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For the past few decades, the psychological literature has highlighted a need for the integration of social justice education and training in professional psychology graduate programs (Burnes & Singh, 2010). Subsequently, scholars, researchers, and practitioners have identified principles and ideals underlying social justice education and training in psychology graduate programs, particularly counseling and clinical graduate programs. Many have explored and developed concrete strategies for clinical supervisors, faculty, and researchers so that they will have the skills to teach and apply social justice in coursework and training activities. I have personally benefited from such a value and focus early in my doctoral training. It has been challenging and rewarding to continue learning about social justice theory and practice. Since starting to teach undergraduate psychology majors and becoming involved with Psi Chi as the Diversity Director, I have begun to wonder: What about the integration of social justice education and principles in the academic experiences of undergraduate psychology students?

What Is a Social Justice Approach?
I have previously facilitated social justice education trainings, and they all start with an exercise in which participants are asked to cocreate a working definition of social justice. Of course, there are definitions out there, and we can always start with how social justice is generally defined by scholars, activists, researchers, and educators. However, the very process of developing one’s own definition, or of a group coming to a consensus about their definition, is in and of itself part of a social justice approach. When constructing a definition, a few themes often stood out no matter who was part of the group at the time, including the importance of active participation in the learning process; the integration of personal awareness, social action, and advocacy; and the use of systems perspectives in exploring and understanding psychological and interpersonal dynamics.

Having a social justice approach moves beyond multiculturalism, diversity, and inclusion, although it encompasses all of these. Approaching education, scholarship, and practice from a social justice
A Social Justice Approach for Psychology Undergraduates

In an academic context, particularly in the context of psychology undergraduate education, I believe the field can apply many concepts, principles, and strategies from such pedagogies and frameworks as multicultural education, social justice education and training, liberation psychology, and feminist psychology. Much of the literature has focused on graduate-level education and training. However, some literature has discussed undergraduate psychology education with a social justice orientation. That is, although the topic of social justice does not seem directly addressed in the literature, certain themes and ideas stand out that align with many social justice frameworks in education and training. Generally, a social justice approach in psychology undergraduate education means demonstrating the genuine value in exploring opportunities to think critically and creatively about how to best understand, teach about, and serve a wide range of individuals and communities. A social justice approach further means intentionally integrating the perspectives of those whose experiences have been marginalized or ignored—in all areas of psychology and in all modalities of psychology education and service.

One prominent social justice theme entails the empowerment of learners as well as educators by encouraging students, research assistants, teaching assistants, and others to cocreate, cofacilitate, and coparticipate in all academic and scholarly endeavors. For example, there are many rich discussions and examples of how service learning activities or projects not only can enrich the learning objectives and outcomes in a course, but also how these activities benefit communities and organizations (Toporek & Worthington, 2014). O’Brien, Risco, Castro, and Goodman (2014) defined service learning as “experiential education in which learning is enhanced through volunteer work and reflection” (p. 973). In their description of how undergraduate student learning was assessed in a service learning course where students worked with children living in a shelter for survivors of intimate partner violence, O’Brien et al. (2014) illustrated how service learning can be a powerful “instrument of social justice.” Specifically, undergraduate students first were educated about intimate partner violence in a didactic course, and then the students had the opportunity to participate in the service learning experience in which they provided support and psycho-educational groups to children living in shelters for survivors of intimate partner violence. This innovative way of learning was an opportunity to put their knowledge into practice, solidify their learning, and offer a valuable support service to a community in need. With the integration of service learning into undergraduate education, we can start to identify and shape a more socially relevant psychology. Infusing scholarship and practice relevant to diversity in both the process (e.g., experiential learning) and the content of education exemplifies a social justice orientation (Enns & Sinacore, 2005).

Another way to create a classroom climate that emphasizes participative and interactive learning might be to incorporate more group discussion activities—either in smaller groups or as a large group—during which students are encouraged to explore ideas through personal experiences and examples. The goal is to help students to see themselves in relation not only to themselves, their immediate relationships, and contexts, but also to broader sociocultural and contextual influences. Furthermore, educators can make course content more inclusive by incorporating textbooks, materials, and sources that address a diversity of perspectives, worldviews, and research findings. Watts (2004) offered some specific examples of how educators also can reconceptualize conventional ideas in U.S. psychology into concepts that reflect cultural relativism and social justice principles. For example, theories and implications of constructs such as self-efficacy or self-esteem/self-concept can be reconceptualized as “collective efficacy,” “group solidarity,” or “empowerment.” Similarly, “moral development” can be explored as “cultural development” or “sociopolitical development.” In clinical contexts, educating students about a psychotherapy theory and strategy such as cognitive behavioral therapy can be expanded to include discussions about “critical consciousness raising,” or a process
of learning to think critically about accepted ways of thinking, underlying assumptions, and other internalized ways of thinking and feeling that serve to reinforce oppressive schemas and subsequent structures of inequality.

Similarly, another theme in the literature has emerged around making research more inclusive and social justice oriented. For example, participatory action research is a research methodology that grounds the research in community participation and action. This approach involves research participants themselves in every step of the process—from conceptualizing the research questions to collecting and analyzing data, and to co-developing conclusions and recommendations. The theory and knowledge gained through this kind of collaboration is grounded in context, aimed at promoting change, and empowering for both researchers and participants/community members. Moreover, Toporek and Worthington (2014) discussed how engaging participants in the process of participatory action research, or other qualitative research approaches in which participants engage with researchers, may allow for more depth and grounded theory in analysis. One example offered was to create an advisory group of participants who can reflect on the process and provide guidance for the project at different stages of the research. Burton and Kagan (2009) also offered examples of action research when describing ways to conduct “community psychological work” with people with learning difficulties. One example was to organize “health awareness groups” to provide opportunities for both researchers and participants to explore and understand experiences from the individual’s point of view, listening and enabling people to get together to share common concerns as well as potential solutions. Generally, the goal in research, particularly undergraduate research, should be more intentionality around choosing what problems to study, what populations to study, and what procedures and measures to use.

Finally, although not specifically informed by social justice principles or ideas, Universal Design for Learning (UDL) is a teaching paradigm that certainly aims to achieve a key social justice goal: to increase equity and access in classrooms. UDL offers practical and effective teaching practices that meet the needs of different kinds of learners. By applying learning, assessment, and disability research and theories, the UDL framework helps educators understand learner differences as well as the impact of different disabilities on educational and academic experiences and needs. Through the use of new media in the classroom and flexible teaching and assessment practices, UDL helps educators to truly create universal access to educational materials for all students. Educators can commit to learning about and striving to use a UDL paradigm in their classrooms so that material and activities are more broadly accessible. Waitoller and King Thorius (2016) further articulated how UDL is consistent with a social justice approach through their discussion of how students with “dis/abilities” have historically experienced oppression in terms of who accesses learning and whose abilities are recognized and valued. The authors added that “pedagogies that value ethnic, racial, and language differences simultaneously and intentionally must be committed to disrupting those that have historically pathologized students’ abilities” (p. 367).

Social Justice Education as a Responsibility

Dykstra (2012) stated the following:

Psychology is an ethical-political endeavor. Its practices are influenced by and influence our societies. Knowledge gained about learning directly impacts a child’s experience in school. How we interpret depression and other mental health symptoms leads to the development of interventions undertaken by millions. The fact that psychology has such an immediate role in our societies impresses upon us the need to develop a form of praxis that is acutely aware of this responsibility. (p. 9)

It has been well-established that society has and will continue to become increasingly diverse and multicultural. Across the globe, contexts of political, social, cultural, and demographic changes have slowly but consistently contributed to a more diverse student body in higher education. Subsequently, this has led to campus communities that are filled with individuals from many cultural backgrounds and with vastly diverse experiences. Because of how intricately intertwined the individuals are with their social contexts, from the standpoint of psychology education, people cannot be understood independently from their social contexts, and psychology as a discipline cannot be learned without the examination of knowledge within a historical, political, cultural, and social context.

On a final note, it is imperative to recognize the challenges of reconceptualizing and adapting one’s approach to teaching, mentoring, and
research. Perhaps we can consider an equally important but less daunting act of becoming a more social justice oriented educator—to make a personal commitment to engage in active and ongoing professional development. Seeking out additional training, literature, and knowledge of multicultural and social justice education and theory is in itself a statement of one’s commitment to a social justice approach. Having a social justice approach is more than just a set of instructional techniques and research strategies—it should be a philosophy, a way of looking at society and the world from psychological perspectives. By adopting a social justice approach, the field of psychology can become a more inclusive discipline.

References


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Psychological distress among college students is a pressing issue, with researchers having declared a “mental health crisis” within this population (Beiter et al., 2015; Krumrei, Newton, & Kim, 2010). Although there are higher rates of depression, anxiety, and stress symptoms in college students than in the general population (Bayram & Bilgel, 2008; Wong, Cheung, Chan, Ma, & Tang, 2006), overall rates of psychological disorders are no different between college students and their same-age peers either in the United States (Blanco et al., 2008) or across 21 other countries (Auerbach et al., 2016). However, 45.79% of college students in a national study met criteria for a psychological disorder in the 12 months prior to assessment, with alcohol use disorders (20.37%) and personality disorders (17.68%) leading the prevalence rates (Blanco et al., 2008). Another national survey found that 86% of students with psychological disorders dropped out of college without completing a degree (Kessler, Foster, Saunders, & Stang, 1995), identifying these students as a vulnerable group.

In their efforts to identify individual differences associated with psychological distress in college students, researchers have found that neuroticism, a dimension of personality, is positively associated with depression, anxiety, and stress (Chien, Ko, & Wu, 2007; Matthews et al., 2006; Wong, Lee, Ang, Oei, & Ng, 2009) and inversely related to well-being (Gutiérrez, Jiménez, Hernández, & Puente, 2005). Additional research has established that personality and coping styles are closely intertwined (Bouchard, Guillemette, & Landry-Léger, 2004). In the present study, therefore, we investigated coping as a mechanism through which neuroticism might predict depression, anxiety, stress, and well-being among college students. More specifically, we examined
negative emotion-focused coping (NEFC) comprised of both negative thoughts (self-blame) and negative behaviors (venting) as a transdiagnostic mediator of the relationships between neuroticism and depression, anxiety, stress, and well-being.

Previous research has established associations between personality and psychological distress among undergraduates (Bouchard et al., 2004). Personality is defined as a set of characteristics that are stable across time and situation (Connor-Smith & Flachsbart, 2007). The most common model of personality is the “Big Five” or five-factor model (FFM), which encompasses the dimensional traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism (Costa & McCrae, 1992). Neuroticism, the dimension of emotional stability vs. instability, is consistently the strongest of the FFM personality traits to predict psychological distress (Bouchard et al., 2004; Costa & McCrae, 1992; Malouff, Thorsteinsson, & Schutte, 2005), and was therefore the focus of the present study. High neuroticism is comprised of high physiological arousal (Connor-Smith & Flachsbart, 2007) and a perception of stressors as threatening rather than challenging (Carver & Connor-Smith, 2010).

Not surprisingly, among the FFM personality traits, high neuroticism was the sole positive predictor of anxiety and stress among both Australian and Singaporean undergraduates in one study (Wong et al., 2009). Matthews et al. (2006) also found that neuroticism positively predicted stress and worry in undergraduates. In a separate college sample, high neuroticism and low agreeableness, extraversion, and conscientiousness predicted depressive symptoms, with neuroticism displaying the highest predictive value (Chien et al., 2007). Researchers have found similar results regarding the primacy of neuroticism as an inverse predictor of well-being. Wong et al. (2007) reported that extraversion (positively) and neuroticism (inversely) predicted life satisfaction in Australian and Singaporean undergraduates, respectively. Furthermore, neuroticism was the single FFM personality trait that negatively predicted psychological well-being in law students (James, Bore, & Zito, 2012). The literature indicates that, among the FFM personality traits, neuroticism is indeed the primary predictor of psychological outcomes in college students.

There is a strong association between personality and coping (Bouchard et al., 2004), which is the process of responding to perceived threat, loss, or harm (Carver & Connor-Smith, 2010). Situational coping refers to a person’s responses to a specific source of stress or stressor (Folkman & Lazarus, 1985), whereas dispositional coping refers to habitual ways of responding to a variety of stressors (Carver & Scheier, 1994). It is dispositional coping that is closely linked to personality traits (Bouchard et al., 2004). Both situational and dispositional coping are often classified as problem-focused, emotion-focused, or both. Problem-focused coping is aimed at altering or finding solutions to a stressor, and emotion-focused coping is aimed at reducing or managing the emotional distress associated with the stressor (Folkman & Lazarus, 1988). Furthermore, Folkman and Lazarus (1988) stated that problem-focused coping is more often utilized in situations perceived as changeable or controllable, whereas emotion-focused coping is used when situations are assessed as unchangeable or uncontrollable.

Although researchers have historically studied problem-focused and emotion-focused coping as broad categories, reviews have concluded that such an approach is inadequate and misleading (Compass, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Skinner, Edge, Altman, & Sherwood, 2003). Compass et al. (2001) emphasized the importance of differentiating between unregulated emotional reactivity that predicts poor outcomes versus appropriate expressions and emotional modulations that predict good outcomes. They drew a distinction between intentional, voluntary emotion-focused coping versus involuntary emotion-focused responses (e.g., self-blame, venting, and rumination). Our focus in the present study is dispositional coping that is comprised of involuntary emotion-focused strategies.

Consistent with the perspective of Compass et al. (2001), Compass-Smith and Flachsbart (2007) defined and coded negative emotion-focused coping (NEFC) as emotional expressions indicating loss of control, distress, and hostility towards others. Conversely, positive emotion-focused coping represented intentional, controlled strategies to regulate and decrease negative emotion. Based upon their definition, self-blame and venting are components of NEFC that were included in their meta-analysis (Connor-Smith & Flachsbart, 2007). Similar to NEFC, Ehring et al. (2011) defined repetitive negative thinking as a style of thinking about one’s problems in a manner that is repetitive, intrusive, and from which it is difficult to disengage (i.e., uncontrollable). Negative thinking (e.g., self-blame) and behavioral expressions of negative emotions (e.g., venting) may be two sides
Coping, Neuroticism, and Psychological Outcomes

of the same coin, as both involve a negative focus on the self (Vollrath, Torgersen, & Alanes, 1998). Repetitive negative thinking was a significant, positive predictor of depression and anxiety among college students in one study (Macedo et al., 2015). Likewise, self-blame and venting may be involuntary dispositional coping responses that have a negative emotion focus, associated with psychological distress.

Addressing the link between aspects of NEFC and psychopathology, researchers have found that self-blame predicts depression, anxiety, and stress among diverse populations (Foody, James, & Leader, 2014; Xu et al., 2013), including college students (Martin & Dahlen, 2005). Likewise, venting has predicted depressive and anxiety symptoms in undergraduates (Klostermann et al., 2011; Liverant, Hofmann, & Litz, 2004). Researchers have established fewer links between these coping strategies and psychological well-being. Within non-student samples, however, self-blame has inversely predicted positive affect (Mackay, Charles, Kemp, & Heckhausen, 2011) and psychological health (Xu & He, 2012), both representations of psychological well-being. Further, both self-blame and venting predicted depression, anxiety, and positive affect in a sample of cancer patients (Keeling, Brambough, & Simpson, 2013).

Returning to personality, Connor-Smith and Flachsbart (2007) found that neuroticism was significantly, positively associated with NEFC, the strongest link between neuroticism and all types of coping investigated in their meta-analysis. Personality and coping are distinct constructs for a variety of reasons, but most importantly, coping appears to predict psychological outcomes over and above personality, demonstrating independent variance (Murberg, Bru, & Stephens, 2002). Personality may shape the selection of specific coping strategies; for example, the physiological arousal of neuroticism may facilitate self-blame and venting negative emotions (Connor-Smith & Flachsbart, 2007). Regarding the interplay between personality, coping, and psychological outcomes, there is evidence for a mediation model (Carver & Connor-Smith, 2010; Panayiotou, Kokkinos, & Kapsou, 2014); that is, personality may affect the selection of coping strategies, which in turn influence psychological outcomes.

Based upon the primacy of neuroticism among the FFM personality factors in predicting both psychological distress and well-being, researchers have examined neuroticism together with coping strategies in predicting distress (Aarstad, Beisland, & Aarstad, 2012; Beisland, Aarstad, Osthus, & Aarstad, 2013) and well-being (Beisland et al., 2013) among cancer patients. Telles-Correia, Barbosa, Mega, and Monteiro (2011) found that among liver transplant patients, neuroticism and self-blamed predicted anxiety, and neuroticism and venting predicted depression. Importantly, these studies demonstrated that neuroticism and aspects of NEFC contributed independent variance in predicting psychological distress and well-being. Nonetheless, these studies did not examine a spectrum of specific psychological outcomes such as depression, anxiety, stress, and well-being within a single sample, nor did they examine these relationships in college students.

Given the relationship between neuroticism and NEFC, as well as the associations between NEFC and psychological distress and well-being, NEFC may partially account for (or mediate) the relationship between neuroticism and psychological outcomes. Indeed, venting mediated the relationship between neuroticism and dysthymia (low-grade depression) but not anxiety among former psychiatric outpatients (Vollrath et al., 1998). Expanding on this work, Panayiotou et al. (2014) reported that venting negative feelings partially mediated the relationship between neuroticism and psychological distress (e.g., depression, anxiety, hostility) in a general population sample. Conversely, Pearson et al. (2014) found that self-blame mediated the relationship between neuroticism and negative affect, but not positive affect, among college students. The literature thus suggests that NEFC could be a transdiagnostic mediator in the relationships between neuroticism and psychological outcomes.

Present Study

To advance the literature on psychological distress among college students, we examined NEFC as a transdiagnostic mediator in the relationships between neuroticism and four specific psychological outcomes: depression, anxiety, stress, and well-being. Although the APA (1994) proposed conceptual distinctions between depression and anxiety, there is substantial clinical overlap between the two types of disorders (Lovibond, P. & Lovibond, S., 1995). We examined separate predictive models for each psychological outcome to assess the veracity of NEFC in predicting the conceptual aspects of multiple psychological outcomes. Researchers have yet to conceptualize self-blame and venting as representing the negative self-focus of NEFC.
in accounting for transdiagnostic psychological outcomes in college students. If NEFC accounts for the relationships between a neurotic personality style and a spectrum of psychopathologies, it could be a target of intervention. In the present study, we hypothesized that NEFC would positively mediate the relationships between neuroticism and (a) depression, (b) anxiety, and (c) stress, and (d) inversely mediate the relationship between neuroticism and well-being.

**Method**

**Participants**
Participants included 189 undergraduates (men = 47, women = 142) recruited from a pool of General Psychology students whose options for a research requirement in the course included participation in departmental research studies. Students who were 18 to 25 years old (M = 18.98, SD = 1.30) and enrolled in college full-time (at least a 12-credit course load) were eligible for the study. First-year students represented 55% of the sample, followed by sophomores (23.8%), juniors (14.3%), and seniors (6.9%). Regarding ethnicity, 84% identified as European American, 8.5% as Latino American, 3.2% as Native American, 1.6% as Asian American, 1.1% as African American, and 1.6% as multiethnic.

**Materials**

**Demographics.** We created a questionnaire to assess age, sex, college year, ethnicity, and course credit load in the semester of recruitment in order to confirm study eligibility and describe our sample.

**Personality.** Neuroticism was assessed with the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992). Although participants responded to the full 60-item measure, we used only the Neuroticism subscale (12 items) in this study. Students responded to each item on a 5-point Likert-type scale ranging from 0 (strongly disagree) to 4 (strongly agree), with higher scores indicating a stronger level of neuroticism. In the Neuroticism subscale, items 1, 16, 31, and 46 were reverse-scored and summed with the other items. Sample items from the Neuroticism subscales were as follows: “When I’m under a great deal of stress, sometimes I feel like I’m going to pieces” and “I often get angry at the way people treat me.” In the present study, the Cronbach’s alpha for the Neuroticism subscale was .89, consistent with the .86 value reported by Costa and McCrae (1992). Murray, Rawlings, Allen, and Trinder (2003) reported that test-retest reliability coefficients for the Neuroticism subscale were .80 at 6 months and .75 at 30 months. In terms of content validity, Rosellini and Brown (2011) found that the Neuroticism subscale was significantly and positively associated with major depression, generalized anxiety disorder, and social anxiety disorder.

**Coping.** Based upon the predictive value of aspects of dispositional negative emotion-focused coping (NEFC) in relation to psychological distress (Compass et al., 2001; Panayiotou et al., 2014), we combined the Self-Blame (α = .77) and Venting (α = .58) subscales from the Brief COPE (Carver, 1997) to create a 4-item NEFC subscale (α = .73). Only these two subscales were used in the study, although participants responded to the full 28-item measure. In the meta-analysis where they defined and coded NEFC, Connor-Smith and Flachsbart (2007) included 10 studies that used the COPE subscales (Carver, 1997), among others, to assess dispositional coping in undergraduates. The response format on the Brief COPE was a 4-point Likert-type scale scored from 1 (I haven’t been doing this at all) to 4 (I’ve been doing this a lot). No items were reverse-scored. A higher total score indicated greater use of the strategy during a given time, which was set as the semester of recruitment to reflect dispositional coping; the Brief COPE can be used to assess either situational or dispositional coping by adjusting the instructions to participants. A sample item for self-blame was “I’ve been blaming myself for things that happened.” A sample item for venting was “I’ve been expressing my negative feelings.”

Carver (1997) suggested that individual subscales could be used in novel ways based on the needs and imagination of the researcher. He reported Cronbach’s α = .50 for Venting and .69 for Self-Blame across three studies, stating that these reliabilities were adequate based on Nunnally (1978). More recently, Ward and Hay (2015) reported Cronbach’s alphas of .80 for Self-Blame and .58 for Venting. Researchers have combined individual subscales using novel conceptualizations such as maladaptive coping (Self-Blame and Behavioral Disengagement), which was inversely related to well-being (Pérez-García, Oliván, & Bover, 2014). However, Elliott and Daley (2013) combined five subscales (10 items) that included Self-Blame and Venting, calling it negative coping (α = .77). They found that negative coping significantly and positively predicted emotional exhaustion. Together, these studies provide support for the content validity of the Self-Blame and Venting
subscases, while also highlighting the novel use of subscales in combination.

**Distress.** Symptoms of depression, anxiety, and stress were assessed with the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). Respondents used a 4-point Likert-type scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). None of the items were reverse-scored. For each outcome, responses were added across seven items and the sum was doubled to yield a subscale score as suggested by the authors. Higher scores indicated more distress. Sample items for subscales were as follows: (a) Depression: “I felt down-hearted and blue,” (b) Anxiety: “I felt I was close to panic,” and (c) Stress: “I felt that I was rather touchy.” In our study, Cronbach’s \( \alpha = .90 \) for Depression, .83 for Anxiety, and .86 for Stress, similar to those of Lovibond and Lovibond (1995), who reported .96 for Depression, .89 for Anxiety, and .93 for Stress. In addition, they reported that 2-week test-retest reliability coefficients were .71 for Depression, .79 for Anxiety, and .81 for Stress.

The DASS-21 recognizes the conceptual distinction between the DSM-IV (APA, 1994) classifications of depression and anxiety, while acknowledging their clinical overlap (Lovibond & Lovibond, 1995). However, it is not designed to be a diagnostic tool. Demonstrating evidence of content validity, researchers have found that the subscales of the DASS-21 each have moderate to high correlations with the Beck Depression Inventory, Beck Anxiety Inventory, State-Trait Anxiety Inventory, and Positive and Negative Affect Schedule (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005) as well as distinct factor structures (Lovibond & Lovibond, 1995). The preceding studies support the use of the DASS-21 subscales rather than the overall score.

**Well-being.** Psychological well-being was assessed with the WHO-Five Well-Being Index (WHO-5; World Health Organization, 1998). Participants responded on a 6-point Likert-type scale ranging from 0 (at no time) to 5 (all the time). None of the items were reverse-scored. Responses to the five items were added and then multiplied by 4 to yield a percentage, as suggested by the developers, with a higher score indicating greater well-being. A sample item was “I have felt cheerful and in good spirits.” In the present study, the Cronbach’s \( \alpha = .81 \), like that of Bech, Olsen, Kjoller, and Rasmussen (2003), who reported a Cronbach’s alpha of .84. Demonstrating content validity, Awata et al. (2007) found that the WHO-5 significantly and positively correlated with the Short-Form 36 Health Survey, a measure of subjective health and quality of life.

**Procedure**
The study was approved by the Worcester State University Human Subjects Review Board. We assessed participants in person in a group setting. The duration of the study was about 30 minutes. Participants provided informed consent. The self-report questionnaires were presented in the following order: Demographic questionnaire, NEO-FFI, Brief COPE, WHO-5, and DASS-21. We did not counter-balance the presentation of questionnaires because the DASS-21 and WHO-5 might have cued participant responses to the personality and coping measures.

**Data Analytic Procedure**
We conducted mediation analyses to test all hypotheses. In conditional process analyses (Hayes, 2013), mediation occurs when a mediator (\( M \)) significantly accounts for the relationship between a predictor variable (\( X \)) and a criterion variable (\( Y \)), as indicated in Figure 1. In the present study, we examined whether NEFC (\( M \)) accounted for the relationship between neuroticism (\( X \)) and one of four psychological outcomes (\( Y_1 \)–\( Y_4 \)).

