ABOUT PSI CHI
Psi Chi is the International Honor Society in Psychology, founded in 1929. Its mission: “recognizing and promoting excellence in the science and application of psychology.” Membership is open to undergraduates, graduate students, faculty, and alumni making the study of psychology one of their major interests and who meet Psi Chi’s minimum qualifications. Psi Chi is a member of the Association of College Honor Societies (ACHS), and is an affiliate of the American Psychological Association (APA) and the Association for Psychological Science (APS). Psi Chi’s sister honor society is Psi Beta, the national honor society in psychology for community and junior colleges.

Psi Chi functions as a federation of chapters located at over 1,130 senior colleges and universities around the world. The Psi Chi Central Office is located in Chattanooga, Tennessee. A Board of Directors, composed of psychology faculty who are Psi Chi members and who are elected by the chapters, guides the affairs of the Organization and sets policy with the approval of the chapters.

Psi Chi membership provides two major opportunities. The first of these is academic recognition to all inductees by the mere fact of membership. The second is the opportunity of each of the Society’s local chapters to nourish and stimulate the professional growth of all members through fellowship and activities designed to augment and enhance the regular curriculum. In addition, the Organization provides programs to help achieve these goals including conventions, research awards and grants competitions, and publication opportunities.

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The twofold purpose of the Psi Chi Journal of Psychological Research is to foster and reward the scholarly efforts of psychology students as well as to provide them with a valuable learning experience. The articles published in the journal represent the work of undergraduates, graduate students, and faculty. To further support authors and enhance journal visibility, articles are now available in the PsycINFO®, EBSCO®, Crossref®, and Google Scholar databases. In 2016, the journal also became open access (i.e., free online to all readers and authors) to broaden the dissemination of research across the psychological science community.

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Help is a multidimensional psychological construct. In our discipline, we often study help-seeking behaviors (White, Clough, & Casey, 2018) and the stigma that can be associated with seeking help (Corrigan, 2005). Individuals experiencing self-stigma have reduced self-esteem and more negative attitudes toward seeking psychological treatment (Tucker et al., 2013). In our society, help providers are often seen as heroic figures, and rightly so. The prototypical figures that come to mind are firefighters, police officers, and emergency medical technicians who dedicate much of their professional lives to the service of others.

Of course, the view of help providers is much broader than those prototypical figures. Psi Chi exists in the realm of worldwide undergraduate and graduate psychology education, so that is the context for my consideration of help and helping behavior, and there are certainly stressors that affect the performance and success of college students (Beiter et al., 2015; Goodwin, Behan, Kelly, McCarthy, & Horgan, 2016). When I consider the structure of education today, the construct of help may be the ultimate tie that binds. Thinking about the 23.1 million undergraduate students and 4,913 degree-granting college and universities (National Center for Education Statistics, 2018) in the United States during 2016–2017, the amount of help available and the amount of help provided to students is most certainly massive. Consider the number of writing centers, math learning centers, counseling centers, career centers, academic advisors, and all the professionals working in these units on college campuses. Every semester I see promotional materials for test anxiety workshops, study skills workshops, offers to organize study groups, tutoring sessions, and so on. The teaching component of a professor's job responsibility is certainly about providing help, and that manifests in more than just an understanding of content or acquisition of skill; that help includes the training and provision of teaching assistants, learning assistants, being available for office hours, and answering countless e-mail inquiries. Scholarly activity can be interpreted as helping our discipline better understand the mind and behavior. If service is considered as providing help to the institution (department, college, university), community, or discipline, then help could be seen as the core of the trinity of a professor's professional life: teaching, scholarship, and service.

Given this premium that higher education places on the provision of help, it is unfortunate that there is stigma associated with help-seeking. As your 2017–2018 President of Psi Chi and with the support of the Psi Chi Board of Directors, I have launched a presidential initiative titled Help Helped Me. The goal of this initiative is to leverage the multiple strengths of Psi Chi to promote the stories of those individuals who have successfully sought help. By telling help-seeking success stories, we aim to improve health (mental, physical, and academic health) on campuses and in communities. When help-seeking is destigmatized, the hope is that unnecessary human suffering is reduced and individuals are empowered to lead more positive and productive lives.

Throughout 2018 Psi Chi will be rolling out resources made available to members and chapters who wish to participate in activities related to the Help Helped Me initiative. Participation in these activities and events will be opt-in, that is, voluntary in nature. Additionally, the strong hope is that chapters that opt in to participate will also include a research component to their Help Helped Me chapter activities, not forgetting the mission of Psi
Chi in “recognizing and promoting excellence in the science and application of psychology.” Perhaps a chapter hosts a movie night followed by a guided discussion, with a goal of increasing awareness of a unit on campus (e.g., advising office, counseling center). With cooperation with those units, perhaps data could be collected to determine if there was increased foot-traffic, e-mail inquiries, or website hits about the services provided by those offices. Chapters might create resource guides for the campus and community, which provide curated lists of help resources available to students, staff, and faculty. A chapter might develop a ‘Help Ambassadors’ program where students, invited by faculty members, visit classrooms and share uplifting stories of help that occur regularly on campus. There are nearly unlimited methods by which Psi Chi chapter members could work together locally to tell and promote help helped me stories—and throughout this initiative we will leverage social media by using the hashtag #help_helpedme.

*Psi Chi Journal* has a 23-year history of publishing research on a wide range of areas including help-seeking behavior and specific support to students interested in conducting empirical research. Below, a short list of related journal articles is included that readers are encouraged to review and share with others in their communities (see Appendix). Perhaps these articles might also inspire ideas for potential types of research related to help-seeking behavior that you could conduct in the near future.

*Psi Chi Journal*’s Editorial Team are eager to welcome additional research articles that could support the purpose of the Help Helped Me Initiative. In February, a special call for submissions will be announced for empirical research related to help-seeking behavior. This promotion will take place via Psi Chi’s magazine, website, digest e-mails, and social media. As always, student and faculty authors are welcome to submit, and submissions will also remain open for all other areas of psychological research. Complete submission guidelines may be viewed at https://www.psichi.org/?page=JN_Submissions.

Imagine a future where the recipients of help were as celebrated as the providers of help. I hope you will join Psi Chi and this initiative to promote how help helps by sharing our success stories, thus encouraging an awareness and atmosphere of positive growth. There are times in everyone’s life where some sort of help would be beneficial. Let us work together to make sure that the positive benefits of help are pervasive in our culture.

**References**


**APPENDIX**

**Recommended Reading**


Psychology as a discipline enjoys a high level of popularity as an undergraduate major and as a foundation for both basic and applied graduate programs. Psychology is one of the top five most common undergraduate degrees in the United States and doubled in popularity during the 2000–10 decade (U.S. Department of Education, 2017). Although estimates vary, research indicates that as many as 45% of psychology undergraduates get graduate degrees in any field including psychology (Carnevale, Cheah, & Hanson, 2015), and of doctoral students in psychology, approximately 64% held psychology undergraduate degrees (National Science Foundation, 2014). Psychology students, advisors, and faculty encounter a large number of career and graduate school options, and resources when delving into the information available about psychology-related futures. In this editorial, I focus on the decision point associated with whether or not students should take the Graduate Record Exam Psychology Subject Test (GRE-PSY). Due to the small number of programs that require the test, I recommend that students only take the exam if it is required by the graduate program(s) to which they are applying. International students and/or students for whom psychology or a closely related field was not their undergraduate major may wish to consider taking the exam as a general indicator of psychological knowledge. However, I would recommend taking the exam as a general indicator of psychological knowledge only if encouraged by a specific graduate program. Furthermore, I hope this editorial and the strikingly low number of programs that require the test decreases the misguided generic advice for graduate-school bound students to take the GRE-PSY as a matter of course. I report on a qualitative analysis of the type and geographic placement of programs that require the GRE-PSY. In the analysis of the more than 1,700 U.S. programs listed in the Graduate Studies in Psychology book, only 17 universities in the United States required the GRE-PSY (representing 24 psychology-related graduate programs). Most of the programs were doctoral, in counseling, clinical, or school psychology and located in the northeastern United States. In addition, none of the 25 Master’s in Social Work programs analyzed required the GRE-PSY.
as a general indicator of psychological knowledge only if encouraged by a specific graduate program. Furthermore, I hope to decrease the misguided generic advice for graduate-school bound students to take the GRE-PSY as a matter of course.

Resources for students preparing for graduate school in psychology often parse the admissions criteria into objective and nonobjective sources (American Psychological Association, 2007; Keith-Spiegel & Wiederman, 2000; Norcross & Sayette, 2014). Objective criteria refer to grade point averages and scores on objective tests such as the GRE. Generally speaking, both the GRE General Test and subject-specific GREs have some level of predictive validity for student success in graduate school (meta-analysis across disciplines; Kuncel, Hezlett, & Ones, 2001). Karazsia and Smith (2016) found that current graduate-level training programs in psychology use GRE scores as one form of broad spectrum indicators of potential success (along with grades and letters of recommendation) in addition to more program specific indicators of goodness-of-fit.

One of the reasons my students and I completed the analysis of the GRE-PSY was the contrast between the data regarding a paucity of graduate schools with the GRE-PSY as an admissions requirement with fairly pervasive advice to students to take the GRE-PSY “as a matter of course.” A decline in the requirement over the past decade is apparent in the numbers of individuals taking the test. Educational Testing Service (ETS, 2016) reports that 14,624 individuals took the GRE-PSY between 2012–15, down from 17,929 (between 2010–13), and 22,683 (between 2006–09). These numbers represent a sizable drop, especially set against the backdrop of the rising number of psychology undergraduate students.

The GRE-PSY is comprised of approximately 200 multiple-choice questions that reflect three content categories: experimental or natural science, social or social science, and general. Questions involve factual information, applications, and research design principles. The test costs $150 and is offered three times a year at authorized test centers. The GRE website (Educational Testing Service, n.d.) provides the following response to the question “Why is it a good idea to take a GRE Subject Test?”

Taking a GRE Subject Test tests your knowledge of specific subjects and can help you stand out from other applicants. If you’re majoring in—or have extensive background in—a specific area, you might want to take a Subject Test in addition to the GRE® revised General Test. Subject Tests are a great way to distinguish yourself. (para. 2)

Despite the data that a relatively low number of programs require the test, reputable sources advise taking the exam as common practice. For instance, the first sentence under the heading “standardized test scores” in APA’s book Getting In reads “most graduate programs in psychology use scores on the general GRE and Psychology GRE as admission criteria” (2007, p. 64). More recently, Dunn and Halonen’s (2016) book The Psychology Major’s Companion: Everything You Need to Know to Get Where You Want to Go also suggests that students applying to psychology-related graduate schools will need to take both the general GRE and the GRE-PSY. Internet searches will yield uncited claims such as the following (Understanding the GRE, n.d.):

...you’ll want to think about taking the Graduate Records Examination (GRE) Psychology Subject Test in order to get into an accredited graduate psychology school program. About half of the available doctoral programs in psychology require you to take the Psychology GRE in order to pursue your degree... (para. 2)

The landscape regarding the requirement has changed, and students appear to be getting advice that is out-of-sync with current admissions’ requirements.

Programs That Require the GRE-PSY

To determine the type and geographic location of psychology-related graduate programs that require the Education Testing Service’s GRE-PSY, two research assistants coded each program listed for the United States in the American Psychological Association’s (2013) Graduate Study in Psychology, 2013 Edition. For universities with multiple programs listed in the book, each program was coded as a separate entry. Coders noted the level of the program (master’s or doctorate), the type of program (e.g., clinical or experimental), and whether the GRE-PSY was required or recommended. The guide listed 1,743 programs. I also corresponded with several program directors regarding their requirement of the GRE-PSY. Finally, given the interest in other clinically oriented programs by
psychology undergraduates, the research team also reviewed the admissions criteria for the top 25 Master’s in Social Work (programs in the United States, as indicated by U.S. News and World Report (2012). Seventeen universities in the United States (representing 24 psychology graduate programs) required the GRE-PSY, representing less than one percent of the total number of programs listed in APA’s Graduate Study in Psychology. Most programs that required the GRE-PSY were at the doctoral level; represent clinical, counseling, or school psychology fields; and were located in the northeastern region of the United States. There was a small number of programs that indicated in their materials that the GRE-PSY is strongly recommended and another small group whose materials recommend the GRE-PSY. None of the Master’s in Social Work programs required the GRE-PSY.

Conclusion

The GRE-PSY is a relatively rare (~1%) requirement for graduate programs in psychology in the United States. Of the small number of universities requiring the GRE-PSY, the majority represented programs in clinical, counseling, or school (CCS) psychology; were doctoral programs; and were most likely to be located in the northeast of the United States. It is not surprising that CCS programs were the predominant field of study of those programs requiring the GRE-PSY given that over half of the doctorates awarded in psychology are currently in the CCS fields (Michalski, Kohout, Wicherski, & Hart, 2011). Although the current study was conducted to be of benefit to students and advisors, the decreasing requirement of the GRE-PSY may also have implications for undergraduate curriculum within departments. Courses such as History & Systems often are taught, in part, to help students prepare for the GRE-PSY. Consequently, departments may wish to reconsider the role and/or timing of specific courses in terms of graduate school preparation.

As indicated at the beginning of this editorial, I recommend that psychology majors take the GRE-PSY only when they are applying to one of a handful of programs for which it is required. Given the rarity of the requirement, the cost of the test, and the preparation involved to take it, students should not be advised casually to take the GRE-PSY. However, students who do not have a degree in psychology might be encouraged to take the test in order to show prowess with psychological content—a recommendation that came from my correspondence with program directors. In contrast to the general notion that most psychology graduate schools require the test and that CCS-bound students should take the test as matter of good preparation, students are better advised to strengthen their dossiers through other methods. Graduate school preparation remains best aided by psychology coursework, strong GPAs, general GRE scores, research experience, and professionally related experiences (American Psychological Association, 2007; Keith-Spiegel & Wiederman, 2000; Norcross & Sayette, 2014).

References


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Sugar, Spice, and Everything Nice: Food Flavors, Attraction, and Romantic Interest
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ABSTRACT. Embodied cognition states that sensory experiences such as temperature, body orientation, or other physical characteristics often influence how the world is thought about, helping to solidify more abstract ideas such as affection, feelings, and morality (Ijzerman & Semin, 2009; Ren, Tan, Arriaga, & Chan, 2015). Because words such as spicy or hot tend to be associated with physical attractiveness, spicy flavor was examined in relation to embodied cognition. Similarly, words such as honey or sweetie tend to be associated with romantic relationships; therefore sweet taste was also examined in relation to embodied cognition. Eighty-seven women were given 1 of 3 snacks: a sweet, spicy, or a nonsweet/nonspicay snack. As they consumed the snack, they were instructed to look at 3 male faces of high, moderate, and low attractiveness and respond to questions asking about the physical attractiveness and their romantic interest in the men. Two 1-way Analyses of Variance were performed separately on the dependent variables of physical attraction and romantic interest. A significant main effect was found for flavor on both dependent variables. Women in the spicy condition rated the men as significantly more attractive than those in the sweet condition, $F(2, 84) = 3.59, p = .03, \eta^2_p = .08$. Additionally, the women in the spicy condition also rated their romantic interest in the men higher than those in the sweet condition $F(2, 84) = 3.84, p = .03, \eta^2_p = .08$. This work extends the breadth and application of embodied cognition, specifically in regard to relationship and attractiveness research.

For human beings, the sweet sensation of sugar seems to be a natural attractant. Even before the tingling taste emits messages from the tongue to the body, the brain releases a sensation of pleasure from the sole idea of the interaction with the sweetness. Although recent work has looked deeper into this relationship between physiological stimuli and associated interpretations, the mind-body problem originated in 17th century philosophy (Pirenne, 1950). Descartes was one of the first to propose a working definition of this relationship in 1637, suggesting that movements made by the body were a direct result of how visual messages interacted with a person’s consciousness, thus activating an assortment of brain structures (Pirenne, 1950). Over centuries, this definition has continued to be altered to more accurately conceptualize how the brain and the body interact with one another to process information.

By 1980, Lakoff and Johnson (1980) proposed a theory addressing this relationship, which has come to be known as embodied cognition. Disgruntled

*Faculty mentor
with the direction of Western philosophy, they began examining how metaphorical language had pervaded into the human brain. They proposed that the language used to discuss the world was so embedded into the human brain that it ultimately shaped the ways in which information could then be perceived, categorized, and processed. This concept was further developed as it translated from philosophy into social sciences, and continues to develop today.

The social sciences utilize a more pragmatic definition of embodied cognition that emphasizes how sensorimotor functions shape cognition (Foglia & Wilson, 2013). This idea can be observed because prior research has revealed a relationship between reading or hearing an action word and the activation of the brain system executing that action (Coello & Fischer, 2016). By the brain deciphering the simple utterance of an action through the same systems it uses to perform the action, the link between sensorimotor functions and cognition becomes apparent. What becomes less obvious, however, is how and when the brain creates these connections. Embodied cognition continues to explore and solidify this relationship.

**Embodied Cognition and Relational Interest**

One application of embodied cognition that researchers have examined is the impact of sensory experiences on relational connections. Zhong and Leonardelli (2008), for example, examined the relationship between the physical experience of temperature and the cognitive label of inclusion. They asked participants to recall situations in which they felt socially included or socially isolated, and then to report the temperature at which they remember the room being. As predicted, participants reported the room at a colder temperature in situations of social isolation than when compared to social inclusion. This was expected because the English language often refers to situations of social isolation as colder (e.g., getting the cold shoulder), whereas social inclusion often is warmer (e.g., warm welcome). This link between physical temperature and relational perceptions was also supported by Fay and Maner (2012). More specifically, participants in their study were either seated on a heated chair or on a neutral chair, and were then asked to fill out surveys assessing their need to belong. Participants seated on the heated chairs, as hypothesized, rated significantly higher on their need to belong than participants in the neutral chairs, reinforcing the relationship between the physical experience of temperature and the intangible, cognitive experience of relational connection.

To further explore the potential romantic application of this experience, Hong and Sun (2012) looked at how a physical temperature would impact a participant’s interest in romance movies. Participants received either a hot or cold cup of tea, then were asked to rate their interest in seeing one of four different genres of movies. Participants consuming the hot tea rated their interest in viewing romance movies significantly greater than those participants consuming the cold tea, likely due to their heightened need to belong. This finding again further supports the claim that physical temperature can impact the need for general social connection as well as romantic connection.

With the relationship found between a physical experience such as temperature, and an abstract concept such as a participant’s need for romantic connection, it becomes plausible that other physical experiences could also impact a participant’s interest in romantic connection. Forest, Kille, Wood, and Stehouwer (2015) addressed this idea by placing participants in either a physically unstable (wobbly desk) or physically stable (standard desk) condition, and asked them to answer a series of relational questions measuring their interest in a potential partner. Participants in the physical instability condition were found to be less interested in the presented profile (because their cognitive processing felt more unstable) than participants in the physical stability condition, continuing to draw attention to the connection between experiencing physical stimuli and cognitive processes. With both temperature and stability shown to have an impact on cognitive processes, it becomes relevant to examine how many other physical experiences may also subtly affect romantic relationship choices.

**Embodied Cognition and Taste**

Another domain of embodied cognition research has examined the effects that taste has on social perception. Lakoff and Johnson (1980) originally proposed that the relationship between words and cognitive functioning is inextricably interwoven. Although words such as sweet, sour, salty, or bitter originated for descriptive purposes of foods, these words have all translated into language often used to describe other human beings. A person who is caring, for example, is often thought of as “sweet,” and a person who is grumpy is often thought of as “sour.” With this shift in language, it becomes plausible that the physical, concrete experience
of taste could shift abstract concepts or opinions regarding human characteristics.

To investigate this idea, Meier, Moeller, Riemer-Peltz, and Robinson (2012) conducted a study investigating the relationship between participants’ sweet taste preferences and their agreeableness. Participants were given a survey in which they rated how much they liked 45 different foods, which were precategorized into one of five food flavors (sweet, bitter, sour, spicy, and salty), as well as a Big Five personality assessment. As predicted, participants with higher agreeableness ratings indicated a higher preference for sweet foods because sweetness is often associated with positive, kind emotional states such as agreeableness. This finding continues to support the study of embodied cognition because sweet taste can be interwoven with an abstract construct such as agreeableness or sweet tendencies.

Ji, Ding, Deng, Ma, and Jiang (2013) further examined the relationship between the sensory experience of taste and abstract opinions, this time looking at a spicy flavor rather than sweet. Participants were first asked to rate how much they liked 12 assorted foods, then were asked to fill out a survey measuring how likely they were to engage in an assortment of behaviors. These behaviors were indicative of trait anger, or a proneness to experiencing anger (Ji et al., 2013). A positive correlation was found such that participants who indicated a greater liking of spicy foods also scored higher on trait anger. This finding is consistent with the usage of words such as spicy or hot to describe feelings of anger (e.g., hot and bothered), which continue to support the proposal that physical experiences shape cognitive perceptions.

**Taste and Relationships**

Not only has taste been shown to affect abstract perceptions, but other physical stimuli have also been associated with cognitive perceptions, specifically in romantic relationships. With these findings, it becomes plausible that utilizing a physical experience such as taste could then have an effect on a participant’s cognitive perceptions, especially in regard to romantic relationships. To examine this, Ren, Tan, Arriaga, and Chan (2015) gathered 142 undergraduate students to complete a study in which they were given either a sweet or nonsweet food and then asked to rate their romantic interest in the profile of a potential partner. Because sweet words such as honey or sweetie are often utilized as terms of endearment in the English language, it was suggested that participants in the sweet condition would be more romantically interested in the profiles than participants in the nonsweet condition. This prediction was supported because participants not currently involved in romantic relationships did show significantly higher levels of romantic interest in the sweet condition compared to participants in the nonsweet condition. This finding suggests that sweet taste can have an influence on romantic interest.

However, sweetness is not the only taste-related experience that could impact relational opinions. Because physical attractiveness is one of the key factors in the origination of a romantic relationship (Miller, 2015), Ren et al. (2015) suggested a further examination of spicy flavor. Although words such as spicy or hot are often used when referring to a romantic partner, many times a person’s physical attractiveness is referred to with words such as spicy or hot. If a sweet taste has been found to elicit higher feelings of romantic interest, a spicy or “hot” flavor may be just as likely to elicit higher feelings of physical attraction.

**Current Study**

The purpose of the current study was to examine the effects that sweet taste and spicy flavor have on women’s ratings of men’s physical attractiveness as well as their romantic interest. Similar to Ren et al. (2015), it was hypothesized that participants in the sweet condition would have higher romantic interest in the men than those in the spicy or nonsweet/nonspicy conditions. Extending Ren et al.’s (2015) study, it was also hypothesized that participants in the spicy condition would rate the attractiveness of the men higher than participants in the sweet or nonsweet/nonspicy conditions.

**Method**

**Participants**

Participants were recruited from a midwestern university via an online SONA system, and from undergraduate psychology courses in which they received extra credit for participating. Participants were also recruited through friends and acquaintances of the researcher in which no extra credit was granted. All participants were also offered entry into a drawing for a $25 Visa gift card upon completion of the experiment. In total, 89 women participated in the study. However, two participants’ data were removed for either not finishing the snack or not filling out the survey correctly. Sixty-six participants identified as White/European American (77%),...
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eight as Asian/Asian American (9%), seven as Black/African American (8%), and five as either Latina, biracial, or other (6%). Participants ranged in age from 16 to 61 years with the mean age being 21.13 years (SD = 5.26). Participants were also asked whether they were currently in a serious romantic relationship: 54 indicated yes (64%), 30 indicated no (34%), and three preferred not to answer (3%). Additionally, the women were asked about their sexual orientation. Two women identified as lesbian (2%), seven women identified as bisexual (8%), and 78 women (90%) identified as heterosexual. Analyses were conducted with women of all sexual orientations as well as solely with heterosexual women. Because both analyses showed similar effect sizes, responses from women of all sexual orientations were included.

Design
This experiment was a between-subjects design. The independent variable was flavor, having three levels: sweet, spicy, or nonsweet/nonspicy (control). The dependent variables were participants’ ratings of the attractiveness of the men, as well as participants’ romantic interest in the men.

Materials
Face stimuli. A computer presentation was devised to present three male faces to each participant. The faces originated from the Chicago Face Database (Ma, Correll, & Wittenbrink, 2015). Because this study took place at a midsize university in the upper Midwest, participants were expected to be predominantly White and in their twenties. For this reason, only White men in their twenties were selected from the database. The original faces were all coded with an attractiveness score as defined by the Chicago Face Database and labeled to correspond with their physical traits (W corresponding with White, M corresponding with Man, and a number following the label which corresponded with a specific face). Of the White men in their twenties, the six most attractive, least attractive, and neutral faces as defined by the Chicago Face Database were selected. These faces were then presented to a group of six undergraduate raters and one professor in an advanced research class. Raters were presented with a sample of each snack, and each rater tasted the snacks in a randomized order. Raters unanimously agreed that the Cheetos® Hot & Spicy crackers were not noticeably spicy, although the Cheez-It® Hot ‘n Spicy and Cheetos Crunchy Cheddar Jalapeño Cheese were spicy enough to notice the spicy flavor, but not so spicy that water was needed directly afterward. However, they agreed that the Chex Mix® Hot & Spicy crackers were not noticeable spicy, although the Cheez-It® Hot ‘n Spicy was so spicy that water was needed directly afterward. Because the unanimous agreement on the selection of the Cheetos® Crunchy Cheddar Jalapeño Cheese created a high level of face validity, this snack was selected for the spicy condition.

Flavor stimuli. Three snacks were selected to create the three levels of the flavor variable: sweet, spicy, and nonsweet/nonspicy (control). Consistent with Ren et al. (2015), the sweet condition consisted of four Oreo Cookies and the nonsweet/nonspicy condition consisted of eight Lay’s® Salt & Vinegar Flavored Potato Chips. Because a spicy condition had not yet been validated, a pilot test was conducted to determine a food sample that would be sufficient for the spicy condition. For this, three assorted spicy snacks (Cheetos® Hot & Spicy crackers, Chex Mix® Hot ‘n Spicy, and Cheetos Crunchy Cheddar Jalapeño Cheese) were selected and presented to a group of six undergraduate raters and one professor in an advanced research course. Raters were presented with a sample of each snack, and each rater tasted the snacks in a randomized order. Raters unanimously agreed that the Cheez-It® Hot & Spicy crackers were not noticeably spicy, although the Cheez-It® Hot ‘n Spicy was so spicy that water was needed directly afterward. However, they agreed that the Cheez-It® Hot & Spicy crackers were not noticeably spicy, although the Cheez-It® Hot ‘n Spicy was so spicy that water was needed directly afterward. Because the unanimous agreement on the selection of the Cheetos® Crunchy Cheddar Jalapeño Cheese created a high level of face validity, this snack was selected for the spicy condition.

Measures
Participant response booklet. A response booklet was developed to record participants’ responses for this study. The first three pages included questions participants answered while viewing the corresponding faces in the computer presentation.

Attraction. The first three questions on each page assessed participants’ attraction toward the photograph of each man by asking, “How attractive do you find this person?” “How handsome do you find this person?” (Elliot & Niesta, 2008), and “How hot/sexy do you find this person?” (Ren et al., 2015). The questions were answered by participants’ responses on a 9-point Likert-type scale from 1 (not at all) to 9 (extremely). This measure was repeated by participants three times, once per face viewed. These individual scores were then averaged together for a
mean attraction score across faces, $\alpha = .90$.

**Romantic interest.** The next three questions on each page assessed participants' romantic interest toward the photograph of the man by asking, "How interested would you be in getting to know this person?", "How interested would you be in going on a date with this person?", (Ren et al., 2015) and "How interested would you be in developing a romantic relationship with this person?" These questions were answered using a 9-point Likert-type scale ranging from 1 (not at all) to 9 (extremely). This measure was also repeated three times, once per face viewed. These scores were averaged together to create a mean romantic interest score across faces, $\alpha = .86$.

**Control measures.** After completing the first three pages assessing attraction and romantic interest in the men, participants then responded to a series of measures to collect data about potential confounds.

**Positive and negative affect.** The Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988) included 10 positive affect words (interested, excited, inspired, strong, enthusiastic, proud, alert, determined, attentive, and active) and 10 negative affect words (distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid) to assess participants’ moods. Participants rated how much they were currently feeling each mental state using a 1 (very slightly or not at all) to 5 (extremely) Likert-type scale. The positive affect score was the average of the 10 positive adjectives, and scores ranged from 1 (low positive affect) to 5 (high positive affect) and had acceptable reliability ($\alpha = .63$). The negative affect score was the average of the 10 negative adjectives, and scores ranged from 1 (low negative affect) to 5 (high negative affect) and also had acceptable reliability ($\alpha = .81$).

**Flavor control.** Next, participants answered a series of questions about their snacks. Participants were asked, “How sweet/spicy/salty/sour/bitter is the snack that you are consuming today?” respectively, derived from Ren et al. (2015). Participants responded on a 7-point Likert-type scale ranging from 1 (not very) to 7 (very) about the snack they were eating (Ren et al., 2015). These questions were employed to ensure the foods were accurately representing the taste they were designed to measure.

**Demographics.** The last page of the Participant Response Booklet included demographics. Participants were asked which race they identified as, how old they are, whether or not they were currently in a serious, committed romantic relationship, and what sexual orientation they identified as.

**Procedure**

Before implementation began, Institutional Review Board approval was granted to conduct this study (1605-2031). Before participants arrived, the researcher rolled a die to determine the conditions that each participant would be placed in. The first roll of the die determined which version of the PowerPoint was presented to the participant. The second roll of the die determined which food condition the participant would be placed in: a 1 or a 4 represented the sweet condition, a 2 or a 5 represented the spicy condition, and a 3 or a 6 represented the control condition. In total, 31 participants were included in the sweet condition, 31 were included in the spicy condition, and 25 were included in the control condition.

When participants arrived, they were ushered to an individual experiment room and given a consent form. After consenting to participate, participants were given a 50 ML glass of distilled water to clear their palette as the researcher prepared their snack in a separate room. Participants were then handed their participant response booklet and their snack and verbally instructed to follow the instructions in their booklet for when to advance the slide and when to turn the booklet pages. They were also reminded to eat the food throughout the entirety of the experiment and that the experiment would last about 10 to 15 minutes. The researcher then left the room and allowed participants to complete the survey at their own pace. Participants were instructed to find the researcher upon completion.

After the survey was completed, participants were then debriefed about the study and offered the opportunity to enter their name into a gift card drawing. Participants who chose to enter the drawing then entered their name and e-mail on a slip of paper placed in a jar separate from other research materials. All participants afterward were thanked for their time and left the lab; the experiment took a total of about 15 minutes.