We used Model 4 in the Hayes (2013) PROCESS macro to conduct four mediation analyses using conditional process analyses in SPSS Version 24. This macro utilizes bootstrapping (set at 5,000), which resamples data to construct bias-corrected confidence intervals. If the 95% confidence interval (CI) spans zero, the result is not significant. The 95% confidence interval reflects two-tailed analyses. In conditional process analyses, mediation occurs if the “indirect effect” of neuroticism (\( X \)) on the psychological outcomes (\( Y_1 \)–\( Y_4 \)) via coping (\( M \)) is significant (the interaction between paths \( a \) and \( b \) in Figure 1). Hayes further stated that paths \( a, b, \) and \( c \) in Figure 1 do not require significance for indirect effects to be statistically significant. Path \( a \) was shared across all four conditional process analyses (see Figure 1).

**Results**

**Descriptive Statistics**
Descriptive statistics and a correlation matrix for neuroticism, NEFC, and the four psychological outcomes appear in Table 1.
Mediation Analyses

We first examined skewness and kurtosis to assess the normality of data (Field, 2013). Regarding skewness, subscale scores were within the range of -1 to +1, indicating normality for neuroticism (.21), NEFC (.41), anxiety (.96), stress (.33), and well-being (-.20), but not depression (1.2). Nonetheless, the SE of skewness for depression was .18, and three times .18 is less than 1.00, another measure of normality. Kurtosis was within -1 and +1 for all subscale scores, indicating normality for neuroticism (-.48), NEFC (-.58), depression (-.58), anxiety (.08), stress (-.57), and well-being (.00). The bias-corrected bootstrapping method of testing mediation corrects for skew, further addressing concerns about whether data were normally distributed.

Analyzing mediated effects in 166 psychology articles published in two prestigious psychology journals between 2000 and 2003, Fritz and MacKinnon (2007) found that bias-corrected bootstrapping was consistently the most powerful test of mediation compared to the Baron and Kenny (1986) method and the Sobel (1982) test, among others. Using Cohen’s (1988) criteria for small (2% of the variance), medium (13% of the variance), and large (26% of the variance) effect sizes, Fritz and MacKinnon (2007) identified corresponding values of paths $a$ and $b$ in a mediation model (see Figure 1). That is, a parameter value of 0.14 = small, 0.26 = small-medium, 0.39 = medium, and 0.59 = large effect sizes. Based on Fritz and MacKinnon’s (2007) empirical estimates of the sample size needed for .80 power for small-medium effect sizes in paths $a$ and $b$, a sample size of 150 is required. Our sample of $N = 189$ met this criterion.

However, Kenny (2016) argued that Cohen’s (1988) parameter estimates for Path $a$ and Path $b$ in a mediation model should be squared when assessing the effect size of $ab$, the indirect effect. Kenny’s conceptualization resulted in the following interpretation of effect sizes for indirect effects: .01 = small, .03 = medium, and .25 = large. We used the MedPower calculator (Kenny, 2016) to assess the sample size we required for a power of .80 and a medium mediation effect size ($ab = .09$). Our sample size of $N = 189$ exceeded the required $N$ of 113.

There were some strong correlations between our four outcome variables, depression, anxiety, stress, and well-being (see Table 1), as stated by Lovibond and Lovibond (1995). Our primary objective was to examine NEFC as a mediator of the relationships between neuroticism and the conceptual definitions of our psychological outcomes rather than their clinical overlap. Given our relatively small sample size and goal of .80 power (Cohen, 1992) for each analysis as described previously, a single Structural Equation Model that included a predictor, mediator, and four outcome variables was beyond the scope of this study, based on the empirical sample power estimates of Fritz and MacKinnon (2007). As a compromise, we examined multicollinearity in a multiple regression analysis with neuroticism and NEFC as predictors; depression, anxiety, and stress as covariates; and well-being as the outcome. The Variance Inflation Factor (VIF) was less than 3.00 for neuroticism (2.14), NEFC (1.87), depression (2.87), anxiety (2.27), and stress (2.28), consistent with the literature that suggests this value should be less than 4.00 (Pan & Jackson, 2008).

We examined our data for homoscedasticity using the Breusch and Pagan (1979) and Koenker tests (1981). We found evidence of heteroscedasticity in the models predicting depression ($BP = 21.69, p = .000$; Koenker = 16.66, $p = .000$) and anxiety ($BP = 8.33, p = .02$; Koenker = 6.80, $p = .03$) as well as well-being ($BP = 10.57, p = .01$; Koenker = 10.59, $p = .01$), but not stress ($BP = 4.62, p = .10$; Koenker = 4.92, $p = .09$). We used HC3 for heteroscedastic-consistent standard errors, as recommended by Long and Ervin (2000) if $N ≤ 250$. The HC3 adjustment is available as an option in PROCESS.

Hypothesis 1

In the first hypothesis (see Figure 2a), neuroticism was the predictor ($X$), NEFC was the mediator ($M$), and depression was the outcome ($Y_1$). In path $a$ of conditional process analyses, neuroticism significantly and positively predicted NEFC.
Neuroticism (X) 

Path c: Total Effect (Direct + Indirect Effect) 

Depression (Y) 

Anxiety (Y) 

Stress (Y) 

Well-Being (Y) 

Path a 

Path b 

Path c: Direct Effect 

Neuroticism (X) 

Negative Emotion-Focused Coping (NEFC) 

Conditional Process Analyses for the Relationships Between Neuroticism (X) and Depression (Y), Anxiety (Y), Stress (Y), and Well-Being (Y), with Negative Emotion-Focused Coping (NEFC) as a Mediator (M).

In Hypothesis 2 (see Figure 2b), neuroticism was the predictor (X), NEFC was the mediator (M), and anxiety was the outcome (Y). In conditional process analyses, neuroticism significantly, positively predicted NEFC (Path a), $R^2 = .34, F(1, 187) = 97.35, p < .001$, Cohen’s $f^2 = .52$. NEFC significantly and positively mediated the neuroticism–anxiety relationship, $B = 0.16, SE = 0.04, 95\% CI [0.08, 0.24]$, supporting Hypothesis 2. Regarding effect sizes of mediation, the first is the variance in anxiety (Y) that was accounted for by NEFC (M), $B = 0.24, SE = 0.04, 95\% CI [0.16, 0.34]$ (Fairchild et al., 2009). The second is the ratio of the indirect effect to the total effect (direct effect plus indirect effect = c), $B = 0.26, SE = 0.07, 95\% CI [0.14, 0.41]$ (Preacher & Kelley, 2011). The third is the completely standardized indirect effect, $\beta = .16, SE = 0.04, 95\% CI [0.09, 0.24]$ (Preacher & Kelley, 2011), indicating a medium–large effect size (Kenny, 2016).

In addition to the preceding indirect effects, neuroticism had a direct, significant, and positive association with depression (Path c), $B = 0.69, SE = 0.06, p < .001, 95\% CI [0.57, 0.82]$. The total effect of neuroticism (including direct and indirect effects) on depression (Path c) was $B = 0.69, SE = 0.06, 95\% CI [0.57, 0.82]$. In the model proposed in Figure 2a, neuroticism and NEFC accounted for 54% of the variance in depression, where $R^2 = .54, F(2, 186) = 80.70, p < .001$ and Cohen’s $f^2 = 1.17$, a large effect size (Cohen, 1992).

**Hypothesis 2**

In Hypothesis 2 (see Figure 2b), neuroticism was the predictor (X), NEFC was the mediator (M), and anxiety was the outcome (Y). In conditional process analyses, neuroticism significantly, positively predicted NEFC (Path a), $R^2 = .34, F(1, 187) = 97.35, p < .001$, Cohen’s $f^2 = .52$. NEFC significantly and positively mediated the neuroticism–anxiety relationship, $B = 0.16, SE = 0.04, 95\% CI [0.08, 0.24]$, supporting Hypothesis 2. Regarding effect sizes of mediation, the first is the variance in anxiety (Y) that was accounted for by NEFC (M), $B = 0.24, SE = 0.04, 95\% CI [0.16, 0.34]$ (Fairchild et al., 2009). The second is the ratio of the indirect effect to the total effect (direct effect plus indirect effect = c), $B = 0.26, SE = 0.07, 95\% CI [0.14, 0.41]$ (Preacher & Kelley, 2011). The third is the completely standardized indirect effect, $\beta = .16, SE = 0.04, 95\% CI [0.09, 0.24]$ (Preacher & Kelley, 2011), indicating a medium–large effect size (Kenny, 2016).

Furthermore, neuroticism had a direct, significant, and positive association with anxiety (Path c), $B = 0.44, SE = 0.06, p < .001, 95\% CI [0.32, 0.55]$. $R^2 = .34, F(1, 187) = 97.35, p < .001$, Cohen’s $f^2 = .52$. Furthermore, supporting Hypothesis 1, NEFC was a significant, positive mediator in the neuroticism–depression relationship, $B = 0.22, SE = 0.04, 95\% CI [0.14, 0.31]$. We present three effect size measures of mediation, all of which yielded significant results. The first is the variance in depression (Y) that was accounted for by NEFC (M), $B = 0.32, SE = 0.05, 95\% CI [0.22, 0.41]$ (Fairchild, Mackinnon, Taborga, & Taylor, 2009). The second is the ratio of the indirect effect to the total effect (direct effect plus indirect effect = c), $B = 0.31, SE = 0.06, 95\% CI [0.21, 0.44]$ (Preacher & Kelley, 2011). The third is the completely standardized indirect effect, $\beta = .21, SE = 0.04, 95\% CI [0.14, 0.29]$ (Preacher & Kelley, 2011), indicating a medium–large effect size (Kenny, 2016).
The total effect of neuroticism (including direct and indirect effects) on depression (Path $c$) was $B = 0.59$, $SE = 0.05$, 95% CI [0.49, 0.70]. Overall, in Figure 2b, neuroticism and NEFC accounted for 43% of the variance in anxiety, where $R^2 = .43$, $F(2, 186) = 76.49$, $p < .001$ and Cohen’s $f^2 = .75$, a large effect size (Cohen, 1992).

**Hypothesis 3**

In Hypothesis 3 (see Figure 2c), neuroticism was the predictor ($X$), negative emotion-focused coping (NEFC) was the mediator ($M$), and stress was the outcome ($Y$). In conditional process analyses, in path $a$, neuroticism significantly and positively predicted NEFC, $R^2 = .34$, $F(1, 187) = 97.35$, $p < .001$. Cohen’s $f^2 = .52$. Supporting Hypothesis 3, NEFC was a significant, positive mediator in the neuroticism–stress relationship, $B = 0.20$, $SE = 0.05$, 95% CI [0.11, 0.31]. In terms of mediation effect size measures, first, variance in stress ($Y$) that was accounted for by NEFC ($M$), $B = 0.24$, $SE = 0.05$, 95% CI [0.15, 0.33] was significant (Fairchild et al., 2009). Second, the ratio of the indirect effect to the total effect (direct effect plus indirect effect = $c$), $B = 0.34$, $SE = 0.08$, 95% CI [0.20, 0.53] was significant (Preacher & Kelley, 2011). Third, the completely standardized indirect effect, $\beta = .19$, $SE = 0.04$, 95% CI [0.11, 0.29] was significant (Preacher & Kelley, 2011), indicating a medium–large effect size (Kenny, 2016).

In addition to the preceding indirect effects, neuroticism was directly, significantly, and positively associated with stress (Path $c$), $B = 0.40$, $SE = 0.07$, $p < .001$, 95% CI [0.25, 0.54]. The total effect of neuroticism (including direct and indirect effects) on stress (Path $c$) was $B = 0.60$, $SE = 0.06$, 95% CI [0.48, 0.72]. In Figure 2c, neuroticism and NEFC accounted for 41% of the variance in stress, where $R^2 = .41$, $F(2, 186) = 64.19$, $p < .001$ and Cohen’s $f^2 = .69$, a large effect size (Cohen, 1992).

**Hypothesis 4**

In Hypothesis 4 (see Figure 2d), neuroticism was the predictor ($X$), negative emotion-focused coping (NEFC) was the mediator ($M$), and well-being was the outcome ($Y$). In conditional process analyses, neuroticism significantly and positively predicted NEFC (Path $a$), $R^2 = .34$, $F(1, 187) = 97.35$, $p < .001$, Cohen’s $f^2 = .52$. NEFC significantly and inversely mediated the neuroticism–well-being relationship, $B = 0.19$, $SE = 0.10$, 95% CI [-0.39, -.01], supporting Hypothesis 4. Effect sizes of mediation were as follows. First, variance in well-being ($Y$) that was accounted for by NEFC ($M$), $B = 0.18$, $SE = 0.04$, 95% CI [0.10, 0.28] (Fairchild et al., 2009). Second, the ratio of the indirect effect to the total effect (direct effect plus indirect effect = $c$), $B = 0.19$, $SE = 0.10$, 95% CI [0.01, 0.41] (Preacher & Kelley, 2011). Third, the completely standardized indirect effect, $\beta = -.10$, $SE = 0.05$, 95% CI [-0.21, -.01] (Preacher & Kelley, 2011), indicating a medium–large effect size (Kenny, 2016).

In the preceding analysis, neuroticism had a direct, significant, and inverse association with well-being (Path $c$), $B = -0.82$, $SE = 0.15$, $p < .001$, 95% CI [-1.12, -0.52]. The total effect of neuroticism (including direct and indirect effects) on well-being (Path $c$) was $B = -1.01$, $SE = 0.11$, 95% CI [-1.24, -0.78]. In Figure 2d, neuroticism and NEFC accounted for 31% of the variance in well-being, where $R^2 = .33$, $F(2, 186) = 40.05$, $p < .001$ and Cohen’s $f^2 = .49$, a large effect size (Cohen, 1992).

**Discussion**

To address a gap in the literature, we examined negative emotion-focused coping (NEFC) comprised of self-blame and venting, as a mediator in the relationships between neuroticism and four psychological outcomes: depression, anxiety, stress, and well-being among college students (see Figure 1). To our knowledge, our study was the first to investigate this mediating effect in relation to a range of specific psychological outcomes in a single study.

**Neuroticism and Psychological Outcomes**

Several interesting findings emerged from the present study. First, neuroticism directly and positively predicted depression, anxiety, and stress, and inversely predicted well-being (see Table 2) after controlling for mediation effects. Lovibond and Lovibond (1995) acknowledged that depression, anxiety, and stress may share a common source of negative affect in the form of neuroticism. Nonetheless, we found no evidence for multicollinearity between neuroticism and the three distress outcomes (depression, anxiety, and stress). Neuroticism appears to reflect a negative cognitive bias that is positively associated with poor psychological outcomes and negatively related to psychological well-being. The results of the present study confirm previous findings on the positive association between neuroticism and distress (Aarstad et al., 2012; Beisland et al., 2013; Chien et al., 2007; Matthews et al., 2006; Wong et al., 2009) and the inverse association between neuroticism...
and well-being (Beisland et al., 2013; Gale, Booth, Mottus, Kuh, & Deary, 2013; Gutiérrez et al., 2005; James et al., 2012).

**Neuroticism and NEFC**
A second interesting finding was that neuroticism significantly and positively predicted NEFC (see Table 2), with a large effect size. Our novel conceptualization of NEFC included both negative thoughts (self-blame) and negative emotional expression (venting). Our findings are consistent with a meta-analytic study that found a significant and positive association between neuroticism and negative emotion focus (Connor-Smith & Flachsbart, 2007). As Connor-Smith and Flachsbart (2007) suggested, personality seems to shape the selection of coping strategies, in that the negative cognitive bias and physiological arousal of neuroticism may facilitate self-blaming thoughts and negative emotional venting.

**NEFC and Psychological Outcomes**
Another important finding in our study was that NEFC significantly and positively predicted depression, anxiety, and stress. The positive relationship between NEFC and distress supports previous research regarding the relationship between self-blame (a component of NEFC) and psychological distress (Foody et al., 2014; Keeling et al., 2013; Martin & Dahlen, 2005; Xu et al., 2013). Likewise, our findings confirm previous work that found associations between venting (a component of NEFC) and depression, anxiety, and stress (Keeling et al., 2013; Klostermann et al., 2011; Liverant et al., 2004; Telles-Correia et al., 2011; Wang, Lambert, & Lambert, 2007).

NEFC did not significantly, inversely predict well-being ($p = .05$), based on our conservative significance level of $p < .001$ (see Table 2). Previous research has established inverse relationships between self-blame and psychological well-being (Keeling et al., 2013; MacKay et al., 2011; Xu & He, 2012) as well as between venting and psychological well-being (Keeling et al., 2013). Our findings were in the same predicted direction of the literature but were not strong enough, perhaps due to limitations in our measures or sample power. Overall, our study indicated that individuals who discharge their thoughts and emotions through self-blame and venting are at risk for depression, anxiety, and stress. The results support the idea that involuntary, repetitive negative thoughts and behaviors are detrimental to college students.

**NEFC as a Mediator**
Most importantly in the present study, using three methods of calculating mediation effect sizes, we established NEFC as a mediator in the positive relationships between neuroticism and depression, anxiety, and stress, and in the inverse relationship between neuroticism and well-being, thus supporting all four hypotheses. Our results are in keeping with those of Aarstad et al. (2012), Beisland et al. (2013), and Panayiotou et al. (2014), who found that coping mediated the relationships between neuroticism and distress as well as the relationship between neuroticism and well-being (Beisland et al., 2013). The preceding studies were conducted among cancer patients (Aarstad et al., 2012; Beisland et al., 2013) and a community sample (Panayiotou et al., 2014), respectively. Furthermore, our findings support those of Pearson et al. (2014), who reported that self-blame mediated the relationship between neuroticism and negative affect among African American university students. Conversely, our findings differ from their report

<table>
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<th>TABLE 2</th>
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<td><strong>Mediation Analyses for the Relationships Between Neuroticism and Depression, Anxiety, Stress, and Well-Being</strong></td>
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<td>Depression**</td>
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<td>Path $c$: Neuroticism</td>
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<td>Path $b$: NEFC</td>
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<td>Path $c$: Neuroticism</td>
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Note: **p < .001; N = 189; NEFC = Negative Emotion-Focused Coping**

Predicting NEFC (Path $a$) $R^2 = .34, F(1, 187) = 97.35, p < .001$, Cohen’s $f^2 = .52$ (large effect size)

Predicting Depression** $R^2 = .54, F(2, 186) = 80.70, p < .001$, Cohen’s $f^2 = 1.17$ (large effect size)

Predicting Anxiety** $R^2 = .43, F(2, 186) = 76.49, p < .001$, Cohen’s $f^2 = .75$ (large effect size)

Predicting Stress*** $R^2 = .41, F(2, 186) = 64.19, p < .001$, Cohen’s $f^2 = .69$ (large effect size)

Predicting Well-Being**** $R^2 = .33, F(2, 186) = 40.05, p < .001$, Cohen’s $f^2 = .49$ (large effect size)
that self-blame did not (inversely) mediate the relationship between neuroticism and positive affect. In addition, our findings in relation to NEFC confirm those of Panayiotou et al. (2014), who found that venting negative feelings partially mediated the relationship between neuroticism and psychological distress (depression, anxiety, and hostility).

A concept that is similar to NEFC called repetitive negative thinking has been associated with several psychological outcomes even when accounting for neuroticism (Mahoney, McEvoy, & Moulds, 2012). Mahoney et al. (2012) emphasized the transdiagnostic value of repetitive negative thinking in independently predicting psychological outcomes, thereby serving as a potential focus of intervention. NEFC is comprised of both repetitive negative thinking and the expression of those thoughts. In the present study, NEFC demonstrated a transdiagnostic capacity in accounting for the relationships between neuroticism and three aspects of psychological distress (depression, anxiety, and stress) as well as well-being. Our findings support those of Panayiotou et al. (2014), who suggested that neuroticism shapes the selection of coping strategies, in turn exacerbating psychological distress and decreasing well-being.

Regarding the interconnections between personality, coping, and psychological distress, Bouchard et al. (2004) found that cognitive appraisals were a by-product of neuroticism, leading to dispositional coping, which in turn predicted both situational coping and psychological distress across time. Their finding that dispositional coping predicted situational coping established that individuals bring a preferred set of coping strategies to each new situation. Given this previous research, our finding that dispositional NEFC is a transdiagnostic mediator in the relationships between neuroticism and depression, anxiety, stress, and well-being in college students, may have even more significance. That is, interventions must target cognitive appraisal of stressors, an aspect of neuroticism, as well as NEFC, to disrupt the forward flow between neuroticism, dispositional coping, and psychological distress. Our conceptualization of self-blame and venting as components of transdiagnostic NEFC is a further contribution to the literature.

**Limitations**

Several limitations were apparent in our study. Some limitations were due to difficulties in participant recruitment. First, we were unable to obtain a similar number of men and women in this study, and the number of men in our sample was relatively small. We recommend that future research explore these variables in larger, gender-matched samples to examine potential gender differences in NEFC (Macedo et al., 2015) and the relationship between NEFC and specific psychological outcomes (i.e., depression, anxiety, stress, and well-being). Second, our sample size was not sufficient to permit adequate sample power for a structural equation model where all four outcomes were examined together. Although multicollinearity was not evident, future studies could account for shared variance in the distress outcomes by using a single model for statistical analysis. Third, our participants were students from a General Psychology undergraduate participant pool, which could have influenced the generalizability of our results to all college students.

In addition, the present study had a few methodological limitations. First, we did not counterbalance the presentation of measures because we wanted to avoid priming participants about the psychological outcomes under study; we acknowledge that this might have led to unintended order effects. Second, although our four-item NEFC subscale yielded an acceptable Cronbach’s alpha of .73, the venting component had a Cronbach alpha of .58, the same as Ward and Hay (2015). Future studies could utilize more items representing the expression of negative emotion to improve the internal consistency of this subscale. Furthermore, such studies would benefit from an NEFC scale that assessed a greater variety of aspects of this concept. Finally, our study utilized a cross-sectional design, thus limiting the predictive value of our findings.

**Conclusions**

Across separate studies, researchers have identified relationships between FFM personality traits and coping strategies in relation to depression, anxiety, stress, and psychological well-being or overall psychological distress. We established negative emotion-focused coping (NEFC) as a mediator in the relationships between neuroticism and several specific psychological outcomes (depression, anxiety, stress, and well-being) in the same undergraduate sample. Our study allowed for observations of the relative contributions of neuroticism and NEFC in predicting all four psychological outcomes. It is noteworthy that NEFC significantly and positively predicted depression, anxiety, and stress over and above the influence of neuroticism. Based on the
Coping, Neuroticism, and Psychological Outcomes

References


Keeling, M., Bambrou, J., & Simpson, J. (2013). Depression, anxiety and positive affect in people diagnosed with low-grade tumours: The role of...
Perceived self-efficacy in mathematics can be an important component of adolescents’ developing self-concept and can potentially facilitate future performance in math (Pajares & Miller, 1994). This is critical because mathematical literacy is frequently considered one of the most important skills a student can have and is beneficial not only in a work setting, but also in everyday life (Jameson & Fusco, 2014). In general, self-efficacy is an individual’s belief regarding how well-equipped the person is to handle and accomplish a task (Bandura, 1997). The causal relationship between self-efficacy and performance is often difficult to determine. Some have suggested that self-efficacy facilitates goal setting, which in turn facilitates performance, while others have suggested that self-efficacy is a reflection of past performance (see Sitzmann & Yeo, 2013). In a meta-analysis of self-efficacy studies, Sitzmann and Yeo (2013) examined the previous findings concerning the relationship between self-efficacy and performance. Their meta-analysis suggested that a number of other factors such as encouragement and feedback moderated the performance/efficacy relationship. This brought into question what sort of external factors might interact with self-efficacy to affect performance, and whether interventions can be utilized to manipulate perceived self-efficacy if, indeed, self-efficacy can facilitate performance.

Previous research has found a positive relationship between performance and trait self-efficacy (Bouffard-Bouchard, 1990; Sitzmann & Yeo, 2013), and has introduced manipulations aimed at enhancing self-efficacy including feedback (Anand, Oehlberg, Treadway, & Nusslock, 2016) and encouragement (Gambino, 2016; Guéguen, Martin, & Rio Andrea, 2015). The current study utilized these two manipulations in a mathematical problem-solving context while considering trait self-efficacy as an individual differences variable.
Randomly Assigned Positive Feedback

Feedback is arguably one of the strongest influences in obtaining a new skill and continuing to improve because learning is a mutual process in which individuals take in information from others or the environment to perfect their performance. Thus, without direct or indirect (e.g., self-generated) feedback, learning would be difficult (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991; Hattie & Timperley, 2007). Feedback is generally provided by an outside source and is based on an individual’s prior performance or an assessment of their conceptual understanding (Hattie & Timperley, 2007).

Receiving feedback about successful performance should provide a boost in self-efficacy, given that this information provides direct evidence of competence (Bouffard-Bouchard, 1990). The effect of accurate feedback is hard to differentiate from ability, given that people who receive positive feedback may simply be more competent; thus, research that involves randomly assigned positive or negative feedback may eliminate this problem (Bouffard, Bouchard, Goulet, Denoncourt, & Couture, 2005; Bouffard-Bouchard, 1990). For example, Bouffard-Bouchard (1990) attempted to create a high self-efficacy group and a low self-efficacy group using randomly assigned positive and negative feedback, in between individual trials of a verbal concept-formation task, regardless of participants’ actual performance. This manipulation was not intended to provide informative feedback regarding specific processes or products of learning, but was designed to convince the learners that their efforts were effective at accomplishing the task. Because past performance predicts self-efficacy (Sitzmann & Yeo, 2013), positive feedback should influence self-efficacy, thus creating downstream effects on subsequent performance (Bouffard-Bouchard, 1990). This is indeed what Bouffard-Bouchard (1990) found because students in the positive feedback condition were able to solve more problems and had increased self-efficacy in regard to their abilities to solve the problems correctly. In an extension of this work, Bouffard et al. (2005) examined the participants’ type of goal as a mediating factor and found that individuals who received positive feedback set higher goals for themselves and performed better. Their findings were similar to the original experiment in that there was a significant increase in performance among individuals with positive feedback in comparison to negative feedback; this relationship was mediated by the individual’s goal orientation (Bouffard et al., 2005). It seemed that enhancing self-efficacy through positive feedback encouraged learners to set higher goals for themselves, which facilitated subsequent performance.

In other studies, randomly assigned negative feedback has been shown to hinder performance and lead to less beneficial problem-solving strategies. In one such study, Anand et al. (2016) presented participants with Compound Remote Associates problems, where participants were asked to identify a word that would successfully create compound nouns when paired with a set of target words. Upon completion, participants received randomly assigned false feedback, either negative or positive, regardless of their actual performance. There was no direct effect of feedback on performance, but there was an association between negative feedback and the effort, which suggests that negative feedback led participants to decrease effort, resulting in a worse performance (Anand et al., 2016). One possible explanation for why performance did not decrease false negative feedback was that participants also received targeted feedback on individual items; this might have prevented an effect of the randomly assigned general feedback. Further, it is possible that the effects of randomly assigned feedback may be lessened if the tasks chosen have obvious right or wrong outcomes and thus serve as feedback themselves. In sum, considering previous research, it is reasonable to suggest that randomly assigned feedback should have effects on mathematical problem solving, with positive feedback resulting in more effort and thus increasing performance.

Encouragement

In contrast to the manipulation of feedback—which focuses on past performance—individuals receive encouragement before or during a task, and encouragement is typically general statements based on personal attributes meant to boost motivation and self-efficacy (Guéguen et al., 2015). Previous research has suggested that when individuals become more confident on a task, their performance benefits (Sitzmann & Yeo, 2013), pointing to a potential benefit of encouragement manipulations.

In one demonstration of this effect, Gambino (2016) gave college-aged students positive or negative statements at specific times during the completion of an adult difficulty level maze. The positive statements led to faster completion of the maze and to the students persevering with the maze completion.
even when they were having difficulty. Gambino’s study had some shortcomings because the researchers included an encouraging and a less encouraging condition, but did not include a control condition. As a result, there was no way to determine whether encouragement increased the scores or if the less encouraging statements negatively affected participants’ performances. A similar study suggests some generalizability to the effects of encouragement by using less novel tasks as the required performance measure (Guéguen et al., 2015).

Research on different types of praise has also demonstrated that encouragement is most effective when it is focused on the process of the task (e.g., “you’re doing great”; Gambino, 2016), rather than on traits of the person (e.g., “you’re smart”; Brummelman, Crocker, & Bushman, 2016; Schunk, 1983). Lessard, Grossman, and Syme (2015) found that college-aged students reacted differently to various types of encouraging praise, similar to effects with children. Specifically, college students demonstrated superior puzzle-solving abilities when given process praise, compared to person praise. These findings suggest that encouragement in the form of process praise, in addition to feedback, could be an effective means of influencing performance in mathematical problem solving.

The Current Study

This study examined the possible influences of randomly assigned positive feedback and encouragement on subsequent mathematical problem-solving performance, while taking into account individual differences in self-efficacy. Based on previous research, we predicted positive effects of both positive feedback (Hypothesis 1) and encouragement (Hypothesis 2) on performance. Individual differences were included to help locate the source of these effects. If these main effects are due to enhancement of self-efficacy, then they should be stronger for individuals with low trait self-efficacy because high-efficacy individuals will already set high goals for their performance without the need for feedback or encouragement. Thus, an interaction was predicted such that individuals with low trait self-efficacy would experience relatively stronger benefits following the administration of positive feedback (Hypothesis 3) or encouragement (Hypothesis 4), compared to high-efficacy participants. The current study addressed this by taking into account individuals’ self-reported trait self-efficacy in mathematics and then assigning participants to receive either positive feedback following a baseline trial, positive encouragement during a subsequent trial, both, or neither. The task used was a set of modular arithmetic problems unfamiliar to college students, which has shown to be sensitive to social manipulations, such as performance pressure (Beilock & Carr, 2005).

Method

Participants

Participants included 80 undergraduate students (44 women, 36 men) from a small private Liberal Arts college, ranging in age from 18 to 25 (M = 19.84, SD = 1.46.). Participants were of mixed ethnic backgrounds with the majority being European American (n = 54). In regard to educational experience, 24 were first-year students, 20 were sophomores, 18 were juniors, and 18 were seniors.

Nine participants indicated that they had a medical condition that might have affected their scores (e.g., dyscalculia). However, excluding these individuals did not alter the nature of these results, so their data were retained. For compensation, participants were given the option to receive entry into a drawing for a gift card, extra credit, or course credit where available from professors.

A sensitivity analysis conducted using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) suggested that this sample size was adequate for detecting effects of one-tailed regression coefficients with an effect size, f^2, of .079. This falls between standards for small (f^2 = .02) and medium (f^2 = .15) effects. In terms of changes to overall model fit, which were used to assess interaction terms, this sample size should be sensitive only to more moderately sized effects (f^2 = .13).

Materials

Demographics. The demographic information sheet asked a variety of questions including those pertaining to age, sex, ethnicity, grade level, academic major, and whether participants had a medical condition that may hinder their mathematic abilities.

Mathematics Self-Efficacy Scale. Participants’ trait math self-efficacy was assessed using the Mathematics Self-Efficacy Scale (Nielsen & Moore, 2003). The Mathematics Self-Efficacy Scale is presented in the form of a 5-point Likert scale ranging from 1 (not at all confident) to 5 (very confident). This scale contains nine statements for students to use to judge their abilities in math with various tasks; some of the statements included “work with decimals” and “determine the degrees of a missing angle”
addition, subtraction, multiplication, and division, taught basic mathematic manipulations including Fusco, 2014). Additionally, all students were role in work settings and in everyday life (Jameson mathematical problem solving due to its important several considerations. First, we wanted to focus on the Modular Arithmetic problems because it focuses specifically on self-efficacy in the mathematics domain. The internal consistency reliability was also adequate (α = .85).

**Modular arithmetic problems.** The tasks given to participants were modular arithmetic problems originally used by Beilock and Carr (2005). Modular arithmetic problems are unique to other math problems in that they have a novel formula and must be answered in a true or false manner. The uniqueness of the formula is meant to lessen the familiarity advantage for individuals with greater math experience, and the formula involves only simple operations, allowing those who have less math experience to still attempt the problems. The modular arithmetic problems are set up as such: 53 = 29 (mod 6). To complete a modular arithmetic problem, participants are instructed to subtract the second number, 29, from the first number, 53, and then divide that outcome by the third number, 6, and this should lead to an answer of 4. To complete the problem entirely, the participant must answer whether the final number is a whole number (an answer of “True”) or not (an answer of “False”); in this example, the answer is 4 so the answer is “True.” In comparison, for the problem 48 = 12 (mod 8), the operations lead to a result of 4.5, which is not a whole number, and thus the correct answer would be “False.”

Two sets of 27 modular arithmetic problems were prepared based on a random selection of items from Beilock and Carr (2005). Sets were administered using a paper-and-pencil format. Pilot data (n = 21) confirmed that the two sets of problems were not of different difficulty levels, based on a paired-samples t test (Set 1 M = 23.62, SD = 3.75; Set 2 M = 24.38, SD = 2.62; t(20) = 1.77, p = .092).

This mathematical task was chosen due to several considerations. First, we wanted to focus on mathematical problem solving due to its important role in work settings and in everyday life (Jameson & Fusco, 2014). Additionally, all students were taught basic mathematic manipulations including addition, subtraction, multiplication, and division, making these specific problems easy to explain with participants in a short experimental session. Finally, modular arithmetic problems, and typically mathematic problems in general, have either a right or wrong answer with no ambiguity for scoring.

**Feedback manipulation.** The feedback manipulation followed the completion of an initial baseline trial of modular arithmetic problems and focused on participants’ superior performance to their peers (Bouffard-Bouchard, 1990). This manipulation involved two levels: false positive feedback or no feedback. Individuals receiving the positive feedback were informed verbally that they scored in the top 90th percentile in comparison to their peers, regardless of their actual performance. A relative performance score was chosen rather than an absolute (e.g., that they answered 90% of the items correctly) in order to be believable even for participants who were aware that they made a mistake, or for those that did not finish all 27 items. This feedback was general and did not involve any feedback regarding the accuracy of individual responses.

**Encouragement manipulation.** The encouragement manipulation occurred during completion of the second trial of modular arithmetic problems. This included statements from the experimenter including “you’re doing well on time,” “keep up the good work,” and “you’ve got this” modified from Gambino (2016). These statements were identical for all participants who received the encouragement condition, were announced at the same times across participants, and always occurred in the same order.

**Performance.** Performance was evaluated by the number of questions each individual answered correctly, minus the number of incorrect responses. This was done to account for any accurate responses that may be due to guessing. Performance was measured both before and after the manipulations.

**Procedure**

This project was approved by the university’s Institutional Review Board prior to all data collection. All participants first read and signed an informed consent document and then completed the Mathematics Self-Efficacy Scale (Nielsen & Moore, 2003). Then, participants were informed about the modular arithmetic problems, received the instructions, and were given an opportunity to ask questions. This was followed by a sample problem for which they could request help to ensure that they understood the problem structure for the proceeding problems. All participants then completed the first trial of 27 modular arithmetic
problems, on paper. They were allotted 3 minutes to complete the trial and were verbally updated of the time they had remaining at the 2.5, 2, and 1 minute marks. This trial served as a baseline measurement and did not include manipulations of feedback or encouragement. For participants who completed all of the problems, the time remaining was recorded on their sheet. Participants then completed the demographic information sheet while the experimenter scored the responses for the first trial. Upon completion of the demographic information sheet, the experimenter asked participants in the feedback group if they wanted to know how they did, and every participant said yes. The experimenter then informed participants that they scored in the 90th percentile compared to other students in the United States who had completed the same problems. After completing the demographic questionnaire, individuals not assigned to receive feedback were asked to move on to the second set of modular arithmetic problems without being asked if they wanted to know how they did.

All participants then completed the second trial of problems, again with the same time restraint, type of problems, and number of problems. The encouragement condition received the reassuring statements during the second set of problems in conjunction with the time announcements. That is, all participants received interruptions during completion of the trials for time reminders, but only individuals assigned to the encouragement condition received encouraging statements following the time reminders.

Once participants finished Trial 2 of modular arithmetic, time remaining was once again recorded on their sheet. They were then informed further of the study’s details through a debriefing. Finally, they indicated their preferred form of compensation and were dismissed.

Design
Participants were assigned to one of four experimental groups using a random order with rotation design. This created a 2 (positive feedback; yes, no) x 2 (encouragement; yes, no) between-groups design, with self-efficacy as a continuous moderating variable. The dependent variable was performance (correct responses minus incorrect responses) on the second trial of modular arithmetic. Performance on the first trial was included as a covariate to control for any baseline differences in performance across groups.

Results
Preliminary Analyses
It was assumed that performance would improve across the two trials of modular arithmetic, due to practice. This practice effect was observed, with higher scores on Trial 2 ($M = 19.84, SD = 6.67$) than the Trial 1 baseline ($M = 16.65, SD = 6.83$), as confirmed by a paired-samples $t$ test, $t(79) = 6.94, p < .001, d = .47$. Based on these data, it appears that participants were able to learn the task, but did not generally reach ceiling-level performance after the second trial (the highest possible score was 27).

There was also an assumption that individuals with higher math self-efficacy would perform better than those with lower math self-efficacy, based on the Mathematics Self-Efficacy Scale. Overall, scores ranged from 12 to 44 ($M = 30.55, SD = 7.49$) with no evidence of substantial skewness (Median = 30). A correlation between self-efficacy and performance confirmed a small to moderate significant relationship between self-efficacy and performance on Trial 1, $r(78) = .23, p = .04$, and Trial 2, $r(78) = .25, p = .03$. Across participants, as trait self-efficacy increased, so did their subsequent performance, although this relationship was not particularly strong.

Major Analyses
A hierarchical multiple linear regression analysis was conducted with Trial 2 performance as the dependent variable. In Step 1, Trial 1 performance was included to control for any baseline performance differences, along with the independent variables (feedback and encouragement) and the self-efficacy moderator. The model was significant overall, $R^2 = .69, F(4, 75) = 41.36, p < .001$. This was due in large part to the strong relationship with Trial 1 performance ($r = .82, \beta = .80, t = 12.07, p < .001$). More importantly, consistent with Hypothesis 1, feedback influenced Trial 2 performance after accounting for Trial 1 performance ($\beta = .14, t = 2.10, p = .02$, one-tailed). As predicted, participants who received positive feedback performed better on trial 2 ($M = 20.85, SD = 6.00$) compared to participants who received no feedback ($M = 18.83, SD = 7.21$). Inconsistent with Hypothesis 2, there was no significant effect of encouragement ($\beta = .05, t = .48, p = .32$, one-tailed). Participants who received encouragement ($M = 20.10, SD = 5.81$) performed

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\textsuperscript{1}Our first approach to data analysis involved an Analysis of Covariance (ANCOVA). After peer-review, we repeated the analysis using multiple regression to avoid issues related to using a median split for the self-efficacy measure. The conclusions based on the two analyses did not differ.
similarly to participants who did not \( (M = 19.58, SD = 7.50) \). There was no effect of self-efficacy, likely because any variance due to this variable was already accounted for by Trial 1 performance.

Hypotheses 3 and 4 stated that individuals with low self-efficacy would be more greatly affected by the presence of positive feedback and encouragement, respectively. To test this, interaction terms were calculated based on the product of standardized results from the Mathematics Self-Efficacy Scores and each of the independent variables (Feedback × Self-Efficacy; Encouragement × Self-Efficacy). These two interaction terms were included in Step 2 of the regression analysis. Contrary to both hypotheses, including the interaction terms did not contribute significantly to the model, \( \Delta R^2 = .01, F(2, 73) = .63, p = .53 \). The interaction between feedback and self-efficacy was not significant, \( \beta = .04, t = .30, p = .76 \).

Similarly, the interaction between encouragement and self-efficacy was not significant, \( \beta = .07, t = .58, p = .56 \). Thus, there was no obvious difference in the effects of the manipulations based on mathematics self-efficacy.

**Exploratory Analyses**

In an attempt to identify why the feedback positively affected performance, we considered whether there may be an interaction between Trial 1 performance and positive feedback. If the positive feedback was only effective for individuals who performed well, then it may indicate that the feedback is only useful when it is informative regarding *true* performance levels. That is, although high performers might not truly have scored in the 90th percentile, this feedback would accurately inform the student of their relatively strong performance.

To test this, we conducted another multiple regression analysis with Trial 2 performance as the dependent variable. We first entered Trial 1 performance and feedback in Step 1, which was redundant with the major analysis above. In Step 2, we entered an interaction term based on the product of Trial 1 performance and feedback. The interaction term did not account for significant variance in Trial 2 performance, \( \Delta R^2 = .01, F(1, 76) = 2.03, p = .16 \). Thus, the main effect of feedback was not obviously dependent on baseline performance levels.

**Discussion**

The current study examined the potential influences of encouragement and randomly assigned positive feedback on performance for individuals varying in math self-efficacy. As predicted, the individuals who received randomly assigned positive feedback following the first set of problems did significantly better on the second set of problems compared to those who did not receive positive feedback. However, encouragement had no such effect on performance, and the results were not significantly moderated by self-efficacy, or by initial performance levels.

There are at least two possible explanations for the effectiveness of the current feedback manipulation. First, the manipulation might have provided useful information to the learners regarding their overall performance. Hattie and Timperley (2007) classified four types of feedback based on what the feedback addresses: the task, the process, self-regulation, or the person. In the present study, the feedback focused on the task. This is also referred to as knowledge of results and is characterized by informing how well a task is being completed (Hattie & Timperley, 2007). In this context, the weakness of the current feedback was that it was general and focused on performance relative to peers without providing any specific information regarding individual errors or process-related information. Although the feedback was randomly assigned to participants and was not based on their actual performance, it is possible that if the participants understood how to complete the problems on the first trial, then this feedback would have a fair representation, or exaggeration, of their actual understanding. This could explain why it was still beneficial. If this is true, though, we would expect a stronger feedback effect for individuals who performed well on Trial 1 compared to individuals who performed poorly, an interaction between Trial 1 performance and feedback. This was not observed, calling into question the idea that the manipulation provided useful knowledge of results feedback.

The second possible explanation is that the positive feedback manipulation provided a boost to self-efficacy on the task, which influenced effortful behavior, goal-setting, and performance on the second trial. Self-efficacy is strongly influenced by past performance (Sitzmann & Yeo, 2013), and participants were randomly assigned to positive feedback regarding past performance (Bouffard et al., 2005). However, if self-efficacy was the locus of the feedback effect, we would expect the manipulation to be more effective for individuals with relatively low trait self-efficacy because high-efficacy learners would not need positive feedback to set relatively high goals. This was not observed,
Influences on Performance

Influences on Performance (2016) used a spatial task that might not have been between the two tasks in question in that Gambino (2016) study, there was a substantial difference. Originally modified from the Gambino (2016) study, there was a substantial difference between the two tasks in question in that Gambino (2016) used a spatial task that might not have been influenced as strongly by the distracting verbal encouragement manipulation. Thus, one possible implication of these findings is that encouragement may have benefits for some types of outcomes, but not for this type of mathematical problem solving. Future studies may be required to determine the conditions under which encouragement does, and does not, boost performance.

Regardless of the specific mechanism, the present study suggests that exclusively positive feedback, even when randomly assigned, can have positive effects on performance even without corrective or formative information (see also Bouffard-Bouchard, 1990). We note that this manipulation has somewhat limited external validity because it would not often be appropriate to give students false positive feedback on their performance in an academic setting. However, one could easily imagine situations where well-meaning instructors or parents could provide exclusively positive or “optimistic” feedback. The current study supports previous findings that this type of positive feedback has some benefits for performance.

The hypothesis that encouragement would have a beneficial effect on performance was not supported by the data. Benefits of encouragement have been supported in previous research (Gambino, 2016; Guéguen et al., 2015). Further, the current encouragement manipulation could be considered similar to “process praise” (see Lessard et al., 2015) because it focused on participants’ performance on the task, rather than their value as people. Research has shown that process praise has positive benefits for performance. Thus, the null effect found here is inconsistent with some previous findings. One potential limitation of the encouragement manipulation is that the encouragement was a much more noticeable manipulation than was feedback. Because participants completed the baseline trial with just verbal time cues and then the second trial added encouragement, it was a noticeable change. Several participants commented after completing the study that they were trying to determine the purpose of the study while others mentioned that they could tell that encouragement was part of it. Therefore, a response bias due to demand characteristics is very possible. Finally, it is possible that the encouragement could have been distracting for participants because it occurred multiple times during a time-limited task that required attentional control to complete (Beilock & Carr, 2005). Originally modified from the Gambino (2016) study, there was a substantial difference between the two tasks in question in that Gambino (2016) used a spatial task that might not have been

Another direction would be to analyze this type of feedback in relation to other, potentially more beneficial forms of feedback to see how they compare. This could be as simple as genuine feedback for which questions they got right or wrong and percentage-based feedback, or more complex addressing the four types of feedback mentioned by Hattie and Timperley (2007). These manipulations may show differential effects depending on trait self-efficacy that were not demonstrated here. It would also be interesting to try this study with different domains such as a motor task, memory task, or creativity based task.
Self-efficacy is a major factor in educational achievement, and so it is important to understand how controllable factors such as positive feedback and encouragement interact with this trait to influence performance. This study has shown that feedback, but not encouragement, from others can affect performance at least at a basic level, but this could be applicable to almost every school setting. Students often must complete tasks in a timed manner and, upon completion, receive feedback on their performance. As Bangert-Drowns and colleagues (1991) pointed out, learning is a mutual effort in that what students learn and how they become proficient in a skill is not solely based on the individuals but on those around them. Delving deeper into how peers or professors may influence an individual’s performance and to what extent, could have major implications in the classroom. Knowing what types of feedback and encouragement are beneficial, for which students, and when, could have a major effect on whether that manipulation is beneficial or harmful to a student’s learning.

References
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Peer Review

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Approximately one-third of the U.S. adult population meets the body mass index (BMI) criteria for being considered obese (National Institute of Diabetes and Digestive and Kidney Diseases, 2012). Similarly, 27.7% of workplace employees are considered obese (Luckhaupt, Cohen, Li, & Calvert, 2014). Research has found that obese individuals, particularly women, are discriminated against based on their appearance, especially during the hiring process. For example, interviewers have neglected to invite obese candidates to interviews due to implicit biases toward their application photographs, despite the candidates’ qualifications for the position (Agerström & Rooth, 2011). Past studies have attempted to reduce obesity’s negative stigma (Burmeister et al., 2017), but weight discrimination still exists. Therefore, the purpose of the present study was to reduce discrimination in the hiring process against obese individuals by providing education on the uncontrollable causes of obesity.

Attitudes Toward Obese Job Applicants
Some of the most common forms of obesity bias include obese individuals receiving low ratings despite the candidates’ qualifications for the position (Agerström & Rooth, 2011). Past studies have attempted to reduce obesity’s negative stigma (Burmeister et al., 2017), but weight discrimination still exists. Therefore, the purpose of the present study was to reduce discrimination in the hiring process against obese individuals by providing education on the uncontrollable causes of obesity (e.g., genetics).
on specific attributes, traits, and characteristics as compared to non-obese individuals. For instance, in one study, students viewed overweight job applicants to be less attractive and associated more negative words with their photos (e.g., untidy/neat) than average weight applicant photos (Polinko & Popovich, 2001). Moreover, Pingitore, Dugoni, Tindale, and Spring (1994) found that obese applicants were more negatively rated on personality traits (i.e., nonproductive, unattractive, and indecisive) than average weight applicants. Research has suggested that these negative attitudes toward obese individuals may influence hiring decisions. For instance, Pingitore et al. (1994) found that obese applicants were less likely to be hired than average weight applicants. Another study that evaluated hiring based on images of women who ranged from skinny to obese found that those with slender bodies were hired more than those with larger bodies. Women who had greater BMIs were also rated as having lower helping behavior (Swami, Chan, Wong, Furnham, & Tovee, 2008).

Not all attitudes toward obese job applicants are negative, however. For example, Krueger, Stone, and Stone-Romero (2014) had student participants assess manipulated female applicant photos on items that included job suitability and traits such as motivation, health, attractiveness, cognitive ability, and social skills. Then, the students indicated whether they would recommend hiring the applicant. Unlike other experiments, this study found that the students rated overweight applicants as more suitable for the job than average weight applicants if they were higher in conscientiousness, which was manipulated by supplying participants with the applicants’ personality assessment scores. In addition, the overweight applicants were ranked as being higher in general cognitive ability, jolliness, and self-control as opposed to the average weight applicant. This research suggests that not all people think negatively of obese individuals.

Based on previous research, it was anticipated that obese candidates would be less likely to be recommended for hiring than non-obese candidates in the present study. However, given the mixed results in the literature on ratings of various traits of obese individuals (e.g., cognitive ability, jolliness, and self-control), it was unclear if obese candidates would be rated more or less favorably than non-obese candidates on professor roles and personal characteristics. Therefore, our first hypothesis was that hiring recommendations, professor role ratings, and personal characteristics would be rated differently for an obese female candidate than a non-obese female candidate.

### Implicit and Explicit Biases Toward Obese Individuals

Many studies have utilized the implicit association test (IAT) in order to evaluate implicit bias toward obese individuals. Implicit bias refers to stereotypes people are unaware they have, whereas explicit bias refers to judgments that stem from individual consciousness. One particular study by Agerström and Rooth (2011) utilized a version of the IAT with images of obese and average weight men and women, and participants were asked to quickly categorize words to match the images. Sample words chosen included lazy, productive, hardworking, and slow. When words such as lazy and slow were more quickly associated with obese images than average weight images, this demonstrated implicit obesity bias. Agerström and Rooth (2011) found that hiring personnel who held more implicit bias (as demonstrated through the IAT) were less likely to call back an obese applicant for a job interview. In another IAT study, Sabin, Marini, and Nosek (2012) found that medical doctors had strong implicit biases toward obese individuals.

In previous studies, explicit bias was measured using survey questions to determine the degree to which participants preferred average weight or obese individuals through Likert-type scale ratings. One study found that, regardless of participant BMI, thinner people were more preferred (Sabin et al., 2012). In another study utilizing a survey measure, participants rated obese individuals as having more negative symptoms such as depression or binge eating (Carels et al., 2013). Flint et al. (2016) also found that obese individuals were less recommended for hire versus average weight individuals, especially when considering workplace activity level (e.g., standing, manual, or heavy manual) in addition to having more negative beliefs towards the obese applicants.

### Using Education to Reduce Implicit and Explicit Obesity Bias

Those who demonstrate bias toward obese individuals may do so because they believe that obesity is under an individual’s control rather than due to uncontrollable factors. *Controllable causes of obesity* (within an individual’s control) include consuming extra calories through food and beverage intake and not expending adequate calories through physical activity. On the other hand, *uncontrollable*
causes of obesity (outside of an individual’s control) include genetic dispositions and an obesogenic environment (e.g., an environment that discourages physical activity such as walking; Persky & Eccleston, 2011; Puhl, Schwartz, & Brownell, 2005). Previous research has suggested that education about uncontrollable causes of obesity can reduce obesity bias. For example, one study evaluated whether implicit and explicit bias could be reduced if participants completed a 12-hour class that discussed both controllable and uncontrollable factors of obesity. It was found that, after the class, participants displayed reduced implicit and explicit obesity bias (O’Brien et al., 2010). Another study had one group of participants listen to a 1-hour lecture about obesity while the other group role-played as an obese individual. The lecture provided insight on how obese persons are discriminated against by society and health professionals in regard to treatment plans, as well as stressed the importance of patient involvement during treatment. The researchers found that explicit bias was significantly reduced in the role-playing condition, and in both conditions, sympathy increased toward obese individuals (Matharu et al., 2014). Diedrichs and Barlow (2011) also found that explicit bias was reduced when participants partook in a 2-hour course discussing weight bias and controllable and uncontrollable factors that influence body weight.