**Results**

**Manipulation Checks**

To ensure that the food tastes were being accurately manipulated, participants rated the foods they were given on an assortment of different flavors (sweet, spicy, bitter, sour, and salty). The manipulation check revealed significant differences in how sweet the foods were rated, $F(2, 84) = 163.24, p < .001, \eta^2 = .80$. Three Tukey’s HSD post-hoc tests were performed with a priori alpha level of .05. Participants in the sweet condition ($M = 5.71$,...
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Descriptive Statistics

Correlations were conducted to examine relationships between variables and to identify potential covariates. The analysis revealed a strong significant positive correlation between attraction and romantic interest \(r = .77\) because people are often more romantically interested in those to whom they are physically attracted to (Miller, 2015). Another significant positive correlation was found between positive affect and romantic interest \(r = .25\). This finding was also expected because the broaden and build theory of interpersonal relationships suggests that people in positive moods often are more inclined to continue developing their social connections (Fredrickson & Branigan, 2005). Additionally, significant but moderate negative correlations were revealed between participant race and attraction ratings \(r = -.27\) as well as race and romantic interest ratings \(r = -.22\), indicating that participants of color were less physically attracted to and romantically interested in the men presented than White participants. This finding is consistent with the literature because people have often been found to have higher physical attraction toward others of their same race than cross-racially (Man, Rojahn, Chrosniak, & Sanford, 2006). Finally, a significant but moderate correlation was found between race and relationship status, suggesting that people of color were less likely to be in a relationship than White people \(r = .34\). Because positive affect and participant race were associated with the dependent variables, preliminary analyses were conducted including these variables as covariates. Results did not change when including covariates in the Analysis of Variance (ANOVA) versus not, so in favor of parsimony, they were omitted from the analyses presented below. See Table 1 for correlations and descriptive statistics.

Attractiveness Ratings

It was predicted that women in the spicy food condition would rate the men as more attractive than participants in the sweet condition or the control condition. To test this hypothesis, a one-way ANOVA was performed, \(F(2, 84) = 3.59, p = .03, \eta^2 = .08\), indicating that the average attractiveness rating of the men varied significantly across the three flavor conditions. To further explore this...

### TABLE 1

Descriptive Statistics and Correlations Between Attractiveness Ratings, Romantic Interest, and Demographic Variables

<table>
<thead>
<tr>
<th></th>
<th>M (SD) or modal response</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attractiveness</td>
<td>3.99 (1.25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Romantic interest</td>
<td>3.58 (1.32)</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Age</td>
<td>21.13 (5.26)</td>
<td>-.04</td>
<td>-.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Race</td>
<td>77% white</td>
<td>-.27</td>
<td>-.22</td>
<td>-.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Relationship status</td>
<td>64% in relationship</td>
<td>-.04</td>
<td>.15</td>
<td>-.11</td>
<td>.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sexual orientation</td>
<td>90% heterosexual</td>
<td>.12</td>
<td>.15</td>
<td>-.15</td>
<td>-.01</td>
<td>-.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Positive affect</td>
<td>2.68 (0.83)</td>
<td>.18</td>
<td>.25</td>
<td>-.19</td>
<td>-.14</td>
<td>-.04</td>
<td>.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Negative affect</td>
<td>1.46 (0.51)</td>
<td>-.08</td>
<td>-.11</td>
<td>.06</td>
<td>.12</td>
<td>-.01</td>
<td>.13</td>
<td>-.01</td>
<td></td>
</tr>
</tbody>
</table>

Note: \(p < .05\).
main effect, three Tukey’s HSD tests were performed with an a priori alpha level of .05. As anticipated, there was a significant difference between ratings of physical attractiveness in the spicy condition \((M = 4.46, SD = 1.3)\) compared to the sweet condition \((M = 3.68, SD = 1.23)\), \(p = .04\). However, there was not a significant difference between those ratings in the spicy condition and the control condition \((M = 3.80, SD = 1.07)\), \(p = .12\). There was also no significant difference between the ratings in the sweet condition and the control condition, \(p = .93\). These findings suggest that spicy flavor was associated with significantly higher ratings of physical attractiveness than sweet taste.

**Romantic Interest Ratings**

It was predicted that participants in the sweet condition would be more romantically interested in the men than participants in the spicy condition or the control condition. A one-way ANOVA revealed that there were significant differences in romantic interest by flavor condition. \(F(2, 84) = 3.84, p = .03, \eta^2 = .08\). Three Tukey’s HSD tests were performed with a priori alpha level of .05 to explore differences between conditions. Surprisingly, romantic interest in the spicy condition \((M = 4.08, SD = 1.34)\) was significantly higher than in the sweet condition \((M = 3.20, SD = 1.23)\), \(p = .02\), even though it was hypothesized that sweet taste would be associated with higher levels of romantic interest. There was not, however, a significant difference in romantic interest between the sweet condition and the control condition \((M = 3.45, SD = 1.24)\), \(p = .75\), nor between those in the spicy condition and the control condition, \(p = .17\). These findings suggest that spicy flavor may be associated with more romantic interest than sweet taste.

**Discussion**

**Attractiveness**

The purpose of this study was to examine how flavor could further be applied to the embodied cognition literature. Because no study had yet examined the relationship between spicy flavor and perceived physical attractiveness, it was hypothesized that a spicy food would elicit higher attractiveness ratings because the words **hot** and **spicy** are often associated with physical attractiveness. As predicted, a main effect was found such that participants in the spicy condition rated men as significantly more attractive than participants in the sweet condition. This finding suggests that the presence of the hot and spicy flavor affected those participants’ cognitions.

However, there was no significant difference found between participants in the spicy condition and the control condition. This finding is likely due to the flavor chosen for the control condition. Consistent with Ren et al. (2015), four Oreo Cookies were used for the sweet condition and eight Lay’s® Salt & Vinegar Flavored Potato Chips were used as the control. Although a salt and vinegar flavor does taste dramatically different from a sweet or a spicy flavor, it is not flavorless. Because of this, participants in the control condition might have responded differently according to their personal preferences (e.g., strong aversion to the flavor or a strong liking of the flavor), which might have reduced the control’s overall reliability. A difference between the spicy and control conditions might have been observed had a more bland control condition such as plain Lay’s® Potato Chips or saltine crackers been used.

Even without a significant difference between the spicy and control conditions, the significant difference found between the spicy and sweet conditions still suggests that flavor contributes to embodied cognition. With women rating men as significantly more attractive when consuming a spicy flavor than compared to a sweet taste, Ren et al.’s (2015) suggestion that spicy flavor could have an influence on physical attraction was supported. This finding strengthens the embodied cognition literature because the relationship between a sensory experience of spicy or hot flavor is connected to the abstract perceptions of hot physical attractiveness.

**Romantic Interest**

Because it had previously been found that sweet taste was associated with higher romantic interest in a potential partner (Ren et al., 2015), this study attempted to replicate and extend the literature by examining the effect spicy flavors would have on romantic interest levels. It was anticipated that a sweet taste would elevate participants’ romantic interest due to the sweet nature of their food influencing their cognition. Instead, it was found that the spicy flavor significantly elevated feelings of romantic interest when compared to the sweet taste. Additionally, no significant difference was found between the spicy condition and the control condition. This again was likely due to the potent nature of the control condition, as aforementioned.

Although the finding that a spicy or hot flavor elicited higher feelings of romantic interest is inconsistent with much of the previous taste literature, it is supported by previous studies on physical
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Past literature has revealed that the sensory experiences, in this case taste, can influence a range of cognitive perceptions. In this study, a spicy flavor was found to increase potential romantic interest as well as physical attractiveness ratings. This relationship between spicy flavor and romantic interest supports the suggestion that the sensory experiences, in this case taste, can influence cognitive perceptions regarding potential romantic relationships. Additionally, the finding that a spicy flavor impacted both romantic interest as well as physical attractiveness ratings suggests that flavor can influence a range of cognitive perceptions.

However, it is worth noting that significantly lower scores in both romantic interest and physical attraction ratings were observed in the sweet condition compared to the spicy. Although literature does partially support the association between a spicy flavor and high levels of interpersonal interest, the absence of an effect for sweet taste should be investigated further. All previous literature has found a relationship between sweet foods and higher interest in interpersonal connection, but this study presents no such effects. Further investigation into the difference between spicy and sweet flavors could help to further clarify how the brain utilizes taste experiences to alter cognitive perceptions.

**General Discussion**

The connection between spicy flavor and ratings of both romantic interest as well as physical attraction suggests that embodied cognition can be applicable when examining both flavor and romantic perceptions. In this study, a spicy flavor was found to increase potential romantic interest as well as physical attractiveness ratings. This relationship between spicy flavor and romantic interest supports the suggestion that the sensory experiences, in this case taste, can influence cognitive perceptions regarding potential romantic relationships. Additionally, the finding that a spicy flavor impacted both romantic interest as well as physical attractiveness ratings suggests that flavor can influence a range of cognitive perceptions.

However, it is worth noting that significantly lower scores in both romantic interest and physical attraction ratings were observed in the sweet condition compared to the spicy. Although literature does partially support the association between a spicy flavor and high levels of interpersonal interest, the absence of an effect for sweet taste should be investigated further. All previous literature has found a relationship between sweet foods and higher interest in interpersonal connection, but this study presents no such effects. Further investigation into the difference between spicy and sweet flavors could help to further clarify how the brain utilizes taste experiences to alter cognitive perceptions.

**Limitations.** Although this study does support the influence of embodied cognition on romantic interest and perceived attractiveness, participants' arousal levels might have played a role in their responses as well. Past literature has revealed that a spicy flavor such as red pepper increases physiological processes such as body temperature (Ludy & Mattes, 2011). Because a spicy snack was consumed in this study, physiological processing was likely altered, which could increase arousal levels. In situations of heightened arousal, people often misattribute one stimulus as the cause for arousal rather than another stimulus. Because misattribution of arousal has been linked with an increase in perceived attractiveness (Dutton & Aron, 1974), the higher attractiveness scores in the spicy condition might have been subtly influenced by heightened arousal from eating a spicy food, not the hot nature of the flavor. Future research could add a physiological measure to the procedure such as measuring a participant’s heartbeat, skin conductance levels, or even by utilizing a facial EMG to further disentangle the effects of arousal from the effects of spiciness.

Additionally, it is important to note that 62% of participants indicated that they were currently in a serious, committed romantic relationship. There was no prompt during the experiment instructing participants to answer the questions if they were single, so their commitment to their significant other might have influenced how they rated the men in the study. Participants in serious, committed, romantic relationships might have indicated lower romantic interest in a potential partner because they theoretically had no need to pursue other romantic interests. Had participants in a relationship been given a prompt to imagine that they were single, or had only single participants been recruited for the study, a stronger effect of flavor might have been observed.

**Future directions.** Because this study took place at a midwestern university, it would be of interest to replicate this study in a different region of the United States. Taste norms can vary dramatically from region to region, so the effects of spicy flavor may present differently in regions that often utilize more potent spices in their cuisine. Additionally, examining non-English speaking populations could
also be of interest. Because the English language often utilizes words such as spicy or hot to describe both food flavors and physical attractiveness levels, the embodiment of the spicy flavor can contribute to cognitive processing to view men as more attractive. In non-English speaking populations that do not use variations of a hot or spicy food term to describe physical attractiveness, the effects of spicy food would likely not affect the cognitive processing of attractiveness levels.

Because sweet taste and spicy flavor have both been shown to impact cognitive processing in relational contexts, other applications of sensory stimuli should also be explored. Embodying the experience of a bitter or sour taste may result in decreased relational interest because bitter and sour people are often associated with negative affect, in contrast to what is typically sought after in relationships (Miller, 2015). Additionally, exploring other sensory stimuli such as smell could further enhance the application of embodied cognition. Although much work has already looked at the effects of subliminal scent on initial physical attraction (Miller, 2015), not much work has focused on an overt experience of scent such as ripe jalapeños or fresh-baked cookies. Using specific, targeted scents such as these and then assessing participants’ romantic interest levels or physical attraction would likely yield similar results because the scent of the spicy flavor or sweet taste could become embodied into cognition.

**Conclusions.** Because the current study found that spicy flavors elicited higher levels of physical attraction as well as romantic interest, it was supported that words such as spicy and hot can become embodied into a person’s cognitive processing of relationships. Additionally, the observation of sweet taste resulting in significantly lower romantic interest ratings than spicy flavor should be of further investigation. Ultimately, the effects of embodied cognition on relational processes such as romantic interest or physical attraction can help to further understand the ways in which the physical world impacts cognitive functioning every day. Thus, because a spicy, savory flavor sends sensations through the body, examining the subtle shifts in sensorimotor processing can ultimately help to further understand how relationships are derived, developed, and deepened.

**References**


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Examining Relations Between Bicultural Efficacy, the Big Five Personality Traits, and Psychological Well-Being in Bicultural College Students

Shadab Fatima Hussain
Stanford University

ABSTRACT. Bicultural efficacy—the belief people have in confidently navigating between their cultures of origin and mainstream culture—can contribute to the positive development of bicultural individuals through strengthening support systems and protecting against risk factors. The current study aimed to examine which personality traits were correlated with bicultural efficacy and how bicultural efficacy can affect psychological outcomes in emerging adults in college. Self-identified bicultural college students (N = 152, 71% women) between the ages of 18–25 (M = 19.9) completed an online survey assessing personality, bicultural efficacy, and psychological outcomes (depressive, anxiety, and stress symptoms). Correlational analysis revealed that the Big Five Inventory personality traits of agreeableness (r = .27, p = .01) and neuroticism (r = -.25, p = .03) were significantly related to bicultural efficacy. Hierarchical regression analysis showed that, (a) controlling for personality traits, bicultural efficacy was positively associated with psychological well-being (η² = .03, b = .12, p = .04) and (b) bicultural efficacy reduced the negative effects of depressive and anxiety symptoms on well-being (η² = .12, b = .26, p < .001). Bicultural efficacy can be a protective factor by decreasing symptoms of psychological maladjustment in college students. Implications of these findings in relation to parenting, teaching, and mental health counseling are discussed.
Few studies have examined dispositional factors such as personality that contribute to the identity development of bicultural college students, and how bicultural efficacy specifically relates to well-being. Thus, the aims of the current study were to examine personality correlates of bicultural efficacy, and to understand how bicultural efficacy relates to bicultural college students’ psychological well-being.

Bicultural College Students
By the year 2035, half of the children in the United States are projected to be part of immigrant families (Hernandez, 2004). Additionally, the racial identification of college students in the United States is becoming increasingly diverse. According to the National Center for Education Statistics (2015), the percentage of students identifying as American Indian/Alaskan Native, Asian/Pacific Islander, Black, or Hispanic continuously increased from 1976 to 2012. Additionally, previous research has revealed that college students from nondominant ethnic/racial groups implicitly identify with more than one culture, suggesting that most U.S. college students hold a bicultural or multicultural identity (Brannon, Markus, & Taylor, 2015; Devos, 2006; Kirmayer, 2006; Park et al., 2013).

Previous research has revealed that bicultural college students face unique types of stress compared to their monocultural peers. Along with general stressors faced by most college students including academic demands, relationship issues, and financial problems, bicultural college students additionally experience stress associated with their racial-ethnic minority status, called minority stress (Smedley, Myers, & Harrell, 1993). Some of these stressors include racial discrimination, a lowered sense of belongingness, and difficulty maintaining relationships with family at home. Furthermore, these stressors can contribute to maladaptive behaviors. For example, Park et al. (2013) revealed a positive association between perceived discrimination and antisocial behavior in Asian American college students. Additionally, in a study examining Latino/a college students, Arbona and Jimenez (2014) found that, along with reports of general college stress, amount of minority stress significantly contributed to depression. These results reveal that bicultural college students face unique stressors that contribute to internalizing and externalizing symptoms of behavior. Thus, the majority of U.S. college students identify as bicultural and these students experience unique types of stress related to their bicultural status. Consequently, it is important to understand factors that can contribute to their psychological well-being such as bicultural efficacy.

Bicultural Efficacy
Biculturalism theory focuses on both individual (e.g., personality, behavior) and contextual (e.g., social structures, environment) aspects of bicultural identity development (LaFromboise, Coleman, & Gerton, 1993). According to this theory, bicultural efficacy is a particularly important factor in the psychological well-being of bicultural college students who frequently transition between and operate in two cultures (LaFromboise et al., 1993). It consists of six dimensions: social groundedness (having a well-developed social system); verbal and nonverbal communication ability; positive attitudes toward both cultures; knowledge of cultural history, institutions, and practices; role repertoire (ability to exhibit culturally appropriate behaviors); and bicultural beliefs regarding identifying with both cultures without compromising one’s cultural identity. Previous research examining behaviors of adolescents and college students indicative of bicultural efficacy (e.g., confidence in speaking English, ability to respond appropriately in different situations) revealed that these behaviors are important in developing one’s bicultural identity (Benet-Martínez & Haritatos, 2005; Buriel, Perez de Ment, Chavez, & Moran, 1998).

Although the construct of bicultural efficacy was proposed in the early 1990s, it was only in the late 2000s after the development of the Bicultural Self-Efficacy Scale that it began being measured (David, Okazaki, & Saw, 2009). Their scale was used in a few studies examining the relation between bicultural efficacy and psychological adjustment variables. Results from some of the studies reveal that high bicultural efficacy can help protect bicultural individuals against rejection from one or both of their cultural groups. It has also been found to be related to mental health outcomes in bicultural college students such as psychological well-being, anxiety, depression, and life satisfaction (David et al., 2009; Miller et al., 2011). In a study of Asian American, Latino/a American, and African American students attending a predominantly White Midwest university, Wei et al. (2010) found that...
that bicultural efficacy buffered the effect of minority stress on depressive symptoms. Altogether, these studies point to the potential coping effect of bicultural efficacy in response to minority stress, and support biculturalism theory’s emphasis on the importance of bicultural efficacy for well-being.

**Biculturalism and Personality**

Clearly, bicultural efficacy is important to the psychological well-being of individuals who identify with two different cultures. However, more information is needed in order to further understand individual antecedents that may contribute to bicultural efficacy, particularly personality. In describing their integrative framework of personality, McAdams and Pals (2006) asserted the relevance of examining personality traits—particularly the Big Five factors (openness, conscientiousness, extraversion, agreeableness, and neuroticism)—in relation to examining variations in human functioning such as psychological well-being (Grant, Langan-Fox, & Anglim, 2009). The Big Five personality characteristics have been validated crossculturally (John & Srivastava, 1999), been used in previous assessments relating personality and well-being (Steel, Schmidt, & Shultz, 2008), and used in previous studies with bicultural college students (Worrell & Cross, 2004). According to McAdams and Pals (2006), personality traits are dispositional traits that can impact characteristic adaptations: how individuals think, behave, and adapt to certain situations. Additionally, culture also plays a role in the relation between dispositional traits because the goals and values of a particular culture may influence characteristic adaptations. Thus, it is useful to understand how the two cultures of bicultural individuals may play a role in their personality, and which personality traits are more pronounced in this population.

However, current research has not yet examined the relation between personality traits and bicultural efficacy. Because bicultural efficacy is also a behavioral variable, personality may play a role in how well a bicultural individual develops efficacy. Examining personality correlates of bicultural efficacy will provide an in-depth understanding of the dispositional factors of bicultural efficacy, and will help develop insight into how individuals with bicultural efficacy respond to, interpret, and evaluate their experiences.

**Present Study**

Overall, past research has demonstrated the multidimensional aspects of biculturalism and how it can vary due to an individual’s different psychological experiences, personality characteristics, and contextual pressures (Benet-Martínez & Haritatos, 2005; LaFromboise et al., 1993). In the case of bicultural college students, bicultural efficacy is related to mental health outcomes such as psychological well-being, life satisfaction, depression, and anxiety (David et al., 2009; Wei et al., 2010). Thus, it is an important construct to consider in examining the positive development of bicultural college students. Drawing on biculturalism theory (LaFromboise et al., 1993) and the Big Five principles of personality (McAdams & Pals, 2006), the current study had the following aims: (a) to examine personality correlates of bicultural efficacy, and (b) to examine how bicultural efficacy predicts psychological symptoms of depression, anxiety, and stress, along with well-being. Results will help determine how personality contributes to bicultural efficacy, and provide additional support for the potential benefit of bicultural efficacy to bicultural college students’ psychological adjustment.

**Hypotheses.** Based on the review of the literature, the following hypotheses were constructed for the two research aims. First, bicultural efficacy was expected to be correlated with neuroticism and openness to experiences. Additionally, agreeableness was anticipated to be correlated with bicultural efficacy because agreeableness involves being cooperative, considerate, and trustful, which are three traits relevant to the social groundedness dimension of bicultural efficacy (David et al., 2009). Second, controlling for personality characteristics, bicultural efficacy was expected to be positively associated with psychological well-being. Third, in the relationship between internalizing symptoms (i.e., depression, anxiety, stress) and psychological well-being, bicultural efficacy was expected to reduce the negative effect of internalizing symptoms on psychological well-being.

**Method**

**Participants**

Undergraduate students between the ages of 18 and 25 who self-identified as bicultural were recruited from a medium-sized, private university in the United States. Data reported by the university state that, in fall 2015, enrollment by ethnic group for all undergraduate students was 43% European American, 23% Asian, 8% African American, 8% International, 7% Mexican/Chicano, 6% Other Hispanic, 2% Native American, 2% Other/declined to state, and 1% Native Hawaiian/Pacific Islander.
Regarding sex, 47% women and 53% men were enrolled. In total, 225 students responded to the survey. The criterion for inclusion in this study was an affirmative answer to the following question:

Do you consider yourself to be bicultural or multicultural? Bicultural in the context in this survey means that you consider yourself part of two different cultures (e.g., At home, your family practices traditions and actions that are part of Hispanic culture, while at school you are part of the mainstream American culture). Multicultural means that you consider yourself part of more than two cultures.

Students were provided another example of a bicultural identity (Vietnamese-American) when asked to further describe which cultures make up their identity (Vietnamese and American). The number of self-identified bicultural and multicultural students was 165. After data cleaning and removing outliers using the median absolute deviation method (Leys, Ley, Klein, Bernard, & Licata, 2013), responses from 152 students were analyzed (96% response rate, AAPOR RR2). Participants’ mean age was 19.96 (SD = 1.51). A total of 32 majors were represented in the sample. The top seven represented majors were undeclared (20%), human biology (13%), biology (7%), computer science (6%), symbolic systems (5%), international relations (4%), and political science (4%). Students at this university typically declare a major during the middle of their sophomore year, which explains the high percentage of “undeclared” students in the sample. In the sample, 53 students (35%) were enrolled as first-year students, 35 (23%) as sophomores, 29 (19%) as juniors, and 35 (23%) as seniors.

Regarding sex, 107 students (70%) identified as women and 45 (30%) identified as men. This study collected information about ethnic group identification through a categorical method currently used by the U.S. Census. The most represented ethnic group of students in the sample was Asian at 74 (49%), followed by 31 Hispanic/Latino students (20%), 22 students who identified as “Other” (14%), eight American Indian/Alaskan Native students (5%), eight Black students (5%), five White students (3%), and one Native Hawaiian/Pacific Islander student (1%). Because Asian students are the largest represented minority group in this university setting (23%), the larger amount of Asian students in this sample positively correlates with the university population. Three students (2%) preferred not to report their ethnicity. Of the Asian students, Korean and Chinese were the most represented ethnic groups.

**Measures**

All measures in the study were distributed in English. For full versions of previously developed scales, see the respective citation in the scale description.

**Demographic information.** Participants provided descriptive information including their age, sex, class standing, international student status, ethnic group affiliation, bicultural status, mother’s educational level, and father’s educational level. This information was obtained in order to control for extraneous effects of demographic variables.

**Bicultural efficacy.** The Bicultural Self-Efficacy Scale (David et al., 2009) is a 26-item questionnaire measuring bicultural efficacy. The items are grouped into six main dimensions: social groundedness, communication ability, positive attitude, knowledge, role repertoire, and bicultural beliefs. Participants evaluated their feelings about a certain statement on a Likert-type scale ranging from 1 (strongly disagree) to 9 (strongly agree). Sample items included: “An individual can alter his or her behavior to fit a certain context” (role repertoire), “I have generally positive feelings about both my heritage culture and mainstream American culture” (positive attitude), and “I can count on mainstream Americans and people from the same heritage culture as myself” (social groundedness). The Bicultural Self-Efficacy Scale has been found to be reliable in previous research with ethnic minority college students (David et al., 2009; Wei et al., 2010). The Cronbach’s α coefficient for the scale was .91.

**Big Five Inventory.** The Big Five Inventory (BFI; John & Srivastava, 1999) is a 44-item self-report survey used to measure the following personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Participants selected how much a certain characteristic applied to them on a scale from 1 (disagree strongly) to 5 (agree strongly). Sample items included: “is talkative,” “tends to be disorganized,” and “has an active imagination.” The BFI has been found to be reliable in research with ethnic minority college students (Benet-Martínez & Haritatos, 2005; Worrell & Cross, 2004). The Cronbach’s α coefficients for each subscale in the current study were .75 (openness), .67 (conscientiousness), .74 (extraversion), .73 (agreeableness), and .71 (neuroticism).
Psychological well-being. The 18-item version of the Ryff Well-Being Scale (Ryff, 1989) was used to measure psychological well-being, a multifaceted concept that includes positive feelings of autonomy, self-acceptance, personal growth, personal relationships, environmental mastery, and purpose in life. Participants rated how much they agreed with a particular statement on a scale from 1 (strongly disagree) to 7 (strongly agree). Example items included: “I am quite good at mastering the many responsibilities of my daily life,” and “The demands of everyday life often get me down” (reverse-coded). Only the total well-being score was used in the analysis for this study, as recommended by Springer and Hauser (2006). This scale has been found to be reliable in research with college students, particularly bicultural college students. The survey was distributed online in English through Qualtrics® and was estimated to take 20 to 25 minutes to complete. The first page of the survey contained the informed consent. Participants confirmed that they were between the ages of 18 and 25 and understanding of the informed consent. Participants were not required to answer every survey question and were reminded of the anonymity of their responses on the top of each page of the survey. To control for order effects, survey questions within each page were randomly presented for each participant. After completing the survey, participants were led to a final page with instructions on how to enter a raffle to win a gift card. Four gift cards of amounts ranging from $25 to $100 were distributed to lottery winners after survey collection concluded.

Results

Preliminary Analysis

All data analysis procedures in this study were conducted using Stata 14® software. Analysis for testing significant effects of demographic variables on bicultural efficacy and psychological well-being was conducted using multiple regression analysis. Pearson correlational analysis was conducted to examine correlations between all variables in the study. Missing data were found to be missing completely at random (MCAR) using the mcartest command in Stata®. $X^2(124) = 125.06, p = .47$ (Li, 2013). Then, missing data were accounted for through the MCMC iterative method of multivariate imputation (Schafer, 1997). Five iterations of the data were created and averaged together for data analysis procedures. All variables tested in the study were standardized in order to reduce multicollinearity. Before running statistical
tests for each research aim, analyses of four regression assumptions were conducted, as recommended by Osborne and Waters (2002). Variables in the study were found to follow the assumptions of linearity, measurement reliability, homoscedasticity, and normality, thus allowing them to be used in regression analyses to reduce over- and underestimation effects.

A multiple regression analysis was conducted to determine if certain demographic variables covaried with psychological well-being, the primary dependent variable in the study analysis revealed that there were no significant effects of age, sex, class standing, parent education, or ethnic group. $R^2 = .03, F(5,146) = 0.93, p = .86$. Due to the nonsignificance of these variables, they were not included in further analysis of psychological well-being. A correlational analysis was conducted for descriptive purposes. Unstandardized means, standard deviations, and correlations for each variable are located in Table 1.

**Research Aim 1**
To test the first research aim, Pearson correlational analysis was conducted to examine relations between personality, bicultural efficacy, and psychological adjustment. It was hypothesized that bicultural efficacy would correlate with agreeable characteristics, bicultural efficacy had a significant positive main effect on psychological well-being (see Table 2 for hierarchical regression results). There was also a significant increase of the model fit to predict psychological well-being, $R^2 = .01, F(1,148) = 8.03, p = .005$. In the first step of analysis, the model accounted for 48% of the variance. Additionally, conscientiousness ($b = .32, p < .001$), extraversion ($b = .16, p = .01$), agreeableness ($b = .16, p = .02$), and neuroticism ($b = -.31, p < .001$) had a significant main effect on psychological well-being. In the second step of analysis, the model accounted for 49% of the variance. Thus, while controlling for personality characteristics, bicultural efficacy had a significant positive effect on psychological well-being ($b = .12, p = .04$). Additionally, after controlling for bicultural efficacy, the effects of extraversion, agreeableness, and neuroticism were slightly lowered. These results suggest that, for bicultural individuals, bicultural efficacy may be a mediating factor between certain personality characteristics, bicultural efficacy may be a mediating factor between certain personality characteristics.

<p>| Table 1: Means, Standard Deviations, and Bonferroni-Adjusted Correlations Among Variables |</p>
<table>
<thead>
<tr>
<th>Variable Name</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bicultural Efficacy</td>
<td>172.59</td>
<td>25.92</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Well-Being</td>
<td>89.70</td>
<td>14.16</td>
<td>.37</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Depression</td>
<td>12.62</td>
<td>4.70</td>
<td>-.16</td>
<td>-.63</td>
<td>--</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Anxiety</td>
<td>11.35</td>
<td>3.84</td>
<td>-.12</td>
<td>-.58</td>
<td>.75</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Stress</td>
<td>13.78</td>
<td>4.05</td>
<td>-.10</td>
<td>-.51</td>
<td>.73</td>
<td>.81</td>
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<tr>
<td>6. Openness</td>
<td>37.86</td>
<td>5.49</td>
<td>.09</td>
<td>.17</td>
<td>.02</td>
<td>-.01</td>
<td>-.03</td>
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</tr>
<tr>
<td>7. Conscientiousness</td>
<td>32.82</td>
<td>5.26</td>
<td>.20</td>
<td>-.51</td>
<td>-.40</td>
<td>-.32</td>
<td>-.29</td>
<td>-.01</td>
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<td></td>
</tr>
<tr>
<td>8. Agreeableness</td>
<td>33.53</td>
<td>4.37</td>
<td>.27</td>
<td>.40</td>
<td>-.32</td>
<td>-.26</td>
<td>-.31</td>
<td>.12</td>
<td>.43</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Extraversion</td>
<td>24.21</td>
<td>6.24</td>
<td>.18</td>
<td>.32</td>
<td>-.20</td>
<td>-.13</td>
<td>-.14</td>
<td>.35</td>
<td>.02</td>
<td>.21</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>10. Neuroticism</td>
<td>23.51</td>
<td>4.99</td>
<td>-.26</td>
<td>-.55</td>
<td>-.56</td>
<td>.51</td>
<td>.64</td>
<td>-.09</td>
<td>-.32</td>
<td>-.28</td>
<td>-.34</td>
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</tr>
</tbody>
</table>

Note. N = 152. Higher amounts indicate higher scores for the variable. Variables were measured using the following scales: (1) Bicultural Self Efficacy Scale, (2) Ryff Well-Being Scale, (3–5) Depression, Anxiety, Stress Scale, and (6–10) Big Five Inventory. Means were calculated using sum scores. **$p < .05$**. ***$p < .01$***. ****$p < .001$****.
personality characteristics and psychological well-being. Examination of this relationship is presented in post-hoc analysis.

Next, the effect of bicultural efficacy on well-being controlling for internalizing symptoms was examined (see Table 3). It was hypothesized that bicultural efficacy would reduce the negative effects of internalizing symptoms on well-being. The subscales of the DASS-21 were regressed onto psychological well-being in the first step. In the second step, bicultural efficacy was added to the model. F tests were used to compare model significance. There was a significant increase of the model fit to predict well-being, $R^2 = .07$, $F(1,150) = 31.57, p < .001$. As expected, the first model was significant and explained 42% of the variance. Both depression ($b = -.47, p < .001$) and anxiety ($b = -.23, p = .04$) had a significant main effect on psychological well-being, although the effect of stress was nonsignificant. In the next step of analysis, bicultural efficacy was added to the model. This model explained 49% of the variance, and better predicted psychological well-being. Although the significant effects of both depression ($b = -.43, p = .02$) and anxiety ($b = -.23, p = .02$) remained, the addition of bicultural efficacy decreased their effects and had a significant positive effect on well-being ($b = .26, p < .001$). Thus, bicultural efficacy reduced the negative influence of internalizing symptoms on psychological well-being through its significant positive association with well-being.

### Exploratory Analysis—Bicultural Efficacy as Mediator

Although not part of the original research aims, based on examination of the correlational analyses from Research Aim 1 and the reduced effects of agreeableness and neuroticism from the hierarchical regression models in Research Aim 2, the mediating effect of bicultural efficacy and the Big Five personality traits was conducted. Although the relationship between personality traits and well-being has been supported in past studies (Diener & Lucas, 1999; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997), recent research proposes that these relations may be explained by variables such as coping and temperament, which influence how individuals evaluate their emotions (Carver & Connor-Smith, 2010; Steel et al., 2008). Thus, bicultural efficacy could be an individual-difference variable related to coping that could mediate the relation between personality and well-being.

Sobel-Goodman mediation analysis was used to test this mediation for agreeableness and neuroticism, the two personality traits that were found to be significantly related to bicultural efficacy in Research Aim 1. First, the direct effect of the personality characteristic on psychological well-being was examined, followed by the direct effect of the personality characteristic on bicultural efficacy. Next, bicultural efficacy was regressed onto psychological well-being. Finally, a multiple regression analysis examining the effects of both the personality characteristic and bicultural efficacy on well-being was completed. Agreeableness was related to bicultural efficacy, $b = .28, p < .001$, and

### TABLE 2

Summary of Hierarchical Regression Analysis for Personality Variables Predicting Psychological Well-Being

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>se</th>
<th>t</th>
<th>$R^2$</th>
<th>$R^2$</th>
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<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness</td>
<td>.05</td>
<td>.06</td>
<td>0.79</td>
<td></td>
<td>.48</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.31**</td>
<td>.07</td>
<td>4.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>.16</td>
<td>.07</td>
<td>2.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.16</td>
<td>.07</td>
<td>2.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.30***</td>
<td>.07</td>
<td>4.73</td>
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<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>.49</td>
<td>.01***</td>
</tr>
<tr>
<td>Openness</td>
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<td>.06</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.31**</td>
<td>.07</td>
<td>4.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>.16</td>
<td>.06</td>
<td>2.49</td>
<td></td>
<td></td>
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<tr>
<td>Agreeableness</td>
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<td>.06</td>
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</tr>
<tr>
<td>Neuroticism</td>
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<td>.06</td>
<td>4.38</td>
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<tr>
<td>Bicultural Efficacy</td>
<td>.12**</td>
<td>.06</td>
<td>2.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *= p < .05, **= p < .01, ***= p < .001.

### TABLE 3

Summary of Hierarchical Regression Analysis for Depressive Symptoms, Anxiety Symptoms, Stress, and Bicultural Efficacy in Predicting Psychological Well-Being

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>se</th>
<th>t</th>
<th>$R^2$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>-.48***</td>
<td>.10</td>
<td>-4.92</td>
<td></td>
<td>.42</td>
</tr>
<tr>
<td>Anxiety Symptoms</td>
<td>-.23</td>
<td>.11</td>
<td>-2.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>.04</td>
<td>.10</td>
<td>0.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>.49</td>
<td>.01***</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>-.44**</td>
<td>.09</td>
<td>-4.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety Symptoms</td>
<td>-.23</td>
<td>.11</td>
<td>-2.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>.05</td>
<td>.10</td>
<td>0.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicultural Efficacy</td>
<td>.25***</td>
<td>.05</td>
<td>4.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *= p < .05, **= p < .01, ***= p < .001.
bicultural efficacy was related to psychological well-being, $b = .25$, $p < .001$. Specifically, 17% of the effect of agreeableness on psychological well-being was explained by bicultural efficacy, $b = .35$, $p < .001$ (see Figure 1A). Neuroticism was also related to bicultural efficacy, $b = -.24$, $p < .001$, and bicultural efficacy was related to psychological well-being, $b = .24$, $p < .001$, with 10% of the effect of neuroticism on psychological well-being explained by bicultural efficacy, $b = -.45$, $p < .001$ (see Figure 1B). These results suggest a partial mediation effect.

With regard to openness and extraversion, there were no significant mediating effects of bicultural efficacy on well-being.

### Discussion

This study not only provided further insight into the concept of bicultural efficacy proposed by LaFromboise et al. (1993), but also expanded upon past research relating to biculturalism and personality, and uncovered the potential beneficial effects of bicultural efficacy on well-being while controlling for internalizing symptoms in bicultural college students (Benet-Martínez & Haritatos, 2005; Wei et al., 2010). Correlational and regression analyses supported the proposed hypotheses and revealed three main findings: (a) agreeableness and neuroticism were correlated with bicultural efficacy, and bicultural efficacy mediated the relation between agreeableness and neuroticism, and psychological well-being; (b) controlling for personality characteristics, bicultural efficacy was associated with psychological well-being; and (c) bicultural efficacy reduced the effect of internalizing symptoms on well-being.

The study’s first hypothesis was partially supported. Openness was not related to bicultural efficacy in this study (Benet-Martínez & Haritatos, 2005). This result could be attributed to differing operationalization of the openness construct in the BFI and in bicultural efficacy. Although components of bicultural efficacy relate to being more flexible regarding the relation between an individual’s two cultures (e.g., feeling that one can alter one’s behavior to fit into two cultures), the openness dimension of the BFI focuses on individual characteristics like curiosity, self-reflectiveness, and imaginativeness (John & Srivastava, 1999). Thus, the type of openness the Bicultural Self-Efficacy Scale assesses may not align with the BFI’s openness dimension (David et al., 2009). Future research can examine which personality traits predict each dimension of bicultural efficacy separately to obtain more in-depth information regarding the relation between personality and bicultural efficacy.

Next, the correlation between bicultural efficacy and agreeableness can be explained by the importance of social support, and how having social skills contributes to bicultural efficacy (Nguyen & Benet-Martínez, 2012). Three factors of bicultural efficacy (i.e., social groundedness, role repertoire, and communication ability) connected conceptually with agreeableness. Last, neuroticism was correlated with bicultural efficacy. Individuals with high neuroticism were more likely to report feeling anxious and stressed. Because bicultural college students must frequently transition between two environments through switching cognitive and behavioral frames, students with high neuroticism may feel particularly anxious due to instability in their environment (Benet-Martínez & Haritatos, 2005). Although correlational in nature, these findings provide valuable insight into the link between personality and bicultural efficacy, and increase understanding regarding how bicultural college students may interpret everyday experiences (McAdams & Pals, 2006).

The current study was the first to examine bicultural efficacy as a mediator between personality and psychological well-being, specifically

![FIGURE 1](image-url)

**FIGURE 1**

Standardized regression coefficients for model explaining the relation between (A) Agreeableness and (B) Neuroticism on psychological well-being as mediated by bicultural efficacy. The standardized regression coefficient for the effect of the personality variable on psychological well-being controlling for bicultural efficacy is in parentheses. $^* = p < .05. ^{**} = p < .01. ^{***} = p < .001.$
agreeableness and neuroticism. This finding additionally ties in with the second main finding regarding the positive association of bicultural efficacy with psychological well-being, controlling for personality characteristics, providing support for previous research asserting the importance of examining mediators between personality and outcome variables (Chaplin, 2007). Although the $R$-squared value between the model with the personality traits and the model with bicultural efficacy added on well-being was small, the significance found may be due to the mediating effect of bicultural efficacy. In other words, bicultural efficacy accounted for some of the effect of personality traits on well-being.

According to the current study's mediation analysis, bicultural college students may report more well-being because aspects of their agreeableness and neuroticism may influence their bicultural efficacy. As McAdams and Pals (2006) explained, personality traits predispose individuals to behave and think in certain ways. In the case of bicultural college students, agreeableness can predispose them to be friendly, optimistic, and cooperative, resulting in being well-liked by peers and gaining social support in both cultural settings. As Benet-Martínez and Haritatos (2005) explained, neurotic individuals are more likely to be anxious and display negative feelings, predisposing bicultural college students to anticipate problems in social situations or misinterpret behaviors because they may not understand how to operate in a particular cultural setting. Therefore, these traits are functional in situations relating to experiences bicultural college students may face, explaining how bicultural efficacy mediates the personality and well-being relationship. The result supports biculturalism theory and past research stating that coping and other variables mediate the relation between personality and well-being (Carver & Connor-Smith; LaFromboise et al., 1993; Steel et al., 2008).

Last, the positive association between bicultural efficacy and well-being controlling for internalizing symptoms was found. The result extended previous research findings concerning the interplay between bicultural efficacy, minority stress, and psychological outcomes (David et al., 2009; Wei et al., 2010). A bicultural college student may feel depressed due to, for example, an insensitive comment another student made about their heritage background. A student with high bicultural efficacy may have various modes of support in both cultural settings to cope with depressive feelings elicited from this event. Overall, the results provide further support for the framework presented by LaFromboise et al. (1993) regarding the use of bicultural efficacy as a coping resource against internalizing symptoms.

**Limitations and Future Directions**

The first limitation to note is the small effect size of the tests reported in this study, particularly in the change in model fit for the hierarchical regression analyses, and the mediation analyses results. Although bicultural efficacy may have positive implications for well-being and may account for some of the effect of personality traits on well-being, there may be other factors not considered within the bicultural efficacy construct that may strongly relate to well-being in bicultural college students. Nonetheless, promotion of students’ bicultural efficacy in university and counseling settings could be useful in addressing issues of school belongingness, acculturative stress, or discrimination that bicultural college students often encounter (Brannon et al., 2015; Carrera & Wei, 2014; Smedley et al., 1993). Next, the items for the attitudinal scales were randomized for each participant to control for potential order effects (Schell & Oswald, 2013). However, not all scales in this study were previously tested to maintain psychometric properties with randomization. Thus, future studies can present inventory items as presented in the original instrument to assure control for potential order effects. Additionally, this study did not examine how bicultural efficacy can impact well-being. One explanation is that bicultural efficacy may act as a positive coping mechanism for bicultural college students (LaFromboise et al., 1993; Wei et al., 2010) against experiences of stress. An alternative explanation is that bicultural efficacy could positively impact how students build their social networks, or maintain their family relationships, because the social groundedness dimension accounted for much of the variance in the initial development study of the Bicultural Self-Efficacy Scale (David et al., 2009).

Thus, future research can examine when and how bicultural efficacy is most used. For example, is it frequently used in response to particular types of stress or consistently used as a skill to promote positive interactions with individuals from multiple cultural settings?

The sample in the current study consisted of bicultural college students at a small, private university in the United States and cannot be generalized to students in different college settings such as community colleges, vocational schools, and universities with more commuter students (only one student in...
this sample reported living off-campus, and first-year students at this university are required to live on-campus). Students in different settings may face different stressors than residential students because they may live with family or live independently. Additionally, the principal investigator and research assistants all identify as Asian/Asian American, which might have impacted the reach of advertisements. More than half of the bicultural college students in the sample considered themselves Asian American, suggesting that announcements of the survey might have spread mostly through the Asian American community, resulting in an imbalance in representation of bicultural college students from various backgrounds. To obtain a more diverse sample, recruitment can be targeted equally to the different university cultural centers, and can be expanded to other universities and colleges. Additionally, with diverse recruitment strategy, studies of differences between ethnic groups can be accomplished. Most studies of bicultural efficacy, including this one, have examined bicultural college students of different identities together or one particular bicultural ethnic group (e.g., Asian Americans, Latino/a Americans). As previous studies have revealed ethnic-group differences in acculturation experiences of bicultural adolescents (Hsiao & Wittig, 2008; Phinney & Devich-Navarro, 1997), future research can examine the expression of biculturalism and whether biculturalism differentially relates to personality and psychological outcomes between ethnic groups.

Another limitation was related to the quantitative and cross-sectional aspect of this study. This study provides a broad overview of the interplay between personality, bicultural efficacy, and psychological outcomes, although causal relations between these variables cannot be inferred through correlational and regression analyses. Additionally, it does not provide a complete picture of how bicultural efficacy presents itself in individuals, or how it can protect against the negative psychological effects of internalizing symptoms. A mixed-methods approach is recommended in order to gain more depth. Conducting focus groups and interviews with bicultural college students about their thought processes and coping mechanisms when dealing with cultural conflict and other stressors can provide valuable insight into the protective effect of bicultural efficacy. Because personality variables cannot be experimentally manipulated, Chaplin (2007) suggested that examining these variables longitudinally through cross-lagged models can enhance understanding of causal priority. In this study, both personality and bicultural efficacy were measured based on self-perception. Considering the mutual constitution of culture and the self, it is important to utilize assessments of personality that are contextually appropriate (Markus & Kitayama, 1998; Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002). By addressing these limitations, future research can discern the direct effect that bicultural efficacy has on psychological outcomes, the mechanism behind these effects, and whether these effects vary between different ethnic groups.

Conclusion and Implications
As stated by Bandura (2002), bicultural efficacy holds high functional value for bicultural individuals. The current study revealed that personality plays a role in predisposing bicultural college students to behave in ways demonstrating bicultural efficacy, and that these behaviors are positively associated with well-being controlling for the negative effects of internalizing symptoms. Current research has not examined causal effects of bicultural efficacy on psychological outcomes in depth. However, there are studies revealing the psychological and academic benefits of targeting unique stressors bicultural college students experience, and promoting behaviors indicative of bicultural efficacy through counseling (Nguyen & Benet-Martínez, 2012; Szapocznik et al., 1986) and university summer bridge programs.

The Meyerhoff Scholars Program at the University of Maryland, Baltimore County, was designed to promote underrepresented minority access in specific fields of higher education. An in-depth, qualitative analysis of the Meyerhoff Scholars Program revealed that students felt that building their own social capital was crucial for their success in the program. Particularly, focusing on social skills related to bicultural efficacy such as conflict resolution, communication skills, and interacting with others from diverse socioeconomic, racial, and linguistic backgrounds was integral to building a cohesive support structure and being successful throughout college (Stolle-McAllister, 2011). Further study of bicultural efficacy can examine this construct’s potential to contribute to psychological well-being through intervention, and how academic institutions, educators, psychologists, student service providers, and parents can support college students’ bicultural efficacy.

References
Bicultural Efficacy, Personality, Well-Being | Hussain


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The Perfect Body: A Potential Pathway of Anorexic Symptom Development in Women

Nicholas Dawson and Timothy Thornberry, Jr.*
Morehead State University

ABSTRACT. Several variables have been related to anorexic symptoms, including socially prescribed perfectionism (SPP), thin ideal internalization (TII), and body dissatisfaction (BD). We sought to extend a previous model of bulimic symptom development to anorexic symptom development. An online survey collected data from 114 predominantly European American undergraduate women attending a Southeastern university. First, we determined whether SPP predicted anorexic symptoms and whether this relationship was mediated by BD. The analyses revealed that SPP predicted anorexic symptoms, $b = .04, t(114) = 2.41, p = .018$. BD was found to mediate this relationship, indirect effect = .02, 95% bias-corrected CI [.01, .05]. We then focused on a similar pathway where TII was the independent variable. We concluded that TII did predict anorexic symptoms, $b = .17, t(114) = 4.85, p < .001$. However, BD only partially mediated this relationship, indirect effect = .10, 95% bias-corrected CI [.06, .15]. Last, we combined the two models into a larger model using structural equation modeling; SPP and TII were hypothesized as occurring first in the model and being independent of one another. The results supported the final model, $\chi^2(1, N = 114) = 1.14, p = .285$, GFI = .995, SRMR = .021, NFI = .991, CFI = .999, RMSEA = .035. We concluded that the development of anorexic symptoms may follow a similar path to that of bulimic symptoms. The findings provide important implications for possible prevention strategies.

Anorexia nervosa is a mental disorder marked with severe symptomology, high relapse rates, poor physical health consequences, and high mortality rates (Arcelus, Mitchell, Wales, & Nielsen, 2011; Carter, Blackmore, Sutandar-Pinnock, & Woodside, 2004; Mitchell & Crow, 2006). Clinicians in the United States report a marked increase in eating disorders, particularly among women, in recent decades. Although there has been a debate about whether the incidence of eating disorders is increasing in the United States (Fombonne, 1995; Hoek, 1993; Steinhausen, 2002a; 2002b), the higher prevalence of disorders such as anorexia nervosa, in Western countries relative to non-Western countries (Makino, Tsuboi, & Dennerstein, 2004), suggests that psychosocial factors may contribute. Although there seems to be an increased empirical focus on the genetic components of eating disorders (DeAngelis, 2002; Keel & Klump, 2003), the bulk of the research has focused on psychosocial factors believed to underlie the observed differences in aspects of these disorders between countries (e.g., Shea & Pritchard, 2007; Stice, Gau, Rohde, & Shaw, 2017; White et al., 2016). Given that anorexia nervosa is highly treatment-resistant and that its antecedents seem to be primarily environmental, more research is needed to discover and understand these psychosocial factors so that future cases of the disorder can be prevented before they fully develop. Psychosocial variables associated with the disorder include perfectionism, body dissatisfaction (BD), and thin ideal internalization (TII).
**Perfectionism**

Although perfectionism may initially seem to be an adaptive personality characteristic, previous research has found it to be both adaptive and maladaptive depending on its severity and context (e.g., Egan, Pick, Dyck, & Kane, 2011; Enns, Cox, Sareen, & Freeman, 2001; Fedewa, Burns, & Gomez, 2005). For example, moderate levels of perfectionism may allow an individual to produce a high-quality product, and elevated levels of perfectionism may cause an individual to spend excessive time on unnecessary components of a product or to fixate obsessively on unrealistic, unachievable standards, which may result in anxiety or despair. Thus, high perfectionism is linked to several mental disorders and dysfunctional behaviors such as depression, social anxiety disorder, trait anxiety, obsessive-compulsive disorder and obsessive-compulsive personality disorder, and eating disorders (Anderluh, Tchanturia, Rabe-Hesketh, & Treasure, 2003; Hewitt et al., 2002; Juster et al., 1996; Sassaroli et al., 2008).

There are multiple theories on why perfectionism may be involved in eating disorders; the primary theory presented in this work was proposed by Tissot and Crowther (2008), which was applied to individuals with bulimic symptoms. In their model, perfectionism predicted bulimic symptoms but only when mediated by other variables such as TII and BD. The model suggests that some women may have perfectionistic tendencies that cause them to become obsessed with particular domains of interest. For example, after seeing a particular image of the perfect body that society portrays, a new domain of interest may be created—obtaining the perfect body; the perfect body for women portrayed by Western societies tends to be excessively slender and/or athletic. After comparing her body to the thin ideal, a woman with high perfectionism may become dissatisfied with her body and subsequently modify her eating patterns to a maladaptive extent (e.g., binging, purging) in an attempt to achieve an unrealistic or unobtainable body type. We hypothesized that this pathway might also result in anorexic symptoms such as fasting, extreme exercising, and extreme weight loss.

Many researchers posit that perfectionism is a multidimensional construct (e.g., Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). According to Hewitt and Flett’s (1991) theory, perfectionism consists of three dimensions: self-oriented perfectionism (SOP), other-oriented perfectionism (SPP), and socially prescribed perfectionism (SPP). Intuitively, the layperson may think of perfectionism as a self-oriented, intrapersonal personality style. Essentially, SOP is this component of perfectionism. SOP entails a motivating tendency to set and perform to high standards. Other-oriented perfectionism is an interpersonal factor that is similar in nature to SOP. Where the two dimensions differ is based upon the direction of high standards. Whereas SOP involves directing high standards toward the self, other-oriented perfectionism directs these standards toward other individuals. In other words, perfectionistic individuals with elevated levels of other-oriented perfectionism will expect high performance from those around them. SPP is the other interpersonal component of perfectionism. Whereas other-oriented perfectionism involves individuals directing unrealistic standards toward others, SPP involves individuals perceiving that others are imposing unrealistic standards onto them. These standards prescribed by others cause individuals to experience feelings of anxiety because they fear that they cannot perform to these standards (Hewitt & Flett, 1991). SOP and SPP are the dimensions that seem to be most related to eating pathology (e.g., Bardone-Cone et al., 2007; Cockell et al., 2002; Tissot & Crowther, 2008). For example, Cockell and colleagues (2002) found that patients with anorexia nervosa tend to have higher levels of SOP and SPP than the normative population.

**Thin Ideal Internalization**

Thin Ideal Internalization (TII) is another factor that may play into the development of eating disorders, particularly anorexia nervosa and bulimia nervosa. TII refers to “the extent to which an individual cognitively ‘buys into’ socially defined ideals of attractiveness and engages in behaviors designed to produce an approximation of these ideals” (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Thompson & Stice, 2001, p. 181). TII has been linked to dieting, negative affect, negative evaluations of one’s body, and eating pathology (Stice, 2001; Stice, Mazotti, Krebs, & Martin, 1998; Thompson & Stice, 2001). TII, as with other eating disorder-related constructs, is primarily an issue in young, Western women because there is a tendency to value thin physiques and use them as the ideal standard of beauty and attractiveness. Investigating the nature of the connection between TII and eating pathology could determine avenues of prevention, treatment, and relapse prevention. In relation to perfectionism, previous research has
suggested that TII may mediate the relationships between both SPP and SOP and bulimic symptoms and predict BD (Tissot & Crowther, 2008).

Body Dissatisfaction
BD is a construct that is beginning to receive a great deal of recognition because it seems to be a key underlying feature of some eating disorders (e.g., Graziano & Sikorski, 2014; Stice et al., 2017; Stice & Shaw, 2002). Essentially, BD is a persistent pattern of negative appraisals of one’s own physical body; it also involves the avoidance of situations that induce such appraisals (Thompson & van der Berg, 2002). For women, this generally involves concerns over body size, hips, figure, and the stomach (Stice & Shaw, 2002) given that these aspects tend to be emphasized by media and society in Western countries. BD has been shown to be highly related to eating pathology and is thought to be a predictor rather than a consequence of eating pathology (Boone & Soenens, 2015; Stice & Shaw, 2002; Tissot & Crowther, 2008).

The Present Study
In both Tissot and Crowther’s (2008) model and Stice’s (1994, 2001) dual-pathway model of bulimic pathology, BD is thought to occur because women who have internalized the thin ideal fail to reach it and consequently become dissatisfied with their bodies. Although the findings presented by Tissot and Crowther (2008) apply mainly to women with bulimic symptoms, we believe that they could be generalized to women with anorexic symptoms for several reasons. First, TII and BD are not necessarily specific to bulimia nervosa. TII can relate to any eating disorder that involves perceived pressures to be thin, and BD can relate to any eating disorder that involves feelings of discontent toward specific body parts or the entire body; this seems to be the case in anorexia nervosa. Second, although bulimia nervosa and anorexic nervosa are distinguishable from one another, the two disorders are similar to one another. For example, the two disorders clinically present in similar ways (e.g., in both disorders, patients may overevaluate their body shape and weight, acutely or chronically restrict their intake of calories, fear gaining weight; American Psychiatric Association, 2013) and share similar correlates (e.g., perfectionism, TII, and BD). The fact that these two disorders are similar calls into question whether they have similar etiologies. The goal of the current work was to investigate whether Tissot and Crowther’s (2008) model could be generalized to individuals in a nonclinical population with anorexic symptoms.

Although Tissot and Crowther (2008) suggested that internalization of the thin ideal may occur after perfectionistic tendencies are formed, we suggested that internalization of the thin ideal could occur so early in one’s lifespan that directionality between certain personality characteristics (i.e., perfectionism) and TII is difficult, if not impossible, to determine. Therefore, we did not propose any directionality between the two variables. Rather, we saw them as independent, although related, factors that directly affect BD and indirectly affect anorexic symptoms.

In the current work, we propose a model that can be separated into two smaller models. The first involves perfectionism predicting anorexic symptoms with this relationship being mediated by BD. The second involves TII predicting anorexic symptoms with this relationship also being mediated by BD. The larger model combines these two models with perfectionism and TII acting independently of each other. Because of the complexity of this model, we decided to take an inductive approach to testing it. We tested each component of the model over a series of three steps.

It was hypothesized that perfectionism scores would significantly predict anorexic symptomatology scores. It was also hypothesized that BD scores would mediate this relationship, such that perfectionism scores would no longer predict anorexic symptoms. These two hypotheses were tested in the first step. We hypothesized that TII scores would significantly predict anorexic symptomatology scores. We also hypothesized that BD scores would mediate this relationship, such that TII scores would no longer predict anorexic symptoms. These hypotheses were tested in the second step of the study. In the third step, we assessed how well the data fit the overall larger model by combining the two smaller models and using structural equation modeling software.

Method

Participants
An online survey was conducted with 151 undergraduate women at a rural, Southeastern university. Participants with missing data were excluded listwise from analyses. Any participant who did not give a response to one item for any of the instruments was excluded from the analyses. Thus, only participants with responses to each item of each instrument were included in the analyses. Thirty-seven of
the 151 participants were missing at least one response. Therefore, the final sample consisted of 114 participants. Of the final sample, 108 (94.7%) were European American, five (4.4%) were African American, and one (0.9%) was Hispanic or Latino. The average age of the women was 18.8 years ($SD = 1.3$; range: 18–27), and the average BMI was 24.9 ($SD = 5.6$; range: 14.9–44.6).

**Procedure**

Participants were recruited from psychology courses through SONA, an online recruitment tool that allows students to participate in studies and receive class credit while maintaining anonymity. After signing up for the study on SONA, participants were linked to a survey on SurveyMonkey.com and were given unlimited time to respond to each item. The survey contained an informed consent and debriefing form. Demographic information was obtained by employing certain items from SurveyMonkey Inc.’s question bank, which were related to age, ethnicity, gender, weight, and height. This study was approved by the university’s institutional review board.

**Measures**

**Perfectionism.** The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991, 2004) is a widely used measure of perfectionism with 45 items scored on a 7-point Likert-type scale with higher scores indicating more perfectionistic tendencies. It aligns with Hewitt and Flett’s (1991) theory that perfectionism is a multidimensional personality style that consists of intrapersonal and interpersonal dimensions. The MPS consists of three subscales, Self-Oriented Perfectionism (SOP), Other-Oriented Perfectionism, and Socially Prescribed Perfectionism (SPP). The measure’s test-retest reliability ranged from .75 to .88 in a small sample of students, and the subscales have been shown to have acceptable to good internal consistency ($\alpha = .74$ to .88; Hewitt & Flett, 1991). A principal component analysis with a sample of 1,106 students provided evidence of the MPS’s construct validity in that it supported the three-dimension structure upon which the test was constructed (Hewitt & Flett, 1991). In the current study, the overall MPS had good internal consistency ($\alpha = .86$), the SOP subscale had good internal consistency ($\alpha = .88$), the SPP subscale had acceptable internal consistency ($\alpha = .74$), and the other-oriented perfectionism subscale had questionable internal consistency ($\alpha = .65$).

The MPS seems to have strong convergent validity because its subscales generally have medium to high correlations with other perfectionism measures (see Flett & Hewitt, 2015, pp. 602–603, for a review). We excluded the dimension of other-oriented perfectionism from our analysis for several reasons. First, previous studies have failed to find relationships between other-oriented perfectionism and eating pathology or between other-oriented perfectionism and body image (e.g., Chang, Iveyaz, Downey, Kashima, & Morady, 2008; García-Villamisar, Dattilo, & Del Pozo, 2012; McLaren, Gauvin, & White, 2001). Second, the internal consistency of the Other-Oriented Perfectionism subscale was low in our study, raising concerns about excessive measurement error. To be parsimonious in our analyses, we combined SOP and SPP into a single composite score; this derivation of a single perfectionism score was a method used by Tissot and Crowther (2008), as well.

**Anorexic symptoms.** The Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) was used as a measure for anorexic symptoms. The EAT-26 was developed to be used as a screener for anorexia nervosa in clinical populations. However, it has occasionally been used in nonclinical samples as a continuous scale (Elgin & Pritchard, 2006; Koslowsky et al., 1992; Mazzeo, 1999; Mintz & O’Halloran, 2000). The original version of the EAT was 40 items; after an exploratory factor analysis, it was shortened to 26 items, and this 26-item version correlated highly ($r = .98$) with the 40-item version. The EAT-26 demonstrated good internal consistency ($\alpha = .83$) in a sample of 140 undergraduate women (Garner et al., 1982) and high test-retest reliability ($r = .84$) over a 2-week period (Carter & Moss, 1984). The EAT-26 tends to have high correlations with body image and BD variables (e.g., Cooper, Taylor, Cooper, & Fairburn, 1987; Garner et al., 1982). Because the scoring of the original EAT-26 is not based on a traditional Likert scale (the three lower ratings are all scored as 0s and the three higher ratings are scored from 1 to 3), the scoring was modified so that anorexic symptoms in our nonclinical population could be measured continuously on a scale from 0 to 5 with higher scores indicating more anorexic symptoms. After this scoring modification, the internal consistency of the EAT-26 in the current study was excellent ($\alpha = .94$).

**Body dissatisfaction.** Like the original study by Tissot and Crowther (2008), we used two different BD measures, the Body Shape Questionnaire-34 (BD measures, the Body Shape Questionnaire-34...
The Perfect Body

(BSQ-34; Cooper et al., 1987) and the Body Image Avoidance Questionnaire (BIAQ; Rosen, Srebnik, Saltzberg, & Wendt, 1991), to capture different dimensions of BD. As explained by Tissot and Crowther (2008), BD can be conceptualized as a multidimensional construct; the BSQ-34 is thought to capture cognitive symptoms of BD, and the BIAQ is thought to capture behavioral symptoms. It is important to note that Tissot and Crowther’s (2008) study used weight discrepancy scores (i.e., difference scores between reported ideal weight and actual weight) as a measure of BD. However, it is not clear what specific dimension of BD such a measure would capture. Although some studies use weight discrepancy as a measure of BD (e.g., Tissot & Crowther, 2008) and it has been found to be a reliable measure of BD (Williamson, Graves, Watkins, & Schlundt, 1993), our previous work with this sample indicated that it was not a reliable measure of BD nor a reliable predictor of anorexic symptoms (Dawson & Thornberry, 2017). Therefore, we excluded weight discrepancy scores from this current work.

The BSQ-34 has been shown to have high test-retest reliability (α = .88) over a period of 3 weeks with 33 undergraduate women. This measure was also shown to have good convergent validity with multiple subscales of the Multidimensional Body-Self Relations Questionnaire, which consists of Appearance Evaluation, Appearance Orientation, and Body Areas Satisfaction, in both clinical and nonclinical samples (Brown, Cash, & Mikulka, 1990; Rosen, Jones, Ramirez, & Waxman, 1996). Rosen and colleagues (1991) demonstrated good internal consistency for the BIAQ (α = .89) in a sample of 353 undergraduate women. In the same study, the BIAQ had high test-retest reliability (r = .87) over a 2-week period with 25 participants of the aforementioned sample. Convergent validity was also high (r = .78) with the BSQ-34 (Rosen et al., 1991). In the current study, the BSQ-34 demonstrated excellent internal consistency (α = .98), and the BIAQ demonstrated good internal consistency (α = .85).