Building on past research, the present study was the first to experimentally examine if brief education about the uncontrollable causes of obesity could reduce hiring bias against an obese candidate. It was anticipated that education about the uncontrollable causes of obesity would result in a reduction of implicit obesity bias, explicit beliefs about the controllability of obesity, and hiring bias toward obese candidates. Due to this, our second hypothesis was that education about the uncontrollable causes of obesity would reduce hiring bias against the obese candidate as compared to controllable causes of obesity education. Our third hypothesis was that implicit obesity bias and explicit beliefs about the controllability of obesity would be reduced for individuals receiving content about uncontrollable causes of obesity education (e.g., diet, exercise) compared to individuals receiving content about controllable causes of obesity education (e.g., genetics, environment) or participants viewing a control presentation (on sleep and memory).

Method

Participants
Participants were recruited from two Northeastern universities in the United States via posters, e-mails from the psychology department, and Experimetrix, an online recruitment tool. Students who participated (N = 166) received either partial course credit for select psychology classes or a $10 Amazon gift card. Participants were mostly women (60.6%). Participants identified as White/European American (81.3%), Black/African American (6.6%), Asian (4.8%), Native Hawaiian/Other Pacific Islander (1.2%), and American Indian/Alaskan Native (0.6%). Nine participants (5.4%) did not report their race. Participants were enrolled as first-year students (22.9%), sophomores (12.0%), juniors (38.0%), seniors (21.7%), and graduate students/other (4.8%). One participant (0.6%) did not report class year. The average age of participants was 20.48 years (SD = 2.31).

Design
The current study utilized a 2 (photo: obese woman vs. non-obese woman) x 3 (education: controllable causes of obesity vs. uncontrollable causes of obesity vs. control) between-subjects experimental design to measure the effect on candidate ratings, hiring recommendations, implicit obesity bias, and explicit beliefs about the controllability of obesity. Female candidates were used for this study due to the larger amount of discrimination they face in the workplace versus male candidates (Agerström & Rooth, 2011).

Measures and Materials
Candidate photos. Photos of two professionally dressed women were selected from an online image database (see Appendix A). One of the photos depicted an obese woman, and the other photo depicted an average weight woman. Because the photos were of two different women in different clothing, participants were asked to rate the attractiveness of the woman in the photo on a 5-point Likert-type scale from 1 (very unattractive) to 5 (very attractive). Candidate attractiveness differed significantly between the two photos (the average weight candidate was rated as more attractive). Therefore, attractiveness was entered as a covariate for all analyses, thereby controlling for attractiveness.

Research presentations. Three PowerPoint presentations were created of a research-based job talk for a candidate for a professor position, with the content either focusing on the controllable causes of obesity (e.g., diet and exercise),
the uncontrollable causes of obesity (i.e., lack of sidewalks in neighborhoods for exercise and genetics), or sleep and memory (control condition). All presentations lasted for 5 minutes, included an image of an obese or non-obese candidate photo on all 12 PowerPoint slides, and had the same female voice-over for each presentation (see Appendix B for sample slides from each presentation).

**Post presentation measures.** Four items were used to measure hiring recommendations ($\alpha = .74$), three items were used to measure professor role ratings ($\alpha = .75$), and three items were used to measure personal characteristics ($\alpha = .79$; see Table 1 for the specific items). All items were created for this study. Responses were on a 4-point Likert-type scale from 1 (not likely at all) to 4 (very likely). We took the mean of each set of items and created composites to represent hiring recommendations, professor role ratings, and personal characteristics in our analyses.

**Explicit beliefs about the controllability of obesity.** The Beliefs About Obese Persons Scale (Allison, Basile, & Yuker, 1991) is an 8-item scale ($\alpha = .74$) that measures beliefs about the controllability of obesity. A sample item is, “In many cases, obesity is the result of a biological disorder.” Participants responded on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). Higher scores on this scale indicate a stronger belief that obesity is not under the obese person’s control.

**Implicit obesity bias.** An online open-source implicit association test (IAT; Mason & Ozturk, 2013) was used to assess implicit obesity bias. The IAT contained silhouettes of obese and thin individuals (Sabin et al., 2012) paired with high-performance (e.g., “efficient”) or low-performance adjectives (e.g., “lazy”; see Agerström & Rooth, 2011). The IAT was scored using the algorithm described by Greenwald, Nosek, and Banaji (2003). Positive scores indicated implicit obesity bias.

**Procedure**
The study was approved by the Institutional Review Board at both universities. When participants arrived in the lab, they were told that the psychology department was planning to hire a new faculty member and that their input was vital for deciding whom to hire. After signing the informed consent form, participants viewed a 5-minute voice-over job talk video for their randomly assigned candidate and condition. During the video, an image of their candidate appeared in the corner of the PowerPoint slides. Once finished, participants were asked to complete the post presentation measures, the Beliefs About Obese Persons Scale, and the IAT. Then, participants were debriefed.

**Statistical Analyses**
For Hypotheses 1 and 2, given that we had three post presentation outcomes, we conducted a

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**TABLE 1**

Differences in Hiring Recommendations, Personal Characteristics, and Professor Roles for the Obese vs. Non-Obese Candidates

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Obese</th>
<th>Non-Obese</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$ (SD)</td>
<td>$M$ (SD)</td>
<td></td>
</tr>
<tr>
<td>Hiring Recommendations</td>
<td>3.19 (0.53)*</td>
<td>3.11 (0.56)*</td>
<td>.025</td>
</tr>
<tr>
<td>How likely would you be to recommend this candidate for a job offer?</td>
<td>2.93 (0.68)</td>
<td>2.96 (0.69)</td>
<td>.394</td>
</tr>
<tr>
<td>How serious do you feel the candidate is about working at this university?</td>
<td>3.12 (0.81)</td>
<td>3.04 (0.82)</td>
<td>.129</td>
</tr>
<tr>
<td>How well do you think this candidate would perform as a professor?</td>
<td>3.02 (0.77)</td>
<td>2.95 (0.84)</td>
<td>.070</td>
</tr>
<tr>
<td>If offered the position, how likely do you feel this candidate is to accept?</td>
<td>3.67 (0.52)*</td>
<td>3.47 (0.63)*</td>
<td>.009</td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>3.20 (0.62)</td>
<td>3.29 (0.60)</td>
<td>.952</td>
</tr>
<tr>
<td>How intelligent do you think the candidate is?</td>
<td>3.05 (0.66)</td>
<td>3.25 (0.62)</td>
<td>.234</td>
</tr>
<tr>
<td>How knowledgeable about the subject matter do you think the candidate is, based on the research presentation?</td>
<td>3.39 (0.70)</td>
<td>3.39 (0.73)</td>
<td>.492</td>
</tr>
<tr>
<td>How motivated do you think the candidate is?</td>
<td>3.15 (0.82)</td>
<td>3.22 (0.81)</td>
<td>.800</td>
</tr>
<tr>
<td>Professor Roles</td>
<td>3.44 (0.49)*</td>
<td>3.25 (0.61)*</td>
<td>.001</td>
</tr>
<tr>
<td>How comfortable would you be in approaching this candidate for help if he/she was your professor?</td>
<td>3.57 (0.61)*</td>
<td>3.36 (0.71)*</td>
<td>.004</td>
</tr>
<tr>
<td>How understanding of students' needs do you think this candidate would be?</td>
<td>3.33 (0.63)*</td>
<td>3.11 (0.75)*</td>
<td>.004</td>
</tr>
<tr>
<td>How responsive would this candidate be to a student with special needs?</td>
<td>3.40 (0.63)*</td>
<td>3.27 (0.74)*</td>
<td>.033</td>
</tr>
</tbody>
</table>

*Note. “Difference is significant at $p < .05$. \*
Multivariate Factorial Analysis of Covariance (MANCOVA) to examine the impact of candidate photo and presentation content on hiring recommendations, professor role ratings, and personal characteristics, while controlling for applicant attractiveness as a covariate. For Hypothesis 3, we conducted two factorial Analyses of Variance to examine the impact of candidate photo and presentation content on implicit obesity bias and explicit beliefs about the controllability of obesity, respectively.

Results

Hypothesis 1 received partial support, and Hypothesis 2 was not supported. The overall MANCOVA revealed a significant main effect for attractiveness, $F(3, 156) = 9.06, p < .001$, partial $\eta^2 = 0.148$, and a significant main effect for photo condition, $F(3, 156) = 5.74, p = .001$, partial $\eta^2 = 0.099$. However, there was no significant main effect for presentation condition, $F(6, 312) = 0.82, p = .56$, partial $\eta^2 = 0.015$, nor a significant interaction between photo condition and presentation condition, $F(6, 312) = 1.10, p = .36$, partial $\eta^2 = 0.021$. Examination of the main effect for photo condition revealed a significant difference between the non-obese and the obese candidate on hiring recommendations, $F(1, 158) = 5.11, p = .025$, partial $\eta^2 = 0.031$. Additionally, there were significant differences between the non-obese and the obese candidate on professor role ratings, $F(1, 158) = 10.71, p = .001$, partial $\eta^2 = 0.063$. To determine which ratings drove these results, we also examined the differences at the item level for hiring recommendations, professor role ratings, and personal characteristics. As shown in Table 1, for hiring recommendations, participants rated the obese candidate as being more likely to accept the job offer than the non-obese candidate, but none of the other three hiring recommendations items differed significantly between the obese and non-obese candidates. Additionally, for professor role ratings, participants reported being more comfortable approaching the obese candidate for help than the non-obese candidate, that the obese candidate would be more supportive of students’ needs than the non-obese candidate, and that the obese candidate would be more responsive to a student with special needs than the non-obese candidate.

Hypothesis 3 was partially supported. Presentation information significantly impacted explicit beliefs about the controllability of obesity, $F(2,158) = 3.92, p = .022$, partial $\eta^2 = 0.05$. Post-hoc tests revealed that the controllable presentation resulted in significantly greater explicit beliefs about the controllability of obesity ($M = 24.40, SD = 5.91$) than the control presentation ($M = 27.55, SD = 6.39$), $p = .006$. Additionally, there was a marginally significant difference between the controllable presentation ($M = 24.40, SD = 5.91$) and the uncontrollable presentation ($M = 26.41, SD = 5.69$), $p = .084$, with higher explicit beliefs about the controllability of obesity in the controllable presentation than the uncontrollable presentation. With regard to implicit obesity bias, results indicated that presentation condition did not significantly impact implicit obesity bias, $F(2,158) = 0.05, p = .956$, partial $\eta^2 = 0.00$.

Discussion

Currently, no law in the United States prohibits employers from discriminating against overweight or obese applicants during the hiring process. However, due to the extensive rate at which obesity discrimination occurs, some believe a law would help lessen the amount of discrimination (Puhl & Heuer, 2011). In the meantime, discrimination against overweight and obese job applicants needs to decrease in order to give these individuals respect and an equal opportunity in the workplace. To that end, the present study aimed to investigate the possibility of reducing obesity bias in the hiring process by providing brief education about the uncontrollable causes of obesity during a mock job talk given by a female candidate for a professor position.

Results indicated that the obese candidate was rated as more understanding of students’ needs, more approachable, and more responsive to students with special needs as compared to the non-obese candidate. To our knowledge, few studies have researched positive attitudes or perceptions toward obese individuals. However, these results are similar to the findings by Krueger et al. (2014) that obese individuals can be viewed positively, with participants reporting, for example, that the obese candidate was jollier than the non-obese candidate. In addition, the obese candidate was rated as being more likely to accept the job offer than the non-obese candidate. We interpret this finding neutrally because it could potentially reflect that the obese candidate was either perceived negatively, such as being less likely to receive other job offers, or positively, such as being very interested in the position and a good fit for the job at the university.

Previous research has evaluated the media’s
influence on obese attitudes. One study found that those who viewed positive images of obese individuals were less apt to socially distance themselves from the model as compared to the group who viewed stigmatizing images (Pearl, Puhl, & Brownell, 2012). The obese candidate image in the present study may be a more positive image because she is not engaging in any stereotypical activity regarding obesity. According to a content analysis study by Heuer, McClure, and Puhl (2011), images of obese individuals portray them as less likely to wear professional clothing and more likely to have inappropriately sized clothing. Furthermore, photos of obese individuals tend to be taken from the side or rear view or to be posed in a sedentary position. However, our image depicted a well-dressed candidate who could arguably be either standing or sitting. Due to this, participants might have rated the obese candidate higher on approachableness and understanding because the image failed to invite discrimination, therefore not resulting in the desire to socially distance themselves. Rather, participants could have viewed the candidate as an asset to their educational needs. Additionally, professors are not required to be physically fit or agile in order to perform their job responsibilities, thus possibly reducing the impact of both implicit and explicit weight bias on them in the current study.

We also found that education about the causes of obesity had an impact on explicit beliefs about the controllability of obesity, but not implicit obesity bias. In particular, participants who viewed a presentation indicating that the causes of obesity were under the obese individual’s control had significantly more explicit beliefs about the controllability of obesity than those who viewed the control presentation or the uncontrollable causes presentation. However, the latter difference was only marginally significant. These findings suggest that a very brief educational intervention about the controllable causes of obesity may actually increase explicit beliefs about the controllability of obesity, and individuals who believe obesity is controllable have more negative attitudes toward obese individuals (Allison et al., 1991). However, previous studies have shown that education and educational interventions have decreased antifat biases in participants (Diedrichs & Barlow, 2011; Matharu et al., 2014; O’Brien et al., 2010).

**Limitations and Future Research**
The educational approach used in the present study to reduce obesity bias and hiring discrimination was very brief (5 minutes). Therefore, the relatively small effect size and marginally significant differences might have been due to the short duration of our educational intervention as compared to previous research. For example, a study that found significance had participants complete a 12-hour course (O’Brien et al., 2010), which is considerably longer than our 5-minute presentation. Although a shorter educational program may be more feasible in the real world, a longer course could be more effective at reducing bias and discrimination (Anderson & Whiston, 2005).

Another limitation of our design is that our study only featured images of women with a voice-over during the PowerPoint presentation, which might not have been as impactful as the candidate presenting face-to-face to participants. Moreover, the present study utilized two different women for the average weight and obese candidate. Despite controlling for attractiveness statistically, it is possible that the average weight candidate was rated as more attractive than the obese candidate due to the different face and clothing. Therefore, observed differences in candidate ratings in this study might have been the result of physical characteristics other than body weight. To correct for this, past studies used makeup and prostheses for the average weight candidate to appear overweight or obese (Pingitore et al., 1994).

Although past research has stated that women are more vulnerable to discrimination based on weight (Agerström & Rooth, 2011), future research should include male professor photo conditions to investigate if they too are affected during the hiring process. Future research should also increase mundane realism because this might influence future results. Particularly, having participants come to a real office versus a lab setting might create an authentic atmosphere and environment so the experiment exemplifies a real hiring situation. Additionally, participants might view a video of a live candidate delivering a job talk to increase the believability of the scenario. Future research should consider other ways to reduce hiring discrimination in the workplace such as intervention techniques other than education or the creation of a law prohibiting weight-based discrimination in the workplace. Furthermore, the majority of past studies researching obesity bias have focused on negative stereotypes, but the present study found evidence to support positive perceptions of obese individuals. Therefore, future studies should research positive attitudes toward the obese
population to further understand its significance. Lastly, future research could examine if the weight status of a rater influences their perceptions of a job candidate.

Implications and Conclusion
Presently, the labor force is made up of 57% women (United States Department of Labor, 2017). However, weight discrimination is still prominent in the hiring process, especially toward women (Agerström & Rooth, 2011). Therefore, the hiring process needs to be fair for these individuals. Moreover, there has been evidence to support that, similar to educational interventions, health-related interventions have helped participants with short- and long-term physical and health behaviors (e.g., exercising and eating healthy; Fettig & Ferraro, 1998; Wright, Broadbent, Graves, & Gibson, 2016). Because the United States is among the top obese countries, interventions for general health and well-being are important for lessening health risks and possibly improving employee performance in the workplace (Schmier, Jones, & Halpern, 2006). Additionally, having those on hiring committees receive education on uncontrollable factors that lead to obesity may allow their hiring decision to be based off of credentials rather than appearances, although future research is needed on this topic.

In conclusion, the present study demonstrated that an obese female candidate for a professor position was rated more positively on certain characteristics than a non-obese candidate. This finding contributes to the literature on the positive perceptions of obese individuals. Furthermore, brief education about the controllable causes of obesity may increase negative attitudes toward obese individuals. This provides unique insight into how focusing education on controllable factors of obesity such as diet and exercise may exacerbate negative beliefs about obese individuals.

References

What causes obesity?

- Individuals choose to eat too many calories and do not burn enough calories through physical activity. (Shauna & Padwal, 2010)
- The obesity epidemic is "undoubtedly attributable to behavioral causes." (Müller, Bosy-Westphal, & Krawczak, 2010, p. 612)
- An "obesogenic environment" that promotes overconsumption and under-expenditure. (Kirk, Penney, & McHugh, 2010)
- Individuals with an obese genetic profile, inherited from their parents, are more likely to become obese in these environments. (Bountin & Froguel, 2001)

What causes obesity?

- An "obesogenic environment" that promotes energy overconsumption and under-expenditure. (Kirk, Penney, & McHugh, 2010)
- Individuals with an obese genetic profile, inherited from their parents, are more likely to become obese in these environments. (Bountin & Froguel, 2001)

Sleep and Memory

- Strong evidence suggests that sleep affects memory. (Chang & Mazzoni, 2014)
- College students who lose sleep the night before an exam tend to perform worse on the exam the next day. (Pilanski et al., 2013)
- Memory for word recall tends to be better after a good night’s sleep. (Diekelmann et al., 2011)
- Goal planning is better after sleeping. (Scullin & McDaniel, 2011)

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The Effects of Religion and Career Priming on Self-Control During Difficult Tasks in College Students

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ABSTRACT. The purpose of this study was to investigate ways that religion and career could be used to increase self-control. Participants (N = 60) were primed by taking the religion or career implicit association test (IAT). These tests were given before participants attempted to solve 3 creative analytical problems. The amount of time spent trying to solve the problems was used to measure self-control under the assumption that participants had to resist the temptation to give up and view the solutions. The riddles given to participants were chosen because they each require extensive thinking and many trials and errors before reaching the solution. Participants were told a cover story that the experiment was about the effects of technology on problem-solving ability, so they were not aware of any connection between the IAT and the problems. After being primed with either religion or career, participants worked longer on the problems than participants who were not primed, F(2, 53) = 5.46, p = .007, ηp² = .17. Locus of control was also measured but did not influence the time that participants spent on the problems. Results indicated that briefly priming participants with either religion or career can lead to greater persistence in the face of difficult tasks.

Out of the many ingenious young minds recruited by institutions of higher education each year, only 59% will graduate in six years and nearly a third will drop out (U.S. Department of Education, 2014). Although earning a college degree is not meant to be easy, these figures raise an important question: What factors lead some students to persevere in the face of difficulty, and why are others so quick to give up? One contributing reason, and the focus of this article, is a lack of self-control in the face of adversity. Accumulating evidence suggests that priming may be an effective manipulation to bolster self-control (Rounding, Lee, Jacobson, & Li-Jun, 2012; Sasaki, Mojaverian, & Kim, 2015; Walsh, 2014) and reduce depletion effects on self-control (Boucher & Kofos, 2012; Sasaki et al., 2013; Walsh, 2014).

Self-control has long been associated with positive life outcomes and has been studied since the 1900s (Mischel, Ebbesen, & Raskoff Zeiss, 1972). It is most commonly defined as the ability to continue pursuing an overarching goal despite more alluring temptations (Duckworth & Gross, 2014; Fishbach & Shah, 2006; Koestner, Powers, Milyavskaya, Carbonneau, & Hope, 2015). Researchers now know that short-term self-control is predictive of long-term academic achievement (Véronneau, Hiatt-Racer, Fosco, & Dishion, 2014). Yet, little is known about the underlying motivations and mechanisms of self-control. In the present study, we examined how career and religious priming increased self-control on difficult subsequent tasks.

Self-Control as a Limited Resource

Evidence has shown that self-control operates as a limited resource that can be depleted when resources such as mental energy are used for other demands (Vohs et al., 2014). Research has also demonstrated that counter-attitudinal behaviors and
decision-making, which both use mental energy, can decrease subsequent self-control (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Vohs et al., 2014). For example, participants who were asked to make a series of choices between products drank less of an unsavory drink for monetary reward than participants who merely rated products (Vohs et al., 2014).

Fortunately, there are simple ways such as priming that can attenuate the depletion of self-control. For instance, priming cues related to one’s self-control goals, such as saving or healthy eating, leads to greater self-control and goal commitment after depletion (Walsh, 2014). Additionally, because religion is associated with behavior that requires self-control such as virtue and altruism (Baumeister & Exline, 1999), priming of religious words may increase self-control (Rounding et al., 2012). Brain research has also shown that mouth rinsing with glucose can increase self-control by activating receptors which then activate regions in the brain associated with reward and motivation (Gant, Stinear, & Byblow, 2010; Molden et al., 2012; Sanders, Shirk, Burgin, & Martin, 2012).

**Autonomous and Controlled Motivation**

A person’s motivation to pursue a particular goal directly affects the amount of control a person has to resist other temptations (Milyavskaya, Inzlicht, Hope, & Koestner, 2015). People tend to pursue goals either because of autonomous motivation or controlled motivation (Brunet, Gunnell, Gaudreau, & Sabiston, 2015; Milyavskaya et al., 2015). Autonomous motivation is driven by an individual’s own internal wants such as interest, whereas controlled motivation is driven by external rewards such as salary or social approval. Previous research has demonstrated that the probability for success is higher when goals are pursued with autonomous motivation (Brunet et al., 2015; Milyavskaya et al., 2015). However, there are instances when a person may pursue a goal with both autonomous and controlled motivation. For instance, correlation between autonomous and controlled motivation can predict success in areas such as health and academics (Brunet et al., 2015). One example given by Brunet et al. (2015) is physical activity. They found that greater agreement between an individual’s autonomous motivation and controlled motivation in regard to motivation for physical activity, led to a greater likelihood that the individual would exercise. In the current study, the degree to which participants relied on both autonomous and controlled motivation could have similarly influenced the likelihood of them solving versus giving up on the riddles.

**Finding Purpose in Career and Religion**

Both career and religion, which may fall under autonomous or controlled motivation, can have great influence over people’s daily decisions. For instance, many socially beneficial behaviors are associated with religion such as altruism and forgiveness, which also require increased self-control (Baumeister & Exline, 2000). On the other hand, people strive for a fulfilling and lucrative career so that they can meet both intrinsic (e.g., realize one’s dreams of becoming an architect) and extrinsic goals (e.g., earn a high salary; Agbor-Baiyee, 1997).

Because career and religion are often integral parts of a person’s life, it is important to consider how they are related to self-control. Research has shown higher job satisfaction to be associated with both childhood self-control (Converse et al., 2016) and selective control strategies during decision-making (Schindler & Tomasik, 2010). In addition, self-control has been related to greater career success based on both extrinsic outcomes and intrinsic outcomes (Converse, Pathak, DePaul-Haddock, Gotlib, & Merbedone, 2012). Religion has also been associated with greater self-control (Rounding et al., 2012). The current study extended these findings by considering if the salience of religion or career could be used to enhance self-control on an unrelated task.

**Locus of Control and Religion**

It is important to note that success has also been largely correlated with a person’s locus of control, the way in which a person attributes outcomes, either internally or externally. People who have an internal locus of control tend to attribute life’s outcomes to their own decisions and behaviors, whereas people with an external locus of control tend to attribute life’s outcomes to forces outside of their control (Ahlin & Lobo Antunes, 2015; Rotter, 1966; Wong-McDonald & Gorsuch, 2004). Locus of control is unconscious, and people are often unaware of their attributions. In addition, many factors such as family, peers, community, and childhood experiences can influence a person’s locus of control (Ahlin & Lobo Antunes, 2015). Like autonomous motivation, an internal locus of control is associated with greater life success and health. An external locus of control is predictive of more negative outcomes, such as aggression.
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and low self-control (Ahlin & Lobo Antunes, 2015; Rotter, 1966). Overall, research has supported the idea that people with an internal locus of control are more likely to be successful than people with an external locus of control, yet there is little research on how people can overcome the disadvantages of developing an external locus of control.

One proposed way that people with an external locus of control may overcome what seems to be a major disadvantage is through religion, although previous research on religion and locus of control has been inconsistent. Religion allows people to place attribution for their life events onto God, fate, or some other powerful force (Wong-McDonald & Gorsuch, 2004), undermining the need for personal control. For instance, research has shown that disadvantaged groups report higher levels of religiosity (Schieman, Pudrovskia, Pearlin & Ellison, 2006). Religion provides people with a sense of security and meaning, so that even when things go wrong, they can believe it is part of a divine plan (Baumeister, 2002; Schieman et al., 2006).

However, religion is a multidimensional concept. Particular aspects of religion, such as frequency of attendance at services and belief in an afterlife, actually enhance an internal sense of control (Ellison & Burdette, 2012). This is in part because people internalize religion differently (Coursey, Kenworthya, & Jones, 2013; Wong-McDonald & Gorsuch, 2004). The current study broadly defined religion as any belief in an external divine intervention. In a previous study, participants who were primed with religious words such as God, spirit, and divine, drank more of an unsavory drink for monetary compensation than participants primed with neutral words (Rounding et al., 2012). Therefore, we predicted that exposure to religious words would increase self-control and lead people to work longer on difficult tasks.