Thin ideal internalization. The Sociocultural Attitudes Towards Appearance Questionnaire – 4 (SATAQ-4; Schaefer et al., 2015) measures internalization of thin and athletic ideals, as well as media, peer, and family pressure to conform to a certain ideal; each of these variables comprise a total of five subscales. For the purpose of this study, we used the 5-item Internalization: Thin/Low Body Weight subscale, which demonstrated good internal consistency (α = .88) with the current sample. We chose this scale because the other internalization subscale, Internalization: Muscular/Athletic, is more focused on men and is less consistent with the thin ideal. The SATAQ-4 was originally validated on a sample of undergraduate women at a Southeastern university in the United States and was cross-validated with similar samples throughout the country. In previous studies, the Internalization: Thin/Low Body Weight subscale has shown good internal consistency (α = .87) and good convergent validity with the Eating Disorders Examination – Questionnaire (ranging from r = .53 to .63), a measure of eating pathology (Fairburn & Beglin, 2008), and convergent validity with the Multidimensional Body-Self Relations Questionnaire – Appearance Evaluation Subscale (ranging from r = -.46 to -.36), a measure of body satisfaction (Brown et al., 1990; Schaefer et al., 2015).

Data Analyses

To measure multiple aspects of perfectionism, we combined SOP and SPP scores by summing the total scores of the two subscales. Because the two subscales consisted of the same number of items and were scored the same, we did not transform the scores when combining them. On the other hand, the BSQ-34 and BIAQ had different scale ratings and number of items, so both scales were transformed into z scores before being combined.1 Tissot and Crowther (2008) used this method of summing the standardized scores of each BD measure, and this method was also utilized by Bardone-Cone, Weishuhn, and Boyd (2009) to achieve adaptive and maladaptive perfectionism scores.

SPSS version 24.0 was used to gather descriptive statistics and observe correlations between variables. PROCESS, an SPSS macro developed by Andrew F. Hayes (2016) was used to test the mediated models. PROCESS is capable of running mediated and moderated models through several series of multiple regressions, allowing for easier and more efficient testing of mediated and moderated models. Baron and Kenny’s (1986) guidelines for determining mediation were followed in addition to this SPSS macro.

The first step of this study involved testing the model in which BD mediated the relationship between perfectionism and anorexic symptoms. The second step involved testing the model in

1 BIAQ scores were non-normally distributed and were therefore transformed logarithmically to eliminate positive skew before being transformed into z scores and then combined.
which BD mediated the relationship between TII and anorexic symptoms. In the third step, each revised model of the previous two steps were combined into a final model. This final model was tested using a path analysis procedure in Amos version 24, a plug-in for SPSS that performs structural equation modeling (Arbuckle, 2016). Using structural equation modeling, researchers can determine how well the observed data fit theoretical models. For our work, we used three absolute fit indices (Chi-Squared test; goodness-of-fit, GFI; and standardized root mean square residual, SRMR), two relative fit indices (normed fit index, NFI; and comparative fit index, CFI), and one adjusted for parsimony index (root mean square error of approximation, RMSEA).

Results

Preliminary Descriptive Statistics

Normality and kurtosis of all variables was assessed before performing regression analyses. As seen in Table 1, SOP alone, SPP alone, SOP and SPP combined, and BSQ-34 scores were normally distributed. However, BIAQ and EAT-26 scores were positively skewed, so these measures were transformed. The BIAQ scores underwent a log transformation, and the EAT-26 scores were transformed into their relative square roots.

To confirm whether our sample had clinically significant symptoms of anorexia, we identified possible cases of anorexia nervosa using two criteria. A BMI of 17.5 or less is one diagnostic guideline in the ICD-10 for identifying anorexia nervosa (World

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<td>Descriptive Statistics</td>
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Note. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; BSQ-34 = Body Shape Questionnaire-34; BIAQ = Body Image Avoidance Questionnaire; EAT-26 = Eating Attitudes Test-26; TII = thin ideal internalization. † Indicates skewness. BIAQ and EAT-26 scores were transformed in order to create normal distributions.

<table>
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<td>Pearson Correlations Between Study Variables</td>
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Note. SOP = self-oriented perfectionism; SPP = socially prescribed perfectionism; BSQ-34 = Body Shape Questionnaire-34; BIAQ = Body Image Avoidance Questionnaire; EAT-26 = Eating Attitudes Test-26; TII = thin ideal internalization. *p < .05. **p < .01. ***p < .001.
Health Organization, 1992). Using this guideline, we identified 2 (1.8%) possible cases of anorexia nervosa. In addition, 36 (31.6%) participants scored above the clinical cut-off score on the EAT-26 on its original scoring scheme. Only 1 (0.9%) participant had a BMI of 17.5 or less and scored above the EAT-26 cut-off score. All participants meeting one or both of these criteria were included in the analyses in order to capture the wider range of anorexic symptoms in the population.

Preliminary Correlations
As seen in Table 2, nearly all the variables were significantly correlated in the expected directions except for some relationships involving SOP; the correlation between SOP and BD was nonsignificant, $r = 0$. Additionally, the correlation between SOP and anorexic symptoms was only marginally significant ($p = .081$) and was weak, $r = .14$. Because of the lack of relationships between SOP and the other important variables, we excluded it from further analyses and investigated SPP alone as the independent variable of the proposed model. Importantly, TII was significantly correlated with SPP as well as with BD and anorexic symptoms, which indicates that there could be covariance occurring among the variables. Therefore, TII was accounted for in the first mediation analysis; SPP was also accounted for in the second mediation analysis.

Step 1: Mediation Analysis
Figure 1 displays the resulting model of this mediation analysis. TII was entered as a covariate in PROCESS in order to control for its effect on SPP and the other variables. Baron and Kenny’s (1986) guidelines for mediation requires four criteria to be satisfied before determining mediation. Criterion 1 requires that the independent variable predicts the dependent variable; SPP did significantly predict anorexic symptoms after controlling for TII, $b = .04, SE = .02, t(114) = 2.41, p = .018$. Criterion 2 requires that the independent variable predicts the mediating variable; SPP did significantly predict BD after controlling for TII, $b = .04, SE = .01, t(114) = 2.54, p = .013$. Criterion 3 requires that the mediating variable predicts the dependent variable after controlling for the independent variable; BD did predict anorexic symptoms after controlling for TII and SPP, $b = .64, SE = .08, t(114) = 7.96, p < .001$. Criterion 4 requires that there must be no significant prediction of the independent variable on the dependent variable after controlling for the mediator; after controlling for TII and BD, SPP no longer significantly predicted anorexic symptoms, $b = .01, SE = .01, t(114) = 1.06, p = .293$. Approximately 52.8% of the variance in anorexic symptoms was explained by TII, SPP, and BD, $R^2 = .52$. The standardized indirect effect was $\beta = .14$. We also tested the significance of this indirect effect using bootstrapping procedures. The unstandardized indirect effect was computed for each of 1,000 bootstrapped samples; this unstandardized indirect effect was .02, and the 95% bias-corrected
confidence interval ranged from .008 to .050. Therefore, the indirect effect was statistically significant, and the effect of SPP on anorexic symptoms was fully mediated by BD.

Step 2: Mediation Analysis
Using PROCESS and following Baron and Kenny’s (1986) guidelines again, Criterion 1 was satisfied; TII significantly predicted anorexic symptoms after controlling for SPP, \( b = .17, SE = .03, t(114) = 4.85, p < .001 \). Criterion 2 was satisfied, as TII did significantly predict BD after controlling for SPP, \( b = .16, SE = .03, t(114) = 4.83, p < .001 \). Criterion 3 was satisfied as well; BD did predict anorexic symptoms after controlling for SPP and TII, \( b = .64, SE = .08, t(114) = 7.96, p < .001 \). However, as seen in Figure 2, Criterion 4 was not satisfied because TII still significantly predicted anorexic symptoms after controlling for BD and SPP, although the \( p \) value did decrease, \( b = .07, SE = .03, t(114) = 2.20, p = .03 \). Again, approximately 52.8% of the variance in anorexic symptoms was explained by TII, SPP, and BD, \( R^2 = .53 \). The standardized indirect effect was \( \beta = .25 \). We also tested the significance of this indirect effect using bootstrapping procedures. The unstandardized indirect effect was computed for each of 1,000 bootstrapped samples; this unstandardized indirect effect was .10, and the 95% bias-corrected confidence interval ranged from .064 to .149. Therefore, the indirect effect was statistically significant, and the effect of TII on anorexic symptoms was partially mediated by BD.

Step 3: Path Analysis of the New Model
In Amos, both SPP and TII were entered as independent variables and covariates of each other; anorexic symptoms was entered as the dependent variable; and BD was entered as a mediator of SPP and anorexic symptoms and a partial mediator of TII and anorexic symptoms. As seen in Figure 3, the overall fit for the model was good, \( \chi^2(1, N = 114) = 1.14, p = .285, GFI = .995, SRMR = .021, NFI = .991, CFI = .999, RMSEA = .035 \). These results support the view that BD fully mediates the relationship between SPP and anorexic symptoms and partially mediates the relationship between TII and anorexic symptoms.

Discussion
The proposed hypotheses were partially supported by the results. Although socially prescribed perfectionism (SPP) did predict anorexic symptoms and this relationship was fully mediated by body dissatisfaction (BD), self-oriented perfectionism (SOP) did not reliably predict BD nor anorexic symptoms and was therefore removed from the mediation analysis. Although many studies have found both SOP and SPP to be related to eating pathology, we could only find a relation between SPP and anorexic symptoms in our sample. There could be multiple reasons for this. First, anorexic symptoms in nonclinical populations like ours could be primarily driven by interpersonal factors, whereas bulimic symptoms may be driven by both intrapersonal and interpersonal factors, as seen in Tissot and Crowther’s (2008) work. Although this might be unique to our sample, we contend that this finding reiterates the importance of social forces in the formation of eating pathology. Successful replication of these findings may have strong implications for future intervention and prevention programs. For example, clinicians can develop prevention programs that emphasize the importance of social factors and the severe outcomes that can result from a society that cultivates appearance overvaluation, weight teasing, and weight stigma. If these programs can be implemented in middle schools and high schools, the social factors contributing to the development of eating pathology can be mitigated.

Second, the rural, Southeastern sample of predominantly European American women used in this study may hold unique characteristics that limit the generalizability of these findings to the rest of the United States. SPP tends to relate to high parental expectations and parental criticism (Flett & Hewitt, 2015). Further, anorexic patients tend to come from families where the mothers are perfectionistic, and adolescent girls with fathers who tease them about their weight and appearance tend to have elevated levels of eating restriction, bulimic symptoms, BD, and TII (Fairburn, Cooper, Doll, & Welch, 1999; Keery, Boutelle, van den Berg, & Thompson, 2005). Given that family connectedness is an emphasized value in the Appalachian region (Tang & Russ, 2007), it is possible that young adult women in the region may interact with their families more and experience more family pressures to appear attractive. Thus, intrapersonal, perfectionistic cognitions are overridden by interpersonal cognitions about the high expectations and standards set by family members. In other words, SPP’s connection to anorexic symptoms may be so strong in this sample that the influence of SOP may be diminished.

Third, the null results of SOP in this study may be due in part to the use of a clinical measure of...
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Anorexia (i.e., EAT-26) in this nonclinical sample. The use of a more sensitive, nonclinical measure might have expanded the range of observed scores and corrected the positive skew observed in this study. If our measure was more sensitive, perhaps we would observe a relationship between SOP and anorexic symptoms.

As hypothesized, BD did predict anorexic symptoms. This is not surprising because previous studies have established the relationship between BD and eating pathology (e.g., Kong et al., 2013; Stice, 2002; Stice & Shaw, 2002; Tissot & Crowther, 2008). We were able to replicate these findings in a unique, understudied Appalachian population, which suggests the robustness of the relationship.

The second model was only partially supported. Although the original model proposed that BD mediated TII’s prediction effect on anorexic symptoms, these findings suggest that BD only partially mediates this relationship. This suggests that TII both directly and indirectly affects anorexic symptoms. There is a reason why BD may only partially mediate the relationship. It is possible that TII’s effect on anorexic symptoms is strong enough that no variable can fully mediate this relationship. Such a strong effect by TII may indicate that anorexic symptoms are heavily influenced by cognitions rather than behaviors. Given the potentially large influence of cognitive variables such as TII on anorexic symptoms, it may behoove clinicians to develop screening programs or prevention programs that assess and address maladaptive cognitions and TII before BD and behavioral symptoms form.

In this study, we expanded on Tissot and Crowther’s (2008) model that was developed for bulimic symptoms and applied it to assess anorexic symptoms. Although the findings of the current work did not completely replicate Tissot and Crowther’s (2008) model, our finalized model exhibited many similarities to their model. This suggests the possibility of a common etiological pathway for the two disorders that merits further investigation.

Despite observing a possible pathway to anorexic symptoms in this study, one major caveat to our findings is that our sample was almost entirely composed of European American women. Because the sample in this study was not ethnically diverse, it is difficult to generalize the findings to women of color. Had our sample included more African American women, it is possible that the strengths of the relationships involving TII would be weakened. African American women tend to desire a thicker or curvier body ideal than European American women (Overstreet, Quinn, & Agocha, 2010; Tylka, 2012), and African American women are at a lower risk for anorexia nervosa than European American women (Taylor, Caldwell, Baser, Faison, & Jackson, 2007). Also, African American women who identify with African American culture, as opposed to those who identify with European American culture, desire a curvier body ideal (Tylka, 2012). Therefore, TII may not play a role in the development of eating disorder symptoms for such women, and the pathway to anorexic symptoms may greatly differ for these women. Supporting this possibility, a meta-analysis found that African American women showed slightly lower levels of BD than European American women (Grabe & Hyde, 2006).

Similarly, Hispanic women experience pressure by their culture to obtain a curvy body (Viladrich, Yeh, Bruning, & Weiss, 2009). However, there are less marked differences between Hispanic women and European American women. For example, Hispanic women are also pressured to achieve a thin body by mainstream American media (Viladrich et al., 2009). This could explain why they prefer thinner body ideals that are comparable to those of European American women (Gordon, Castro, Sitnikov, & Holm-Denoma, 2010) as well as similar levels of BD (Schooler & Lowry, 2011). Because of these conflicting pressures to conform to two different body types, it is possible that the model presented in this study could vary for Hispanic women.

Less is known about eating disturbances and BD in Asian American women because there are mixed findings about the differences between Asian American women and European American women (George & Franko, 2010). However, there seem to be more similarities than differences. In a meta-analysis, Asian American women expressed similar levels of BD as European American women (Grabe & Hyde, 2006). A study by Evans and McConnell (2003) suggested that Asian American women may buy into the Western thin ideal at similar rates as European American women, as indicated by their ratings of European American blonde models. Nouri, Hill, and Orrell-Valente (2011) revealed a pathway to TII and BD that was found in both Asian American and European American women. Because of this, Nouri and colleagues (2011) suggested that many of the findings on eating pathology and body image in European American women could be applied to Asian American college women.
Nevertheless, we cannot generalize the findings presented in the current study to Asian American women because our sample did not include any women of this ethnicity.

Limitations
There are some limitations worth noting in this study. First, the data in this study were gathered via an online survey, which is vulnerable to extraneous variables and environmental factors that cannot be controlled. Second, a convenience sampling method was utilized to obtain the data. Third, a clinical measure was used with our nonclinical population to capture anorectic symptoms instead of a nonclinical measure. Some scales were modified, combined, or transformed in order to fit these clinical measures to our sample, which might have influenced this study’s results. Fourth, although the sample size (N = 114) was fairly large, a larger sample is more desirable because such a small sample size would decrease sampling error. Fifth, it is impossible to determine directionality of all the variables, given the use of a cross-sectional design. Although this study can give implications about the directionality of the variables, a longitudinal and/or experimental design would be able to determine the directionality of the variables more accurately.

Another limitation involves the use of the SATAQ-4, particularly just one of its five subscales. Although the psychometric properties of the SATAQ-4 are relatively sound, only one subscale was used. If the three subscales measuring social pressures to be thin had been included, perhaps we could have made better conclusions about the social aspects related to the development of anorexic symptoms. Additionally, the subscale that was utilized in this study and the previous one only contained five items. It is possible that TII as a construct may be successfully captured in five items, but it is also possible that TII is more complex than this. Therefore, using only five items might have hindered us from capturing a more comprehensive picture of a participant’s level of TII. We used this single subscale because this method was utilized by Tissot and Crowther (2008). We recommend that future studies utilize measures of TII that contain more items such as the 10-item Ideal-Body Stereotype Scale-Revised (Stice, Ziemba, Margolis, & Flick, 1996).

Future Directions
Because of this study, we were able to discern the possible antecedents of symptoms of anorexia in women. We recommend that future researchers not only replicate this study but also measure social and cultural pressures, which are included in the SATAQ-4. In addition, we recommend that this model be tested on clinical samples of individuals with anorexia as well as clinical and nonclinical samples comprised of more racially and ethnically diverse individuals. The latter is especially important because our sample almost entirely consisted of European Americans. After this research has been conducted, a longitudinal study should be conducted to better determine directionality of all the variables observed in the current work. Although our primary aim of this study was to extend a model of bulimic symptomatology to anorexic symptomatology, more research should be conducted on both of these mental disorders within the same sample so that a direct comparison can be made between their developmental paths.

References
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The Child Abuse Prevention and Treatment Act Reauthorization Act of 2010 (P.L.111–320) defined child abuse and neglect as an act by a parent or caretaker that results in an immediate risk of serious physical or emotional harm, exploitation, or death of a child. Childhood adverse events are a pervasive phenomenon in the United States. In 2012, there were 3.4 million reports of child abuse that involved 6.3 million children (U.S. Department of Health and Human Services, 2013). In that year, there were 1,640 children fatalities as a result of childhood adverse events, resulting in an average loss of four to seven children per day (U.S. Department of Health and Human Services, 2013).

Childhood adverse events have a widespread occurrence in the United States and existing research has established their long-term effects on adult mental health. Prior research has indicated an association between experiencing childhood adverse events and poorer adult mental health (Edwards, Holden, Felitti, & Anda, 2003; Felitti et al., 1998; Greenfield & Marks, 2010; Higgins & McCabe, 2003; Horwitz, Widom, McLaughlin, & White, 2001; Jovev et al., 2013; Kendall-Tackett, 2002; Keyes et al., 2012; Sugaya et al., 2012). In a study conducted by Greenfield and Marks (2010), maternal childhood psychological violence was associated with poorer mental health in adulthood. This relationship remained consistent even when physical violence was never or rarely present. In addition, paternal childhood violence has been...
linked with less psychological stability in adulthood (Greenfield & Marks, 2010). Research conducted by Edwards and colleagues (2003) established that childhood physical and sexual abuse were correlated with poorer mental health functioning in adulthood. In addition, respondents who reported experiencing at least two types of childhood adverse events were associated with even poorer mental health than those who reported experiencing only one type of childhood adverse event (Edwards et al., 2003). Finally, there was a positive correlation between respondents who self-reported emotional abusive families and increased mental health risks (Edwards et al., 2003). Similarly, in a study conducted by Felitti and colleagues (1998), participants who reported experiencing four or more types of childhood adverse events had a 4- to 12-fold increased risk for alcoholism, drug abuse, depression, and suicide attempts.

Research has also established the effects of experiencing childhood adverse events on risk for experiencing psychopathology later in life. Pérez-Fuentes and colleagues (2013) examined the effects of childhood sexual abuse on psychopathology, and concluded that individuals who experienced such abuse had higher risks of both psychopathology and suicide attempts. Childhood physical abuse has also significantly predicted a risk for psychopathological disorders, including attention-deficit hyperactivity disorder, posttraumatic stress disorder, and bipolar disorder (Sugaya et al., 2012). Results from a study conducted by Jovev and colleagues (2013) revealed that childhood abuse predicted an increase in symptoms of antisocial personality disorder, and childhood neglect predicted an increase in symptoms associated with borderline personality disorder. Similarly, Waxman, Fenton, Skodol, Grant, and Hasin (2014) found that different types of childhood adverse events predicted risk of different personality disorders in adulthood, such that sexual abuse increased risk for borderline and schizotypal personality disorders, physical abuse increased risk for antisocial personality disorder, and emotional neglect increased risk for avoidant and schizoid personality disorders. Further, research conducted by Horwitz and colleagues (2001) reported that victims of childhood abuse and neglect exhibited an increase in both dysthymia and antisocial personality disorder in adulthood. Female victims were also more likely to have alcohol problems in adulthood, but this was not true for male victims (Horwitz et al., 2001). This research heightens the adulthood mental health risks associated with childhood adverse events.

In addition to the resulting mental health effects of childhood adverse events in adulthood, researchers have found evidence linking cognitive deficits in adulthood (Nikulina & Widom, 2013). For example, prior research has demonstrated that childhood maltreatment and childhood neglect were associated with both decreased executive functioning and nonverbal reasoning in middle adulthood. However, there were no links between physical or sexual abuse and poor executive functioning (Nikulina & Widom, 2013).

The research establishing the long-term effects of childhood adverse events on adult physical health is relatively limited although existing research has established an association between childhood adverse events and physical health deficits in adulthood. For example, childhood adverse events pose an increased risk of several physical health conditions in adulthood (Afifi, Mota, MacMillan, & Sareen, 2013; Felitti et al., 1998; Min, Minnes, Kim, & Singer, 2013; Morton, Schafer, & Ferraro, 2012; Rapoza et al., 2014; Scott et al., 2011). Scott and colleagues (2011) found that individuals who reported at least three childhood adverse events experienced an increased risk of heart disease, asthma, diabetes, osteoarthritis, chronic spinal pain, and frequent or severe headaches. Morton and colleagues (2012) demonstrated that childhood adverse events were associated with an increased risk of cancer in adulthood. This effect differed based on gender; physical abuse by a parent of the same gender increased cancer risk (Morton et al., 2012).

In addition to increased risk of several physical health conditions, Felitti and colleagues (1998) demonstrated that childhood adverse events were associated with several leading causes of death in the United States. In fact, participants who reported experiencing four or more types of childhood adverse events had a 2- to 4-fold increase in smoking, poor self-rated health, at least 50 sexual partners, sexually transmitted disease, a 1.4- to 1.6-fold increase in physical inactivity, and severe obesity (Felitti et al., 1998). Further, Felitti and colleagues (1998) established that the more types of childhood adverse events that respondents reported, the more likely the presence of ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease in those respondents.

An association between childhood adverse events and a decrease in overall adult health-related quality of life has also been examined in past literature (Corso, Edwards, Fang, & Mercy, 2008;
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Irrving & Ferraro, 2006; Springer, Sheridan, Kuo, & Carnes, 2007). For example, Irving and Ferraro (2006) demonstrated that childhood adverse events were associated with poorer self-reported overall physical and mental health in a national United States sample. This study determined that emotional abuse was key in understanding the effects of childhood adverse events. Springer and colleagues (2007) established that parental physical abuse predicted a variety of both mental and physical health symptoms in adulthood, including depression, anxiety, anger, physical symptoms, and medical complications. Based on data collected in the Adverse Childhood Experiences Study, Corso and colleagues (2008) also reported a correlation between childhood adverse events and an overall loss in health-related quality of adulthood life. However, the sample in the study was not representative of the United States' population because it only included those who had access to health care (Corso et al., 2008). Still, these studies clearly linked an overall decrease in adulthood health with self-reported childhood adverse events.

Conversely, some previous research has indicated that the established relationship between childhood adverse events and lifetime overall health is confounded by other life stressors (Higgins & McCabe, 2003; Horwitz et al., 2001; Schafer, Morton, & Ferraro, 2014). For example, Horwitz and colleagues (2001) established that, after controlling for stressful adult life events, childhood adverse events had a minimal effect on adulthood mental health. In addition, the effects of childhood adverse events are not universal and may affect individuals differently. For example, Higgins and McCabe (2003) demonstrated that some individuals who reported experiencing childhood adverse events later exhibited psychological maladjustment in adulthood, and others displayed a higher level of adjustment (Higgins & McCabe, 2003). Schafer and colleagues (2014) proposed that the effects of childhood adverse events on adult health are often poorer when respondents also had a negative relationship with one or more of their parents. These studies suggest that childhood adverse events may actually have only a minimal effect on health in adulthood, especially after accounting for stressful adult life events.

Study Overview

Despite the evidence that childhood adverse events are a widespread phenomenon, the current literature base is limited for three reasons: (a) the lack of representative samples, which may misconstrue rates of resulting adult impairment; (b) exclusive reliance on questionnaires without interviews, which may not be as accurate because some cases of childhood trauma may not be self-identified (Corso et al., 2008); and (c) inconsistent attention to potentially confounding variables that might affect adult adjustment and be mistakenly attributed to childhood adverse events, such as the experience of trauma as an adult (Horwitz et al., 2001).

To address these limitations, the current study investigated the nature of the relationship between childhood adverse events, sometimes referred to as adverse childhood experiences, and adult physical and mental health using a large and uniquely representative national sample that was collected during a face-to-face, computer-assisted personal interview. These data built upon previous research that suggested childhood adverse events have a negative effect on adult health. The current study expanded on the previous research by using data that featured an extensive assessment of a wider range of potentially confounding variables. Therefore, researchers were able to control for variables that have been found to affect self-reported adult health, including gender, age, race, education, personal income, marital status, and reported experience of adult adverse events, but that have not been consistently accounted for in past research (Alegria et al., 2013; Min et al., 2013). It was expected that participants who reported experiencing any form of childhood adverse events (physical abuse, sexual abuse, physical neglect, verbal abuse, and/or emotional neglect) would have lower physical and mental health scores as compared to participants who reported not experiencing any form of childhood adverse events. It was also anticipated that participants with a higher count of childhood adverse events (calculated by summing the total number of childhood adverse event types reported by the participant) would have lower physical and mental health scores as compared to participants with a lower count of childhood adverse events. Participants with greater perceived severity of childhood adverse events (calculated by summing the severity ratings of each reported childhood adverse event question) were expected to have lower physical and mental health scores as compared to participants with a lesser perceived severity of childhood adverse events. Finally, participants who reported experiencing any form of adulthood adverse events (sexual assault, physical assault, or close relationship with an alcoholic)
would have lower physical and mental health scores as compared to participants who reported not experiencing any form of adulthood adverse events.

**Method**

**Procedure**

This study employed an archival analysis to examine the long-term effects of childhood adverse events on adult physical and mental health while accounting for several potential confounding variables, which was approved by the John Jay College of Criminal Justice (City University of New York) Human Research Protections Program Office. The study utilized cross-sectional survey data from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), collected by the National Institute of Alcohol Abuse and Alcoholism from 2004–2005. Wave 1 of NESARC was collected from 2001–2002 (Grant et al., 2004). Both waves of NESARC were conducted using face-to-face, computer-assisted personal interviews administered by trained lay interviewers. The research protocol, including informed consent, was approved by the U.S. Census Bureau and the U.S. Office of Management and Budget. Further details of the NESARC are available elsewhere (Grant et al., 2004; Grant, Dawson, & Hasin, 2007; Grant et al., 2009).

**Participants**

The NESARC represents the civilian, noninstitutionalized population of the United States, including respondents living in households and miscellaneous noninstitutional group residences. For the Wave 2 NESARC sample, all eligible participants from Wave 1 were re-interviewed, with a response rate of 86.7% (Grant et al., 2007). The study sample size from Wave 2 of NESARC was 34,653 participants. Most participants (58.0%, n = 20,089) identified as men. At the time of Wave 2, the sample of adults were 20 years of age or older. All participants in the study ranged in age from 20 to 90 (M = 49.1, SD = 17.3). Most of the sample (58.2%, n = 20,161) self-identified as non-Hispanic European American, 19.0% identified as African American (n = 6,587), 18.4% identified as Hispanic (n = 6,359), 2.8% identified as Asian/Native Hawaiian/Other Pacific Islander (n = 968), and 1.7% identified as American Indian/Alaska Native (n = 578). Although the level of reported total personal annual income ranged from $0 to over $100,000, most of the sample (72.7%; n = 25,183) reported a personal income below $40,000. Most participants reported at least some college (56.8%; n = 19,687), 27.3% (n = 9,452) reported a high school or equivalent degree, and 15.9% (n = 5,514) reported not completing high school. Most participants (54.4%; n = 18,866) reported that they were married, and 45.6% (n = 15,787) reported being single.

**Childhood Adverse Events**

All participants completed the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV (AUDADIS-IV), Wave 2 version (Grant et al., 2007). This included an assessment of childhood adverse events occurring before the age of 18, which was based upon the Adverse Childhood Experiences study (Dong, Anda, Dube, Giles, & Felitti, 2003; Dube et al., 2003). The questions were a portion of the items in the Conflict Tactics Scale (Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and the Childhood Trauma Questionnaire (Bernstein et al., 1994). Question topics included physical abuse, verbal abuse, sexual abuse, physical neglect, and emotional neglect.

Participants were asked to rate several questions about childhood adverse events (except emotional neglect) on a 5-point Likert-type scale (never, almost never, sometimes, fairly often, and very often). Emotional neglect was coded on a 5-point scale (never true, rarely true, sometimes true, often true, and very true). Responses were coded into categories of abuse and neglect based on prior research (Afifi et al., 2011; Afifi, Henriksen, Asmundson, & Sareen, 2012). Participants were categorized as having experienced physical abuse if they responded “sometimes” or greater to either (a) being pushed, shoved, grabbed, slapped, or hit by a parent or caregiver, or (b) to having bruises or injuries as a result of being hit by a parent or caregiver (Afifi et al., 2011; Afifi et al., 2012). Participants were coded as having experienced verbal abuse if they responded at least “fairly often” when asked about (a) a parent or caregiver threatening to hit or throw something at them, or (b) a parent or caregiver making the participants fear that they would be physically hurt or injured (Afifi et al., 2011; Afifi et al., 2012). Consistent with Wyatt (1985), participants were classified as having experienced sexual abuse if a response of anything other than “never” was reported when asked about (a) fondling, (b) touching in a sexual way, (c) attempted sexual intercourse, or (d) actual sexual intercourse with another adult when the participants were too young to know what was happening or did not want this.
In the AUDADIS-IV, participants were coded as having experienced physical neglect if a response of anything other than “never” was recorded when asked about (a) difficult or dangerous chores; (b) being left alone or unsupervised; and not being provided (c) necessary things (e.g., school supplies or clothing), (d) regular meals, or (e) proper medical attention. In the current study, physical neglect was coded differently than the Adverse Childhood Experiences study (Dong et al., 2003; Dube et al., 2003) because one of the questions by the original researchers in the study was changed by the AUDADIS-IV (Afifi et al., 2011). For this reason, an adapted definition of physical neglect was used based on the AUDADIS-IV criteria.

Consistent with past research on emotional neglect (Afifi et al., 2011; Dong et al., 2003; Dube et al., 2003) participants were asked about (a) the extent of family support, (b) whether the family was considered close-knit, (c) whether the family made the participants feel special, (d) whether the family made the participants feel successful, and (e) whether the family believed in the participants. Responses were reverse-coded and summed, and participants who reported scores of 15 or greater were categorized as having experienced emotional neglect.