The purpose of the current study was to investigate how religion and career priming can enhance self-control. More specifically, we examined how priming from the religion or career implicit association test (IAT) could be used to enhance self-control after a cognitive-depleting task. We also tested to see if locus of control or importance of religion, career, and family had any effect on self-control. Self-control was measured as the amount of time participants spent working on difficult problems. Participants primed with religion, or career, were predicted to have more self-control after a depletion task than participants who were not primed.

This approach is similar to that of previous research. For instance, in Boucher and Kofos’s experiment (2012), participants who completed a cognitive depletion task demonstrated more self-control after unscrambling money-related words than did participants who unscrambled neutral words. In another study, participants from a religious institution who were exposed to a moral fable judged situations such as jaywalking more harshly. Participants primed to think about the religious institution subsequently judged honor code infractions more harshly (Moon, Wright, Broadbent, & Robinson, 2017).

Method

Participants

Participants were recruited from the psychology research pool and introductory psychology classes at a midsized university in the southeastern United States. Participants signed up to participate voluntarily and received one credit toward their class for participating. There were 60 participants in the study, and each was randomly assigned to either a control condition (n = 20), a career condition (n = 21), or a religion condition (n = 19). Forty-four participants were European Americans (74.6%), eight were African American (13.6%), and seven others identified as another race (11.9%), not specified. There were 41 women and 19 men, and the average age was 20.31 (SD = 4.47) years old. Participants were collected from a wide range of majors including psychology, business, and majors from the arts and humanities. Twenty-five participants were first-year students (42.4%), nine were sophomores (15.3%), 15 were juniors (25.4%), and nine were seniors (15.3%). The average GPA was 3.28 (SD = 0.51). All participants were treated in accordance with the American Psychological Association’s ethical guidelines and principles (APA, 2002). Institutional review board approval was received prior to conducting the experiment.

Materials

The implicit association test (IAT) was used for cognitive depletion and priming (Greenwald, McGhee, & Schwartz, 1998). The IAT is a computer-based test that measures peoples’ implicit associations between different concepts. It is typically used to reveal unconscious biases. For this study, the test was used primarily as a depletion and priming mechanism, and biases were not recorded. It was chosen as the manipulation because it depletes cognition by requiring participants to make many
The IAT presents words pertaining to some category (e.g., religion, career) and shows two separate categories on each side of the screen. The participant is to assign the word on the screen to one of the categories by pressing either the E or the I key as quickly as possible. The second part of the test pairs two categories together that people either often associate together (e.g., women and family) or that people do not often associate together (e.g., women and career) and again, asks the participant to place the words into the corresponding category as quickly as possible. Faster response times to one category over another are indicative of an implicit preference or stereotype. The test requires a significant amount of mental ability by forcing participants to often select an answer that is against their initial associations. Thus, the test depletes the mental energy of the one taking the test.

For the current study, participants in the experimental conditions took either the Religion IAT or the Gender-Career IAT to induce priming of religion or career (Greenwald et al., 1998). Participants were not made aware of the true purpose of the test. The Religion IAT displayed words from various world religions including Christianity, Judaism, and Islam. Religions were then randomly paired with the categories good and bad, and participants had to place related words to the proper category. For example, if the categories Christianity and bad were on the left side, and the categories Islam and good were on the right side, the word happy should be placed on the right side. In a similar format, the Career-Gender IAT paired different career-related words with the categories male and female, and participants had to allocate the words to the proper category. For example, if the categories family and male were on the left side, and the categories career and female were on the right side, the word children should be placed on the left side. Both tests are free and available online for anyone to take.

Next, three different riddles were chosen as dependent measures. The first riddle involved a scenario with three houses and three suppliers that participants were asked to draw lines connecting without intersecting lines (see Appendix A). The second riddle asked participants to think of three words containing all five vowels that are also related to the world of mathematics or geometry (e.g., education), which was also chosen due to the combination of its simple form yet thought-provoking solution (see Appendix B). Third, the nine-dot riddle was used, which asked participants to connect nine dots using only four continuous straight lines (see Appendix C). These riddles were all borrowed from Archimedes Laboratory Project (Sarcone & Waerber, 1997). These particular riddles were chosen to measure participants’ self-control and persistence to continue because they require abstract thinking and multiple attempts before one reaches a solution.

Other measures included were locus of control items taken from Rotter’s scale (1966),¹ and four measures each about the influence of religion, career, and family in one’s life. Fifteen items were used to measure locus of control, \( \alpha = .67 \). The items used to measure importance of religion were created from the religion scale by Brown, Nesse, House, and Utz (2004). For instance, one item states, “I try hard to carry my religious beliefs over into all my other dealings in life.” Questions measuring importance of career and family were generated by the experimenter. For example, participants were asked to rate how much they agreed with the statements “My love for my family encourages me to always do the best I can” and “My career goals encourage me to always do the best I can.” Questions were answered on a 4-point Likert-type scale from 1 (strongly disagree) to 4 (strongly agree). Participants were also asked questions concerning basic demographics including age, race, sex, major, class rank, and GPA.

Procedure

Before conducting the study, approval was given by the institutional review board. To begin, participants were randomly assigned to the control, religion, or career condition, and were asked to read and sign an informed consent form explaining that their participation was voluntary and anonymous. Participants were told a cover story that the experiment was about the effects of using technology before taking a written test to ensure that they were not aware that they were being primed. Next,

¹Due to a copying error during the printing of materials, only the first 24 items of Rotter’s Locus of Control scale were included. Five of those items were fillers. Cronbach’s alpha of the remaining 19 items was .59. Because this internal consistency value was poor, we conducted an item-analysis and removed four additional items that were negatively correlated or correlated near zero with the overall measure. This reduced item LOC measure produced an improved Cronbach’s alpha of .67, which is still low but closer to the .70 value reported by Rotter (1966).
participants in the religion and career conditions took either the Religion or the Gender-Career IAT (Greenwald et al., 1998). Participants were told to stop the IAT on the last blank screen so that the remainder of the study was not influenced by viewing their test results. A researcher in the room ensured that participants did not see the IAT results, and participants were given the opportunity to view them during the debriefing. Participants were not informed about the true nature of the IAT to detect stereotypes. In the control condition, participants completed a simple computer-based task for the same amount of time. The control task consisted of categorizing shapes and colors into the correct geometric and color categories by pressing keys on the keyboard. Similar to the instructions of the IAT, participants in the control condition were told to complete the task as quickly as possible. Although participants believed that they were being tested, the control task did not require participants to correct for mistakes, nor did it record responses like the IAT. All tasks were conducted on a computer. After the initial task, participants were instructed to solve three riddles (Sarcone & Waeber, 1997). Participants were informed that, at any point, they could give up and retrieve the solutions. The experimenter timed how long each participant spent on the riddles. Lastly, participants completed items measuring locus of control (Rotter, 1966), importance of religion, family, and career (Brown et al., 2004), and demographics. They then had the opportunity to view their results to the IAT before being debriefed. Participants were asked during debriefing if they suspected the true nature of the study and if they had ever been exposed to the IAT. All tasks were conducted on a computer.

Results

Participants spent an average of 3.64 minutes (SD = 70.99) on each riddle. The time spent on problems ranged from 84.67 seconds to 6 minutes, at which point participants were asked to stop working on the problem. Analysis of Variance showed a significant difference between time spent on the three problems, F(2, 177) = 3.05, p < .01, $\eta^2_p = .24$. Participants spent the most time on the first problem ($M = 4.22$, $SD = 3.10$), less time on the second problem ($M = 3.42$, $SD = 2.89$), and the least time on the last problem ($M = 3.28$, $SD = 3.12$).

The average locus of control score was 8.08 (SD = 2.77); higher scores indicated an external locus of control, and lower scores indicated an internal locus of control. Because there was not much variation, locus of control was dichotomized using a median-split. Participants were then categorized into internal locus of control, where locus of control < 10 ($n = 37$), or external locus of control, where locus of control > 10 ($n = 22$).

Importance of religion, career, and family was also measured. The average score of importance was 2.53 ($SD = 0.74$) for religion. The average scores of importance were 3.10 ($SD = 0.57$) for career and 3.22 ($SD = 0.61$) for family.

A Pearson correlation coefficient was computed to determine the relationship between religiosity and self-control. A 2-tailed test was utilized with $p < .05$ to determine statistical significance. The results showed a negative correlation between the religion measures and time spent solving the problems, $r(60) = -.27$, $p = .04$. The correlation between grade point average and time spent solving problems was also marginally significant, $r(60) = .23$, $p = .10$. However, there was no correlation between importance of career and time spent on the problems, $r(60) = -.15$, $p = .25$, or importance of family and time spent on the problems, $r(60) = -.12$, $p = .38$.

To test the hypothesis that the priming of career or religion and locus of control would interact to influence self-control, a 3 (condition: control, career, or religion) x 2 (locus of control: internal or external) factorial Analysis of Variance was conducted. This was calculated by taking the average amount of time, measured in seconds, that participants spent on each problem. The analysis revealed a significant main effect for condition, $F(2, 53) = 5.46, p < .01$, $\eta^2_p = .17$, and a nonsignificant effect for locus of control, $F(1,53) = 0.03, p = .87$, $\eta^2_p = .00$. The interaction between condition and locus of control was not statistically significant, $F(2, 53) = 0.14, p = .87$, $\eta^2_p = .01$. However, post-hoc comparisons showed that participants in the control condition ($M = 182.55$, $SD = 53.40$) worked on the problems for less time than participants in the career ($M = 240.27$, $SD = 63.37$, $p = .02$) and religion groups ($M = 255.21$, $SD = 75.94$, $p < .01$). Participants in the religion group did not work on the problems longer than participants in the career group, with only a mean difference of 14.9 seconds ($p = .76$). These results are displayed in Figure 1.

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Because we used a median-split to categorize LOC as either external or internal, we also ran the same ANOVA with the initial 19 item LOC scale. The results were nearly identical to the reported 15 item LOC scale. Most importantly, the main effect for LOC, and the interaction effect involving LOC, were also not statistically significant.
Discussion

As previously stated, participants primed with either religion or family and career were predicted to have more self-control after a depletion task than participants who were not primed. The results supported the hypothesis by demonstrating that participants in both priming conditions worked on the problems longer than participants in the control condition. These results are consistent with previous research indicating that self-control is positively associated with both religion and a higher grade point average (Duckworth & Gross, 2014). However, there was no significant difference between the religiously primed condition and the career primed condition. It appears that on average, participants’ mental energy weakened after each problem because they spent less time on each subsequent problem.

Multiple factors may help explain why locus of control had no effect. Only 24 of the original 29 items were used to measure locus of control, which might have reduced the sensitivity. In addition, people tend to internalize religion differently and attribute responsibility and control to the self as opposed to a divine other on a continuum (Coursey et al., 2013; Wong-McDonald & Gorsuch, 2004). Therefore, religion can have a more profound effect on a person with an external locus of control only if religion is internalized as having more control than the individual (e.g., God controls man’s fate). It may also be important to consider an individuals’ motivation to complete the task. Participants in the current study had relatively low incentives for participating, and low intrinsic motivation might have reduced performance on the problems (Adelman & Lee, 1982). Although motivation was not measured, it is possible that locus of control had no effect due to overall low motivation to try hard on the riddles.

Furthermore, it is unclear why there was a negative correlation between scores on the religion measures and time spent on the problems. As mentioned earlier, religion is a complicated multidimensional concept and may mean different things to different people. Perhaps our four items did not quite capture the entirety of religion. It is also possible that participants rated religion as more important than was accurate due to the tendency to self-report higher levels of perceived desirable behaviors (Haeffel & Howard, 2010). This might have also been true for self-reports of the importance of family and career because both were also negatively correlated with time spent on problems.

Overall, our findings are consistent with other research that has used priming as an effective way to enhance self-control and other prosocial behaviors (Boucher & Kofos 2012; Mehta & Zhu, 2009). Our study added to the evidence that priming can be a useful approach for short-term enhancement of self-control by demonstrating that students work longer after a priming manipulation. Students who were not primed with career or religion were quicker to give up on attempting to solve difficult riddles. More research is needed to determine if these results generalize into other settings and scenarios, such as a classroom. Lastly, it appears that career and religion both have beneficial implications on self-control.

Future studies may consider other priming manipulations for career and religion. The current study used the religion and gender-career IATs (Greenwald et al., 1998) for priming, which might have also prompted extraneous concepts such as gender stereotypes or family. Other priming manipulations that could be used include word searches containing priming words (Rounding et al., 2012) and computer-based tasks where participants are asked to evaluate words as negative or positive rather than categorizing them (Degner, 2009).

There are several limitations to the current study that we would like to acknowledge. First, our sample consisted of 60 college students, with the majority being European American women. Additional research should be conducted with larger and more diverse samples. Another limitation is the limit of 6 minutes given to participants to work on each riddle. Allowing an extended amount of time may provide for more clear results on who expressed the most determination to solve the riddles. Participants also completed all measures after the priming manipulation, which might have influenced responses on locus of control.

![FIGURE 1](image.png)

Average times spent working on problems in three conditions in relation to internal and external control.
Effects of Religion and Career on Self-Control | Boytos and Pettijohn II


References


control and importance of religion, career, and family measures. Due to the nature of priming, participants’ responses might be more reflective of the situational circumstances than trait attributions. In addition, this study did not consider individual differences of how religion is internalized.

Overall, the study provided important insights to teaching and enhancing students’ self-control in the classroom. These findings suggest that getting good grades may not be the only motivation for students to work hard when solving problems, and that reminding students about long-term career goals or overall purpose may help them perform better on unrelated tasks. In the future, researchers should consider applying these findings and testing them in the classroom. Because priming students with religion and career increases self-control during task-completion, it may be applied to other scenarios, such as attempting to enhance self-control when faced with the temptation to cheat or commit other forms of academic dishonesty. This study provided insight on how to increase student productivity and determination during difficult tasks. When considering the quote by Thomas Edison, “genius is only one percent inspiration and ninety-nine percent perspiration” (Simonton, 2015), it seems that helping students connect class work with a greater purpose may help them persevere during difficult tasks.

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APPENDIX A

Three Houses Riddle

Participants received the following instructions. The three buildings below represent gas, water, and electricity suppliers. Each of the houses beneath them needs to receive gas, water, and electricity. However, the lines for these cannot intersect. Please find a way for the houses to receive all utilities by drawing lines to get each utility into every house, without crossing over any line. You may erase lines and continue on the back for more space if needed.

APPENDIX B

Vowels Riddle

1.
2.
3.

Participants received the following instructions. Think of 3 words having all the five vowels A, E, I, O, U once, related to the world of mathematics and geometry…

APPENDIX C

Nine Dots Riddle

Participants received the following instructions. Join all the dots up with no more than 6 continuous straight lines.
Perceived Parental Rejection in Middle Childhood as a Predictor of Lower Adulthood Resilience

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ABSTRACT. Negative relationships with parents can affect psychological adjustment, coping, and stress levels. It is possible that these relationships can also impact resilience, although this is an area not greatly explored. Resilience is the ability to bounce back from, or thrive despite, potentially traumatic events. One theoretical framework from which to explore resilience’s association with perceived negative parental relationships is interpersonal acceptance-rejection theory, or IPARTheory, a theory of human development aiming to uncover the associated outcomes of perceived acceptance and rejection from significant others. Research investigating IPARTheory has revealed that perceived parental rejection is negatively associated with well-being, with some evidence for a negative association with resilience. Thus, we sought to investigate if perceived parental rejection would predict lower resiliency, for both women and men, and how the predictive strength of perceived maternal and paternal rejection might differ for men and women, separately. Participants (N = 308; M_age = 36.29) were recruited via snowball sampling and Amazon Mechanical Turk, and they completed measures of perceived parental acceptance-rejection and resilience. Using multiple linear regression, we found that perceived paternal rejection—but not perceived maternal rejection—predicted lower resilience for men and women combined (β = -.19, p = .007). However, analyzing genders separately, the only significant regression was perceived paternal rejection predicting lower resilience for men (β = -.29, p = .02). Additional results controlling for age are reported. The present findings suggest that perceived parental rejection is an imperative focus for future resilience research and intervention.
hostility, neglect, or some other form of rejection—is correlated with negative self-adequacy, negative self-esteem, and reduced stress management (Rohner & Rising, 2006).

Despite the importance of resilience (McCanlies, Mnatsakanova, Andrew, Burchfiel, & Violanti, 2014) and the negative effects of perceived parental rejection (Rohner, 2004), only a few studies have evaluated their relationship. Sart, Börkan, Erkman, and Serbest (2016) conducted a mediational study and found that resilience mediated the relationship between perceived rejection and depressive symptoms for female, but not male, Turkish college students. Mekhaimer (1996) demonstrated that psychological hardiness, a construct related to resilience, negatively correlated with perceived parental rejection. Additionally, in a review article, Rohner (2005) suggested that resilience, coupled with healthy relationships, is integral to overcoming the effects of perceived parental rejection. Therefore, the paucity of studies on perceived parental rejection and resilience suggests that more research is warranted. Additionally, to our knowledge, no published studies have focused solely on perceived rejection’s ability to predict lower resilience. Thus, the goal of the present study was to analyze the predictive effect of perceived parental rejection on resilience. The predictors and correlates of resilience are an important domain to study because resilience is negatively associated with symptoms of posttraumatic stress disorder, such that resilience seems to protect against the development of the disorder following trauma (McCanlies et al., 2014). Moreover, resilience is associated with emotion regulation (Karreman & Vingerhoets, 2012) and quality of life (Mizuno et al., 2016).

Resilience

Resilience as a theory and construct has undergone much conceptual development (Richardson, 2002). The following sections address resilience’s seminal research, definitions, and correlates.

History and seminal work. In his seminal work, Garmezy (1971) described children of schizophrenic mothers, who showed variation in whether they struggled with mental health as adults, and factors that classified a child as vulnerable, such as disorganized familial structures. More importantly, he discussed children whom he called “invulnerables,” children who thrive behaviorally, socially, and productively despite familial and ecological indicators that they should not (Garmezy, 1971). This “invulnerability” would later be called resilience. Resilience emerged from phenomenology as an area of inquiry encompassing persona and interpersonal strengths that researchers believed could be embodied to grow through adversity (Richardson, 2002). Today, correlates of the construct are better understood, but its definition continues to be debated.

Defining and conceptualizing resilience. Following trauma, people can react with a range of responses, from “the development of persistent stress-related disorders to posttraumatic growth” (Nugent, Sumner, & Amstadler, 2014, p. 1). The two core concepts of resilience are adversity and positive adaptation to it (Fletcher & Sarkar, 2013). Additionally, Grych, Hamby, and Banyard (2015) argued that the construct includes both the assets required for adaptation and the act of functioning well after trauma. Fletcher and Sarkar (2013) reviewed the many definitions of resilience and concluded by defining it as growing through, thriving in spite of, or bouncing back from potentially traumatic events, due to protective mental assets and behaviors. However, although some researchers have noted it as distinct from coping (Campbell-Sills, Cohan, & Stein, 2006), adaptation, or resistance (Smith et al., 2008), others have argued that it can be conceptualized as growth rather than just recovery (Richardson, 2002). Overall, stemming from the Latin verb resilire (“to spring back”), resilience is, at its core, the ability to bounce back from stress (Smith et al., 2008).

In addition to the varying definitions of resilience, it can be conceptualized in differing ways. Specifically, a dialogue between Southwick, Bonanno, Masten, Panter-Brick, and Yehuda (2014) resulted in multiple conceptualizations: normal functioning throughout adversity (Bonanno), a decision to continue on with a growth-oriented mindset (Yehuda), the ability for positive adaptation within a threatened system (Masten), and a process of garnering resources to maintain health (Panter-Brick). Although some theorists have debated whether resilience is a stable personality trait or a fluid construct (Fletcher & Sarkar, 2013), other researchers have agreed with Panter-Brick (2014) that resilience is a process that is able to be developed (Flett & Hewitt, 2014; Grych et al., 2015). Indeed, in support of the latter, research has shown that resilience can increase over the course of cognitive behavioral therapy (Chen et al., 2014), thereby implying that it is not a stable characteristic.

Bridging definitions and theories. Researchers have suggested various and evolving definitions of...
resilience (Nugent et al., 2014). However, some researchers have combined these various definitions to examine resilience from a multidisciplinary perspective (Grych et al., 2015) or as a metatheory (Richardson, 2002). Grych et al. (2015) posited a theoretical model of resilience called the “resilience portfolio,” combining positive psychology, posttraumatic growth, and coping, to provide a comprehensive view of resilience that includes regulatory, interpersonal, and meaning-making strengths. Similarly, Richardson’s (2002) resilience metatheory combined many fields and encompassed psychoimmunology, biopsychospiritual homeostasis, and defined resilience as growing through adversity—“the force within everyone that drives them to seek self-actualization” (p. 313). In the present study, which uses the Brief Resilience Scale (Smith et al., 2008; see Method section), we chose to define resilience as bouncing back from stress (Smith et al., 2008) and as growing through, or thriving despite, potentially traumatic events (Fletcher & Sarkar, 2013).

**Correlates and Predictors of Resilience**

Resilience is positively correlated with numerous factors. These include well-being, optimism (Petros, Opacka-Juffry, & Huber, 2013), self-efficacy (Fletcher & Sarkar, 2013; Petros et al., 2013), and self-esteem (Mizuno et al., 2016), while gender and age do not significantly predict resilience (Petros et al., 2013). Bonanno (2004) also found that resilience was correlated with hardiness, positive emotion and affect, and extraversion, as well as quality of life and social functioning (Mizuno et al., 2016). Further, it is predicted by (Mizuno et al., 2016), correlated with, and supported by spirituality or belief in a higher power (Brewer-Smith & Koenig, 2014; Fletcher & Sarkar, 2013; Grych et al., 2015; Nugent et al., 2014; Richardson, 2002).

**Psychological and biological correlates and predictors.** Resilience appears to be supported by mental health. Indeed, resilience is negatively correlated with depression (Mizu, et al., 2016; Petros et al., 2013; Sart et al., 2016; Smith et al., 2008), hopelessness (Mizuno et al., 2016), and anxiety (Petros et al., 2013; Smith et al., 2008). Similarly, Loh, Schutte, and Thorsteinsson (2014) found resilience to mediate the relationship between depression and negative affect. Likewise, Sart et al. (2016) found that, for women but not for men, resilience fully mediated the relationship between perceived parental rejection and depression. Further, resilience seems to be higher in psychologically healthy people as compared to those with psychological disorders such as schizophrenia or bipolar disorder (Mizuno et al., 2016).

The work of Mizuno et al. (2016) and Petros et al. (2013) provides contrasting evidence for a biological basis of resilience. Specifically, Petros et al. (2013) found that resilience positively correlated with and predicted levels of dehydroepiandrosterone sulphate (DHEA-S), which helps to control the cortisol response of the hypothalamic-pituitary-adrenal axis under stress. Conversely, Mizuno et al. (2016) did not find resilience to be significantly related to any of the biomarkers they explored (e.g., plasma brain-derived neurotrophic factor, adrenocorticotropic hormone, cortisol). It appears that future research is needed to clarify biomarkers of resilience.

**Parenting and Resilience**

In the present study, we employed a developmental perspective to evaluating resilience. The following sections address the connection between resilience and developmental factors such as family and parenting.

**Family and ecology.** Resilience levels seem to be closely connected to ecological (Bell, Romano, & Flynn, 2013) and familial factors (Wyman et al., 1999), leading us to believe that they may also be connected to perceived parental acceptance and rejection within IPARTheory (Rohner & Khaleque, 2002). Specifically, Bell et al. (2013) examined the multilevel ecological correlates (i.e., Bronfenbrenner’s ecological systems theory model; Bronfenbrenner, 1977) influencing children’s outcomes within the child-welfare system, such as resiliency as measured by normative levels on indicators of well-being (e.g., conduct, academic performance). Their results showed that more exposure to maltreatment (a child-level ecological variable) predicted less emotional resilience. Moreover, family-level variables (e.g., ineffective parenting) accounted for a moderate amount of the variance in resilience as measured by behavioral function (e.g., prosocial behavior). Thus, familial and maltreatment ecological factors account for much variance in resilience.

**Parenting.** Most important to the current study, resilience appears to be connected to parenting and familial stress (Krtizas & Grobler, 2005; Petros et al., 2013; Wyman et al. 1999). Specifically, Petros et al. (2013) found that resilience significantly and negatively correlated with early life stress (i.e., in adolescence). Additionally, in terms of parenting...
styles and resilience, Kritzas and Grobler (2005) found that authoritative parenting accounted for the most variance in resilience. Moore and Shell (2017) found that maternal support predicted lower internalizing symptoms, such as depression, which is negatively correlated with resilience (Sart et al., 2016), and higher self-esteem, a variable positively correlated with resilience (Mizuno et al., 2016). Similarly, parents’ emotionally responsive and competent parenting (e.g., nurturing involvement, authoritative discipline) has been shown to mediate the relationship between the criterion variable resilience and the predictors, psychosocial support, and relational history (Wyman et al., 1999). Further, unresponsive parenting is a predictor of reduced resilience (Wyman et al., 1999).