### Coding Childhood Adverse Events

The three independent variables were then calculated based upon data for each of the childhood adverse events. For the first hypothesis, participants who reported any type of childhood adverse event were separated from participants who did not report any type of childhood adverse event in a dichotomous variable. For example, if one participant reported physical neglect only and another participant reported all five types of childhood adverse events, they were both coded the same, as reporting any childhood adverse event. For the second hypothesis, participants’ reports of each of the five types of childhood adverse events were summed together in a count variable (with a range of 0 to 5). More specifically, if a participant reported sexual abuse and emotional neglect, the variable was coded as 2. Finally, for the third hypothesis, participants’ responses to all 18 of the childhood adverse events questions were summed together (emotional neglect was reverse coded prior to the calculation) in a severity variable (with a range of 18 to 90). For example, if a participant scored 5 on sexual abuse, 3 on physical neglect, 0 on physical abuse, 7 on verbal abuse, and 10 on emotional neglect (reverse coded), the severity variable was coded as 25. Any childhood adverse event, count of childhood adverse event types, and overall severity of childhood adverse events were the independent variables used in the analyses.

### Adulthood Adverse Events

In the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV (AUDADIS-IV), all participants completed five questions pertaining to adulthood adverse events (Alegria et al., 2013). Consistent with prior research, participants were coded as experiencing any adulthood adverse event if they responded “yes” to any one of the following dichotomous questions: (a) been sexually assaulted, molested, raped, or experienced unwanted sex, (b) been physically attacked, beaten, or injured by spouse or romantic partner, (c) been physically attacked, beaten, or injured by anyone else, (d) been married to an alcoholic, or (e) lived as if married to someone who was an alcoholic. The coded adulthood adverse event variable was utilized as a potential confounding variable in the analyses.

### Adult Physical and Mental Health

Version 2 of the Short Form-12 Health Survey (SF-12v2; Ware, Kosinski, Turner-Bowker, & Gandek, 2002) was the primary self-report measure of adult physical and mental health. This measure probes life satisfaction and current functioning over the last 4 weeks. The SF-12v2 is scored to produce a norm-based mental component summary score and a norm-based physical component summary score (Ware et al., 2002). These scale scores are standardized with a range of 1–100 and a mean of 50 (SD = 10). Higher scores indicate better functioning. Reliability estimates for the United States general population are 0.89 on the physical component summary score, and 0.86 on the mental component summary score. The relative validity of the SF-12v2 physical component summary score compared to the SF-36 parallel scale is 0.81, and the mental component summary score comparison is 0.92 (Ware et al., 2002).

### Data Analyses

The main outcome measure of interest was self-reported adult physical and mental health, measured by the SF-12v2 (Ware et al., 2002). The measure is scored to produce a standardized mental and physical component summary score, which were utilized as the outcome measure in two hierarchical linear regressions. Prior to the hierar-
chical linear regressions, two independent-samples $t$ tests were conducted to determine if there were significant differences in both adult physical and mental health between those who reported experiencing any childhood adverse event and those who did not report experiencing any childhood adverse event. Two additional independent-samples $t$ tests were conducted to determine if there were significant differences in both adult physical and mental health between those who reported experiencing any adulthood adverse event and those who did not report experiencing any adulthood adverse event. Then, a hierarchical linear regression was conducted for the mental health variable and the physical health variable, controlling for the potential confounding variables of age, race, gender, education, personal income, marital status, and reported experience of any adulthood adverse event. Significance was set to a $p$ value of less than .05 in all analyses.

**Results**

**Reported Prevalence Rates of Childhood Adverse Events**

Prior to all analyses, data were screened for missing values. Descriptive statistics were calculated to determine the reported prevalence rate for each type of childhood adverse event. Table 1 describes the reported prevalence rate for each of the types of childhood adverse events, as well as the reported prevalence rate of any of the five types of childhood adverse events. For count of childhood adverse events, up to five types could be reported. As noted in Table 1, 44.5% ($n = 15,426$) of participants reported experiencing at least one type of childhood adverse event. Multiple types of childhood adverse events were reported by 18.1% ($n = 6,279$) of participants.

**Correlational Analyses**

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, homoscedasticity, and multicollinearity. To detect

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<th>TABLE 1</th>
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<tr>
<th>Participants’ Reported Prevalence Rates of Childhood Adverse Events</th>
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<tbody>
<tr>
<td>Childhood Adverse Events (CAEs)</td>
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<tr>
<td>Reported Any CAE</td>
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<tr>
<td>Reported 1 CAE</td>
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<tr>
<td>Reported 2 CAEs</td>
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<td>Reported 3 CAEs</td>
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<tr>
<td>Reported 4 CAEs</td>
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<td>Reported 5 CAEs</td>
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<tr>
<td>Physical Abuse Frequency</td>
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<td>Verbal Abuse Frequency</td>
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<td>Emotional Neglect Frequency</td>
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**TABLE 2**

<table>
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<tr>
<th>Correlations Between Study Variables</th>
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<tr>
<td>Measure</td>
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<tr>
<td>1. Gender</td>
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<tr>
<td>2. Age</td>
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<td>3. Race</td>
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<td>4. Income</td>
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<td>5. Education</td>
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<td>6. Marital</td>
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<tr>
<td>7. AAEs</td>
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<tr>
<td>8. Any CAE</td>
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<td>9. Count</td>
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<tr>
<td>10. Severity</td>
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<tr>
<td>11. Phys Hlth</td>
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<td>12. Ment Hlth</td>
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</table>

Note. AAEs = any adult adverse event; Any CAE = any childhood adverse event; Count = number of different types of childhood adverse events experienced; Severity = total score of every childhood adverse event question; Phys Hlth = adult physical health; Ment Hlth = adult mental health. *$p < .05$; **$p < .01$; ***$p < .001$. 

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TABLE 3
Model Summaries for Both Hierarchical Linear Regressions

<table>
<thead>
<tr>
<th>Model</th>
<th>( R^2 )</th>
<th>Adjusted ( R^2 )</th>
<th>( F )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Health</td>
<td>1</td>
<td>.22</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>.23</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>.24</td>
<td>.24</td>
</tr>
<tr>
<td>Mental Health</td>
<td>1</td>
<td>.04</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>.09</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note. * \( p < .001 \).

TABLE 4
Regression Coefficients for Physical Health

<table>
<thead>
<tr>
<th>Model</th>
<th>( \beta )</th>
<th>SE</th>
<th>( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td>.11</td>
<td>.00</td>
</tr>
<tr>
<td>Race</td>
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<td>.11</td>
<td>-.02**</td>
</tr>
<tr>
<td>Age</td>
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<td>.03</td>
<td>-.37**</td>
</tr>
<tr>
<td>Education</td>
<td>1.26</td>
<td>.07</td>
<td>.11**</td>
</tr>
<tr>
<td>Income</td>
<td>.71</td>
<td>.02</td>
<td>.17</td>
</tr>
<tr>
<td>Marital Status</td>
<td>-1.70</td>
<td>.11</td>
<td>-.06**</td>
</tr>
</tbody>
</table>

Model 2

| Gender | .27 | .11 | .01** |
| Race   | -.61 | .11 | -.03** |
| Age    | -2.35 | .03 | -.36** |
| Education | 1.24 | .06 | .10** |
| Income | .71 | .02 | .17 |
| Marital Status | -1.50 | .11 | -.07** |
| Any AAE Experience | -2.05 | .12 | -.09** |

Model 3

| Gender | .24 | .11 | .01** |
| Race   | -.57 | .11 | -.03** |
| Age    | -2.35 | .03 | -.36** |
| Education | 1.19 | .06 | .10** |
| Income | .69 | .02 | .17 |
| Marital Status | -1.52 | .11 | -.07** |
| Any AAE Experience | -1.48 | .12 | -.06** |
| Severity of CAEs Total | -0.06 | .01 | -.04** |
| Count of CAEs Total | -0.39 | .12 | -.04** |
| Any CAE Experience | 0.16 | .17 | .01 |

Note. CAE = childhood adverse event; AAE = adulthood adverse event.
*p < .05. ** p < .001.

Two independent-samples \( t \) tests were conducted to determine if there were significant differences in both adult physical and mental health between those who reported any childhood adverse event \((n = 15,426)\) and those who did not report any childhood adverse event \((n = 18,589)\). Because Levene’s Test for Equality of Variances was significant \((p < .001)\) for both \( t \) tests, the assumption of homogeneity of variance was violated, so the results were interpreted using \( t \) tests with Satterthwaite approximations. On average, participants who reported any childhood adverse event reported a lower quality of physical health \((M = 48.93, SE = 0.09)\) than those who did not report any childhood adverse event \((M = 50.37, SE = 0.08)\). This difference, 1.44, bias-corrected and accelerated method \((BC_a) 95\% CI [1.21, 1.68]\), was significant, \( t(31840.34) = 12.14, p < .001 \). However, it represented a small-sized effect, \( d = 0.13 \). Similarly, participants who reported any childhood adverse event reported a lower quality of adult mental health \((M = 49.47, SE = 0.08)\) than those who did not report any childhood adverse event \((M = 52.46, SE = 0.07)\). This difference, 2.99, \( BC_a 95\% CI [2.78, 3.20]\), was significant, \( t(30847.21) = 28.05, p < .001 \). However, it represented a small-sized effect, \( d = 0.31 \).

In addition, two independent-samples \( t \) tests were conducted to determine if there were significant differences in both adult physical and mental health between those who reported any adulthood adverse event \((n = 10,281)\) and those who did not report any adulthood adverse event \((n = 24,372)\).
Once again, because Levene’s Test for Equality of Variances was significant \((p < .001)\) for both \(t\) tests, the assumption of homogeneity of variance was violated, so the results were interpreted using \(t\) tests with Satterthwaite approximations. On average, participants who reported any adulthood adverse event reported a lower quality of physical health \((M = 48.15, SE = 0.12)\) than those who did not report any adulthood adverse event \((M = 50.28, SE = 0.07)\). This difference, 2.13, BC, 95% CI [1.87, 2.40], was significant, \(t(17202.73) = 15.73, p < .001\). However, it represented a small-sized effect, \(d = 0.20\). Similarly, participants who reported any adulthood adverse event reported a lower quality of adult mental health \((M = 48.30, SE = 0.11)\) than those who did not report any adulthood adverse event \((M = 52.21, SE = 0.06)\). This difference, 3.91, BC, 95% CI [3.67, 4.15], was significant, \(t(16348.49) = 31.70, p < .001\), and it represented a medium-sized effect, \(d = 0.41\).

### Hierarchical Linear Regressions

To examine the effects of all three predictor variables on adult physical and mental health, while controlling for several known confounding variables, two hierarchical linear regressions were conducted. Consistent with prior literature (Alegria et al., 2013; Min et al., 2013), confounding variables controlled for in the analyses included gender, age, race, education, personal income, marital status, and reported experience of adulthood adverse events. Both regressions were a three-step analysis. In Step 1, age, race, gender, education, income, and marital status were regressed. In Step 2, experience of adult adverse events was included. In Step 3, the predictor variables of any childhood adverse event, count of types, and severity of types were added simultaneously.

Reported experience of any childhood adverse event, count of types, and overall severity had significant effects on quality of adult physical health \((R^2 = .24, p < .001)\). After Step 2, there was a significant main effect for experience of adulthood adverse events \((\Delta R^2 = .01, p < .001)\). The total variance explained by the model was 23.5%, \(F(7, 33,928) = 322.33; p < .001\). After Step 3, there was a significant interaction effect between adulthood adverse events and all three predictor variables \((\Delta R^2 = .03, p < .001)\). The total variance explained by the model as a whole was 6.2%, \(F(7, 33,931) = 332.33; p < .001\). After Step 3, there was a significant interaction effect between adulthood adverse events and all three predictor variables \((\Delta R^2 = .03, p < .001)\). The total variance explained by the model as a whole was 8.9%, \(F(10, 33,928) = 332.18; p < .001\).

The model summaries for both regressions are summarized in Table 3. The increases in model fit, although relatively small in size, were consistently statistically significant for both adult physical and adult mental health. The betas, standardized beta

### TABLE 5

<table>
<thead>
<tr>
<th>Regression Coefficients for Mental Health</th>
<th>Model</th>
<th>(\beta)</th>
<th>(SE)</th>
<th>(\beta)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-1.40</td>
<td>.11</td>
<td>-.07*</td>
<td></td>
</tr>
<tr>
<td>Race</td>
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<td>.11</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.26</td>
<td>.03</td>
<td>.06*</td>
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</tr>
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<td>.00</td>
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<td>.05*</td>
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<td>.02</td>
<td>.11*</td>
</tr>
<tr>
<td></td>
<td>Marital Status</td>
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<td>-.07</td>
</tr>
<tr>
<td>Any AAE Experience</td>
<td>-3.37</td>
<td>.12</td>
<td>-.16*</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<td>.11</td>
<td>-.05*</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>0.10</td>
<td>.11</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.20</td>
<td>.03</td>
<td>.04*</td>
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<tr>
<td>Model 3</td>
<td>Education</td>
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<td>.06</td>
<td>.03*</td>
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<td>0.38</td>
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<tr>
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<td>Count of CAEs Total</td>
<td>0.35</td>
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<td></td>
<td>Any CAE Experience</td>
<td>-1.13</td>
<td>.17</td>
<td>-.06*</td>
</tr>
</tbody>
</table>

Note. CAE = childhood adverse event; AAE = adulthood adverse event.

\(p < .05\), \(p < .01\)
values, and standard errors for the physical health regression are presented in Table 4, and also presented for the mental health regression in Table 5. In general, participants who reported experiencing any childhood adverse event also experienced a lower quality of adult physical and mental health, even after accounting for several confounding variables, including reported experience of adulthood adverse events.

Discussion

Previous research has demonstrated that the experience of childhood adverse events can result in a decrease of overall adulthood health (Corso et al., 2008; Irving & Ferraro, 2006; Springer et al., 2007). In this study, consistent with the previous research, reported experience of childhood adverse events was significantly associated with poorer adult physical and mental health. On average, participants who reported experiencing any type of childhood adverse event experienced an adult physical health score that was lower than participants who did not report experiencing any childhood adverse events. Similarly, participants who reported experiencing any childhood adverse event also experienced an adult mental health score that was lower than those who did not report experiencing any childhood adverse event.

Reported experience of any childhood adverse event significantly predicted a lower quality of health in the regression models. Count of childhood adverse event types and overall severity significantly predicted lower quality of adulthood physical health. Reported experience of any childhood adverse event, count of childhood adverse event types, and overall severity significantly predicted lower quality of adulthood mental health. This effect remained significant in both regression models after accounting for known demographic and clinical confounding variables. However, although the models remained significant, they do not explain a substantial portion of the variance. After accounting for the known confounding variables, the report of experiencing childhood adverse events only predicted an additional small percentage of the variance in adulthood physical health and adulthood mental health. The results suggest that, although experiencing childhood adverse events does significantly predict lower quality of adulthood physical and mental health, they do not explain a substantial portion of the variance. Because the current study utilized a large and uniquely representative U.S. sample, these findings pose significant implications for the treatment of childhood abuse. For example, treatment providers may improve treatment outcomes by directing treatment toward preventative care for childhood clients who have experienced adverse events prior to adulthood.

In the current study, there were significant differences in both mental health and physical health scores between participants who reported experiencing adulthood adverse events and participants who reported not experiencing any adulthood adverse events. This variable was also a significant predictor in the regression models because it had a main effect on both adult mental health and adult physical health. These findings, in combination with the small change in variance in adulthood physical health and adulthood mental health scores after accounting for the reported experience of childhood adverse events, suggest a youthful resilience against the long-term effects of childhood adverse events. This finding is similar to other studies that have concluded that childhood adverse events may have a less substantial impact on adult health after controlling for adult life stressors (Horwitz et al., 2001).

As indicated by the results, the relationship between childhood trauma and adult health is complex, which may be due to the impact of repeated trauma. Existing research has established that individuals with a history of childhood physical abuse, sexual abuse, or neglect are at an increased likelihood for subsequent victimization (Widom, Czaja, & Dutton, 2008). For example, Gidycz, Coble, Latham and Layman (1993) suggested that childhood sexual victimization predicted poorer adjustment, which in turn predicted later adult revictimization. The findings from the current study may be explained by Gidycz and colleagues’ (1993) findings, in that reported experiences of childhood adverse events were associated with deficits in adult physical and mental health, but the variables were not strongly associated after accounting for adulthood adverse events. The research is relevant for clinicians, who may increase efficacy by focusing on preventative care for childhood clients who have recently experienced adverse events.

There are three noteworthy elements of the current study that distinguish it from previous research on childhood adverse events. First, this study investigated the nature of the relationship between childhood adverse events and adult physical and mental health using a large and uniquely representative national sample. Second, data were collected during a face-to-face, computer-assisted
personal interview. Third, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) data featured an extensive assessment of a wide range of potentially confounding variables that have affected self-reported adult health in past research, but have not been consistently accounted for in past research.

Despite these findings, there are a number of limitations in this study that must be considered. All childhood adverse events were retroactively reported by participants, who were at least 20 years old, but up to 90 years old, at the time of participation. The reliability of these retroactively reported statements is an ongoing debate in the field. And, the debate about retrospective versus prospective findings in childhood adverse events research is mixed (Kendall-Tackett & Becker-Blease, 2004). Widom, Weiler, and Cottler (1999) found significant differences between retrospective findings and prospective findings within the same sample. Still, some researchers argue that retrospective findings are reliable over time (Dube, Williamson, Thompson, Felitti, & Anda, 2004). Kendall-Tackett and Becker-Blease (2004) concluded that, although prospective findings are valuable, they are not necessarily preferred over retrospective findings. Retrospective childhood adverse events research measures a portion of the population that prospective research fails to capture. For this reason, research regarding childhood adverse events would suffer if retrospective findings were rejected altogether (Kendall-Tackett & Becker-Blease, 2004).

A few other limitations must be considered in this study. First, childhood adverse events were determined based on a small number of questions. This limits the type of childhood adverse events that were included in the current coding scheme, and may restrict other experiences that would otherwise be included in the definition of childhood adverse events. Because only cross-sectional data from Wave 2 of NESARC was utilized in the current study, inferences about causality cannot be made. Finally, modifications were made to Version 2 of the Short Form-12 Health Survey (SF-12v2; Ware et al., 2002) in order to allow for its inclusion in the NESARC questionnaire. These modifications were not consented by the owners of the SF-12v2, OptumInsight Life Sciences (QualityMetric), and may limit the reliability and validity of the measure. However, in light of this limitation, scores for the SF-12v2 were derived and standardized by the National Institute of Alcohol Abuse and Alcoholism using the techniques described by Ware et al. (2002).

Due to the retrospective and cross-sectional nature of this study, as well as the limitations addressing the childhood adverse event questions, the effect of childhood adverse events on adult mental and physical health requires further replication. Future research should consider the use of a representative national sample measuring these variables that is collected both prospectively and retrospectively. Because prior research has demonstrated an effect of ethnicity in risk of revictimization (Widom et al., 2008), the imminent need for a nationwide sample that reflects the growing diversity in the United States should also be taken into consideration. This design is ideal because it would allow future researchers to determine if there are differences in adulthood health of an ethnically representative national sample when measured both prospectively and retrospectively, while accounting for known demographic and clinical confounding variables.

References


Childhood Adverse Events and Adult Health


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Lauren Clatch is now at the Department of Psychology, University of Minnesota.

Portions of the manuscript have been presented at the annual convention of the American Psychology-Law Society. Special thanks to Psi Chi Journal reviewers for their support.

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The Influence of Cognitive Heuristics and Stereotypes About Greek Letter Organizations on Jury Decisions

Allison Kramer and Michele Van Volkom*
Monmouth University

ABSTRACT. The current study utilized data from 140 participants ranging in age from 18–35 years old ($M = 19.66$, $SD = 1.84$) to test whether a defendant’s affiliation with a Greek letter organization would result in biased jury decisions. Participants read a short case summary about a college aged man arrested for driving under the influence. The defendant in question was described as either being a member of a fraternity, or an affiliation was not mentioned. Participants were then asked a series of questions regarding their perception of the defendant and asked to determine a final verdict. In addition to the defendant’s affiliation, participants’ affiliation with Greek life was also taken into consideration. Results indicated that nonaffiliated participants were less attracted to the defendant ($p = .05$). Main effects were also found for both participants’ affiliation and the defendant’s affiliation on guilty ratings. Guilty ratings were higher when the defendant was affiliated with Greek life, compared to when the defendant was not affiliated with Greek life ($p = .04$). Additionally, nonaffiliated participants rated the defendant as more guilty than affiliated participants ($p = .03$). Gender differences were also found, indicating that men were more lenient in verdict decisions compared to women ($p = .002$). These results can be used to understand factors that influence jury decisions, including the use of cognitive heuristics and biases within the court system.

When people hear the words fraternity or sorority, what are the first words that come to mind: drinking, partying, hazing? Due to how Greek life (i.e., activities performed by members of a fraternity or sorority) has been portrayed by the media, people might have begun to associate fraternities and sororities with problem behaviors such as binge drinking or hazing pledges. The overall belief about the perception of Greek letter organizations is often negative (Tollini & Wilson, 2010). This negative stereotype about the organizations and those affiliated with the organizations may have harmful implications both on and off campus. These stereotypes may not only contribute to distrust among member and nonmember students (Warber, Taylor, & Makstaller, 2011), but also have the potential to impact decisions made in a court of law.

The Sixth Amendment of the Constitution of the United States of America declares that every citizen has the right to a fair trial. However, jurors often succumb to implicit biases which can influence their decision-making processes (Colwell, 2005). Understanding the different factors that can lead to these biases is the first step in overcoming them. It is important to investigate these factors in order to ensure that the court system is upholding its duty to ensure fair and unbiased trials. The purpose of the current study was to understand the potential influence that stereotypes about Greek letter organizations have on jury decisions. More specifically, the study sought to determine whether disclosure of a Greek life affiliation of a defendant, accused of driving under the influence, would affect jurors’ perceptions of the defendant.

*Faculty mentor

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Heuristics and Jury Decisions

Heuristics in the Court Room

Every U.S. citizen has the right to a fair trial according to the Constitution. Although unbiased trials cannot be guaranteed, one factor that can hinder this basic right is the use of heuristics by juries. People have the tendency to allow individual preferences, expectations, and experiences to influence the decision making process (Colwell, 2005). Cognitive heuristics are mental shortcuts often used when a person has to make a difficult decision (Saks & Kidd, 1981). Common heuristics used in court situations include the representative heuristic and availability heuristic (Colwell, 2005). Both of the aforementioned mental shortcuts involve making decisions based on faulty beliefs surrounding the probability of an event occurring. In the context of a court room, these faulty mental processes could manifest as jurors believing a prosecutor’s case simply because it fits into common beliefs held by the jury rather than being proven by the actual facts of the case. Consequently, this often results in unfair verdict decisions and evidentially jail time or costly fines for the defendant in question.

Heuristics are most often employed when the decision making process seems difficult. Determining a verdict has the potential to be both challenging and stressful, particularly when a case is complex. A study by Cooper, Bennett, and Sukel (1996) found that jurors used mental shortcuts to come to a verdict when a case was difficult to understand. Jurors were exposed to an expert testimony given by either a person with high credentials (i.e., multiple degrees from prestigious universities, currently involved in research, 45 published articles), or a person with moderate credentials (i.e., degrees from small universities, not involved in research, few publications). Despite hearing the same testimony, jurors in the highly credentialed expert condition voted in favor of the plaintiff more often than jurors in the moderately credentialed expert condition. Jurors allowed perceptions of the expert witness to influence how they made their decision.

Another factor that could potentially influence a juror’s perception of a defendant and the accompanying verdict is the perceived attractiveness of the defendant. Early research showed that jurors tend to give more lenient verdict decisions to defendants they find physically attractive (Stephan & Tully, 1977), are less confident in their decision of guilt for defendants that are perceived as attractive (Efran, 1974), and rate defendants found to be socially unattractive as more guilty (Griffitt & Jackson, 1973). More recent research has also suggested that attractiveness leads to lesser sentences (e.g., Gunnell & Ceci, 2010). Results from these studies indicate that the social and physical attraction a juror feels toward a defendant could possibly influence the verdict decision.

A factor that also tends to promote the use of heuristics in the judicial system is pretrial publicity. Many studies have examined the effect of pretrial publicity on jury decisions and how it may contribute to the use of availability heuristics (Daftary-Kapur, Penrod, O’Connor, & Wallace, 2014; Otto, Penrod, & Dexter, 1994; Platania & Crawford, 2012). Media coverage of certain court cases influences how common people believe those types of cases to be and creates the illusion that uncommon situations occur more frequently than in reality (Folkes, 1988).

Pretrial publicity can also influence how a jury perceives a defendant or plaintiff of a case. Mock jurors who read about negative aspects of a defendant’s character were more likely to rule that the defendant was guilty than jurors who did not read about negative characteristics, despite the information presented during the trials being the same (Otto et al., 1994). Jurors who read the negative information entered the trial with preconceived notions that the defendant was a bad person and allowed that information to bias the final verdict. This is often a side effect of pretrial publicity. Pre-existing beliefs also influence jury decisions (Daftary-Kapur et al., 2014). When participants read the trial proceedings of a case against a European American police officer accused of manslaughter of an African American male, the mock jurors with pre-existing beliefs that police were racists were more likely to vote that the police officer was guilty. The information presented during the trial did little to mitigate the jurors’ pre-existing beliefs. The tendency for people to use availability heuristics and pre-existing beliefs when making jury decisions is a major issue for the judicial system. Groups that have negative stereotypes fight a losing battle in court. Negative media surrounds certain groups of people and maintains the associated stereotypes that make fair trials difficult to obtain. One of those groups is members of Greek letter organizations on college campuses.

Stereotypes About Greek Letter Organizations

Due to information provided by multiple sources including the media (e.g., Neighbors, Animal House), people might have formed stereotypes about members of Greek letter organizations. Common
stereotypes that are associated with Greek letter organizations, fraternities in particular, are that members engage in excessive drinking, haze pledges, are sexually promiscuous, are arrogant, and pay for friends (Tollini & Wilson, 2010). Although research has supported that members of Greek life drink more than nonmembers (Baer, 1994; Eberhardt, Rice, & Smith, 2003), the other stereotypes about members are not empirically supported. The existence of these beliefs is often due to media coverage of extreme cases and can be explained using the availability heuristic described previously. Conversely, it can be argued that positive facts about those affiliated with Greek-life are rarely newsworthy. Another stereotype involving fraternities and sororities is that members are often assumed to be less intelligent than other students (Tollini & Wilson, 2010). People may assume that members’ focus is on the social aspect of college and not the academic aspect. However, members of Greek life have been found to develop more academically and personally during college than nonmembers (Pike, 2003). A study of 650 college campuses across the country found that students affiliated with a Greek letter organization had more interaction with faculty, were involved in more community service projects, participated in more curricular activities, and were more engaged in active learning than those not affiliated with a fraternity or sorority (Hayek, Carini, O’Day, & Kuh, 2002). As these studies show, there are many advantageous aspects to being a member of a fraternity or sorority that most people do not realize.

Although in reality there are many positive aspects of Greek letter organizations, a phenomenon called in-group favoritism could potentially contribute to the negative connotation surrounding fraternities and sororities due to a tendency for people to view those belonging to a different group as outsiders (Aronson & Aronson, 2012). The influence this concept has on someone views others, can be seen in a study during which participants were randomly assigned to two groups and asked to rate participants in the opposite group (Crocker, Thompson, McGraw, & Ingreman, 1987). Participants rated those who were in the other group more negatively than those in their own group. The same phenomenon has been studied in reference to Greek life (Warber et al., 2011). Students who are not affiliated with Greek life hold beliefs that students affiliated with Greek life engage in more deviant behaviors and are less trustworthy. Wells and Corts (2008) examined reaction times on an implicit bias assessment where participants had to match pictures with the word good or bad. Participants had faster reaction times when the word bad was matched up with pictures relating to fraternities and sororities, indicating that participants had implicit biases toward members of Greek organizations. If a member of a fraternity or sorority was to be put on trial, these biases and stereotypes against Greek letter organizations could have detrimental effects on the final verdict.

Research has demonstrated that implicit biases towards members of Greek letter organizations exist (Wells & Corts, 2008), but the influence of these biases in situations other than personal interactions has not been studied. Previous research has also identified a variety of factors that can influence jury decisions such as race (Lynch & Haney, 2011), perceived similarity (Mitchell & Byrne, 1973), attractiveness (Weiten & Diamond, 1979) and pretrial publicity (Daftary-Kapur et al., 2014). What research has yet to examine is the effect of stereotypes about Greek life organizations on jury decisions. The current study added to research by bridging the gap between these two topics. We examined how jury decisions may be altered based on a defendant disclosing information of affiliation with a Greek organization or not. It was predicted that when the defendant disclosed being a member of a Greek letter organization, participants would judge the defendant as being more guilty and deserving of a more severe punishment. Participants were also expected to rate the affiliated defendant lower on interpersonal attraction. However, when the participant was also a member of a Greek letter organization, it was predicted that the defendant would be judged as less guilty, deserving of a less severe punishment, and higher on interpersonal attraction. These predictions were based on past research on how members of Greek letter organizations are perceived and how heuristics work within the court system.

Method

Participants

The data used in this study were collected from 140 undergraduate students from a private Northeastern University. Participants’ ages ranged from 18 to 35 years old (M = 19.66, SD = 1.84). There were 39 men, 100 women, and one participant who failed to report gender. The sample was comprised of 38.6% first-year students, 25% sophomores, 29.3% juniors, 6.4% seniors, and one participant (0.7%) who did not report a school-year classification.
Although many of the participants were humanities and social science majors, a variety of other majors were represented as well (see Table 1). Additionally, 37.1% \((n = 52)\) of participants were members of Greek life (e.g., in a fraternity or sorority) or were in the process of becoming a member and 62.9% \((n = 88)\) of participants were not involved in Greek life in any way. Participants were selected using both a convenience sampling of a research participation pool and a convenience sample of university students outside of the participation pool. Participants from the participation pool were awarded credits toward a research participation grade for their psychology classes. However, participants recruited from outside of the pool were not compensated. All participants followed a procedure approved by the participating university’s Institutional Review Board.

**Materials**

**Case summary.** Each participant was given a short case summary that described a fictional situation. The summary described the charge against a male college student accused of driving under the influence. The confrontation between the defendant and the arresting officer was described in addition to personal details about the defendant. The case summary was the manipulated variable in this experiment. For one group, being a member of a fraternity was included in the list of activities and organizations of which the defendant was a part (see Appendix A). In the case summary for the second condition, membership in a fraternity was not mentioned (see Appendix B). Participants were told to judge the defendant based on the details described in the case summary.

**Interpersonal Attraction Scale.** This study utilized a modified version of the Interpersonal Attraction Scale (McCroskey & McCain, 1974) to measure how participants perceived the defendant. Out of the three original subscales, participants completed the Task Attraction and Social Attraction subscales. The Task Attraction subscale included items such as “He is a typical goof-off at work” and “I could not get anything accomplished with him.” The Social Attraction subscale included items such as “We could never establish a personal friendship with each other” and “It would be difficult to meet and talk with him.” The two original subscales were analyzed together to create one interpersonal attraction score. The Cronbach’s \(\alpha\) for this revised scale was .86. A total of 10 items, some of which were reversed scored, were on the questionnaire. Participants rated each statement on a 7-point Likert-type scale from 1 (strongly agreed) to 7 (strongly disagreed). To score the questionnaire, all ratings were added up; low scores indicated that participants were less attracted to the defendant, and high scores indicated a higher attraction to the defendant.