**Parental attachment.** One specific theory of parenting is attachment theory, which also appears to be intertwined with resilience (Li, 2008). Secure attachment has been shown to significantly predict resilience (Farber & Egeland, 1987; Karreman & Vingerhoets, 2012), in addition to healthy emotion regulation (Karreman & Vingerhoets, 2012). Further, resilience and emotion regulation together mediate the relationship between insecure attachment and well-being (Karreman & Vingerhoets, 2012). Similarly, secure attachment and resilience in college students has been shown to together predict the ability to cope with stress (Li, 2008). Moreover, some researchers have posited that resilience can be increased through parental attachment, particularly to treat complex trauma (Kinniburgh, Blaustein, Spinazzola, & Van der Kolk, 2005). Secure parental attachment seems to be protective against variables negatively correlated with resilience (e.g., depression; Sart et al., 2016). Fox and Borelli (2015) found that attachment security moderated the relationship between maternal depression and child depressive symptoms, such that there was a significant relationship between maternal depression and child depression for less securely attached children, but no significant relationship for those who were more securely attached. From these studies, it is evident that parenting relates to resilience levels. One parenting and relational theory that is related to resilience is interpersonal acceptance-rejection theory, or IPARTheory (Rohner & Khaleque, 2002).

**Interpersonal Acceptance-Rejection Theory**

IPARTheory is a theory of life span development and socialization (Rohner & Khaleque, 2002; Khaleque, 2013). In the following sections, we overview the theory, address subtheories relevant to resilience, and discuss gender differences in perceived rejection.

**Overview of the theory.** IPARTheory posits that the warmth one perceives from significant relationships (e.g., parents, romantic relationships) affects personality dispositions and experiences in future relationships (Rohner, 2016). One integral aspect of IPARTheory is its emphasis on the child’s perceived rejection or acceptance, rather than objective behavioral observations of the relationship, because what one perceives “as real has real consequences” (Thomas & Thomas, 1928, p. 572 as cited in “Ronald P. Rohner,” 2004). Rejection and acceptance comprise the warmth continuum, spanning coldness (i.e., perceived rejection) to warmth (i.e., perceived acceptance; “Ronald P. Rohner,” 2004). The perception of rejection can be experienced through one or more of the four main behavioral categories: coldness, hostility, neglect, and undifferentiated rejection (i.e., the perception of being rejected without any clear behavioral indicators; Rohner, 2004; Rohner & Khaleque, 2002). Ultimately, perceived parental rejection, specifically (as opposed to perceived rejection in other relationships), is associated with a distinct constellation of personality dispositions called the acceptance-rejection syndrome (Rohner & Rising, 2006) that could also be correlated with resilience levels.

**Personality subtheory and the acceptance-rejection syndrome.** Research has consistently revealed that perceived parental rejection is associated with the acceptance-rejection syndrome, part of IPARTheory’s personality subtheory (Rohner & Rising, 2006). Acceptance-rejection syndrome (i.e., psychological maladjustment) comprises seven personality dispositions (Rohner, 2004). These include (a) trouble managing anger, (b) dependence or defensive independence, (c) poor self-esteem, (d) reduced self-adequacy, (e) unstable emotions (e.g., reduced ability to manage stress), (f) emotional unresponsiveness (e.g., trouble giving and receiving love), and (g) negative worldview (e.g., believing the world to be a dangerous place; Rohner, 2004; Rohner & Khaleque, 2002; Rohner & Rising, 2006). In a meta-analysis of 30 studies, Khaleque (2013) found, with strong effect sizes, that these personality dispositions held true across cultures, as did Faherty, Eagan, Ashdown, Brown, and Hanno (2016) in their study of perceived parental rejection in Guatemala. Moreover, these personality dispositions lead to a reduced capacity to deal with stress (“Ronald P. Rohner,” 2004). Therefore, perhaps...
acceptance-rejection syndrome is additionally associated with less resilience, because resilience is positively associated with self-esteem (Mizuno et al., 2016), self-efficacy (Smith et al., 2008), and by definition, stress management (Fletcher & Sarkar, 2013).

In addition to the personality dispositions of acceptance-rejection syndrome enumerated above, perceived parental rejection has been associated with other negative factors that could suggest lower resilience (Rohner & Khaleque, 2002; "Ronald P. Rohner," 2004; Sart et al., 2016). Namely, rejection is also associated with a tendency to be anxious and insecure, in addition to belief in a wrathful God (“Ronald P. Rohner,” 2004). This is particularly interesting because resilience is positively associated with spirituality (Richardson, 2002). Additionally, resilience is positively associated with social support (Iacoviello & Charney, 2014) and negatively correlated with depression (Sart et al., 2016). In contrast, perceived rejection appears to be associated with trouble in future relationships (Rohner, 2004)—perhaps thereby suggesting lower social support—and is positively correlated with depression (Sart, 2016) as well as externalizing symptoms (e.g., substance abuse, behavioral difficulties; Rohner & Britner, 2002). Additionally, although resilience is correlated with well-being (Petros et al., 2013), perceived rejection is associated with reduced well-being, such as psychosomatic pain (Naz & Kauser, 2012). These relationships appear to suggest a negative relationship between resilience and perceived rejection.

**Gender differences in perceived rejection.** There appear to be gender differences in the perception of parental rejection and warmth, and in the effects of perceived paternal as compared to maternal rejection. In a study of the ability of perceived parental rejection and warmth to predict hostility, Meesters, Muris, and Esselink (1995) found that men were significantly more likely to denote perceiving less emotional warmth from their parents. Additionally, rejection by the father was the strongest predictor of hostility (Meesters et al., 1995). Likewise, Kausar and Kazmi (2011) also found that sons were significantly more likely than daughters to perceive their fathers as rejecting. No gender difference in participants’ perceptions of mothers was observed (Kausar & Kazmi, 2011). As previously noted, Sart et al. (2016) also observed gender differences in the ability of resilience to mediate the relationship between perceived rejection and depression. However, the results of a cross-cultural meta-analysis (Khaleque & Rohner, 2002a) showed that, regardless of differences in gender, perceived parental rejection is consistently associated with psychological maladjustment, or acceptance-rejection syndrome. As a whole, these findings suggest that it would be fruitful to evaluate gender differences in the ability of perceived rejection to predict resilience.

**Coping subtheory.** When addressing resilience, one subtheory of IPARTheory that is perhaps most relevant is *coping subtheory* (Rohner, 2004; Rohner & Khaleque, 2002). This theory aims to address why some children who report perceived rejection appear to show little behavioral or psychological indicators of the rejection (Rohner, 2016; “Ronald P. Rohner,” 2004). Indeed, researchers found that about 80% of those who report rejection tended to display the personality correlates expounded above. However, the other 20% (i.e., *copers*) do seemingly well despite significant rejection (Rohner & Khaleque, 2002). Specifically, two types of *copers* in IPARTheory are *affective copers* (i.e., positive mental health despite rejection) and *instrumental copers* (i.e., despite rejection and reduced mental health, success at task-oriented undertakings such as schoolwork; Rohner, 2016; Rohner & Khaleque, 2002). Interestingly, of those who are affective copers, women (64.4%) account for a significantly greater proportion than men (36%; Ki, 2015). Although coping and resilience are not synonymous (Fletcher & Sarkar, 2013), they are connected, and coping subtheory suggests that some of those who have perceived rejection may still be highly resilient. Coping subtheory is the most undeveloped area of IPARTheory research, and it is still unclear why some thrive yet others struggle (Rohner, 2016). Therefore, the present study aimed to extend coping subtheory by evaluating resilience.

**Present Study: Perceived Parental Rejection and Resilience** It appears that the measures of perceived parental rejection and resilience could be inversely related. Indeed, research has begun to address resilience as it relates to perceived parental rejection through using mediational models (Sart et al., 2016) or evaluating related constructs (e.g., psychological hardness; Mekhaimer, 1996). However, more studies are warranted. For example, Sart et al. (2016) found resilience to mediate between rejection and depression only for women. Thus, research is needed to understand the gender difference that Sart et al. (2016) found and to explore the
relationship between resilience and rejection in other cultures, as their study was conducted in Turkey. Moreover, our previous research with a small sample of women showed some significantly negative, yet weak, associations between perceived maternal rejection and resilience (Camden, Brown, Bronner, Zhang, & Carter, 2016), leaving more room for exploration, particularly in the realm of gender. Therefore, in the present study, we had two aims: (a) we sought to investigate if perceived paternal and maternal rejection would predict lower resiliency for both men and women, and (b) we were curious if perceived paternal and maternal rejection would have different predictive strengths for men and women, separately.

Method
Participants
Participants (N = 371) comprised 207 women (age range: 18–76, M = 29.01, SD = 13.42) and 101 men from the United States (age range: 18–78, M = 36.29, SD = 15.54), with a mean age of 36.29 (SD = 15.45, age range: 18–78). Inclusion criteria for participation comprised English proficiency (i.e., good–very strong on our survey) and current residence in the United States. If they did not meet these criteria or had significant missing data, participants were excluded. We removed 46 participants from the original sample (of 371) for this reason (leaving N = 325). Seventeen participants reported being agender, transgender, or fluid, or did not report a gender. Because we did not have a large enough subsample to compare these gender groups to those identifying as men and women, they were removed from subsequent analyses, leaving N = 308. Participants noted their racial background as White (58.4%), Asian (19.5%), Black (9.7%), and Hispanic or Latino (2.9%). Racial backgrounds that were not as represented included American Indian or Alaskan Native (less than 1%), Native Hawaiian or Pacific Islander (less than 1%), and multi- or biracial (e.g., American Indian or Alaskan Native and White: 5.2%). Moreover, three participants identified as “other,” and six additional participants did not provide a racial background. In terms of educational level, most participants had completed some college (31.2%), a bachelor’s degree (26.9%), master’s degree (16.2%), or had a high school diploma or had completed the GED (12%). Other participants had finished some postgraduate work (3.6%), an associate’s degree (3.2%), a doctorate degree (e.g., PhD; 2.6%), a professional degree (2.6%), or lower levels of education. Reporting their location, most participants denoted being from the South (59.1%), while the others were nearly derived from the Midwest, Northeast, and West.

Measures
Perceived parental rejection. To measure participants’ perceptions of parental warmth or parental coldness and rejection, we used the Parental Acceptance-Rejection Questionnaire (Short Form): Mother and Father (PARQ; Rohner & Khaleque, 2005). Rohner and Khaleque (2005) defined acceptance-rejection as “the warmth dimension of parenting . . . a bipolar dimension, with acceptance defining one end of the continuum and parental rejection defining the other” (p. 43). These two scales have 24 questions each, and four subscales (i.e., warmth/affection, hostility/aggression, indifference/neglect, and undifferentiated rejection), with the directions (Rohner & Khaleque, 2005) asking participants to think back to how their parent treated them when they were 7 to 11 years old (i.e., middle childhood). The Likert scale ranges from 1 (almost always true) to 4 (almost never true). After reverse-coding some items and summing all responses, higher total scores indicate more perceived rejection, and for the subscales, more coldness (i.e., warmth/affection subscale), hostility/aggression, indifference/neglect, and undifferentiated rejection, respectively. An example item is “My father frightened or threatened me when I did something wrong” (Rohner & Khaleque, 2005).

In Khaleque and Rohner’s (2002b) meta-analysis, they reported mean alphas ranging from .78 to .91 for the subscales and total PARQ scores across cultures. Faherty et al. (2016) also found the PARQ to have good reliability, with Cronbach’s alphas of .76 to .87 for the subscales, and .94 to .96 for the measure as a whole. In terms of convergent validity, the PARQ’s Warmth/Affection subscale (i.e., perceived coldness) has been shown to strongly correlate with another acceptance measure, and the Hostility/Agression subscale to correlate with physical punishment (Rohner & Khaleque, 2005, p. 61). Moreover, Faherty et al. (2016) found that the subscales and measure as a whole showed good convergent validity with the Adult Personality Assessment Questionnaire (i.e., psychological maladjustment; Rohner & Khaleque, 2005). In our current sample, we also found strong reliability for the PARQ: Mother (αmen = .97; αwomen = .96) and for the PARQ: Father (αmen = .96; αwomen = .96).
**Resilience.** To evaluate psychological resiliency, we used the Brief Resilience Scale, which defines resilience as the ability to bounce back from stress (Smith et al., 2008). The Brief Resilience Scale is a 6-item measure with a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). After averaging the six items, higher scores indicated more resilience. An example item is “I tend to bounce back quickly after hard times” (Smith et al., 2008). The measure is unique in measuring only resilience, as compared to coping or resources like some other scales (Smith et al., 2008). In their psychometric study, Smith et al. (2008) found alphas ranging from .80 to .91. For convergent validity, they found it to positively correlate with other resilience measures, optimism, purpose in life, and positive affect, and negatively with anxiety and depression. For our sample, we found an alpha = .67 for men and .68 for women.

**Procedure**

After we gained approval from the Agnes Scott College institutional review board, 20 research assistants used flyers, e-mail, and social media to recruit participants via snowball sampling. To increase the representation of men in the sample, we also recruited 60 additional men (19.48% of N = 308) from Amazon Mechanical Turk (MTurk). These men did not significantly differ from the other men in age, nor their likelihood of being Hispanic or Latino, Black, Native American or Alaskan Native, or a race/ethnicity that they classified as “other.” However, MTurk men were more likely to be White or Asian. Additionally, there could be other critical differences between our MTurk sample and non-MTurk sample that we did not measure; for example, we did not evaluate response bias in participants. Nonetheless, MTurk participants were subject to the same inclusion criteria as non-MTurk participants, including living in the United States and denoting “good” to “very strong” English language proficiency. All participants responded to the survey online using Survey Monkey, and MTurk workers were compensated $0.50. Although participation in this research was voluntary, participants could choose to participate in a drawing for one of two $50 Amazon gift cards by providing their e-mail address in a separate linked survey that was not connected to their survey data.

**Results**

Table 1 includes the intercorrelations and descriptive statistics for all main study variables, in addition to those for the subscales of the PARQ: Mother and PARQ: Father (although not used as separate predictors in the present study). Table 2 shows the average resilience scores and percentages of perceived rejection between genders.

The first aim of the present study was to evaluate whether perceived parental rejection would predict lower resilience for men and women combined. After checking the intercorrelations (see Table 1), tolerance, variance inflation factor, and condition index, we determined that the data not.

### TABLE 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PARQ: Mother</td>
<td>38.79</td>
<td>16.04</td>
<td>24</td>
<td>96</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Coldness</td>
<td>13.56</td>
<td>6.06</td>
<td>8</td>
<td>32</td>
<td>.93</td>
<td>-</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hostility</td>
<td>9.39</td>
<td>4.26</td>
<td>6</td>
<td>24</td>
<td>.87</td>
<td>.70</td>
<td>-</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Neglect</td>
<td>9.85</td>
<td>4.42</td>
<td>6</td>
<td>24</td>
<td>.92</td>
<td>.83</td>
<td>.70</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Undiff. Rej.</td>
<td>5.91</td>
<td>2.90</td>
<td>4</td>
<td>16</td>
<td>.90</td>
<td>.77</td>
<td>.82</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>PARQ: Father</td>
<td>43.47</td>
<td>17.13</td>
<td>24</td>
<td>96</td>
<td>.45</td>
<td>.40</td>
<td>.35</td>
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<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Coldness</td>
<td>15.67</td>
<td>6.61</td>
<td>8</td>
<td>32</td>
<td>.40</td>
<td>.42</td>
<td>.25</td>
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<td>.91</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Hostility</td>
<td>9.95</td>
<td>4.59</td>
<td>6</td>
<td>24</td>
<td>.39</td>
<td>.30</td>
<td>.38</td>
<td>.37</td>
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<td>.63</td>
<td>-</td>
<td></td>
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</tr>
<tr>
<td>9</td>
<td>Neglect</td>
<td>11.48</td>
<td>4.76</td>
<td>6</td>
<td>24</td>
<td>.40</td>
<td>.34</td>
<td>.31</td>
<td>.42</td>
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<td>.82</td>
<td>.68</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Undiff. Rej.</td>
<td>6.37</td>
<td>3.15</td>
<td>4</td>
<td>16</td>
<td>.42</td>
<td>.33</td>
<td>.35</td>
<td>.44</td>
<td>.40</td>
<td>.90</td>
<td>.72</td>
<td>.83</td>
<td>.78</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Resilience</td>
<td>3.22</td>
<td>0.68</td>
<td>1</td>
<td>5</td>
<td>-.14</td>
<td>-.10</td>
<td>-.13</td>
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<td>-.17</td>
<td>-.17</td>
<td>-.14</td>
<td>-.16</td>
<td>-.16</td>
<td>-.14</td>
</tr>
</tbody>
</table>

Note. PARQ: Mother = Parental Acceptance-Rejection Questionnaire: Mother Total Score; Coldness = Warmth/Affection subscale; Hostility = Hostility/Aggression subscale; Neglect = Indifference/Neglect subscale; Undiff. Rej. = Undifferentiated Rejection subscale; PARQ: Father = Parental Acceptance-Rejection Questionnaire: Father Total Score; Min = minimum possible score; Max = maximum possible score. *p < .05. **p < .001.
met the requisite assumption of nonmulticollinearity for multiple linear regression and was therefore acceptable for further testing. We conducted a multiple linear regression to determine if perceived paternal rejection and perceived maternal rejection, together, would predict resilience (see Table 3). The regression equation was significant, \( F(2, 239) = 5.39, p = .005 \), with \( R^2 \) accounting for 4.3% of the variance. The model had a small effect size, \( f^2 = .04 \), according to Cohen’s (1988) parameters of \( f^2 \geq .02 \) being small, \( f^2 \geq .15 \) being medium, and \( f^2 \geq .35 \) being large (as cited in Selya, Rose, Dierker, Hedecker, & Mermelstein, 2012). In terms of individual contribution to the model, perceived paternal rejection significantly predicted resilience, \( \beta = -.19, p = .007 \), while maternal rejection did not, \( \beta = -.03, p = .67 \). Additionally, we found that resilience positively correlated with age, \( r = .22, p < .001 \). Controlling for age in the multiple regression (see Table 4), the model remained significant, \( F(3, 236) = 9.83, p < .001 \), and \( R^2 \) accounted for more variance in resilience (11.1%). Again, only perceived paternal rejection made an independent contribution to the model, \( \beta = -.22, p = .002 \), and perceived maternal rejection was not a significant predictor, \( \beta = -.04, p = .57 \). The covariate, age, also remained significant, \( \beta = .27, p < .001 \). This model had a larger effect size than the original regression, \( f^2 = .12 \), though still small.

For our second aim, we investigated if perceived paternal and maternal rejection would differ in their predictive strength for men and women separately. To evaluate this, we conducted the same multiple regression again, but separately for men and women. In both cases, the data met the assumption of nonmulticollinearity based on intercorrelations, tolerance, variance inflation factor, and condition index. For men (see Table 5), the equation was significant, \( F(2, 76) = 7.28, p < .001 \), with \( R^2 \) accounting for 16.1% of variance. The model had a medium effect size, \( f^2 = .19 \). Perceived paternal rejection significantly predicted men’s resilience, \( \beta = -.29, p = .02 \), but perceived maternal rejection did not, \( \beta = -.154, p = .22 \). Controlling for age (see Table 6), the model remained significant, \( F(3, 75) = 7.13, p < .001 \), and accounted for more variance in resilience (22.2%), with a large effect size, \( f^2 = .29 \). Again, perceived paternal rejection contributed independently to the model, \( \beta = -.34, p = .007 \), and perceived maternal rejection did not predict resilience, \( \beta = -.11, p = .39 \). Age also remained a significant predictor in the final model, \( \beta = .25, p = .018 \). For women (see Table 7), the equation was not significant, \( F(2, 160) = 1.61, p = .20 \); neither perceived paternal rejection nor perceived maternal rejection predicted women’s resilience. Interestingly, controlling for age (see Table 8), the model became significant, \( F(3, 157) = 4.19, p = .007 \). However, only age made a significant independent contribution to the model, \( \beta = .24, p = .002 \), therefore conveying that...
resilience is not predicted by perceived parental rejection. Indeed, both perceived paternal rejection, $\beta = -0.16$, $p = .06$, and perceived maternal rejection, $\beta = -0.001$, $p = .99$, did not predict resilience. Additionally, $R^2$ accounted for only a small amount of variance, 7.4%, and the model had a small effect size, $f^2 = .08$.

### Discussion

In the present study, we sought to explore (a) how perceived paternal and maternal rejection together predicted resilience for men and women, and (b) how the variance paternal and maternal rejection accounted for might differ for men and women separately. For our first goal, we found that paternal and maternal rejection together significantly predicted resilience, such that, as rejection increases, the predicted resilience level decreases. However, the variance that rejection accounted for was relatively small. Moreover, within that multiple regression, when we evaluated the independent contribution of maternal rejection and paternal rejection to the variance in resilience, paternal rejection significantly predicted resilience, while maternal rejection was not significant; the same held true when we controlled for age. Age also remained a significant predictor in the final model.

Second, addressing our other aim to compare genders, we found that for men, maternal and paternal rejection together significantly predicted resilience and accounted for more variance than our original model with both men and women. Within that multiple regression, parsing apart the independent contribution of maternal and paternal rejection, only paternal rejection significantly predicted resilience. This independent contribution was also true once we controlled for age, and age remained a significant predictor in the final model. Interestingly, for women, this was not the case; we did not find women’s resilience to be predicted by perceived parental rejection. From these results, it appears that men’s resilience is particularly impacted by perceived parental rejection, specifically that of their father because we found consistently throughout the regressions that perceived paternal rejection, but not maternal rejection, predicted resilience. Additionally, it seems that age has a significant positive association with resilience, perhaps reflecting that, as people age, they become increasingly adept at bouncing back from adversity.

### Comparison to Prior Research

The present findings connect to previous literature in IPAR Theory and in resilience, both by supporting...
and contradicting prior findings. Specifically, both we and Sart et al. (2016) found perceived rejection negatively related to resilience, but our study found the relationship only for men, whereas Sart et al. found it only for women. The difference between our studies could be because of cultural factors because Sart et al.’s study was conducted in Turkey and ours was conducted in the United States. However, we extend their findings by demonstrating that perceived parental rejection during the middle childhood years of 7–11 predicts less self-reported resilience in the United States as well. Also within the IPARTTheory literature, our findings support those of Mechkaimar (1996) who found that perceived parental rejection negatively correlated with psychological hardiness. Although hardiness and resilience are separate constructs, our findings and those of Mekhaimar (1996) suggest that people’s ability to withstand stress is negatively associated with the rejection they perceive from their parents.

Finally, evaluating the gender difference that we found, our findings intersect with Ki’s (2015) study of affective copers. Ki (2015) found that significantly more women than men tend to be affective copers; this could explain why we did not find women’s resilience to be predicted by perceived parental rejection. If they are coping well, despite rejection, as IPARTTheory posits about affective copers (Rohner & Khaleque, 2002), then it is plausible that their resilience levels may be unaffected by any parental rejection they perceived, as our regression with women suggests (see Table 7). Additionally, in our previous study with a completely female sample (Camden et al., 2016), we found a small negative correlation between resilience and perceived parental rejection, but only for specific items of the Brief Resilience Scale and subscales of the PARQ. The present study’s gender difference may help to explain why, in our previous study, there was minimal correlation for women. Finally, our finding that perceived paternal rejection, but not maternal rejection, significantly predicted men’s resilience aligns with Meesters et al. (1995). Although they studied hostility and we studied resilience, they likewise found that perceived rejection by the father was the strongest predictor.

Evaluating the literature on parenting and resilience, our findings also strengthen and support many previous studies, which found resilience to be negatively related to the perception of poor parenting (Li, 2008; Petros et al., 2013). In particular, it appears that insecure attachment is negatively related to coping and resilience (Karrreman & Vingerhoets, 2012; Kinniburgh et al., 2005; Li, 2008). Moreover, our findings support those of Petros et al. (2013), who found that early life stress was negatively related to resilience. Similarly, Kritzas and Grobler (2005) and Wyman et al. (1999) found that authoritative parenting was positively correlated with resilience. In support of this research, we found that perceived parental rejection was negatively related to resilience.

Implications and Applications

The current study and its results can be applied both to theory and practice. Specifically, in terms of IPARTTheory, it appears that not only is perceived parental rejection related to coping (Rohner & Khaleque, 2002), but also resilience levels, specifically for men perceiving rejection from their father. This supports and extends the theory. Additionally, these results imply that parental warmth may be important to developing resiliency, particularly for men receiving paternal warmth. This implication is corroborated in part by Kausar and Kazmi’s (2011) finding that sons were significantly more apt than daughters to perceive their fathers as rejecting, and Meesters et al.’s (1995) finding that perceived paternal rejecting was the strongest predictor of hostility.

A second theoretical implication of the current study comes from our results that women’s resilience did not appear to be predicted by perceived parental rejection. Albeit interesting, this may imply that women and men experience parental rejection differently, or that their resilience levels are predicted in separate ways. Applying IPARTTheory’s coping subtheory to this finding, this could suggest that women, more than men, tend to be affective copers (i.e., those who, despite rejection, function seemingly well), as found by Ki (2015).

Finally, in terms of practical applications, our results can be applied to parenting and psychotherapy. Because we found that, particularly for men, perceived rejection from a father predicts lower resilience, it may be especially important for fathers to provide warmth to their male children. Wyman et al. (1999) provided insight into how best to parent in order to foster resilience in one’s child. They found that, above other factors such as the parent’s developmental history and psychosocial resources, emotionally responsive parenting mediated, and was predictive of, resilience in the child. This is supported by Kinniburgh et al.’s (2005) proposition for a childhood trauma treatment model focused on improving attachment.
to increase resilience. Additionally, in terms of application to psychotherapy, resilience-increasing interventions, such as cognitive behavioral theory, might be considered for men having experienced paternal rejection because it has been shown to increase resilience (Chen et al., 2014).

**Strengths and Limitations**

The present study has multiple strengths. Primarily, our findings contribute to the limited literature on resilience as it relates to IPARTheory. Additionally, we had a large sample of 308 participants. This number strengthens our confidence in the results of perceived parental rejection’s ability to predict resilience levels. The present study is also strong because of its theoretical underpinning in IPARTheory; numerous research studies using this theory have shown the adverse effects of perceived parental rejection (Rohner & Rising, 2006).

In addition to the strengths of this study, there are areas that could be improved upon. One weakness of the present study is the Cronbach’s alphas we found for the Brief Resilience Scale (Smith et al., 2008) for our sample (αmen = .67; αwomen = .68), which are slightly below the reliable level of α = .70. However, strong reliability for this measure was previously found in Smith et al.’s (2008) prior research (α = .80–.91) and in our previous research (α = .86; Camden et al., 2016). A second weakness of this study is the use of snowball sampling to gather part of the sample (more women than men were recruited through this method). Because many participants knew the research assistants, there could be similarities among the participants that would not have been found in a completely random sample. Relatedly, our differing sample sizes in men (n = 108) and women (n = 207) and two sampling procedures should be remedied in future research; it is possible that the differing as and sampling procedures influenced the findings. Finally, another weakness of the current study is the retrospective and subjective nature of the measures we used. Although perception is held as an important construct in IPARTheory (“Ronald P. Rohner,” 2004), the same may not hold true for resilience measurement. Because resilience is a relatively young area of research, researchers are still learning how to best measure the construct. However, the Brief Resilience Scale (Smith et al., 2008) is a strong measure of resilience because of its focus on the core aspects of resilience: adversity and bouncing back from it.

**Directions for Future Research**

The findings of the present study can be extended in future research. One interesting finding was that women’s resilience appeared to be unrelated to perceived parental rejection. This implies that the female participants could be affective or instrumental copers, according to IPARTheory (Rohner & Khaleque, 2002). Future research could disentangle participants’ resilience levels from affective and instrumental coping. To do this, researchers would first need to establish a measure of coping in line with IPARTheory. They could then measure coping, resilience, and perceived rejection, and conduct a hierarchical multiple regression with coping type as a covariate in order to control for its possible effect on resilience. Moreover, IPARTheory posits that, although 80% of people display the personality dispositions associated with perceived rejection, the other 20% manifest as healthy or functional despite the rejection (Rohner & Khaleque, 2002). Thus, researchers could also separate participants into (a) affective copers, (b) instrumental copers, and (c) rejection-affected participants and conduct a one-way Analysis of Variance (ANOVA) to understand how resilience levels might differ between these groups.

Another direction of future research is to work to understand why we found that only men’s resilience was predicted by perceived rejection, and why Sart et al. (2016) found that, only for women, resilience mediated the relationship between perceived rejection and depression. Ki (2015) also found that women tended to be affective copers more often than men. These gender differences provide an avenue for further research. Ki (2015) mentioned that the difference in coping could be because women, more than men, tend to seek emotional and social support, which are correlates of resilience. Future work should continue to explore gender differences in coping and resilience as they relate to perceived parental rejection, so that it can be understood whether these differences are supported. Also, correlates of resilience, such as social support, spirituality, and positive affect (Richardson, 2002) should be compared between genders within these studies to disentangle the differences.

A final idea for future research is exploring potential biomarkers of resilience (e.g., DHEAS, cortisol; Petros et al., 2013) in relationship to perceived parental rejection. There have been differential findings in whether these salivary steroids predict resilience (Mizuno et al., 2016; Petros et
al., 2013). However, it would be informative to understand whether those who reported perceived rejection from their parent(s) differ biologically from those who tended to perceive acceptance. Using salivary samples, levels of biomarkers could be analyzed, and factorial ANOVAs could be conducted to analyze group differences in the multiple biomarkers, and regression analyses could be used to understand the predictive ability. This would provide insight into the impact of perceived rejection on biology.

**Conclusion**

This study evaluated the predictive ability of perceived parental rejection on resilience levels in a large sample of adults. Overall, our results convey that, for men, perceived parental rejection significantly predicts lower resilience. These results strengthen our confidence in the theory of the negative effect of perceived parental rejection (Rohner & Khaleque, 2002). Moreover, although coping and resilience are not identical constructs (Fletcher & Sarkar, 2013), these results extend the reach of coping subtheory (Rohner & Rising, 2006) because they show that men’s and women’s resilience is differentially related to perceived parental rejection. This may convey that women, more than men, tend to be effective copers. Ultimately, the findings of the present study suggest that perceived parental rejection during middle childhood may be a critical component of resilience development. Therefore, parental acceptance-rejection represents a fruitful and imperative area of inquiry for future resilience research and intervention.

**References**


Resilience and Perceived Parental Rejection


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A crime occurs and a series of decisions ensue. The victim or witness decides whether or not to notify the police about the crime and the alleged offender. If notified, the police decide whether or not to arrest the suspect. If an arrest is made, a court official decides whether or not to set bail. A prosecutor decides whether or not to seek an indictment and what charges seem to be appropriate. If there is an indictment, the prosecutor decides whether or not to offer a plea bargain. Should the case go to trial, a judge or jury will decide on a verdict and possibly a subsequent sentence. And while all of this occurs, reporters decide whether or not to keep the case in the public eye, thus influencing public opinion.

At each of the decision points in a criminal case, both legal factors and extralegal factors impact outcomes, sometimes by affecting perceptions of the character of the defendant as well as the severity of the crime (cf. Finkelhor & Wolak, 2003; Merrall, Dhami, & Bird, 2010). It is important to understand how these factors interact and to investigate the character perceptions that may contribute to those outcomes. The development of an instrument that reliably measures perceptions of the character of criminal defendants would be useful to researchers as they examine legal outcomes at multiple decision points, especially if the scale was valid for use across varying types of crimes and defendants. In this article, we present an overview of the breadth of psychological research on extralegal factors affecting case outcomes, a discussion of the limits of measures currently used

**Perceptions of Criminal Defendants Scale: Development and Validation**

Donna Crawley, Casey Ramos, and Janelle Leyva
Ramapo College of New Jersey

**ABSTRACT.** A 10-item Perceptions of Criminal Defendants Scale (PCDS) was developed and validated in 3 studies. In Study 1, we compiled a list of 23 traits associated with criminal defendants and presented these items to 295 participants in the form of statements; participants rated the degree to which they agreed with each statement after reading 1 of 4 homicide cases. Principal components analyses of participants’ ratings yielded 10 items significantly loading on 1 primary factor measuring perceptions of the personal character of the defendant. This factor pattern was consistent across defendant gender, defendant race, and crime details. In Study 2, this 10-item scale was validated with a separate sample of 206 participants who responded to 1 of 3 biographies of publicly known defendants who had been previously pretested and ranked as being mildly, moderately, and severely negative people. The 10-item PCDS significantly distinguished between these 3 criminal defendants, $F(2, 201) = 140.48, p < .001, \eta^2 = .581$, with strong internal reliability ($\alpha = .94$). Factor analysis yielded the same factor structure as in Study 1. In Study 3, we examined the structure of the 10-item scale when applied to older and teenaged male defendants. Again, 1 primary component accounted for the variance, with factor loadings across ages replicating patterns found earlier. Confirmatory factor analysis reaffirmed the unidimensional structure of the PCDS. Based on these 3 studies, we believe that the PCDS is a useful instrument for measuring perceptions of the character of criminal defendants.
in this research, and a description of the development of a new scale to measure perceptions of defendants.

Past Research
Research into extralegal factors that affect the perception and treatment of criminal defendants is abundant in psychology. Examples of topics studied include the influence of the demographics and personality traits of both the defendant and the perceiver. For example, the majority of research on gender has found that adult female defendants are treated more leniently than male defendants, particularly with respect to sentencing (Gruhl & Welch, 1984; Herzog & Oreg, 2008; Kruttschnitt, 1985; Merrill et al., 2010; Steffensmeier & Demuth, 2006).

Socioeconomic status and race are also factors that have been found to play a role in the perception, and subsequent treatment, of defendants. Researchers have found that individuals coming from lower socioeconomic backgrounds were less likely to be represented effectively in legal proceedings than individuals from higher socioeconomic backgrounds (Daly & Tonry, 1997). Many studies have shown that minority defendants, particularly Black defendants, are treated more negatively in the criminal justice system and are given more severe sentences than comparable White defendants (Austin & Allen, 2000; Mustard, 2001; Stolzenberg, D’Alessio, & Eitle, 2013), although there have been inconsistent results when examining racial biases by juries (Mitchell, Haw, Pfeifer, & Meissner, 2005).

In addition, an examination of the interaction of race and gender has shown that race impacts sentencing for male defendants more than for female defendants (Freiburger & Hillinksi, 2013; Steffensmeier & Demuth, 2006). Interestingly, although race differences in treatment are quite apparent in examinations of differential treatment in actual legal records including police contacts (Crutchfield, Skinner, Haggerty, McGlynn, & Catalano, 2012) and sentencing records (ACLU, 2014; Mustard, 2001), race effects do not always appear in lab studies on the impact of race when judging defendants (cf. Crawley & Suarez, 2016).

Other variables studied include the age of defendants, with findings of leniency toward older defendants (Morrow, Vickovic, & Fradella, 2014; Mueller-Johnson & Dhami, 2010; Steffensmeier & Motivans, 2000), and more complex findings with respect to juveniles. For example, juvenile offenders may be shown leniency when judges decide whether or not to incarcerate. However, there appears not to be leniency in the length of sentence if incarcerated (Jordan & McNeal, 2016). In addition to defendant age, researchers have focused on such extralegal factors as the presentation of remorse by offenders (Corwin, Cramer, Griffin, & Brodsky, 2012; Everett & Nienstedt, 1999), and the defendant’s personal appearance including physical attractiveness (Abwender & Hough, 2001; Sigall & Ostrove, 1975), smiling (Abel & Watters, 2005), style of dress (Fontaine & Kiger, 1978), and tattoos (Funk & Todorov, 2013). Pretrial publicity (Hope, Memon, & McGeorge, 2004; Kovera, 2002; Ruva & Guenther, 2015; Steblay, Besirevic, Fulero, & Jimenez-Lorente, 1999) and juror characteristics such as attitudes toward the death penalty, empathy, and type of religious beliefs (Crawley & Suarez, 2016; Fitzgerald & Ellsworth, 1984; Miller, Maskaly, Peoples, & Sigillo, 2014) have all been subjects of psychological study regarding perceptions of criminal defendants.

The literature on defendant outcomes, and the factors impacting those outcomes, is broad and complex. The instruments used to measure outcomes have been more limited, however, and tend to focus on trial outcomes, with single-item measures of verdict and sentence. Certainly the outcomes of real trials are important, but they are not the only outcomes that matter in the treatment of a criminal defendant. In addition, verdict and sentence alone may not always be sensitive to biases operating at other decision points in a criminal case.

Common Methodologies
Several methodologies have been used to examine perceptions and treatments of criminal defendants (see Merrill et al., 2010). Some researchers analyze archival records of criminal justice outcomes (cf. Austin & Allen, 2000; Clarke & Koch, 1976; Crutchfield et al., 2012; Martin, 2014; Mustard, 2001; Stolzenberg et al., 2013). Others present descriptions of defendants or fictional trials, in print or via video, to participants, and measure their judgments about the defendant and about the crime itself (cf. Abwender & Hough, 2001; Crawley & Suarez, 2016; Gordon, Bindrim, McNicholas, & Walden, 1988; Mueller-Johnson & Dhami, 2010; Plumm & Terrance, 2009). Such participants may respond individually or in groups, acting as mock juries. In these studies, researchers generally have used single-item dependent measurements of perceived guilt and recommended sentence when
studying how extralegal factors affect judgments of criminal defendants (cf. Abwender & Hough, 2001; Corwin et al., 2012; Fontaine & Kiger, 1978; Miller et al., 2014; Najdowski & Bottoms, 2012). Some researchers have included additional measures such as bail recommendation, ratings of crime severity, likelihood of a repeat offense, or perception of the defendant’s future (cf. Gordon et al., 1988; Loeffler & Lawson, 2002) to investigate some nuances of a verdict or sentence, but often researchers use only the summary judgments of guilt and appropriate sentence. With single-item, summary dependent measures, it is not possible to separate out attitudes about the seriousness of the crime from perceptions of the character of the defendant. These perceptions are conflated within the verdict and within the recommended sentence.

In other studies, researchers have developed more nuanced measures, using scales specific to the topics, crime scenarios, or types of defendants under examination. For example, Crosby, Britner, Jodl, and Portwood (1995) used a 6-item Questionnaire on the Culpability of Juvenile Offenders in Capital Cases in addition to a sentencing item; Magyarics, Lynch, Golding, and Lippert (2015) created a 6-item Victim Fear and Distress subscale and a 5-item Defendant Intent to Cause Fear and Distress subscale to measure reactions specific to criminal stalking in addition to a measure of guilt. Côté-Lussier (2016) examined perceptions of criminals in general, without reference to specific defendants, using a 6-item scale assessing perceptions of criminal competitiveness and social status, 10 items measuring views of criminal competence and warmth, a set of 24 items measuring emotional response toward criminals, and 3 items on societal punitiveness. Some of Côté-Lussier’s measures could be rewritten for application to a target defendant, but in current form measure general attitudes, not case-specific perceptions.

All of these scales were useful and appropriately administered, but they would not be appropriate for use across crime types or to evaluate perceptions of individual defendants varying by age or situation. Similarly, guilt ratings and recommended sentences also may be inadequate dependent measures for investigating perceptions of defendants across situations and decision points. For example, such measures are not appropriate in evaluating the impact of extralegal factors on the decision to report a criminal act (cf. Finkelhor & Wolak, 2003; Weiss, 2013) or the decision of a prosecutor regarding a charge or plea offer (cf. Tonry, 2012).

We did not find a general scale that could be used in a wide range of studies involving judgments of defendants and legal outcomes.

A reliable method of capturing a more complex perception of a defendant, including views of the defendant’s character, would benefit psychological research. A method such as this would address the following problems with simple measures of perceived guilt and recommended sentence. First, perceived guilt and appropriate sentencing are often measured with single items, and as such may not be as reliable as more complex measures. Second, the measures commonly used do not assess specific aspects of how the defendant is viewed; rather, a summary judgment regarding guilt or a summary judgment of appropriate sentence is required of the participant. Such summary judgments may miss subtle differences in how various defendants are perceived, judged, and treated. In addition, summary judgments of guilt and sentence are not equivalent to perceptions of a criminal defendant’s character. Guilt may be decided based on the black letter law; perceptions of the personal character of a defendant may be more influenced by extralegal factors. Thus, a judgment about guilt should be a separate measure from a judgment of character. Finally, summary judgments of guilt or sentence conflate details of the alleged crime with judgments about the person accused of the crime. Although the details of a crime may affect how a defendant is viewed, perceptions of that defendant are not based only on the details of the crime. It would be helpful to have measures that disentangle perceptions of the criminal act from perceptions of the person allegedly committing the act.

Therefore, there is a need for a more sensitive measure, not based on a single item, to evaluate how a participant perceives a criminal defendant. Such a measure may be able to pick up on nuances of judgment that single-item measures of guilt and sentence do not. The current project was designed to develop and validate a multi-item, unidimensional scale that would measure how a criminal defendant is perceived. We were interested in a measure that would focus on the defendant as an individual within the context of the criminal case. Our goal was to develop a scale that could accurately measure fine variations in perceptions toward criminal defendants, and that was applicable across various types of defendants and crimes.
Study 1: Scale Development

Method

Participants. There were 295 participants in this study, solicited via Amazon Mechanical Turk (MTurk); 139 identified as men, 152 as women, and 2 as transgender. Participants ranged in age from 18 to 76 years old, with a mean age of 30.41 (SD = 10.98). Two hundred twenty-five reported their race as White, 24 identified as Asian, 18 as Hispanic, 13 as Black, and 15 as multiracial or another racial category.

Materials and procedure. After institutional review board approval (#306) was given, we created an online survey, which included four homicide scenarios, differing in the race and the gender of the defendant and crime details. Four scenarios were included to afford us the opportunity to examine principal components analysis results for these 23 items when applied to various types of people and at least two different crime scenarios. Each participant was randomly assigned to one of the four scenarios. Following the crime description, the survey included a 6-point Likert-type scale, ranging from 1 (strongly agree) to 6 (strongly disagree). Participants were asked to rate the degree to which they agreed with each of 23 statements regarding their perceptions of the criminal defendant in the scenario. A written debriefing was included at the end of the survey.

The different crime scenarios included a White man who allegedly killed another driver while texting and driving, a Black man who allegedly shot a person who had killed his son in a drunk driving accident, a Hispanic woman who allegedly killed another driver while texting and driving, and an Asian woman who allegedly shot a person who killed her son in a drunk driving accident. Fictional mug shots of the individuals were included with the written scenarios. We created the mug shots; the pictures did not depict real individuals. Any resemblance to actual persons is purely coincidental. The texts and mug shots used are included in Appendix A.

To compile the set of 23 response statements, we collected lists of traits that have been associated with criminal defendants in the forensic psychology literature. In addition, we informally interviewed personal acquaintances regarding their thoughts about criminal defendants. For the final list, we included only items that were mentioned by more than one source. The resulting list of 23 items included such concepts as the degree to which the perceiver feared the defendant, perception of cruelty in the defendant, degree of defendant’s self-centeredness, the defendant’s capability of understanding the consequences of actions, whether or not the defendant deserves mercy, and degree of defendant remorse. See Table 1 for the full list of 23 items.

The survey was posted online and adult participants could take the survey for a compensation of $1.00. Following a consent statement, each participant was randomly assigned to read one of the four crime scenarios and then anonymously responded to the 23-item survey about the defendant. The last questions asked for demographic information about the participant. Following the survey questions, participants were debriefed.

Results

A principal components analysis was performed on SPSS, with 25 iterations. Results were consistent regardless of rotations. Therefore, we used the
results without rotation. The components derived were limited to those with eigenvalues above 1. When examining how the individual items loaded on components, only loadings of .50 or higher were considered in order to facilitate the interpretation of the components. Overall, there were five components or factors. Factor 1 accounted for 28.55% of the variance and reflected perceptions of the character of the defendant as a person, Factor 2 accounted for 13.90% of the variance and dealt with aspects of the crime, Factor 3 accounted for 8.36% of the variance and dealt with aspects of the crime and impact to victim; the other two factors accounted for 10.90% of the variance together, but were not clearly interpretable. We retained the 13 items that loaded above .50 on the first principal component focusing on the defendant as a person and discarded the items loading on the other components.

We then conducted a series of follow-up principal component analyses on subsets of data in order to make sure that the factor structure for our final scale would be the same regardless of defendant race, defendant gender, type of crime, or respondent gender. Therefore, we selected the final set of items to have a similar pattern of loadings regardless of defendant race, gender, or type of crime. To be selected for the final scale, an item must have had a loading of .50 or higher on the first principal component in at least 9 out of the 10 follow-up factor analyses. In every analysis, the first component reflected perceptions of the defendant as a person. The follow-up analyses were conducted on the following subsets of data: (a) female defendant cases only; (b) male defendant cases only; (c) the Asian defendant case; (d) the Black defendant case; (e) the Hispanic defendant case; (f) the White defendant case; (g) the texting cases; (h) the shooting cases; (i) female respondents across cases; and (j) male respondents across cases.

We selected the final set of items to create a unidimensional scale that focused on perceptions of the defendant as a person, rather than perception of the crime or impact on the victim(s). The follow-up factor analyses yielded 10 items that loaded on one primary component in similar ways, resulting in a 10-item Perceptions of Criminal Defendants Scale (PCDS). The 10 items included: degree to which the defendant is feared, perception of cruelty, perception of the defendant as an evil person, perception of the defendant as emotionally cold, degree to which the defendant deserves mercy, perceived likelihood of committing future crimes, probability of prior criminal record, perception of trustworthiness, severity of appropriate bail for the defendant, and recommended type of sentence. See Table 2 for an overview of all factor analysis results.

Study 2: Scale Validation—Perceptions of Well-Known Criminal Defendants

To validate the scale, we selected three publicly known criminal defendants (Plaxico Burress, Jeffrey Dahmer, and Bernie Madoff) who differed in how severely they seemed to be viewed by the public. To ensure that people ranked these criminals consistently, we asked 37 people in a convenience sample to rank the criminal defendants from most severe/most negative to least severe/least negative. Out of the 37 participants, 20 identified as women and 17 as men, with an age range from 18 to 78. Of the 37, 33 ranked Dahmer the worst, then Madoff, and then Burress. Four rated Madoff the worst, followed by Dahmer, and Burress. A Friedman’s analysis indicated that the majority of participants ranked the criminal defendants in a consistent order, χ²(2, N = 37) = 66.86, p < .0001. Post-hoc analyses with Wilcoxon Signed Rank tests indicated that significant differences existed between all pairs of defendants: Dahmer versus Madoff, Z = -4.77, p < .001; Dahmer versus Burress, Z = -5.82, p < .001; Madoff versus Burress, Z = -5.82, p < .001. All three defendants were used as the stimuli in this validation study.

Method

Participants. There were 206 total participants; 70 participants identified as women, 136 identified as men. They ranged in age from 19 to 67 years old, with a mean age of 32.47 (SD = 9.30). These participants were compensated $0.50 via Mturk. Among the participants, 154 identified as White, 25 as Asian, 11 as Black, 9 as Hispanic, and 7 as multiracial or another racial category.

Materials and procedure. An online survey was created that included biographies of the three well-known criminal defendants: Burress, Dahmer, and Madoff. The brief biographies used are presented in Appendix B. After a biography was presented, the survey included the 10-item PCDS developed in Study 1 with 6-point response scales. Participants were asked to rate the degree to which they agreed with each of the first nine statements, and to select a sentencing category for the 10th item. See Appendix C for the PCDS. A debriefing was also included at the end of the survey.
### TABLE 2

Consistency of Item Loadings Across Development Analyses in Study 1 and Cross Validation Item Loadings in Study 2, Study 3, and Caposela et al. (2017)

#### Study 1 Full Data Set

<table>
<thead>
<tr>
<th>Items</th>
<th>Across All Participants (N = 295)</th>
<th>Female Defendant Scenarios (N = 140)</th>
<th>Male Defendant Scenarios (N = 155)</th>
<th>Texting and Driving Scenarios (N = 143)</th>
<th>Shooting of Drunk Driver Scenarios (N = 152)</th>
<th>Asian Female Scenario (N = 68)</th>
<th>Black Male Scenario (N = 84)</th>
<th>Hispanic Female Defendant (N = 72)</th>
<th>White Male Defendant (N = 71)</th>
<th>Female Participants Across Scenarios (N = 152)</th>
<th>Male Participants Across Scenarios (N = 139)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am fearful of this individual</td>
<td>.67</td>
<td>.63</td>
<td>.68</td>
<td>.63</td>
<td>.72</td>
<td>.62</td>
<td>.69</td>
<td>.57</td>
<td>.66</td>
<td>.66</td>
<td>.67</td>
</tr>
<tr>
<td>This individual appears to be cruel</td>
<td>.77</td>
<td>.75</td>
<td>.79</td>
<td>.81</td>
<td>.79</td>
<td>.70</td>
<td>.83</td>
<td>.82</td>
<td>.79</td>
<td>.79</td>
<td>.74</td>
</tr>
<tr>
<td>This individual is an evil person</td>
<td>.78</td>
<td>.76</td>
<td>.77</td>
<td>.79</td>
<td>.78</td>
<td>.75</td>
<td>.80</td>
<td>.83</td>
<td>.76</td>
<td>.76</td>
<td>.77</td>
</tr>
<tr>
<td>This individual is emotionally cold</td>
<td>.71</td>
<td>.66</td>
<td>.77</td>
<td>.69</td>
<td>.71</td>
<td>.58</td>
<td>.80</td>
<td>.63</td>
<td>.73</td>
<td>.76</td>
<td>.66</td>
</tr>
<tr>
<td>This individual deserves mercy (reversed)</td>
<td>.68</td>
<td>.64</td>
<td>.70</td>
<td>.59</td>
<td>.72</td>
<td>.64</td>
<td>.78</td>
<td>.65</td>
<td>.54</td>
<td>.62</td>
<td>.74</td>
</tr>
<tr>
<td>… likely to commit a crime in the future</td>
<td>.72</td>
<td>.71</td>
<td>.74</td>
<td>.71</td>
<td>.72</td>
<td>.69</td>
<td>.75</td>
<td>.69</td>
<td>.73</td>
<td>.71</td>
<td>.71</td>
</tr>
<tr>
<td>… probably has a prior record</td>
<td>.69</td>
<td>.68</td>
<td>.74</td>
<td>.71</td>
<td>.68</td>
<td>.61</td>
<td>.75</td>
<td>.72</td>
<td>.75</td>
<td>.63</td>
<td>.71</td>
</tr>
<tr>
<td>This individual seems trustworthy (reversed)</td>
<td>.56</td>
<td>.60</td>
<td>.54</td>
<td>.52</td>
<td>.54</td>
<td>.58</td>
<td>.55</td>
<td>.56</td>
<td>.46</td>
<td>.61</td>
<td>.52</td>
</tr>
<tr>
<td>I would set the bail very high …</td>
<td>.66</td>
<td>.65</td>
<td>.71</td>
<td>.60</td>
<td>.67</td>
<td>.70</td>
<td>.67</td>
<td>.47</td>
<td>.72</td>
<td>.59</td>
<td>.71</td>
</tr>
<tr>
<td>… type of sentence … you recommend</td>
<td>.62</td>
<td>.59</td>
<td>.67</td>
<td>.56</td>
<td>.64</td>
<td>.57</td>
<td>.66</td>
<td>.45</td>
<td>.66</td>
<td>.50</td>
<td>.70</td>
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</table>