**Final verdict.** The questionnaire given to each participant contained two items that comprised the final verdict. One item measured how guilty participants believed the defendant was. The item asked participants how guilty they found the defendant on a 7-point Likert-type scale from 1 (not guilty) to 7 (guilty). Each questionnaire also included a question to measure how severe participants believed the defendant’s punishment should be. This question was also rated on a 7-point Likert-type scale from 1 (minimum punishment) to 7 (maximum punishment).

**Manipulation check.** An activities checklist was given for participants to fill out which acted as the manipulation check for the experiment. The list consisted of seven different activities and organizations of which the defendant could potentially be a member. Participants had to check off all of the activities or organizations that were listed in the case summary. The activity of interest was fraternity/sorority, which provided information on whether participants noticed that the defendant was in a Greek letter organization or not.

**Demographics.** The last piece of information that participants filled out was a demographics form, which included information such as age, sex, major, and year in school. The demographics sheet also asked participants to check off one of two statements. The first statement was that the participant was a member of a Greek letter organization on

<table>
<thead>
<tr>
<th>Descriptive Statistics for Participants’ Major</th>
<th>Frequency ((N))</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities and Social Science</td>
<td>76</td>
<td>54.2</td>
</tr>
<tr>
<td>Nursing and Health Studies</td>
<td>23</td>
<td>16.4</td>
</tr>
<tr>
<td>Business</td>
<td>21</td>
<td>15.0</td>
</tr>
<tr>
<td>Science (i.e., Biology, Chemistry, and Computer Science)</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td>Social Work</td>
<td>6</td>
<td>4.3</td>
</tr>
<tr>
<td>Undeclared</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Math</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>No Response</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>
The second option was that the participant was not affiliated with a Greek letter organization in any way. Participants were told to check off the statement that best represented them.

**Design**
The study was a 2 (Affiliation of Participant) x 2 (Affiliation of Defendant) factorial design. The manipulated variable was the Greek life affiliation of the defendant in the court case summary. In the summary, the defendant was either described as being a member of a fraternity along with involvement in other activities, or involvement in Greek life was not mentioned. Participants were randomly assigned to the different conditions. The second variable was the Greek life affiliation of the participants; this was not able to be manipulated. All participants indicated whether they were affiliated with a Greek letter organization or not affiliated. The dependent variables measured in the study were guilty ratings, severity of punishment, and interpersonal attractiveness of the defendant, which were all measured using questionnaire items.

**Procedure**
After institutional review board approval (#SP1730) was obtained, research sessions consisting of approximately eight participants at a time began. Upon entering the lab, participants were informed to sit in any available seat. Once all participants were present, two copies of the informed consent script were given to each student; one to sign and return to the researcher, and the other to keep. The signed consent form was then filed separately from all other data collected during the study. Participants were then given a brief scenario to read over describing the events leading up to a male college student being arrested for driving under the influence. In the scenario, the defendant was described as either being affiliated with Greek life on campus or not affiliated with Greek life on campus. Participants read the court case for 1 minute before the researcher collected it and handed each participant a questionnaire packet, including the modified Interpersonal Attraction Scale, final verdict questions, activities checklist, and demographics form. Upon completion of the packet, the researcher collected the questionnaires and provided all participants with a debriefing form to take home. Participants were told to read the debriefing form silently while the researcher read it out loud. The researcher then answered any questions and thanked participants for taking the time and effort to participate in the study as the participants left the lab. Due to an initial lack of participants affiliated with Greek life, additional participants were recruited from outside of the research participation pool. Participants recruited in this fashion were approached on campus and asked if they were a member of a Greek letter organization or were in the process of becoming a member. The researcher then asked students affiliated with a Greek letter organization if they would be willing to participate in a study. Students who agreed were given the same materials in the same order as all other participants. Informed consent and debriefing forms were also given and read in the same way as all other participants.

**Results**

**Manipulation Check**
Because this study aimed to investigate whether the Greek life affiliation of a defendant would influence jury decisions, a manipulation check was needed in order to ensure that participants noticed whether the defendant in the case summary was in a fraternity or not. An activities checklist was utilized as the manipulation check. Out of the total 140 participants, 92% (N = 129) of participants correctly identified the Greek life affiliation of the defendant in the case summary.

**Guilty Ratings**
The influence of Greek life affiliation on guilty ratings was examined using a factorial Analysis of Variance (ANOVA). It was hypothesized that the affiliation of the defendant would influence guilty ratings. This hypothesis was supported \( F(1,136) = 4.20, p = .04, \) partial \( \eta^2 = .03 \). The defendant affiliated with Greek life was given higher guilty ratings than the defendant not affiliated with Greek life (see Table 2). It was also hypothesized that participants’ affiliation with Greek life would influence guilty ratings. This was also found to be significant, \( F(1,136) = 4.75, p = .03, \) partial \( \eta^2 = .03 \). Participants affiliated with Greek life rated the defendant as less guilty than participants not affiliated with Greek life. The last hypothesis regarding guilty ratings was that, when both a participant and the defendant were affiliated with Greek life, the participant would give lower guilty ratings compared to when a participant was not affiliated with Greek life and the defendant was. However, results did not support this hypothesis, \( F(1,136) = 0.44, p = .51, \) partial \( \eta^2 = .003 \). There

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was no significant interaction between defendant and participant affiliation on guilty ratings.

**Punishment Severity**

The influence of Greek life affiliation on punishment severity was also tested. A factorial ANOVA was used to test this relationship. It was hypothesized that the Greek life affiliation of the defendant would influence the punishment severity recommendations given by participants. Results did not support this hypothesis, $F(1,136) = 0.02, p = .90$, partial $\eta^2 = .0001$. Participants did not recommend a more severe punishment to the defendant affiliated with Greek life compared to the defendant not affiliated with Greek life (see Table 3). Participants’ Greek life affiliation was also hypothesized to influence severity of punishment ratings. This was also found to be not significant, $F(1,136) = 0.49, p = .49$, partial $\eta^2 = .004$. Participants in Greek life did not give lower severity recommendations than nonaffiliated participants. The interaction between Greek life affiliation and participant affiliation was also not significant, $F(1,136) = 1.90, p = .17$, partial $\eta^2 = .01$. There was no significant difference between Greek life affiliation of participants and of the defendant and punishment severity recommendations.

**Interpersonal Attraction**

The last relationship examined was between participants’ Greek life affiliation, Greek life affiliation of the defendant, and interpersonal attraction. A factorial ANOVA was conducted to test the influence of participants’ Greek life affiliation and the defendant’s Greek life affiliation on interpersonal attraction. It was hypothesized that a main effect would be found for affiliation of the defendant such that participants would be more attracted to the defendant who was not a member of a fraternity compared to the defendant in a fraternity. This hypothesis was not supported, $F(1, 136) = 3.53, p = .06$, partial $\eta^2 = .03$. There was no difference in attraction score between the defendant affiliated with Greek life and the defendant not affiliated with Greek life (see Table 4). It was also hypothesized that participants in Greek life would be more attracted to the defendant than participants not in Greek life. Results supported this hypothesis, $F(1,136) = 3.98, p = .05$, partial $\eta^2 = .03$. Participants affiliated with Greek life scored higher on interpersonal attraction compared to participants not affiliated with Greek life. An interaction effect was also hypothesized so that attraction would be higher when both a participant and the defendant were affiliated with Greek life compared to when a participant was not affiliated and the defendant was. This hypothesis was not supported, $F(1,136) = 0.04, p = .84$, partial $\eta^2 = .0003$. The interaction between participant affiliation and defendant affiliation did not influence interpersonal attraction.

**Participant Gender**

Although not part of the original hypotheses, an
exploratory analysis was conducted to investigate whether sex influenced any of the verdict factors or interpersonal attraction. A t test was conducted comparing the means given by each sex on guilt, punishment severity, and interpersonal attraction. Significant differences were found between men and women’s ratings of punishment severity, t(137) = 3.17, p = .002 (two-tailed), effect size d = .59, and guilt ratings, t(137) = 2.56, p = .012 (two-tailed), effect size d = .46. Men rated the defendant lower on both suggested punishment severity (M = 3.33, SD = 1.49) and guilt (M = 4.21, SD = 1.84) compared to women’s ratings of punishment severity (M = 4.16, SD = 1.34) and guilt (M = 4.98, SD = 1.50). Overall, men gave a more lenient verdict than women.

Discussion

The goal of this study was to investigate potential biasing effects that occur when Greek life affiliation of a defendant is disclosed to members of a jury. The researchers hypothesized that, when a defendant disclosed information regarding an affiliation with a fraternity, the participants acting as mock jurors would give the defendant a higher guilty rating, recommend a more severe punishment, and be less attracted to the defendant compared to when the defendant’s affiliation with Greek letter organizations was not mentioned. Results found that participants gave higher guilty ratings to the defendant who was a member of a fraternity. Additionally, exploratory analyses revealed that men were more lenient toward the defendant, giving lower guilty ratings and lower severity of punishment ratings, compared to women. This finding warrants further research attention because sex differences in perceptions of guilt, as well as punishment recommendations, may have crucial implications in actual court cases.

Implications

Although previous research has not attempted to connect stereotypes about Greek letter organizations and their potentially biasing effects on jury decisions, there have been multiple studies on other factors that influence jury decisions. The findings from the current study tie into past research on the use of heuristics when making jury decisions in many ways. Past research has found that a main stereotype held about members of Greek letter organizations is excessive alcohol use (Baer, 1994; Tollini & Wilson, 2010). According to the representative heuristic, jurors are more likely to believe that a defendant committed a crime when that defendant fits into the stereotype surrounding those who typically commit that crime. Due to the belief that members of Greek life drink more frequently than nonmembers, jurors would be more likely to believe that a member of a Greek organization committed a drinking related crime. Findings from the present study supported this idea because participants rated the defendant affiliated with a fraternity higher in guilt compared to the defendant not affiliated with Greek life. The accusation under investigation was whether the defendant was drunk driving or not. Participants were more likely to believe that the defendant in the fraternity was guilty of drunk driving than the defendant not in Greek life, despite the details of the case being the same.

Past research has also found that perceived similarity and attraction toward a defendant influenced jury decisions (Mitchell & Byrne, 1973). The lack of significant interaction effects in the present study goes against past findings that jurors are more lenient toward defendants similar to themselves. Participants affiliated with Greek life did not give different ratings for guilt, attraction, or punishment severity to the defendant affiliated with Greek life compared to the defendant not affiliated with Greek life. However, significant differences were found between men and women regarding guilt and punishment ratings. Men gave lower ratings in both categories compared to women. Similarity could play a role in these results due to the defendant also being a man around the same age as participants. The inconsistent results on similarity could indicate that perceived similarity does not play as big of a role in influencing jury decisions as other factors such as attraction. In the present study, attraction was found to have an influence on guilty ratings. Participants affiliated with Greek life were more attracted to the defendant and also rated the defendant as less guilty compared to participants not affiliated with Greek life.

The current study also strengthened the literature on the biases surrounding Greek life organizations on college campuses. Results indicated that participants gave the defendant who was a member of a fraternity higher guilt ratings. This can be tied into past research that has found that students believe members of Greek letter organizations are more likely to engage in deviant behavior (Warber et al., 2011). These results also support the concept that people have implicit, negative biases toward members of Greek letter organizations (Wells
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& Corts, 2008). Participants were more likely to believe that the defendant was guilty of drinking and driving when the defendant was described as being in a fraternity.

**Strengths and Limitations**

Although the results of the current study contributed to the understanding of how heuristics are used in court decisions, there are some limitations that need to be discussed. The current study utilized a relatively small sample size, which might have affected the power and limited the study’s ability to find significance. The study also has limited generalizability to the outside world. Participants were expected to act as mock jurors and react to the situation as if it was a real trial. However, the testing environment did not mimic a true court environment. Testing sessions were conducted in a lab at a university, and participants were not able to discuss their opinions with each other. In reality, trials take place in a courthouse, and jurors are encouraged to discuss the case in order to come to a conclusion. Also, participants might not have taken their decision as seriously as real jurors do because, participants’ verdict decisions in the study had no real impact on the defendant’s life.

Another limitation was the methodology of the study. Due to the hybrid nature of the study, participants’ Greek life affiliation could not be manipulated, and the researcher was not able to ensure an equal and sufficient number of participants in each experimental group. To mediate this restriction, participants outside the initial participant pool had to be recruited.

All participants being from the same midsized university was also a restriction. The view participants held of Greek life may not be the same as those held by students at a school with more prominent Greek life involvement such as large universities in the south. Participants might not have been exposed to as many events that support Greek life stereotypes such as large parties, which would limit their biases toward members of fraternities and sororities. A final limitation of the current study was that it did not ask for additional demographics outside of questions such as age and sex (e.g., race and ethnicity of participants was not obtained).

Despite the limitations just mentioned, the study had many strengths as well. The experimental control exhibited throughout the study was one of its many strengths. All materials presented to participants were exactly the same in all conditions aside from one sentence added to half of the case summaries indicating that the defendant was a member of a fraternity. Additionally, all sessions were conducted in the same lab location and everything was presented in the same order. An already established measure was also used to measure the interpersonal attraction each participant felt toward the defendant, and despite slight modifications to the questionnaire, the measure was found to be reliable. The manipulation was also successful with a majority of participants recognizing whether the defendant they read about was in a Greek organization or not. Another strength of the study was that it studied a new concept not yet covered by past research. All findings added to the understanding of factors that influence the use of heuristics in jury decisions and possible implications of being a member of Greek life.

**Future Directions**

It is important to continue research on this topic to further the understanding of the relationship between a defendant’s affiliation with Greek life and how that information may influence jury decisions. Future studies should attempt to create a more realistic jury setting in order to increase external validity. Also, more information should be given about the defendant and the case itself on which participants can base their decisions. Researchers should consider taping a fake trial consisting of opening statements, testimonies, and closing remarks to make the case seem more realistic and capture participants’ attention.

Future studies should also focus on collecting data from a more diverse sample such as including multiple universities of different sizes, or utilizing a sample of participants who are no longer in college to test whether stereotypes about Greek life change later in life. Additionally, different types of crimes should be studied to investigate whether jurors are more likely to use heuristics for certain crimes. Some crimes to consider for future studies are robbery or financial fraud. Studies examining these criminalities may find different results because there is no Greek life stereotype supporting fraud like there is for drinking and driving.

**Conclusion**

This study aimed to discover whether jurors utilized cognitive heuristics when making a jury decision about a defendant who was involved in a Greek letter organization. Although results did not support the idea that jurors based decisions
for punishment severity oft off of stereotypes and pre-existing biases, the results did support that Greek life affiliation influenced guilty ratings. Participants in Greek life rated the defendant as less guilty than participants who were not affiliated. Additionally, higher guilt ratings were given to the defendant when involvement in a fraternity was mentioned compared to when an affiliation with Greek life was not mentioned. The findings of this study also supported the hypothesis that participants affiliated with Greek life would score higher on interpersonal attraction toward the defendant than participants not in Greek life. Further analyses revealed that men gave lower guilt ratings and less severe punishment ratings in comparison to women. Results indicated that personal characteristics of both a defendant and a juror can influence how a juror will perceive a defendant. This in turn can encourage the use of cognitive heuristics when making a jury decision and result in biased, unfair verdicts.

References

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APPENDIX A
Case Summary With a Nonaffiliated Defendant

The defendant in question is a 22-year-old male college student. On campus he is involved in the television station, student activities board, and the club soccer team. Around 2:00 a.m. on Saturday, October 13, the defendant was pulled over in his car for speeding by Officer Morgan. The speed limit on the road was 45 mph, and the defendant was reportedly going 65 mph. When Officer Morgan approached the car, he asked where the defendant had been coming from. The defendant reported that he was on his way home from hanging out with a small group of friends. After asking a few more questions, Officer Morgan noticed that the defendant was having a difficult time focusing on what was being said to him, and was slightly slurring his words. When asked if he had been drinking earlier that night, the defendant denied that he had any alcohol and claimed he was just tired and wanted to go home. After further questioning, Officer Morgan arrested the defendant for driving under the influence.

APPENDIX B
Case Summary With an Affiliated Defendant

The defendant in question is a 22-year-old male college student. On campus he is an active member of the fraternity Delta Psi Beta, involved in the television station, student activities board, and the club soccer team. Around 2:00 a.m. on Saturday, October 13, the defendant was pulled over in his car for speeding by Officer Morgan. The speed limit on the road was 45 mph, and the defendant was reportedly going 65 mph. When Officer Morgan approached the car, he asked where the defendant had been coming from. The defendant reported that he was on his way home from hanging out with a small group of friends. After asking a few more questions, Officer Morgan noticed that the defendant was having a difficult time focusing on what was being said to him, and was slightly slurring his words. When asked if he had been drinking earlier that night, the defendant denied that he had any alcohol and claimed he was just tired and wanted to go home. After further questioning, Officer Morgan arrested the defendant for driving under the influence.
Stress is an inevitable aspect of everyday life that individuals of all ages experience. Some argue that college students in particular experience a substantial amount of stress. According to a survey of 90,666 college students across the United States conducted by the American College Health Association (2012), approximately 46% of female college students and 37% of male college students reported experiencing more than average stress in the last 12 months. Additionally, 29% of students surveyed reported that stress had a negative impact on their grades (American College Health Association, 2012).

The stress that college students experience is often related to a number of other factors such as financial insecurities and social strain (Skowron, Wester, & Azen, 2004). These stressors result in college students feeling as though they have to choose between schoolwork, social life, or sleep. Failure to find a balance often results in students feeling fatigued from lack of sleep, lonely from lack of socialization, or academically inferior from insufficient studying. Indeed, the American College Health Association (2012) found that approximately 46% of female students and 41% of male students reported feeling tired or sleepy during the day for three to five days in a given week, and 20% of students reported that sleeping difficulties had a negative impact on their grades (American College Health Association, 2012).

College students need to address sources of stress from multiple aspects of their lives, and if a stressor in one area of life proves too much to handle, it may have a spillover effect resulting in detrimental health outcomes both physically and psychologically (Brannon, Fiest, & UpDegraff, 2014). The current study sought to investigate the relationship between stress and health outcomes, and the moderating role of coping strategies in a student college sample.

ASSOCIATIONS BETWEEN COPING STRATEGIES, PERCEIVED STRESS, AND HEALTH INDICATORS
Mariama Furman, Nataria Joseph* and Cindy Miller-Perrin*
Pepperdine University

ABSTRACT. Stress is an inevitable aspect of life, and the ability to cope with stress can impact health indicators such as sleep quality and nocturnal blood pressure (BP). Coping strategies protect both mental and physical health from the negative effects of stress. We examined the relationship between perceived stress, coping strategies, and the health indicators of sleep and nocturnal BP dipping in a college sample. Participants included 131 students (60.3% women) who completed the Perceived Stress Scale, Brief COPE, Pittsburgh Sleep Quality Index, a sleep diary, and wore an ambulatory BP monitor for 24 hours. Linear regressions demonstrated that, controlling for economic status, perceived stress and maladaptive coping were significantly associated with poorer sleep quality, \( \beta = .22, \ p < .05 \), and \( \beta = .20, \ p < .05 \) respectively, with total model \( R^2 = .18 \). However, maladaptive and adaptive coping did not moderate the association between perceived stress and poor sleep quality. There were no significant associations between stress and coping and nocturnal BP dipping. These findings encourage further study of the relationship between perceived stress and coping strategies to better understand the psychological contributions to poor sleep quality in college students.
Defining Stress

Stress has been defined in three different ways: as a stimulus, as a response, and as an interaction (Brannon et al., 2014). These views of stress have been combined into various theories, but the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) has dominated the field of stress research. This theory proposes that an individual’s perception of a psychological situation determines whether or not the event is actually stressful. A person’s perceptions of threat, vulnerability, and ability to cope determine if an event is perceived as a stressor rather than the actual event itself.

Stress and Coping Strategies

Because stress is an inevitable part of life, how a person is able to cope with stress is important for human function (Lazarus & Folkman, 1984). Coping strategies are thoughts and responses to stress as well as feelings about the stressor. Lazarus and Folkman (1984) defined coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). Their definition provides information about several important aspects of coping, specifically that coping is a dynamic process that is constantly changing as one’s efforts are evaluated as more or less successful. Additionally, coping is not automatic; it is a learned pattern of responding to stressful situations and requires behavioral or cognitive effort, although people do not have to be conscious of this effort. Lastly, coping is an attempt to manage the situation; control and mastery are not necessary. A person’s resources and strategies determine their capacity to cope.

Brannon et al. (2014) explained how coping serves two functions: to manage or change the stressor causing distress (problem-focused coping) and to regulate emotional responses to the stressor (emotion-focused coping). Problem-focused coping strategies are aimed at changing the source of the stress and are a form of action-oriented coping. Emotion-focused coping strategies, on the other hand, are directed toward managing the emotions that accompany the perception of stress. Such strategies are aimed at restructuring thoughts in order to reduce negative emotions and stress related to the stressor. Additionally, the level of distress experienced is dependent on the goodness of fit between the stressor and the coping strategy. Problem-focused strategies are more effective for handling controllable stressors, and emotion-focused strategies are more effective for handling uncontrollable stressors. Individuals often engage both problem-focused and emotion-focused coping strategies to address the same stressor. When used together, problem-focused and emotion-focused coping can either enhance or inhibit one another. For example, if individuals focus on a problem in order to find a solution, this would effectively change any emotional distress they might have been experiencing; thus making their emotion-focused coping easier. There are many different coping strategies, including, for example, avoidant/escape, in which a person denies that an event happened or fantasizes about alternative outcomes. Meaning-focused coping, in which a person believes that everything happens for a reason, results in seeking benefit or purpose in the stressor.

In a study involving community college students from the United States, Pierceall and Keim (2007) found that women perceived more stress than men and that the majority of students surveyed engaged in healthy coping activities (i.e., talking with friends and family, leisure activities, exercise) that could potentially provide college students with a sense of purpose and competence. Nevertheless, a substantial percentage of students reported using unhealthy coping activities as well (i.e., drinking, smoking, illegal drug use), which could be an explanation for the initial percentage of students reported using unhealthy coping activities as well (i.e., drinking, smoking, illegal drug use), which could be an explanation for 87% of the students sampled being in the moderate-/high-stress category on the Perceived Stress Scale (Pierceall & Keim, 2007).

In France, Doron, Trouillet, Maneveau, Neveu, and Ninot (2014) found, using third-year University students, that students who used high avoidant coping strategies (i.e., use of avoidance and low use of problem solving and cognitive restructuring) reported the highest levels of perceived stress and engaged in unhealthy behavior such as decreased exercise and smoking. Additionally, their results revealed that students using adaptive coping strategies (i.e., high use of problem solving, moderate use of cognitive restructuring, and low use of distraction and avoidance) were less likely to abuse substances and more likely to engage in physical activity.

Further, coping strategies provide a critical defense, protecting both mental and physical health from the negative effects of stress (Penley, Tomaka, & Wiebe, 2002). Penley et al. (2002) conducted a meta-analysis on 34 studies investigating associations between coping strategies, as measured by the Ways of Coping (Folkman & Lazarus, 1985), and measures of physical and psychological health in adult community members (Penley et al., 2002).
Their results demonstrated that use of emotion-focused coping strategies, which included two avoidance scales, was associated with experiencing negative health outcomes. The only exception was positive reappraisal, which was associated with less negative health outcomes. In addition, seeking social support was only significantly correlated with health outcomes for controllable stressors and/or acute stressors, not uncontrollable and/or chronic stressors.

Based on the aforementioned studies, it is clear that both stress and coping influence psychological well-being and health behaviors. As we will review below, both stress and coping also influence indicators of physical health including cardiovascular health and sleep patterns (Germain, Buyssse, Ombao, Kupfer, & Hall, 2003; Penley et al., 2002; Stewart, Janicki, & Kamarck, 2006).

**Stress and Blood Pressure**

Stress can lead to a biological response that, long term, may result in cardiovascular disease (Stewart et al., 2006; Warrenburg et al., 1989). One significant factor in cardiovascular health is blood pressure (BP; Fox, 2012). Evidence indicates that individuals whose BP drops only a small amount while they sleep, relative to their daytime BP, are at a higher risk for numerous cardiovascular illnesses relative to those individuals whose BP dips more substantially (Dimsdale et al., 2000; Hermida, Ayala, Mojón, & Fernández, 2013). Specifically, nocturnal BP dipping is defined as at least 10% lower BP at night than during the day. Because stress has the ability to increase a person’s BP and has been associated with less adaptive nocturnal BP dipping, it has become increasingly important to understand factors that can moderate its effects (Burford, Low, & Matthews, 2013; Dimsdale et al., 2000; Taylor et al., 2015).

Linden, Klassen, and Phillips (2008) investigated whether perceived stress, high trait hostility, and anger coping preferences as well as potential for rumination, might vary between dippers and nondippers in a sample with a mean age of 57 years. They found that 38% of the variance in systolic BP dipping and 44% of variance in diastolic BP dipping was because of the coping strategies employed by participants. These findings provide evidence to further suggest that psychological factors may contribute to the exhibition of nocturnal BP dipping. One of the mechanisms that coping strategies may lead to nondipping is through poor sleep efficiency (Taylor et al., 2015).

**Stress, Coping, and Sleep Patterns**

The literature suggests that sleep plays a crucial role in stress, coping, and cardiovascular health. Shortened and disturbed sleep has been associated with increased risk for cardiovascular disease (Dimsdale et al., 2000; Kashani, Eliasson, & Varnalis, 2012). Furthermore, increased levels of perceived stress are correlated with shortened total sleep time, suboptimal sleep scores on a variety of sleep quality questionnaires, increased fatigue, and an average of 20 minutes less sleep (Kashani et al., 2012). These findings are particularly influential in that they provide support for the observed association between stress, sleep, and cardiovascular disease. Sleep patterns have a significant impact on cardiovascular disease because of their connection to nocturnal dipping. Increased sleep disturbance limits the time spent asleep, resulting in higher nocturnal BPs and higher risk for cardiovascular disease later in life (Kashani et al., 2012).

Researchers have also found relationships between perceived stress, coping strategies, and sleep patterns (Taylor et al., 2015; Morin, Rodrigue, & Ivers, 2003). These studies suggest that coping strategies are a significant predictor in whether a person will have good sleep efficiency. Taylor and colleagues (2015), for example, evaluated the relationship between stress, avoidant coping, and sleep efficiency in dementia caregivers. Taylor and colleagues defined sleep efficiency as prolonged sleep latency and/or fragmented sleep. Using ambulatory polysomnography, they divided participants into two groups: fragmented sleep (poor sleep efficiency), defined as receiving 80% on the polysomnograph reading, and nonfragmented sleep (good sleep efficiency). Their findings indicated that coping style was a significant predictor of sleep efficiency, with avoidant coping being significantly positively correlated with low sleep efficiency in older caregivers. These findings by Taylor and colleagues are particularly impactful because they suggest that avoidant coping may be an ineffective strategy for reducing distress, which is consistent with additional literature (Dedert et al., 2012; Doron et al., 2014). By altering individuals’ ability to get quality sleep, avoidant coping is shown to play a significant role in health outcomes.

Lund, Reider, Whiting, and Prichard (2010) evaluated the relationship between poor-quality sleep, as defined using the Pittsburgh Sleep Quality Index (Buysse, Reynolds III, Monk, Berman, & Kupfer, 1989), and emotional and academic stress in college students. The researchers reported
that students with poor sleep quality reported higher levels of stress, drank more alcohol per day, reported using alcohol to induce sleep, and drank significantly more alcoholic drinks during the week when compared to students with more quality sleep (Lund et al., 2010). Lund and colleagues (2010) suggested that perceived stress is a significant risk factor for poor sleep quality. Leblanc and colleagues (2007) examined the relationship between insomnia and psychological and health-related quality of life factors. After dividing participants into one of three groups (i.e., insomnia syndrome, insomnia symptoms, and good sleepers), the results revealed a significant association between coping strategies and perceived stress. Insomnia syndrome participants reported higher perceived stress and also had increased scores on the Coping Inventory for Stressful Situations (Endler & Parker, 1990) for emotion coping. Leblanc and colleagues (2007) added to previous literature by providing additional evidence for the belief that emotion-focused coping styles may result in negative health outcomes (Dedert et al., 2012; Doron et al., 2014; Taylor et al., 2015). The findings of Leblanc and colleagues (2007) aligns with the literature and highlighted that insufficient or disturbed sleep leads to increased stress, which depending on a person’s coping strategies, can result in negative health outcomes.

Consideration of the Role of Socioeconomic Status
Socioeconomic status (i.e., perceived or objective ranking within the social and economic ranks of society) is a factor that may play a role in all the variables of interest in the current study (Nobles, Ritterman Weintraub & Adler, 2013). Previous research has demonstrated that those of lower socioeconomic status may experience more stress, more maladaptive coping practices, poorer sleep, and greater cardiovascular risks (Burford et al., 2013; Lupien, King, Meaney, & McEwan, 2001; Soltani et al., 2012) compared to individuals with higher socioeconomic status. Given this, it is important to assess the role of socioeconomic status in the current investigation.

The Current Study
Previous research has clearly demonstrated that the majority of college students report excessive levels of stress. Additionally, research suggests that a person’s inability to properly manage stress, by using ineffective coping strategies, can result in disturbed sleep and decreased nocturnal BP dipping, which, long-term, will result in increased risk for cardiovascular disease.

A notable gap in the research on this topic is the limited amount of literature evaluating these four variables together: perceived stress, coping strategies, sleep, and nocturnal BP dipping. Most research has examined some combination of the relationships that exist. However, no studies have examined them simultaneously among college students. We sought to provide additional information about the moderating role of coping strategies on the relationship between perceived stress and nocturnal BP dipping as well as the relationship between perceived stress and sleep. This will provide additional information about the intricate relationship that exists between perceived stress and coping strategies, BP, and sleep, bringing the literature one step closer to fully understanding this connection. Another gap in the research literature to date is that most research has examined the impact of stress on BP dipping and sleep focused on those over the age of 40 years. Coping is dynamic and changes with time. Thus, it is important to understand how college students manage stress because this will provide insight into health outcomes experienced later in life. The coping strategies employed by older adult members of the population could vary from those of college students, resulting in different health effects between college students and older adults.

Based on previous research and in order to fill the important knowledge gaps outlined, we hypothesized that, controlling for socioeconomic status and other relevant covariates, (a) high levels of perceived stress in college students would be associated with disturbed sleep and less nocturnal BP dipping, and (b) coping strategies would moderate the relationship between perceived stress and sleep quality as well as perceived stress and nocturnal BP dipping.

Method
Participants
A convenience sample of 140 U.S. undergraduates enrolled in a foundational psychology course at a small, private, Christian, liberal arts university in Southern California participated in this study. Participants were recruited using an online research management system. Participants signed an informed consent form and received three research credits for participating in this study. The only exclusion criteria applicable to this study was hypertensive BP on multiple recordings at
initial meeting and formal insomnia diagnosis by a healthcare professional. To maintain confidentiality, participants were assigned a number once they had entered the room and were seated.