#### Study 1 Subsets of Data

<table>
<thead>
<tr>
<th>Items</th>
<th>Female Participants Across Scenarios (N = 152)</th>
<th>Male Participants Across Scenarios (N = 139)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am fearful of this individual</td>
<td>.66</td>
<td>.66</td>
</tr>
<tr>
<td>This individual appears to be cruel</td>
<td>.79</td>
<td>.79</td>
</tr>
<tr>
<td>This individual is an evil person</td>
<td>.76</td>
<td>.76</td>
</tr>
<tr>
<td>This individual is emotionally cold</td>
<td>.69</td>
<td>.69</td>
</tr>
<tr>
<td>This individual deserves mercy (reversed)</td>
<td>.63</td>
<td>.63</td>
</tr>
<tr>
<td>… likely to commit a crime in the future</td>
<td>.72</td>
<td>.72</td>
</tr>
<tr>
<td>… probably has a prior record</td>
<td>.68</td>
<td>.68</td>
</tr>
<tr>
<td>This individual seems trustworthy (reversed)</td>
<td>.58</td>
<td>.58</td>
</tr>
<tr>
<td>I would set the bail very high …</td>
<td>.65</td>
<td>.65</td>
</tr>
<tr>
<td>… type of sentence … you recommend</td>
<td>.57</td>
<td>.57</td>
</tr>
</tbody>
</table>

#### Study 2

<table>
<thead>
<tr>
<th>Items</th>
<th>Known Criminals Validation Study (N = 206)</th>
<th>Male Defendants in their 50s (N = 134)</th>
<th>Male Defendants, teenaged (N = 162)</th>
<th>Criminal motives and perception of defendants (N = 438)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am fearful of this individual</td>
<td>.58</td>
<td>.71</td>
<td>.76</td>
<td>.67</td>
</tr>
<tr>
<td>This individual appears to be cruel</td>
<td>.92</td>
<td>.88</td>
<td>.84</td>
<td>.89</td>
</tr>
<tr>
<td>This individual is an evil person</td>
<td>.92</td>
<td>.82</td>
<td>.84</td>
<td>.87</td>
</tr>
<tr>
<td>This individual is emotionally cold</td>
<td>.90</td>
<td>.79</td>
<td>.84</td>
<td>.85</td>
</tr>
<tr>
<td>This individual deserves mercy (reversed)</td>
<td>.75</td>
<td>.65</td>
<td>.60</td>
<td>.75</td>
</tr>
<tr>
<td>… likely to commit a crime in the future</td>
<td>.86</td>
<td>.79</td>
<td>.87</td>
<td>.85</td>
</tr>
<tr>
<td>… probably has a prior record</td>
<td>.61</td>
<td>.75</td>
<td>.81</td>
<td>.70</td>
</tr>
<tr>
<td>This individual seems trustworthy (reversed)</td>
<td>.76</td>
<td>.43</td>
<td>.48</td>
<td>.70</td>
</tr>
<tr>
<td>I would set the bail very high …</td>
<td>.85</td>
<td>.74</td>
<td>.79</td>
<td>.77</td>
</tr>
<tr>
<td>… type of sentence … you recommend</td>
<td>.91</td>
<td>.71</td>
<td>.68</td>
<td>.84</td>
</tr>
</tbody>
</table>

#### Study 3 Subsets of Data

<table>
<thead>
<tr>
<th>Items</th>
<th>Male Defendants, teenaged (N = 162)</th>
<th>Criminal motives and perception of defendants (N = 438)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am fearful of this individual</td>
<td>.76</td>
<td>.67</td>
</tr>
<tr>
<td>This individual appears to be cruel</td>
<td>.84</td>
<td>.89</td>
</tr>
<tr>
<td>This individual is an evil person</td>
<td>.84</td>
<td>.87</td>
</tr>
<tr>
<td>This individual is emotionally cold</td>
<td>.84</td>
<td>.85</td>
</tr>
<tr>
<td>This individual deserves mercy (reversed)</td>
<td>.60</td>
<td>.75</td>
</tr>
<tr>
<td>… likely to commit a crime in the future</td>
<td>.87</td>
<td>.85</td>
</tr>
<tr>
<td>… probably has a prior record</td>
<td>.81</td>
<td>.70</td>
</tr>
<tr>
<td>This individual seems trustworthy (reversed)</td>
<td>.48</td>
<td>.70</td>
</tr>
<tr>
<td>I would set the bail very high …</td>
<td>.79</td>
<td>.77</td>
</tr>
<tr>
<td>… type of sentence … you recommend</td>
<td>.68</td>
<td>.84</td>
</tr>
</tbody>
</table>

#### Caposela, Segovia, Zhang, & Crawley (2017)

<table>
<thead>
<tr>
<th>Items</th>
<th>Criminal motives and perception of defendants (N = 438)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am fearful of this individual</td>
<td>.67</td>
</tr>
<tr>
<td>This individual appears to be cruel</td>
<td>.89</td>
</tr>
<tr>
<td>This individual is an evil person</td>
<td>.87</td>
</tr>
<tr>
<td>This individual is emotionally cold</td>
<td>.85</td>
</tr>
<tr>
<td>This individual deserves mercy (reversed)</td>
<td>.75</td>
</tr>
<tr>
<td>… likely to commit a crime in the future</td>
<td>.85</td>
</tr>
<tr>
<td>… probably has a prior record</td>
<td>.70</td>
</tr>
<tr>
<td>This individual seems trustworthy (reversed)</td>
<td>.70</td>
</tr>
<tr>
<td>I would set the bail very high …</td>
<td>.77</td>
</tr>
<tr>
<td>… type of sentence … you recommend</td>
<td>.84</td>
</tr>
</tbody>
</table>

### Cronbach’s alpha

<table>
<thead>
<tr>
<th>Items</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am fearful of this individual</td>
<td>.94</td>
</tr>
<tr>
<td>This individual appears to be cruel</td>
<td>.90</td>
</tr>
<tr>
<td>This individual is an evil person</td>
<td>.92</td>
</tr>
<tr>
<td>This individual is emotionally cold</td>
<td>.93</td>
</tr>
</tbody>
</table>
The online survey opened with a consent statement. Each participant indicated consent, was randomly assigned to read one of the three biographies, and completed the PCDS for that one defendant. Following the survey, participants were debriefed.

Results
Mean scores on the PCDS indicated significantly different perceptions of these three defendants, \( F(2, 201) = 140.48, p < .001, \eta^2 = .581. \) The scale distinguished between these criminal defendants, with an overall Cronbach’s alpha of .94. The criminal defendants were rated comparably to their rankings in the pilot study, with Jeffrey Dahmer being rated most harshly (\( M = 5.22, SD = 0.71, N = 65 \)), Bernie Madoff slightly less so (\( M = 4.50, SD = 0.62, N = 69 \)), and Plaxico Burress most leniently (\( M = 3.04, SD = 0.96, N = 72 \)); see Table 3. Tukey HSD post-hoc analyses indicated that all three means were significantly different from one another, \( p < .001. \)

Principal components analysis on these data indicated that the 10 items loaded on one component, which accounted for 69.49% of the variance, as presented in Table 2.

Study 3: Scale Validation—Perceptions of Defendants by Age

Taken together, Studies 1 and 2 provided evidence for consistent factor analysis results for the 10-item PCDS scale, regardless of the type of crime, race, or gender of the defendant, and regardless of the gender of the respondent. However, we had not demonstrated that the resulting component structure was the same for defendants of different ages, holding the crime constant. In addition, confirmatory factor analysis, across ages, would be useful to support the unidimensional nature of the scale. Finally, an indication that the PCDS measures something different from guilt would provide discriminant validity for the scale. Study 3 was designed to address these issues.

Participants were presented with a shooting scenario similar to that used in Study 1, with one of six defendants pictured: two older defendants and four teenage defendants. Given that factor analyses had already been conducted for adult defendants in Study 2, we decided to include four rather than only two teen defendants in Study 3 in order to increase the validity of the structure analyses by age. Headshots of Black and White men were selected from public websites to be comparable in pose. The men were either in their 50s or were teenagers. In a pretest of nine pictures, 24 participants provided valid ratings for all 9 pictures, using a 10-point scale from 10 (extremely attractive) to 1 (extremely unattractive). Ten participants self-identified as women and 14 as men, with ages ranging from 18 to 65 (\( M = 31.88, SD = 9.32 \)); 20 of the 24 identified as White.

As a result of the pretest, three pictures were discarded because they were rated much lower than the others, \( F(1,23) = 243.63, p < .001, \eta^2 = .91. \) Six pictures were selected for use; the mean ratings for these six were not significantly different. These six included a 54-year-old Black man (\( M = 5.30, SD = 1.70, Mode = 6 \)), a 50-year-old White man (\( M = 5.39, SD = 1.65, Mode = 6 \)), a Black 16-year-old male teen (\( M = 5.25, SD = 2.05, Mode = 5 \)), a second Black 16-year-old male teen (\( M = 5.29, SD = 2.14, Mode = 6 \)), a White 18-year-old male teen (\( M = 5.04, SD = 1.88, Mode = 5 \)), and a 16-year-old White male teen (\( M = 4.54, SD = 1.89, Mode = 5 \)). The dependent measures for this study included the PCDS, a rating of the likelihood that the defendant was guilty, and an estimate of defendant age.

Method
Participants. A total of 317 participants completed an online study via Mturk and were compensated \$0.50; 128 identified as women and 186 as men. The mean age was 35.47 (SD = 11.96), with a range from 19 to 77. The most common racial identification was White (\( n = 241 \)); other racial identities included Asian (\( n = 27 \)), Black (\( n = 22 \)), Hispanic (\( n = 17 \)), multiracial and other identities (\( n = 10 \)).

Materials and procedure. After reading the consent statement, participants were presented with a one-paragraph description of a male defendant who was accused of shooting and killing a drunk driver who had hit and killed the defendant’s young nephew. The defendant was described as either an “older man” or a “young man,” and a picture of

<table>
<thead>
<tr>
<th>Defendants</th>
<th>PCDS Score</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jeffrey Dahmer</td>
<td>5.23 (SD = 0.71)</td>
<td>65</td>
</tr>
<tr>
<td>Bernie Madoff</td>
<td>4.50 (SD = 0.62)</td>
<td>69</td>
</tr>
<tr>
<td>Plaxico Burress</td>
<td>3.04 (SD = 0.96)</td>
<td>72</td>
</tr>
</tbody>
</table>

Note. All three mean scores are significantly different from one another, \( F(2, 201) = 140.48, p < .001, \eta^2 = .58. \)
Perceptions of Criminal Defendants Scale | Crawley, Ramos, and Leyva

the defendant was included with the paragraph to reinforce the age of the defendant. The defendant was pictured as either Black or White. Thus, there were six versions of the case.

After the case description, the 10-item PCDS was presented, followed by a 6-point rating scale asking the participant’s judgment of the likelihood that the defendant was guilty of homicide. Finally, participants were asked to estimate the age of the defendant, as a manipulation check.

The online survey opened with a consent statement. Each participant indicated consent, and was randomly assigned to one of the six versions of the survey. Following the survey, participants were debriefed.

Results

Structure. Principal components analyses were conducted separately for two subsets of the data (i.e., the older male defendants and the teenage defendants) in order to determine whether the structure was the same across age. Twenty-one participants either judged a teenage defendant to be over the age of 26 or judged the adult defendant to be younger than 30; these participants were deleted from the data set for all age-related analyses.

For the two older defendants, the factor analysis yielded one primary component with an eigenvalue significantly above 1. Nine of the 10 items loaded above .50 on that component. The 10th item (trustworthiness) loaded on a second component all by itself, with an eigenvalue of only 1.07. The primary component accounted for 53.99% of the variance, with high reliability (α = .90).

For the younger defendants, the factor analysis also yielded one primary component with an eigenvalue significantly above 1. Again nine items loaded above .50 on that component. Similar to the analysis for older defendants, the 10th item (trustworthiness) loaded on a second component all by itself, with an eigenvalue of 1.23. The primary component accounted for 57.69% of the variance, with high reliability (α = .92). These analyses indicate that the scale is structured similarly for both age groups, and has a structure similar to that found in Study 1. See Table 2.

Confirmatory Factor Analysis (CFA). We performed a CFA using AMOS SPSS with all of the data together to test the fit of a model with one latent variable, which we labeled as “criminal character,” underlying all 10 of the PCDS items. The criteria used to evaluate the model fit included the following: the chi-squared value (CMIN) and CMIN/df, which should be less than 5, and ideally less than 2; the comparative fit index (CFI), which should be greater than .90; root mean square of error approximation (RMSEA), less than .08 for a good fit and less than .05 for an excellent fit; goodness of fit (GFI), which should be greater than .90; and parsimony-adjusted goodness of fit (PGFI) larger than .50 (cf. Kämpfe & Mitte, 2009). After the first CFA, modification indices pointed to the covariation of four sets of variables: perception of the person as evil and as cold; judgment of the person deserving mercy and recommended type of sentence; estimates of future criminal behavior and assumptions of a past criminal record; perception of trustworthiness and deserving mercy. Although trustworthiness has a low loading (.37) with this model, the fit was better than when trustworthiness was taken out. The best model, therefore, has one latent variable, as presented in Figure 1. Loadings are above .50 for 9 of the 10 items. The chi-squared is significant, CMIN = 73.12, p < .001, with CMIN/df = 2.36. Other indices of fit are strong: CFI = .98, RMSEA = .07, GFI = .95, PGFI = .54.

Age and race effects on PCDS scores and guilt. Significant effects were found for age on the PCDS scores, F(1, 292) = 4.71, p = .04, η² = .015. The younger defendants were rated more harshly on the PCDS (M = 3.32, SD = 0.99) than the older defendants (M = 3.08, SD = 0.90).

No significant age or race effects were found for the ratings of guilt. Thus, the PCDS detected a difference by the age of the defendant that the single measure of guilt did not. This implies that the PCDS measures something other than just perceptions of guilt; the correlation between the PCDS score and guilt rating was small, albeit significant, r(315) = .21, p < .01.

Age and race effects on age estimation. Accuracy in age estimation was examined as a function of defendant age and race. Accuracy was defined as the estimated age minus the actual age of the defendant. There were significant effects for defendant age group; participants tended to estimate the older defendants as younger than they really were (M = 6.78, SD = 6.89), while estimating that the teens were older than they actually were (M = 4.34, SD = 2.85), F(1, 290) = 350.25, p < .001, η² = .547. Although there was no main effect for defendant race, a significant interaction between defendant age group and race emerged, F(1, 290) = 4.92, p = .03, η² = .017. Black teens (M = 5.03, SD = 2.56) were erroneously estimated to be significantly older than were their White counterparts (M = 3.65,
Discussion

Numerous factors affect impressions of criminal defendants and thereby may impact the outcomes of criminal cases. There are considerations of race, gender, socioeconomic status, and age, as well as emotional presentation, past record and appearance (cf. Ruva & Guenther, 2015; Steffensmeier & Demuth, 2006) among others. In turn, characteristics of the individuals making outcome decisions are also relevant. For example, there are systematic differences in judgments by jurors who are death-qualified and jurors who are excludables (Ellsworth, 1991; Thompson, Cowan, Ellsworth, & Harrington, 1984) and various attitudinal effects based on the similarity between a juror and defendant (Taylor & Hosch, 2004). Many studies have been conducted in forensic psychology on the legal and extralegal factors affecting case outcomes. Commonly, the dependent variables in these types of studies have been judgments of guilt and/or appropriate sentence (cf. Miller et al., 2014). However, these measures do not adequately measure perceptions of defendants across situations, and are not relevant at all of the decision points affecting legal outcomes.

Summary of Current Results

There is a need for a valid and reliable measure of personal assessments of defendants that would be useful across types of criminal cases and for investigations of multiple decision points in a case. We addressed this need by creating a multi-item, one-dimensional scale to measure perceptions of criminal defendants—specifically perceptions of the character of the defendant. Items were selected after a series of factor analyses in Study 1 to ensure that the scale would have the same structure and utility regardless of defendant race, defendant gender, type of crime, or respondent gender. Study 2 confirmed that structure, and the results of Study 3 indicate that the structure is consistent across defendant age as well. Confirmatory Factor Analysis supported the one latent variable model for the scale.

The validity of the scale was demonstrated in Study 2; the scale significantly differentiated between criminal defendants known to be different in public opinion. Furthermore, in Study 3, the scale was sensitive to differences in perceptions based on the age of the defendant when a single
item of judgment of guilt was not. This provides evidence for the utility of the scale, and also provides some discriminant validity in distinguishing the scale measurement from simple guilt assumptions. Finally, across all three studies, the Perceptions of Criminal Defendants Scale (PCDS) had high internal reliability.

We note that the findings of Study 3 regarding age estimation for Black and White teens were similar to the results of previous research (e.g., Goff, Jackson, DiLeone, Culotta, & DiTomasso, 2014). The Black teens were judged to be older than they actually were, whereas White teens were judged more accurately. Goff et al. found racial biases in outcomes for Black juveniles, associated with misjudgments of age and consequent attributions of maturity, lack of innocence, and responsibility for actions. Although we found differences in age estimation accuracy as a function of race for teen defendants, we did not find differences in PCDS scores for Black and White teens. This may raise a question regarding the validity of the PCDS with respect to measuring differences in perceptions of young defendants due to misinterpretations of age by race. However, one reason for the discrepancy between the perceptions of teen defendants in our study and the findings of Goff et al. is that in very few cases were the teens of either race judged as children in our study; only 6.79% of age estimates for the teens were under 17. The teen defendants in our study were perceived as young adults rather than as juveniles, which may mitigate the effects of age misjudgment.

We first studied the validity of the PCDS in Study 2; in that design, we used defendants known to be viewed differently in public opinion. Results indicated that the scale significantly differentiated the perceptions of character for these defendants. However, these three defendants had committed very different types of crimes (murder, fraud, and weapons offense), were very different from one another in public perception, were all well-known figures, and had already been adjudicated. Further validation with unknown defendants, and more similar crimes, would be a better test of the sensitivity of the PCDS.

A recent study by Caposela, Segovia, Zhang, and Crawley (2017) addressed this issue. These researchers used the PCDS to investigate the impact of criminal motive on perceptions of defendants. Participants were presented with a written description of either a violent (third-degree murder) or white-collar (securities fraud) crime. Within each crime type, one of three defendant motives was embedded in the description: prosocial (the crime committed to aid another person), trauma (the crime resulted from a negative personal circumstance), or no extenuating motive (the crime was committed from rage or greed). After reading the description, participants completed the PCDS and were also asked to rate how guilty they thought the defendant was of the charge.

Results indicated that the PCDS was useful in measuring participants’ views of the defendants based on motive for both the violent and white-collar crime. As expected, criminal motive significantly affected perceptions of the defendants as measured by PCDS scores. Interestingly, ratings of guilt were significantly impacted by motive for the violent crime, but not for the white-collar crime. Thus, the PCDS picked up variations in perception that guilt ratings alone would have missed for the white-collar scenarios. These results are similar to those in Study 3 and support the validity and sensitivity of the scale, as well as provide more evidence that the scale is distinct from guilty judgments. Finally, a principal components analysis conducted with the Caposela et al. (2017) data resulted in the same unidimensional structure (see Table 2).

Across these studies, the utility of the PCDS in measuring perceptions of a defendant was validated across five different types of crime scenarios: serial murder, two types of financial fraud, weapons offense, and manslaughter. Furthermore, some items on the PCDS have face validity when considered in light of research findings on factors influencing legal judgments. For example, one theory to explain the greater leniency in sentencing shown to women is that, in complex cases with an overload of information, judges and prosecutors rely, in part, on preconceived attributions when making sentencing decisions. Two of these attributions are blameworthiness and dangerousness; judges tend to attribute less dangerousness to female defendants and thus may give women lighter sentences (cf. Rodriguez, Curry, & Lee, 2006). Given this effect, the PCDS items measuring fear of the defendant, the perceived attributes of cruelty and evil, and judgments of the likelihood of committing a crime in the future appear relevant and useful.

Limitations and Future Research
A key limitation of this research is the use of Mturk to solicit participants in all three studies. Mturk, a crowdsourcing platform sponsored by Amazon, has tremendous advantages. As discussed by Miller,
toward a defendant in the news, whether a pros-
whether a citizen will be outraged or sympathetic
or not a crime victim or observer will call the police,
character can help psychologists to predict whether
attributes that a person perceives in a defendant's
outcomes. An accurate measure of the types of
it will detect perceptions of defendants that
range of criminal defendant cases is needed.
guilt alone does not. Confirmation of this across a
the PCDS can measure effects that a judgment of
utility over and above single-item measures of guilt
remain that the PCDS provides
identity, and other defendant variables. It remains
might occur due to gender, economic class, racial
and race. Additional research is needed to test the
sensitivity in measuring differences in perception based on defendant age
and mock juror on U.S. participants, judgment and sentencing
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Crowe, Weiss, Maples-Keller, and Lynam (2017). Mturk is very efficient; large samples, with greater
diversity than often available in college student
samples, can be obtained quickly and at low cost. Mturk also allows for some filtering of participants
and flexibility in study design; for research requiring
large sample sizes such as scale creation, Mturk
can be very effective.

Samples obtained via Mturk tend to be more
educated and younger, to be over representative of
White and Asian adults, and to have a disproportion
of adults who are home during the day (Miller et al.,
2017). Thus, Mturk samples are not representative of
all adults in the United States. However, they have
been found to be as reliable as samples solicited
via traditional methods with respect to data quality
(cf. Buhrmester, Kwang, & Gosling, 2011). In the
current studies, the lack of diversity presented
an obstacle to certain analyses. Given the limited
racial diversity in the samples used in Studies 1, 2,
and 3, it was not possible to verify that the PCDS
has the same structure and utility for participants
with diverse racial identities. Further research is
needed with varying types of samples to ascertain
the stability of the structure for different types of
respondents.

Another limitation is that the PCDS needs fur
validation. In Study 3, we tested the structure of
the scale, and examined its sensitivity in measuring
differences in perception based on defendant age
and race. Additional research is needed to test the
sensitivity of the scale in measuring effects that
might occur due to gender, economic class, racial
identity, and other defendant variables. It remains
be fully demonstrated that the PCDS provides
utility over and above single-item measures of guilt
or recommended sentence. Study 3 suggests that
the PCDS can measure effects that a judgment of
guilt alone does not. Confirmation of this across a
range of criminal defendant cases is needed.

We believe that the PCDS scale is useful and
that it will detect perceptions of defendants that
may not be captured by current methodologies,
thus facilitating better understanding of case
outcomes. An accurate measure of the types of
attributes that a person perceives in a defendant’s
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or not a crime victim or observer will call the police,
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toward a defendant in the news, whether a pros-
ecuter will decide to charge a defendant with a
lesser crime when there is possible discretion, and
whether a juror will vote to convict or acquit.

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Perceptions of Criminal Defendants Scale

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In Texas a mother is being charged with gunning down a suspected drunken driver who struck and killed her son. Lily XXXX, 28, is accused of taking the law into her own hands, executing the driver who authorities say killed her son, age 6, in a November 2015 crash. The accident happened near Waco, Texas. Lily’s car had run out of gas and she was outside of the car with her son waiting for AAA, when an alleged drunk driver lost control of the car and hit the son. Prosecutors say the enraged mother grabbed a gun and shot the 20-year-old in the head. Lily’s spouse stated that they were already devastated at the loss of their son and now she fears the loss of her husband, if convicted. The case features many complexities. Police never found the gun. Lily’s spouse said that she was trying to revive the son at the time of the crime. However, an eyewitness stated that he saw Lily with a gun, although he did not witness an actual shooting. These charges, at this point, are allegations and the trial is pending.

In Texas a father is being charged with gunning down a suspected drunken driver who struck and killed his son. Brandon XXXX, 28, is accused of taking the law into his own hands, executing the driver who authorities say killed his son, age 6, in a November 2015 crash. The accident happened near Waco, Texas. Brandon’s car had run out of gas and he was outside of the car with his son waiting for AAA, when an alleged drunk driver lost control of the car and hit the son. Prosecutors say the enraged father grabbed a gun and shot the 20-year-old in the head. Brandon’s spouse stated that they were already devastated at the loss of their son and now she fears the loss of her husband, if convicted. The case features many complexities. Police never found the gun. Brandon’s spouse said that he was trying to revive the son at the time of the crime. However, an eyewitness stated that he saw Brandon with a gun, although he did not witness an actual shooting. These charges, at this point, are allegations and the trial is pending.

A 22-year-old female has been charged in New Jersey with manslaughter, assault, and texting while driving in connection with a June 2013 fatality collision. It’s a moment the young driver can never take back, and one prosecutor said could have been avoided if she just put down her phone. According to the County prosecutor, Maria XXXX was texting on her cell phone when she lost control of her vehicle and collided with a car, killing the driver. Maria was allegedly looking at her cell phone and texting when she ran off the side of the road. When she returned her vehicle to the road, she struck a car heading in the opposite direction. These charges, at this point, are allegations and the trial is pending.

A 22-year-old male has been charged in New Jersey with manslaughter, assault, and texting while driving in connection with a June 2013 fatality collision. It’s a moment the young driver can never take back, and one prosecutor said could have been avoided if he just put down his phone. According to the County prosecutor, John XXXX, was allegedly texting on his cell phone when he lost control of his vehicle and collided with a car, killing the driver. John was allegedly looking at his cell phone and texting when he ran off the side of the road. When he returned his vehicle to the road, he struck a car heading in the opposite direction. These charges, at this point, are allegations and the trial is pending.

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