Nine participants were excluded from analysis; two participants had been formally diagnosed with a sleep disorder and the other seven participants were outliers, defined as being three or more standard deviations from the mean on the Perceived Stress Scale (Cohen, Kamarck, & Mermeistein, 1983), Pittsburgh Sleep Quality Index (Buysse et al., 1989), or the Brief COPE (Carver, 1997). Table 1 shows the demographic characteristics of the final 131 participants (79 women and 51 men). The sample was relatively diverse, i.e., 26% of the sample identified as Asian or Asian-American, 13% as Latino, 49% as European American, and the remaining 12% of the sample identified as African American (4.6%), Native American (3.1%), or “other” (3.8%). The mean age of participants was 19.1 years ($SD = 1.11$). Of the participants, 77 were first-year students (58.8%), 22 were sophomores (16.8%), 24 were juniors (18.3%) and 8 were seniors (6.1%). The mean number of units in which students were enrolled was 15.7 ($SD = 2.3$). The mean body mass index for men was 24 ($SD = 4.62$) and the mean body mass index for women was 21.5 ($SD = 2.5$).

**Measures**

*Pittsburgh Sleep Quality Index (PSQI).* The PSQI is a 19-item self-rated questionnaire that assesses sleep quality and disturbances over a 1-month time interval (Buysse et al., 1989). Participants responded on a 4-point Likert-type scale ranging from 0 (*not during the past month*) to 3 (*three or more times a week*). Items generate seven “component” scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The sum of scores for these seven components yields one global score. A global score greater than 5 indicates a poor sleeper. Sleep quality levels can be categorized by scores: 0–5 (*good sleep score*); 6–10 (*mild sleep difficulty*); 11–15 (*moderate sleep difficulty*); and 16–21 (*severe sleep difficulty*). The PSQI has an overall reliability coefficient (Cronbach’s $\alpha$) of .83, indicating high internal consistency (Buysse et al., 1989). The internal consistency for the current sample was slightly lower than that reported in the literature ($\alpha = .74$). However, it was still acceptable. This scale has shown good content and concurrent validity (Buysse et al., 1989; Gelaye et al., 2014).

*Perceived Stress Scale (PSS).* The PSS is a 14-item questionnaire that asks participants how often certain experiences of stress occurred in the last month and is designed to measure the degree to which situations in one’s life are appraised as stressful (Cohen et al., 1983). Participants responded to each item using a 5-point Likert-type scale ranging from 0 (*never*) to 4 (*very often*). Total global scores range from 0–56 with high scores indicating high stress. The PSS is designed for use in community samples with at least a middle school education. The questions are general in nature and relatively free of content specific to any subpopulations. Cohen and colleagues (1983) found the coefficient alpha reliability for the PSS to be strong, and it also had

<table>
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<th>TABLE 1 Sample Characteristics</th>
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<tr>
<td>Characteristic</td>
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<td>--------------------------------</td>
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<tr>
<td>Women</td>
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<tr>
<td>Race</td>
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<tr>
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<tr>
<td>1–3 times a week</td>
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<tr>
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<td>More than 9 times a week</td>
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</tr>
<tr>
<td>1–3 times a week</td>
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<tr>
<td>4–6 times a week</td>
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</tbody>
</table>
adequate test-retest reliability. The internal consistency for the current sample is consistent with that reported in the literature (α = .80). This scale has been shown to have good concurrent, predictive, and construct validity (Cohen et al., 1983; Oruç & Demir, 2009).

Brief COPE. The Brief COPE is a 28-item questionnaire that contains 14 two-item subscales from the full COPE (Carver, 1997). The subscales of the Brief COPE are: Active Coping, Planning, Positive Reframing, Acceptance, Humor, Religion, Using Emotional Support, Using Instrumental Support, Self-Distraction, Denial, Venting, Substance Use, Behavioral Disengagement, and Self-Blame. Participants were asked to rate the extent to which they typically used each of the strategies described in order to manage stressful situations encountered during the past month. Scores range from 1 (not at all) to 4 (usually). The Brief COPE has been shown to have adequate internal reliability (Carver, 1997). The overall internal consistency calculated for the current study was consistent with the literature (α = .81) and acceptable. This scale has been shown to have good face and content validity (Carver, 1997).

For the current study, the Brief COPE was used to create scores indicating levels of adaptive and maladaptive coping strategies. The Adaptive Coping Subscale included the following subscales: Active Coping, Planning, Positive Reframing, Acceptance, Religion, use of Emotional Support, and use of Instrumental Support. The internal consistency reliability for the current study for this subscale was strong (α = .81). Humor was included in the Maladaptive Coping Subscale rather than the Adaptive Coping Subscale for a number of empirical reasons, primarily because, although previous studies have shown that humor can be classified as adaptive or maladaptive (Ito & Matsushima, 2017; Rnick, Dozois, & Martin, 2016), it tended to be associated in the literature with adverse profiles on our dependent variables (Ito & Matsushima, 2017) and demonstrated better psychometric properties when included with the Maladaptive Coping Subscale in our sample. The Maladaptive Coping Subscale included the following subscales: Humor, Self-Distraction, Denial, Venting, Substance Use, Behavioral Disengagement, and Self-Blame. Internal consistency reliability for the current study for this subscale (α = .70), although slightly lower than the conventionally acceptable value, captures the multifaceted nature of the items within the Maladaptive Coping Subscale and was designed to capture various ways of coping.

Demographic questionnaire. This was a 14-item questionnaire that asked participants about themselves. Questions included sex, height, weight, age, major, socioeconomic status, alcohol consumption, whether they have been formally diagnosed with a sleep disorder and whether, to their knowledge, members of their immediate family have been diagnosed with high BP. To measure socioeconomic status, participants reported their “perceived economic status” with response options ranging from 1 (lower class) to 5 (upper class).

Sleep diaries. Sleep diaries were used as a method to determine which BP recordings fell within participants’ self-reported sleep window in order to calculate nocturnal BP dipping. Participants were asked to record what time they went to sleep and what time they woke up the next morning.

Ambulatory BP. Ambulatory BP was assessed using a 24-hour protocol. Participants wore the Oscar 2™, which is manufactured by Suntech, for 24 hours. The Oscar 2™ has been validated using several internationally recognized protocols (Jones, Bilous, Winship, Finn, & Goodwin, 2004). The cuff was worn on the upper arm and inflated hourly with the monitor recording BP. This provided information on whether participants experienced nocturnal BP dipping. The computer program used to extract the BP recordings from the ambulatory BP monitor reported each participant’s nocturnal BP dipping based on self-reported sleep/wake times. Systolic and diastolic nocturnal BP dipping was calculated using Equation 1 (see Figure 1).

Procedure
Prior to conducting the study, approval was given by Pepperdine University’s Institutional Review Board (16-03-203). Participants selected from a list of available times for a lab appointment. During the lab appointment, participants completed a demographic questionnaire, the PSS, the Brief COPE, and the PSQI. The order of the PSS and the Brief COPE were counterbalanced. A sequentially assigned identification number was assigned to all participant data. After completing the questionnaires, participants were instructed to sit quietly for 10 minutes. Researchers left the room and returned after 10 minutes to collect preliminary BP recordings as well as to provide instructions on proper use of ambulatory BP monitors. All participants were required to wear the BP monitor for 24 hours, which was set to collect BP hourly. Participants were told to complete a sleep diary for the next
24 hours. Participants returned to the lab after 24 hours to return the ambulatory BP monitors and the sleep diaries. A debriefing form was e-mailed to participants at the end of the study.

**Results**

**Descriptive Statistics**

Mean and standard deviations for all primary independent and dependent study variables were calculated and are reported in Table 2. Missing responses were replaced with the mean score for the missing item across all participants. To analyze BP, the winsorized mean, setting extreme values to be the value of the lowest (or highest) included value, was used when outliers were three or more standard deviations from the mean. The mean for systolic nocturnal BP dipping was 10.60 \( (SD = 10.50) \) and the mean for diastolic nocturnal BP dipping was 18.70 \( (SD = 12) \). Both the mean systolic and diastolic nocturnal BP dipping were within the normal range. Higher scores on the PSS indicate more perceived stress (Cohen & Janicki-Deverts, 2012). Cohen and Williamson (1988) established a norm from a United States probability sample to be 19.62 for the 14-item Perceived Stress Scale. The mean PSS score in this sample was 27 \( (SD = 7.10) \), indicating that the sample experienced high perceived stress. The mean score on the PSQI was 6 \( (SD = 2.40) \) indicating that, on average, the sample had poor reported sleep quality.

**Preliminary Analysis**

Preliminary analysis revealed that, of the demographic variables, only socioeconomic status was negatively correlated with PSQI \( (r = -0.28, p = .001) \) and work status was positively correlated with PSQI \( (r = 0.30, p < .001) \). Because socioeconomic status and work status are closely related variables, only socioeconomic status was controlled for in the linear regression analysis examining sleep quality as an outcome.

**Bivariate Correlations**

See Table 3 for the intercorrelations between our variables of interest. Because of the skewed nature of BP dipping, the correlations between BP dipping and other variables of interest were assessed using Spearman’s rho and are not included in Table 3. A statistically significant positive correlation was found between PSS and PSQI \( (r = .35, p < .01) \) indicating that as PSS increases, sleep quality decreases. PSQI scores were also significantly negatively correlated with socioeconomic status \( (r = -.28, p < .001) \) indicating that, as socioeconomic status increases, sleep quality increases. There was no statistically significant correlation observed between PSS scores and either systolic or diastolic nocturnal BP dipping. PSS scores were significantly positively correlated with the maladaptive coping strategy subscale scores \( (r = .52, p < .001) \) indicating that, as PSS scores increased, the use of maladaptive coping also increased. The correlation between PSS scores and adaptive coping scores was not significant. Both adaptive and maladaptive coping scores were associated with sleep quality \( (r = .19, \ldots) \).

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**TABLE 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
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<tr>
<td>SBPDiP</td>
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<tr>
<td>DBPDip</td>
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<tr>
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<td>PSQI Score</td>
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</tr>
<tr>
<td>Maladaptive Coping</td>
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<td>5.5</td>
</tr>
</tbody>
</table>

**Note:** SBPDIP = Systolic nocturnal BP dipping. DBPDIP = Diastolic nocturnal BP dipping. PSS Score = Perceived Stress Score. PSQI Score = Pittsburgh Sleep Quality Index Score

**TABLE 3**

<table>
<thead>
<tr>
<th></th>
<th>PSS</th>
<th>PSQI</th>
<th>Adaptive Coping</th>
<th>Maladaptive Coping</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.</td>
<td>.</td>
</tr>
<tr>
<td>PSQI</td>
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<td>1</td>
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</tr>
<tr>
<td>Adaptive CS</td>
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<td>.19*</td>
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<td>.</td>
</tr>
<tr>
<td>Maladaptive CS</td>
<td>.52**</td>
<td>.28**</td>
<td>.34**</td>
<td>1</td>
</tr>
<tr>
<td>SES</td>
<td>-.171</td>
<td>-.280**</td>
<td>-.053</td>
<td>.083</td>
</tr>
</tbody>
</table>

**Note:** PSS = Perceived Stress Score. PSQI = Pittsburgh Sleep Quality Index Score. SES = Socioeconomic status. Adaptive CS = Adaptive Coping Strategy Subscale. Maladaptive CS = Maladaptive Coping Strategy Subscale. \( p < .05 (2-tailed), \quad "p < .01 (2-tailed), \quad "p < .001 (2-tailed). \)
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$p < .05$ and $r = .28$, $p < .01$, respectively) but were not correlated with either systolic nocturnal BP dipping or diastolic nocturnal BP dipping.

**Primary Multivariate Regressions**

A linear regression analysis was conducted to determine whether perceived stress, adaptive and maladaptive coping, and the interactions between them predicted PSQI scores. Although socioeconomic status and work status were both determined to be covariates with PSQI scores, we only controlled for socioeconomic status during the PSQI linear regression analyses because socioeconomic status and work status had a negative correlation ($r = -.26$, $p = .003$). Socioeconomic status was entered into the first step of the analysis. The second block of the analysis included the PSS score. The third block of the analysis contained the maladaptive coping strategy subscale score or the adaptive coping strategy subscale score. The final block contained the interaction term between PSS score and the respective coping strategy subscale score. A linear regression model demonstrated that, controlling for socioeconomic status, the main effects of perceived stress and maladaptive coping were both significantly associated with poorer sleep quality, $F(1,126) = 9.42$, $p < .05$, $\beta = .22$, $\Delta R^2 = .10$ and $F(1,126) = 9.42$, $p < .05$, $\beta = .20$, $\Delta R^2 = .03$, respectively (see Table 4). The overall model also accounted for a significant amount of the variance in sleep quality, with total model $R^2 = .18$ and $R^2_{adj} = .16$, $F(3,127) = 9.42$, $p < .001$. The same linear regression model was repeated using adaptive coping strategies. This revealed that, controlling for socioeconomic status, only the main effect for perceived stress was significantly associated with poor sleep quality, $F(1,127) = 11.70$, $p < .001$, $\beta = .32$, with total model $R^2 = .16$, $R^2_{adj} = .14$, $\Delta R^2 = .10$. The interaction term was not significant in either of the subsequent regressions adding in the interaction term (see Table 5 for example), so we accepted the main effects only models. No main effects or interaction terms were significantly associated with nocturnal BP dipping.

These results indicated that neither stress, maladaptive coping strategies, nor the interaction of these two variables independently predicted sleep quality scores once all variables were entered into the model. The same applies for when PSS, adaptive coping, and the interaction of these two variables was entered into the model. The significance of both models came from the socioeconomic status control variable indicating that, for this sample, socioeconomic status is a powerful predictor of PSQI scores. No moderation effect of maladaptive coping score or the adaptive coping score on the relationship between PSS and PSQI was found.

**Discussion**

The primary purpose of the present study was to examine the relationship between college students’ perceived stress levels, sleep quality, and nocturnal BP dipping. Additionally, this research evaluated whether coping strategies, adaptive or maladaptive, moderated the relationships between perceived stress and sleep quality, and between perceived stress and nocturnal BP dipping. The results of the current study partially supported the hypotheses. Several findings were consistent with prior research. The first hypothesis was partially supported by the finding that higher perceived stress was associated with poorer sleep quality. This finding is consistent with prior research (Germain et al., 2003; Kashani et al., 2012; Lund et al., 2010; Pierceall & Keim, 2007) and suggests that, as college students experience more perceived stress, they also experience poorer sleep quality. Given the cross-sectional nature of this study, the relationship
between perceived stress and sleep quality might be bidirectional. Perceived stress may result in poorer sleep quality as, in line with Lazarus and Folkman’s Transactional Model of Stress, suggesting that those higher in perceived stress may have difficulty falling asleep and staying asleep because of arousal caused by thoughts of threats to their well-being and feeling ill-equipped to deal with such threats. Further, poor sleep can result in increased sensitivity to stimuli. Thus, students with poorer sleep may judge events as more stressful.

Interestingly, socioeconomic status demonstrated to be a powerful predictor of sleep quality and perceived stress. This seems reasonable given that students who grew up in lower socioeconomic status communities would have had consistent exposure to extraneous factors that could result in higher perceived stress levels as well as barriers to achieving good sleep quality. More than half of the sample identified as first-year students and thus, more than half of the sample was likely to still be strongly influenced by the socioeconomic environment of their family. Further, it could be that students from lower socioeconomic backgrounds have not yet developed the necessary effective coping strategies to handle the various stressors that accompany being a college student. This deficit in effective coping strategies could potentially result in them experiencing worse sleep quality and higher perceived stress and, ultimately, could be a cause for these students leaving college before receiving a degree.

It is also important to note that studies have found racial differences in BP dipping (Burford et al., 2013; Muntner et al., 2015; Profant, Ancoli-Israel, & Dimsdale, 2002), with African Americans consistently exhibiting less BP dipping. We were not able to fully explore this due to the limited number of African Americans in the sample, so future studies should recruit adequate amounts of participants from all ethnic/racial backgrounds.

The results of the current study also indicated that maladaptive coping strategies are positively associated with both perceived stress and poor sleep quality, which is also consistent with prior research (Dedert et al., 2000; Germain et al., 2003; Leblanc et al., 2007). Further, adaptive coping strategies were found to be positively associated with sleep quality, which was consistent with the findings of Taylor and colleagues (2015).

Interestingly, maladaptive and adaptive coping strategies did not moderate the influence of perceived stress on sleep quality or nocturnal BP dipping. It is possible that our coping measurement, although widely used and reliable, is limited in its ability to capture the dynamic processes that unfold as individuals cope with various stressors and switch between different strategies for different stressors.

Further, nocturnal BP dipping was not associated with perceived stress, either coping variable, or sleep quality in bivariate and multivariate analyses. Both systolic and diastolic BP depend on very intricate physiological mechanisms that fluctuate as participant behavior and emotion throughout the day fluctuates, so the fact that we did not capture relevant variables as they unfolded on the day of BP monitoring might have precluded our ability to find associations between our psychosocial variables and nocturnal BP dipping. For example, we assessed the overall smoking behaviors of the participants, but we did not assess their smoking patterns on the day of BP monitoring. Further research should be conducted in order to continue to understand the various factors that contribute to nocturnal BP dipping. Additionally, it could be possible that nocturnal BP dipping is not affected by these variables until later in life when the effects of poor sleep quality and use of maladaptive coping strategies to handle greater stress are finally taking a toll on the body. This could possibly explain why BP dipping was not associated with perceived stress, either of the coping variables, or sleep quality in this study.

There are several strengths to the current study. The PSS and the PSQI were used to measure stress and sleep quality, respectively, and only a limited number of other studies have used these measures simultaneously. In addition, measuring BP through an ambulatory BP monitor enabled the collection of recordings that more accurately described the BP of the participants as they underwent their typical daily routines. Thus, the study has strong ecological validity. Another strength of the current study was the use of a linear regression analysis to test for a moderating effect. This linear regression approach, rather than a bivariate approach, allowed the thorough investigation of the relationship between the predictor variables of perceived stress and maladaptive coping strategy or adaptive coping strategy and the dependent variables.

Although this study contributes insight into further understanding factors that contribute to poor sleep quality and less nocturnal BP dipping, it is not without limitations. The most obvious limitation is the lack of generalizability. The ethnic and socioeconomic status of the participants limits...
the inferences that can be drawn from the findings of this study, especially the fact that we did not have substantial numbers of African Americans or Native Americans, and the fact that a majority of the sample perceived themselves to be middle class or higher. Another limitation of this study was that specific pathways contributing to overall poor sleep quality, such as sleep efficiency and latency, were not evaluated. Future research should examine these pathways to provide insight into the various factors that contribute to poor sleep quality.

Another limitation of the current study was the use of subjective self-reports of sleep and wake times. It is possible that, as a result of social desirability, participants either over or under reported these values. The sleep and wake times were used to calibrate the BP monitors in order to determine nocturnal BP and diurnal BP. Thus, if participants misrepresented these sleep values, it could have affected the reliability and accuracy of our BP variables. The final limitation of this study was the time constraints. Because of the limited time available for data collection, ambulatory BP was collected over a 24-hour time period instead of the recommended 48 hours. This was a significant limitation because collecting ambulatory BP measurements over multiple days has higher reliability in measuring nocturnal BP dipping.

Findings from the current study encourage further study of the relationship between perceived stress and coping strategies in an attempt to better understand the psychological contributions to poor sleep quality experienced by many college students. Additionally, future research should incorporate more intricate socioeconomic status measures in order to gain further understanding on the manner in which socioeconomic status is impacting sleep quality and perceived stress. It would also be beneficial for future studies to continue exploring possible ethnic differences among these variables. Further, given that this study found that both higher levels of perceived stress and the use of maladaptive coping strategies were associated with poor sleep quality, student counseling centers on college campuses should more frequently provide psychoeducation regarding these connections, offer stress interventions that emphasize coping as well as offer sleep interventions that are cognitive behavioral in nature rather than the simple behavioral focus on sleep hygiene and stimulus control.

Overall, results suggest that these relationships are very complex; further research should be conducted to continue expanding the literature on the effect of coping strategies on nocturnal BP dipping and sleep quality. Future studies should aim to include a more diverse sample that considers multiple factors such as relative ratio of adaptive to maladaptive coping, when examining the relationships between stress, coping strategies, and health.

References

Author’s Note. Mariama Furman, Pepperdine University; Nataria Joseph, Department of Psychology, Pepperdine University; and Cindy Miller-Perrin, Department of Psychology, Pepperdine University.
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Religion is a social identity grounded in a system of guiding beliefs, and may serve as a powerful tool to shape psychological and social processes (Ysseldyk, Matheson, & Anisman, 2010). Previous research has shown that, in and of itself, religion contributes to the experience of greater positive and fewer negative emotions for the people who believe in it (Kim-Prieto & Diener, 2009). Religion often provides a “moral compass” and allows people to identify with groups, which in turn may reduce feelings of uncertainty (Hogg, Adelman, & Blagg, 2010, p.76). Other research has shown that the social aspect of religion is a key factor in health and well-being (Knipscheer & Kleber, 2007). Religion has been shown to be specifically helpful for the well-being of college students (Burris, Brechtling, Salsman, & Carlson, 2009), helping them cope with high levels of stress (Berry, 1997) as they adapt to new roles, handle greater responsibilities, cope with their separation from friends and family from home, and learn to navigate their new social environment (Credé & Niehorster, 2012).

However, despite the fact that religion and religious belief have largely been associated with well-being (Chamberlain & Zika, 1992), across studies, researchers have conceptualized religion in different ways. Although religious identity and practice tend to be related, they may be differentially related to well-being (Lopez, Huynh, & Fuligni, 2011), and this relationship may differ based on societal factors such as race and gender (Diener, Tay, & Myers, 2011). In the present study, 157 undergraduate students completed measures of religious identity, religious practice, public regard (the extent to which people feel that their race and gender identity is viewed positively or negatively by the broader society), and well-being. Regression analyses demonstrated that religious identity, but not practice, was associated with higher positive ($\beta = 0.25$, $p = .013$, $R^2_{\text{Adjusted}} = .28$) and lower negative affect ($\beta = -0.22$, $p = .030$, $R^2_{\text{Adjusted}} = .28$). Overall, results suggest that religious identity plays a more important role in well-being than religious practice. A marginal finding suggests that religious identity may be associated with more well-being when accompanied by a racial identity that is perceived by the individual to have higher public regard, but this result should be replicated. The relationship between religion and well-being is not affected by perceptions of public regard for gender.

### ABSTRACT
Religion is often related to greater psychological well-being in college students (Burris, Brechting, Salsman, & Carlson, 2009). However, researchers have conceptualized religion in different ways. Although religious identity and practice tend to be related, they may be differentially related to well-being (Lopez, Huynh, & Fuligni, 2011), and this relationship may differ based on societal factors such as race and gender (Diener, Tay, & Myers, 2011). In the present study, 157 undergraduate students completed measures of religious identity, religious practice, public regard (the extent to which people feel that their race and gender identity is viewed positively or negatively by the broader society), and well-being. Regression analyses demonstrated that religious identity, but not practice, was associated with higher positive ($\beta = 0.25$, $p = .013$, $R^2_{\text{Adjusted}} = .28$) and lower negative affect ($\beta = -0.22$, $p = .030$, $R^2_{\text{Adjusted}} = .28$). Overall, results suggest that religious identity plays a more important role in well-being than religious practice. A marginal finding suggests that religious identity may be associated with more well-being when accompanied by a racial identity that is perceived by the individual to have higher public regard, but this result should be replicated. The relationship between religion and well-being is not affected by perceptions of public regard for gender.
and intrinsic aspect of religion, that is the most important for well-being (Graham & Haidt, 2010). However, Chan, Tsai, and Fuligni (2015) found that, rather than religious practice, the importance that is placed on religious affiliation and practice was linked with a greater sense of meaning and purpose, but not with psychological well-being. Many studies have used different terms to describe similar aspects of religion. In the present study, these dimensions of religion have been grouped into two major categories: religious identity and religious practice.

**Religious Identity**

Identity is a way to describe and define a person’s sense of self, group affiliations, and status, and “results from internal subjective perceptions, self-reflection, and external characterizations” (Peek, 2005, p. 217). Religious identity, in particular, has been shown to be associated with beneficial effects on well-being. The salience of religious identity alone may be enough to change a person’s momentary emotional experience (Kim-Prieto & Diener, 2009). Identifying with a group can also have a positive impact on a group member’s health, which can be explained, at least in part, by the social relationships that often result from a shared identity (Khan et al., 2015; Peek, 2005). A study by Keyes and Reitzes (2007) on older working and retired adults found that increased religious identity was associated with better mental health outcomes in terms of increased self-esteem and decreased depressive symptoms. In addition, Maltby and Day (2003) found that psychological well-being was positively associated with an intrinsic religious orientation (which includes religious identity), and was negatively associated with an extrinsic orientation (which includes religious practice). These findings were explained by the fact that religious attitudes determine the extent to which religion serves as a mechanism to appraise and cope with stressful life events, and explains the link between religious attitudes and well-being.

**Religious Practice**

Religious practice comprises both public practice, which includes praying with other people and attending religious services and events, and private practice, which includes praying privately, meditating, reading religious literature, and watching or listening to religious TV or radio programs (Capanza, Stratta, Collazzoni, & Rossi, 2013). There are some contradictory findings about whether religious practice is directly related to well-being.

Many studies have found that religious practice is linked to beneficial effects (Bierman, 2006; Maselko, Gilman, & Buka, 2009; Tewari, Khan, Hopkins, Srinivasan, & Reicher, 2012). Attendance at religious services has been shown to moderate the relationship between the effects of discrimination on negative affect for African Americans, such that African Americans who face discrimination and also attend religious services tend to have better emotional outcomes than African Americans who face discrimination but do not attend religious services (Bierman, 2006). In addition, people who participate in religious practice have been shown to be significantly less likely to experience a major depressive episode than people who do not participate in religious practice (Maselko et al., 2009). This protective effect has been seen across cultures. People in India who took part in a mass religious gathering during a month-long pilgrimage reported a longitudinal increase in well-being compared to those who did not participate (Tewari et al., 2012). According to the authors, the event led to close relationships and a shared identity, which had indirect effects on changes in self-reported health (Khan et al., 2015).

Despite associations with increased well-being, some studies show that religious practice may not be beneficial in and of itself. For example, religious practices performed as a result of upbringing and custom rather than out of an individual’s own accord are less likely to contribute to well-being (Vilchinsky & Kravetz, 2005). Dezutter, Soenens, and Hutsebaut (2006) found that church attendance did not predict either psychological distress or psychological well-being. They claimed that this was because religious practice only examines surface level factors, whereas religious identity is more deeply rooted. Therefore, religious practices are more likely to be influenced by contextual factors and less representative of an individual’s functioning.

Studies on religious identity and religious practice link each of the dimensions of religion to well-being, but it is still unclear which of the two accounts for the most well-being. The first goal of the present study was to assess whether religious identity or religious practice had the strongest influence in the relationship between religion and well-being. It was hypothesized that, although both religious identity and practice would be associated with more positive and less negative affect, this relationship would be stronger for religious identity. This is because religious identity has
Religion and Well-Being

almost consistently been shown to be related to well-being, although there have been conflicting findings regarding religious practice, which can be affected by factors such as habit (Vilchinsky & Kravetz, 2005).

**Group Differences**

Despite the fact that religion has overall been associated with well-being, research has shown that this relationship may be conditional on societal categorizations and circumstances that result from these categorizations (Diener, Tay, & Myers, 2011). Studies have shown that places with fewer resources are more likely to have a more religious population because religion allows them to compensate for feelings of deprivation (Beit-Hallahmi, 2014). In situations where people face discrimination, religious people report higher levels of subjective well-being than people who are not religious (Hoverd & Sibley, 2013). A qualitative study with Somali Muslim immigrants in the United Kingdom found that religion can help immigrants cope with difficult circumstances (Whittaker, Hardy, Lewis, & Buchan, 2005). Beit-Hallahmi (2014) cited Glock, Ringer, and Babbie (1967), who said that “being female, unmarried, old with little income, and little education are all forms of deprivation that would lead to greater religious involvement” (p. 58). The question that follows is whether religious involvement in situations where individuals face some sort of discrimination is associated with well-being. Specifically, the present study examined race and gender—two identities on the basis of which individuals are often stigmatized or discriminated against. There has been a great deal of research on the role of these identities in the relationship between religion and well-being, with conflicting results.

The first of these identities, race, has been extensively researched in the relationship between religion and well-being. Blaine and Crocker (1995) showed that Black students face more discrimination and stigma on university campuses, and are more religious than White students. Similarly, Patel, Ramgoon, and Paruk (2009) found that Black and Indian university students in South Africa had higher religiosity levels overall, but White students still had higher life satisfaction scores. Students of color have to cope with the stresses of stigmatization, which could explain lower life-satisfaction even when they are more religious.

Research regarding the strength of the link between religion and well-being for specific racial groups is inconsistent. A study by Ellison (1995) found that church attendance (religious practice) was linked with fewer depressive symptoms, but only for White, and not Black participants. Not having a denominational affiliation (religious identity) was also associated with more depressive symptoms only for Black participants. However, a study on university students in the United States found that religiousness was only associated with psychological well-being for Black students, and not White students (Blaine & Crocker, 1995). According to the authors, this is because attributions made to God enhanced the meaning of life and positive social identification for the Black students (Blaine & Crocker, 1995).

Research has shown that people implicitly categorize race in terms of a certain hierarchy, where Whites are on the top, followed by Asians, Blacks, and then Hispanics (Axt, Ebersole, & Nosek, 2014). Therefore, the current study hypothesized that the dominant group in the hierarchy, which is White people, would experience the relationship between religion and well-being in a different way from the nondominant groups in the hierarchy, which are people of color.

Another form of discrimination is gender. Research has demonstrated that women are generally more religious than men (Collett & Lizardo, 2009), which could be because they face more discrimination than men. Beyond this main effect, whether religion is differentially associated with well-being between genders is greatly disputed. A study by Jung (2014) revealed that religious practice was only associated with decreased stress and higher levels of happiness for women. Another study by Mirola (1999) found that religious practice, particularly prayer, was linked with decreased effects of depression in women, but no such relationship was found for men. However, other studies have shown that, although women receive more emotional support from church members than men do, religious practice such as church-based support is associated with more mental health benefits only for men (Krause, Ellison, & Marcum, 2002; McFarland, 2010).

To test the theory of discrimination further, the present study examined individuals’ own perceptions of public regard, which is the extent to which people feel that their identity is viewed positively or negatively by the broader society (Sellers, Smith, Shelton, Rowley, & Chavous, 1998). People with stigmatized identities often have lower public regard and tend to feel like their identities are not
respected, and that they are discriminated against by society. For example, Black students have lower estimations of public regard for their race (Sellers et al., 1998). Studies have shown that public regard functions differently than individuals’ own perceptions of their group (Rivas-Drake, 2011), and having low public regard and perceiving discrimination has harmful effects on well-being (Schmitt, Branscombe, Postmes, & Garcia, 2014). Women and people of color tend to perceive more discrimination than men and White people (Schmitt et al., 2014), so will likely have lower estimations of public regard for these identities. Perception of public regard is an aspect of race and gender identity that has not been studied in much detail with regard to how it affects the link between religious identity and practice and well-being. This study considered whether the relationship works differently for public regard and group membership.

The second goal of this study was to assess whether religion is associated with the same positive effects on well-being for everyone. We examined whether it was simply differences by membership in dominant (White, men) or nondominant groups (people of color, women), or the perception that one’s identity is devalued by society (public regard), that moderates the link between religion and well-being. We hypothesized that women and people of color would have a stronger relationship between religion and well-being than men and White people, and religion would be associated with greater well-being for individuals with lower public regard. This is because religion may counter the effects that low public regard has on a person’s racial and gender identity.

Current Study
To summarize, we examined the links between religious identity and religious practice and well-being. Well-being was operationalized as positive and negative affect experienced on a day-to-day basis. This way of measuring well-being was based on Lazarus’ (1997) assertion that emotions can describe the struggles and stressors faced by college students in a richer and more multidimensional way than focusing only on psychological stress.

We chose to measure religious practice and well-being with a daily diary method, allowing us to examine the ongoing experience of religious practice as well as subjective feelings within everyday situations. The fact that there was a minimal amount of time between the experience and its reporting reduced the likelihood of bias due to retrospection over long periods of time, and increased the likelihood of reliable and valid person-level information reported (Bolger, Davis, & Rafaeli, 2003).

In addition, we examined whether these aspects of religion are associated with the same benefits for people from different race and gender backgrounds, and for people who felt like their gender or race identity had low versus high public regard. We chose to look at these predictors in a college setting given that religion has been shown to be important to well-being in college students (Burris et al., 2009).

Method
Participants, Recruitment, and Procedure
This study was approved by all schools’ ethics review committees (either through a process of accepting the host school’s IRB approval or by conducting their own review). Participants were drawn from five colleges/universities in the Midwest. At each school, the Offices of Institutional Research used internal data to facilitate recruitment via a stratified random sample. They generated two lists of students, one of traditionally underrepresented backgrounds (which included students from under-represented ethnic groups, lower socioeconomic backgrounds, or first-generation college students), and the other list of the remaining, currently enrolled, full-time undergraduates. The college officials then randomly selected 85 students from each list and provided us with those students’ e-mail addresses. Across the five schools, a total of 850 students were recruited as potential participants (425 traditionally underrepresented and 425 well-represented).

Students were e-mailed and invited to take part in a study on “the daily lives of college students.” The first component was a one-time survey that included questions about the participants’ background including religious beliefs and current experiences. The other was the daily survey, which began the Sunday after they completed the one-time survey. Participants who completed some part of the one-time survey received an e-mail every evening for seven consecutive evenings that contained the link for the daily survey. These daily surveys focused on each day’s experiences and emotions. Participants were asked to complete each checklist just before going to bed for the night. Each day’s link was only active from 8 p.m. to 2 a.m., so participants had to complete each survey toward the end of the day, and they could not complete multiple daily surveys in one sitting. The daily diary
portion of the study was administered during the second week of November because officials at each school indicated that it was a “typical” week for their students (no breaks or exam periods).

Participants received $11 for completing the one-time survey, and $2 for completing each daily survey. If participants completed five out of the seven daily surveys, they also received a $10 bonus. In addition, four $25 Amazon gift cards were raffled on each day of the study, and every participant who completed a survey that day was entered into the drawing. These incentives resulted in high rates of participation: of the seven possible daily surveys, participants completed an average of $M = 5.75$, $SD = 1.53$ surveys. Across schools, the response rate ranged from 25.9% to 45.3%.

A total of 303 undergraduate participants completed at least some part of the study measures, but only the 157 participants who identified with a religion or faith were included in this study. These 157 participants were all full-time students between 18 and 25 years old ($M = 20.14$, $SD = 1.31$), and self-identified as White (79.0%), Asian (3.8%), Black (3.2%), Latino/a (5.1%), and Multiracial (7.6%). Two participants (1.3%) did not specify their race/ethnicity. For the purposes of analyses, the sample was divided into White ($n = 123$) and people of color ($n = 33$), given that the sample size of non-White participants was too small to examine differences between specific ethnic groups. Of the participants, 29.3% identified as men, 70.1% as women, one participant chose not to specify, and no participants selected the option of “other.” Participants self-reported their religious beliefs in open-ended answers, which were coded into five categories. Of the participants, 111 were Christian (70.7%). Several denominations of Christianity were represented including Presbyterian, Lutheran, Evangelical, Episcopalian, and Protestant. Of the remaining participants, 29 were Catholic (18.5%), 2 were Unitarian Universalists (1.3%), 10 were Jewish (6.3%), 3 were Buddhist (1.9%), 1 practiced Mysticism (0.64%), and 1 identified as Alternative/Spiritual (0.64%).

**Measures**

This study included measures of religion, public regard, and well-being. The source of each measure (i.e., one-time survey or daily surveys) is noted for each. Response rates for each are in Table 1.

**Religious affiliation.** On the one-time survey, participants reported their religious affiliation by answering the open-ended questions, “Do you have a particular religion or faith?” and “If yes, what is it?” (Chan et al., 2015). Based on the large number of Christian participants, responses that stated specific denominations of Christianity that were not Catholic were grouped into the larger category of “Christian.”

**Religious identity.** On the one-time survey, participants were asked four questions to assess their religious identity based on Chan et al.’s (2015) adaptation of Tyler and Degoey’s (1995) measure of social identity: “I have a strong sense of belonging to my own religion,” “Being a part of my religion is an important reflection of who I am,” “In general, being a part of my religion is an important part of my self-image,” and “I feel a strong attachment toward my own religion.” Participants rated these items on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The items had an excellent internal reliability ($\alpha = .95$), and the means of all of the scores were taken such that higher scores indicated a stronger sense of religious identity.

**Religious practice.** On the daily survey, participants answered seven “Yes” or “No” questions about whether they participated in religious practice that day. Three of these were about public religious practice: “Did you attend religious services today?,” “Did you attend any other special activities as a part of your religion or faith?,” and “Did you pray with other people today?” Four of the questions were about whether they participated in private religious practice that day. These were adapted from the Private Religious Practice Subscale of the Brief Multidimensional Measures of Religiousness/Spirituality-Italian Version (Capanna et al., 2013). These questions were: “Did you participate in religious programs on TV or radio today?,” “Within your religious or spiritual tradition, did you meditate today?,” “Did you read religious literature today?,” and “Did you watch or listen to religious programs on TV or radio today?” The sum of all of the religious practice was taken for each person for each day of the study. Then, these sums were divided by the total number of days that participants completed diaries. Thus, this variable can be interpreted as the average number of times someone participated in religious practice on a given day.

**Public regard for race and gender.** Items from the Multidimensional Inventory of Black Identity–Teen (MIBI–T; Scottham, Sellers, & Nguyen, 2008) were adapted to examine a particular dimension of participants’ race and gender identities public regard. On the one-time survey, participants were asked to rate three statements for race ($\alpha = .81$) and
three statements for gender ($\alpha = .84$) on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). These statements were: “People from other ethnic/gender groups think that my ethnic/gender group has made important contributions to society,” “Most people think that people of my ethnic background/gender are as smart as people of other backgrounds/genders,” and “People think that my ethnic/gender group is as good as other groups.” The means of all of these scores were taken such that higher scores indicate a stronger sense of public regard.

**Psychological well-being.** Well-being was operationalized as the amount of positive and negative emotions that were experienced each day.

**Positive emotions.** On the daily surveys, participants responded to six items that asked the extent to which they had felt positive emotions on a 7-point Likert-type scale from 1 (not at all) to 7 (extremely). These positive emotions were relief, happiness, pride, love, gratitude, and compassion (Lazarus, 1997). These emotions had good internal reliability for each day of the study (Sunday: $\alpha = .82$, Monday: $\alpha = .79$, Tuesday: $\alpha = .80$, Wednesday: $\alpha = .79$, Thursday: $\alpha = .82$, Friday: $\alpha = .75$, Saturday: $\alpha = .82$). Thus, for each day of the study, the average of these positive emotions was taken as an index of that day’s positive emotions. Then, the mean of these daily means was taken in order to get each person’s average positive emotions across the days of the study.

**Negative emotions.** On the daily surveys, participants responded to nine items that asked the extent to which they had felt negative emotions on a 7-point Likert-type scale from 1 (not at all) to 7 (extremely). These negative emotions were: anger, sadness, envy, jealousy, hopelessness, anxiety, fright, guilt, and shame (Lazarus, 1997). On each day of the study, these emotions had excellent internal reliability (Sunday: $\alpha = .88$, Monday: $\alpha = .89$, Tuesday: $\alpha = .87$, Wednesday: $\alpha = .90$, Thursday: $\alpha = .89$, Friday: $\alpha = .89$, Saturday: $\alpha = .92$). The average of these negative emotions was taken as an index of that day’s positive emotions. The overall mean of these daily means was then taken to get each person’s average negative emotions across the days of the study.

**Results**

In this study, we used data from 157 people who reported having a religion. Religious identity, public regard for race, and public regard for gender were reported on the one-time survey, and religious practice, positive emotions, and negative emotions were averaged from daily reports. Descriptive statistics and correlations for all variables are presented in Table 1.

For the variables derived from daily surveys, initial analyses examined whether there was evidence that the act of completing the survey over several days influenced participants’ responses. Table 2 shows the average religious practice, positive emotions, and negative emotions for each day of the study. Repeated-measures ANOVAs with Greenhouse-Geisser corrections indicated that mean religious practice, mean positive emotions, and mean negative emotions differed significantly between days (See Table 2). A series of paired sample $t$ tests with the Bonferroni correction indicated that, as would be expected, religious practice was higher on Sunday than on all other days except for Wednesday. The other days did not differ from one another in terms of religious practice. For positive emotions, participants reported more positive emotions on Friday than Thursday. No other pair-wise comparisons of positive emotions reached significance with the Bonferroni correction. Finally, for negative emotions: Sunday and Monday did not differ from one another, but they were both more negative than Thursday, Friday, or Saturday (which did not differ from one another). In addition, Wednesday was less negative than Sunday and Tuesday.

Although some days differed more than others, there was little evidence of participant reactance over the days of the study. Instead, the differences

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
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<tbody>
<tr>
<td><strong>Response Rates, Means, Standard Deviations, and Correlations</strong></td>
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<tr>
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</table>

Note: $^*$ $p < .05$. $^*$ $p < .01$.
### TABLE 2

#### Daily Means

<table>
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<tr>
<th></th>
<th>Sun M (SD)</th>
<th>Mon M (SD)</th>
<th>Tue M (SD)</th>
<th>Wed M (SD)</th>
<th>Thu M (SD)</th>
<th>Fri M (SD)</th>
<th>Sat M (SD)</th>
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<td>n</td>
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<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>Religious practice</td>
<td>1.88 (1.89)</td>
<td>1.42 (1.50)</td>
<td>1.24 (1.42)</td>
<td>1.48 (1.72)</td>
<td>1.30 (1.45)</td>
<td>1.39 (1.69)</td>
<td>1.15 (1.46)</td>
<td>$F(4.73, 316.62) = 4.48, p = .001$</td>
</tr>
<tr>
<td>Positive emotions</td>
<td>4.72 (1.11)</td>
<td>4.75 (1.04)</td>
<td>4.61 (1.06)</td>
<td>4.64 (1.01)</td>
<td>4.61 (1.08)</td>
<td>4.89 (0.99)</td>
<td>4.80 (1.10)</td>
<td>$F(4.63, 282.36) = 2.92, p = .016$</td>
</tr>
<tr>
<td>Negative emotions</td>
<td>2.59 (1.19)</td>
<td>2.46 (1.18)</td>
<td>2.36 (1.11)</td>
<td>2.22 (1.14)</td>
<td>2.15 (1.08)</td>
<td>2.19 (1.14)</td>
<td>2.09 (1.18)</td>
<td>$F(4.52, 275.72) = 6.32, p &lt; .001$</td>
</tr>
</tbody>
</table>

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### TABLE 3

#### Regression Analyses Predicting Positive and Negative Affect From Religious Identity and Practice

<table>
<thead>
<tr>
<th>Affect</th>
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<th>Negative</th>
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<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>SE</td>
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<tr>
<td>Religious identity</td>
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<td>.08</td>
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<tr>
<td>Religious practice</td>
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<td>.07</td>
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<tr>
<td>Religious identity*Religious practice</td>
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<td>.06</td>
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<tr>
<td>Adjusted $R^2$</td>
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</tr>
<tr>
<td>$F$</td>
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</tbody>
</table>

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### TABLE 4

#### ANCOVA Analyses Predicting Positive and Negative Affect From Religion and Race

<table>
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<th>Affect</th>
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<th>Negative</th>
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<tbody>
<tr>
<td></td>
<td>$F$</td>
<td>$p$</td>
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<td>Religious identity and race</td>
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<td>.002</td>
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<tr>
<td>Religious identity</td>
<td>2.30</td>
<td>.131</td>
</tr>
<tr>
<td>Race</td>
<td>0.91</td>
<td>.341</td>
</tr>
<tr>
<td>Religious identity*Race</td>
<td>5.11</td>
<td>.025</td>
</tr>
<tr>
<td>Religious practice and race</td>
<td>1.84</td>
<td>.177</td>
</tr>
<tr>
<td>Religious practice</td>
<td>1.05</td>
<td>.307</td>
</tr>
</tbody>
</table>

---

### TABLE 5

#### ANCOVA Analyses Predicting Positive and Negative Affect From Religion and Gender

<table>
<thead>
<tr>
<th>Affect</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$F$</td>
<td>$p$</td>
</tr>
<tr>
<td>Religious identity and gender</td>
<td>10.62</td>
<td>.001</td>
</tr>
<tr>
<td>Religious identity</td>
<td>3.74</td>
<td>.055</td>
</tr>
<tr>
<td>Gender</td>
<td>0.70</td>
<td>.406</td>
</tr>
<tr>
<td>Religious identity*Gender</td>
<td>1.32</td>
<td>.253</td>
</tr>
<tr>
<td>Religious practice and gender</td>
<td>5.73</td>
<td>.018</td>
</tr>
<tr>
<td>Religious practice</td>
<td>3.85</td>
<td>.052</td>
</tr>
<tr>
<td>Religious practice*Gender</td>
<td>1.32</td>
<td>.253</td>
</tr>
</tbody>
</table>
between days were as would be expected from the day of the week (e.g., especially high religious participation on Sunday and especially positive affect on Friday). Regardless, this study was interested in examining between-person associations. For example, do people who engage in religious practice more often also tend to have more positive affect? To test our hypotheses, therefore, we took the average of the daily variables: religious practice was the average number of times each person participated in religious practices across the days of the study, and positive and negative emotions were the typical amount of positive or negative emotions experienced by each participant across the days of the study. The remaining analyses (reported below) used these aggregated variables.

**Religious Identity and Practice as Predictors of Well-Being**

The current study evaluated the hypothesis that religion is associated with well-being. It was predicted that both identity and practice would be linked with well-being, but that this relationship would be stronger for religious identity. Bivariate correlations showed that both religious identity \( r(154) = .24, p = .002 \) and religious practice \( r(154) = .16, p = .043 \) were associated with higher average levels of positive emotions. Religious identity was associated with lower average levels of negative emotions \( r(154) = -.19, p = .019 \). However, religious practice was not associated negative emotions \( r(154) = -.09, p = .284 \).

To determine the unique predictability of each aspect of religion on positive and negative affect, hierarchical regression models were run with religious identity, religious practice, and the interaction between them entered simultaneously as predictors. All regression coefficients are presented in Table 3. For average levels of positive affect, these predictors accounted for a significant amount of variance, \( F(3,152) = 3.55, p = .016, \text{adjusted } R^2 = .047 \). Higher religious identity was associated with higher average positive affect. Neither religious practice nor the interaction between religious identity and religious practice were significant predictors of average positive affect. For average levels of negative affect, these predictors, as a whole, did not account for a significant amount of variance in average negative affect, \( F(3,152) = 2.00, p = .116, \text{adjusted } R^2 = .019 \). Higher religious identity was associated with lower negative affect, but religious practice and the interaction between religious practice and religious identity were not linked with negative affect.

**Moderation of Religion and Well-Being by Group Membership and Public Regard**

The second research question examined whether or not religious identity and practice were liked with well-being for everyone.

**Differences by group membership.** To examine whether participant race or gender moderated the relationships between religious identity and religious practice and well-being, we conducted a series of Univariate Analyses of Covariance (ANCOVAs) in which we used tests of equal slopes to test the interactions between the religious variables and group (i.e., race and gender). Altogether, we ran eight ANCOVAs—four models tested the interactions between religious variables and race (i.e., Religious Identity x Race predicting positive affect, Religious Identity x Race predicting positive affect, Religious Practice x Race predicting positive affect, and Religious Practice x Race predicting positive affect) and the remaining four models tested the interactions between religious variables and gender.

Across all models, race was never a significant predictor of either average positive or average negative affect (see Table 4). For gender, there was only a marginally significant association for positive, but not negative emotions (see Table 5). The key findings from these analyses, however, were that across all eight models, there were no significant interactions between group (race or gender) and religion (identity or practice). These null effects suggest that the associations between religious variables and well-being did not vary by gender or race (see Tables 4 and 5).

**Differences by public regard.** To examine whether perceptions of group public regard moderated the relationships between religious identity and religious practice and well-being, we ran a series of regression analyses with religious identity, religious practice, and public regard as predictors, and positive and negative emotions as outcomes (see Tables 6 and 7).

Four multiple regressions included religious variables and public regard for race as predictors (i.e., Religious Identity x Public Regard for Race predicting positive affect, Religious Identity x Public Regard for Race predicting negative affect, Religious Practice x Public Regard for Race predicting positive affect, and Religious Practice x Public Regard for Race predicting positive affect). Public regard for race was a significant predictor of positive, but not negative, affect (see Tables 6 and 7). However, the interaction between religious identity and public regard for race was only a marginally
significant predictor of positive emotions.

Although this interaction was only marginally significant, we explored the underlying pattern by running separate bivariate correlations for participants with a higher than average and a lower than average public regard for their race. Religious identity was correlated with positive emotions for all participants, but the association may be stronger among participants with a high public regard for their race, \( r(92) = .25, p = .014 \), than for participants with low public regard for their race, \( r(60) = .20, p = .121 \).

We ran a similar series of four multiple regressions with public regard for gender, religious identity, and religious practice as predictors. Public regard for gender was only marginally associated with positive, but not negative, emotions, and there were no significant interactions in this model.

**Discussion**

College life can include many stressors for students (Credé & Niehorster, 2012), and if adequate coping strategies are not employed to deal with these stressors, students may experience lower psychological health (Berry, 1997). One such coping strategy is religion. Previous research has shown religion to be strongly associated with well-being (Chamberlain & Zika, 1992), and the present study aimed to examine this relationship further.

The first goal of this study was to determine which aspect of religion would be most strongly related to well-being. We predicted that, although religious identity and practice would both be associated with well-being, religious identity would have a stronger association for people who have a particular religion. These hypotheses were supported.

Both religious identity and religious practice were associated with well-being when examined separately. However, further analyses that examined the unique effect of each variable show that religious identity alone was associated with increased positive emotions and decreased negative emotions. This means that the initial association between religious practice and well-being may only be true because of the confounding influence of religious identity in this relationship. Results are supported by Greenfield and Marks (2007), who stated that religious identity mediates the relationship between religious practice and psychological well-being. They found that, although religious service attendance was associated with higher well-being, the strength of this relationship was eliminated when religious social identity was added as a variable to their models.

One of the reasons that religious identity was most strongly related to well-being may be because religious identity not only contributes to an intrinsic aspect of religion (Chan et al., 2015), but is associated with a shared identity through an “eternal group membership” unlike any other social group (Ysseldyk et al., 2010). Having a strong sense of shared identity provides social connections that

<table>
<thead>
<tr>
<th>TABLE 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression Analyses Predicting Positive Affect From Religion and Public Regard</td>
</tr>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>Religious identity and public regard for race</td>
</tr>
<tr>
<td>Religious identity</td>
</tr>
<tr>
<td>Public regard - Race</td>
</tr>
<tr>
<td>Religious identity*Public regard</td>
</tr>
<tr>
<td>Adjusted ( R^2 )</td>
</tr>
<tr>
<td>( F )</td>
</tr>
<tr>
<td>Religious practice and public regard for race</td>
</tr>
<tr>
<td>Religious practice</td>
</tr>
<tr>
<td>Public regard - Race</td>
</tr>
<tr>
<td>Religious practice*Public regard</td>
</tr>
<tr>
<td>Adjusted ( R^2 )</td>
</tr>
<tr>
<td>( F )</td>
</tr>
<tr>
<td>Religious identity and public regard for gender</td>
</tr>
<tr>
<td>Religious identity</td>
</tr>
<tr>
<td>Public regard - Gender</td>
</tr>
<tr>
<td>Religious identity*Public regard</td>
</tr>
<tr>
<td>Adjusted ( R^2 )</td>
</tr>
<tr>
<td>( F )</td>
</tr>
<tr>
<td>Religious practice and public regard for gender</td>
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<tr>
<td>Public regard - Gender</td>
</tr>
<tr>
<td>Religious practice*Public regard</td>
</tr>
<tr>
<td>Adjusted ( R^2 )</td>
</tr>
<tr>
<td>( F )</td>
</tr>
</tbody>
</table>
have a positive impact on group members (Khan et al., 2015). In addition, religious identity may offer specific emotional and cognitive benefits to individuals (Peek, 2005). According to Peek (2005), in the United States, religious identity can ease tensions that may arise by having identities that are not congruent with traditional American identities (e.g., being from an immigrant family). It can also be used to maintain individuality among the diverse multicultural landscape. This could be true especially in a college context where students may feel that they do not fit in with the larger campus community (Credé & Niehorster, 2012).

Another reason that religious identity, rather than religious practice, was more associated with well-being may be that religious identity in itself is not affected by external factors such as habit (Vilchinsky & Kravetz, 2005), but that religious practice may be influenced by habit and upbringing (Lazar, Kravetz, & Fredrich-Kedem, 2002). In a place such as a college campus, this may be a particularly significant reason that people participate in religious activity; students may be looking for ways to maintain a connection with their home culture. This means that religious practice is often a surface-level factor and may not accurately represent deeper religiosity (Dezutter et al., 2006), which may be why it was not associated with well-being in the present study.

The second goal of the study was to test whether religion would be equally associated with well-being across people with different racial or gender identities. Analyzing the results by group membership (race: White versus person of color; gender: men versus women) did not show any differences in associations. In other words, race and gender were not linked with the relationship between well-being and religious variables. Previous research has been inconsistent regarding the differences by race or gender in well-being as a function of religion (Blaine & Crocker, 1995; Ellison, 1995; Jung, 2014; McFarland, 2010). It is possible that findings from these studies were tapping into confounding variables that led to differences in well-being other than just religious variables, such as the fact that women may receive more social support from religious practice than men (Jung, 2014). However, for the nonsignificant race effect, we should highlight that because our sample was mostly White, we had to run analyses as White versus people of color. The people of color category might have been too broad to detect differences.

Results suggest that it is not actual identity groups that play a role in well-being. Although we did not find overall group differences, one of the reasons that these differences were expected was related to how people feel that society views their identity, and not just group membership. To test this, we examined individuals’ own perceptions of public regard for their identities and whether this would play a role in the relationship between religious identity or practice and well-being.

### TABLE 7

| Regression Analyses Predicting Negative Affect From Religion and Public Regard |
|---------------------------------|-----------------|----------------|----------|
|                                 | B               | SE          | β        | p       |
| Religious identity and public regard for race |                   |              |          |         |
| Religious identity              | -.15            | 0.07        | -.17     | .370    |
| Public regard - Race            | -.08            | 0.06        | -.10     | .218    |
| Religious identity*Public regard| .05             | 0.05        | .07      | .359    |
| Adjusted $R^2$                  | 0.03            |             |          |         |
| F                               | 2.82            |             |          |         |
| Religious practice and public regard for race |                   |              |          |         |
| Religious practice              | -.06            | 0.06        | -.08     | .317    |
| Public regard - Race            | -.11            | 0.06        | -.14     | .095    |
| Religious practice*Public regard| -.01            | 0.05        | -.02     | .513    |
| Adjusted $R^2$                  | 0.01            |             |          |         |
| F                               | 1.33            |             |          |         |
| Religious identity and public regard for gender |                   |              |          |         |
| Religious identity              | -.17            | 0.07        | -.19     | .017    |
| Public regard - Gender          | .05             | 0.07        | .06      | .443    |
| Religious identity*Public regard| -.02            | 0.06        | -.03     | .725    |
| Adjusted $R^2$                  | 0.02            |             |          |         |
| F                               | 2.12            |             |          |         |
| Religious practice and public regard for gender |                   |              |          |         |
| Religious practice              | -.06            | 0.06        | -.09     | .297    |
| Public regard - Gender          | .04             | 0.07        | -.05     | .583    |
| Religious practice*Public regard| -.04            | 0.05        | -.06     | .461    |
| Adjusted $R^2$                  | 0.01            |             |          |         |
| F                               | 0.73            |             |          |         |
One marginally significant finding suggests that having a stronger sense of religious identity may be associated with more well-being via positive emotions when accompanied by a racial identity that is perceived by the individual to have higher public regard. Had this been significant, this would have meant that, although religious identity is associated with greater well-being for everyone, this relationship may be especially true for people who feel like their racial identity is more respected by society. This would be contrary to our initial hypothesis and to previous research which states that religion often leads to greater well-being for people who face some form of discrimination compared to people who do not (Hoverd & Sibley, 2013; Jung, 2014). It is possible that religion acts as a buffer for people who use it to cope with discrimination, thus leading to an improved perceived public regard. Additionally, individuals with higher public regard do not have to cope with the stress of stigmatization, which can allow them to invest more fully in, and benefit from, their religious identity. Blaine and Crocker (1995) suggested that religiousness can protect and enhance people’s self-perceptions, which could mean greater benefit for those who already have a positive self-perception. However, it is important to emphasize here that this finding was only marginal and many regression analyses were run in this study (increasing the possibility of finding an association by random chance alone). Thus, this result might have been found by chance and should be interpreted very cautiously. Future research should aim to provide significant evidence of this finding.

Similar to religious identity, the relationship between religious practice and well-being is not associated with public regard for race, despite the fact that a higher public regard for race is generally associated with more well-being. This may be because the link between religious practice and public regard for race is very strong. Although research has shown that some people of color, especially Black individuals, tend to practice religion more than White individuals (Johnson, Matre, & Ambrecht, 1991), results imply that this practice has little to do with how they think their racial identity is perceived by society. Religious practice is associated with greater social identification with other group members (Blaine & Crocker, 1995), but it does not play a role in their perception of public regard for their race because religion is not often practiced with members of other racial groups.

We also found that, contrary to our hypothesis, the relationship between religious identity or religious practice and well-being was not affected by having a higher or lower public regard for gender. The reason that this relationship was not found for public regard for gender may be that both men and women face stressors related to their gender. For example, women are more likely to report internalizing disorders, and men are more likely to display externalizing disorders (Nolen-Hoeksema & Rusting, 2003). Although these stressors may be distinct from one another, they all may inhibit individuals from investing fully in their religious identity.

Limitations and Future Directions
There were some limitations to the current study which may have contributed to some of the findings and null results. One such limitation was the fact that only 303 participants out of the original 850 students who were recruited completed the surveys, and out of these, 157 were included in the current study. The low number of participants might have resulted in the study being underpowered. Furthermore, it is possible that the participants who were included in the study are not representative of religious college students in general. Thus, it is not clear to whom the results of this study might generalize.

In addition, although the current sample included students who attended five different colleges, the sample was not very representative of the general population—it was heavily weighted toward White, female, and Christian students. This lack of diversity in gender, race, and religion might have skewed the results by limiting the number of participants in each sample and not accurately portraying the benefits of well-being for each group. The fact that there was little religious diversity in the sample also meant that it was not possible to compare the differences in well-being between different religious groups. Past research has shown that there may be differences in well-being between religious groups (Patel et al., 2009), so it may be that religious identity and religious practice play different roles in well-being with people from different religious backgrounds. However, sample limitations meant that this study was unable to answer that question. Future research should examine similar relationships between religion and well-being for people from more diverse race, gender, and religious backgrounds. Other forms of social inequality such as socioeconomic status could also be studied to broaden the scope of identities for which people
may perceive higher or lower public regard.

In addition, a similar study with the general population could test whether there are differences in the relationship between religion and well-being between the college population and general populations. College students could be more likely to practice religion as a way of connecting to home, but this relationship may be different outside of the college environment. Additionally, race, gender, and public regard may moderate the relationship between religion and well-being in different ways when not tested within a population that is taught to be active and aware regarding social issues around race and gender.

Another limitation is that there were many regression analyses run in this study, which means that some of the significant findings might have been attributable to chance. In general, the effect sizes in the study were very small, suggesting that although religious and group variables accounted for significant portions of variance in positive and negative affect, large amounts of variance in affect must be explained by other factors that were not assessed in this study. This is why the present study should be replicated in future research to determine whether the findings remain consistent.

In terms of more methodological concerns, although the use of self-reported data allowed us insight into participants’ daily routines and feelings, it was also a limitation of the study. Although participants knew their responses were confidential, it is possible that they were not truthful in their answers in order to uphold a certain image of themselves. They might also have lacked the introspective ability to correctly identify the emotions they experienced throughout the day. Even if they did identify their emotions correctly, these were rated on a scale, which might have been interpreted differently by different participants. In a similar vein, there is no way to know whether participants understood the survey questions. There are a variety of ways in which to measure well-being, including cognitions such as life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985); psychosocial well-being such as loneliness, depression, and social support (Wright et al., 2017); and even physical health symptoms and behaviors such as diet, exercise, and sleep (Wright, Broadbent, Graves, & Gibson, 2016). Our study focused on emotions because of their ability to describe college students’ experiences in a multifaceted way (Lazarus, 1997), which can be easily measured on a daily level. However, further research may involve using another measure of well-being.

Further research might also deepen understanding on religiousness by looking at certain variables, such as religious practice, in more detail by analyzing data at the daily level. Although the daily diary method used in this study obtained repeated measures on participants, we chose to summarize each person’s data in the form of means and standard deviations. This is because studies have shown that aggregates of empirical daily responses are closer to actual experiences than subjective aggregates, as they reduce systematic and random measurement errors (Bolger et al., 2003). However, more specific daily level analyses may be helpful to determine whether practicing certain religious acts multiple times a day has an effect on well-being.

This study demonstrates the importance of religious identity with regard to well-being. It also shows that religious identity has a stronger association with well-being for people who have higher public regard for their race. This indicates that college campuses should try to foster a sense of religious identity for all students who identify with any religion. Colleges should allow students space to connect with other students from their own religious background and to discuss issues they may face in regard to their religious identity. This could be done by having religious chaplains of diverse religious backgrounds who are present in the campus community with scheduled open hours to talk to students. This may also be achieved through encouraging the presence of religious organizations or religious identity collectives so students can connect with their peers of similar religious backgrounds, in addition to having spaces and events for students to practice their faith.

College campuses should strive to create inclusive and safe environments for students of all races, genders, and religious backgrounds. This is especially true for religious spaces, which often times are not very racially diverse, and are spaces mostly dominated by women. The fewer stressors that students face in relation to these identities, the more likely it is that they will benefit from their religious identity, which in turn is associated with greater well-being.

References


Religion and Well-Being


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“What if we lived in a world where seeking help was considered as noble as offering help? . . . Let’s work together toward a future where seeking help is universally perceived as a psychological strength.”

R. Eric Landrum, PhD
Psi Chi President

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