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The indirect association of personality with perceived stress as mediated by humor in university students during COVID-19

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PERSONALITY, HUMOR, AND PERCEIVED STRESS

**The Indirect Association of Personality with Perceived Stress as Mediated by Humor in
University Students During COVID-19**

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Abstract

Humor is known to be an effective coping strategy due to its stress-reducing capabilities (Overholser, 1992; Peterson & Seligman, 2004). However, more recent research into humor has revealed it can also lead to increased levels of stress (Fritz et al., 2017; Martin et al., 2003). Extraverts tend to have positive emotions and are better able to cope with stressful emotions (Ford et al., 2016). However, individuals higher in neuroticism are more likely to engage in maladaptive types of coping strategies and humor (Greengross et al., 2011), putting them at a higher risk for increased stress levels. The current research utilized a two-study design to further explore the relation between personality factors and perceived stress by examining whether humor mediates this association. In Study 1, 342 undergraduate students completed personality, coping humor, and stress measures. Contrary to the hypothesis, coping humor did not significantly mediate personality and perceived stress. Study 2 extended these findings by examining four humor styles as mediators in 311 undergraduate students. The link between extraversion and stress was mediated by affiliative and self-enhancing humor, where affiliative humor led to increased stress, and self-enhancing humor led to decreased stress. The relation between neuroticism and perceived stress was mediated by self-enhancing and self-defeating humor, where decreased use of self-enhancing humor and increased use of self-defeating humor led to increased stress levels. These findings demonstrate how using humor to cope with stress can be vary for individuals who differ on personality dimensions.

Keywords: Personality, Neuroticism, Extraversion, Coping, Stress, Humor, University Students

The Indirect Association of Personality and Perceived Stress as Mediated by Humor in University Students During COVID-19

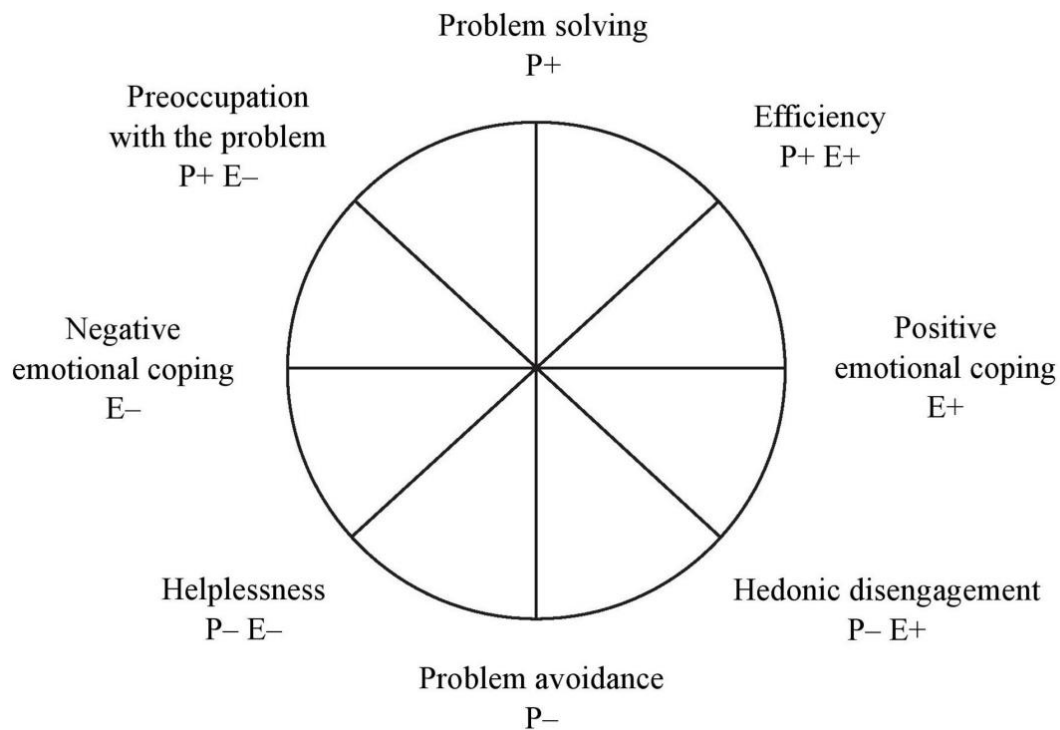
Humor can be a strategy used to cope with feelings that arise during stressful times and may be a way to avoid the severity of a situation, promote objectivity, and distance oneself from a problem (Overholser, 1992). The understanding of how humor relates to coping gained popularity during the positive psychology movement, when Peterson and Seligman (2004) established humor as a character strength. This view allows for the perception of humor as a beneficial characteristic through an individual's maintenance of a positive outlook despite adversity they may face. However, further research into this concept suggests that humor may also have negative characteristics (see Fritz et al., 2017, Martin et al., 2003, Overholser, 1992), which is why it is important to consider the positive and negative aspects of humor when it is used for coping.

Humor is crucial in protecting the self and maintaining positive psychological functioning in daily life (Frankl, 1963; Freud, 1928). Coping with humor has been linked to stress-buffering effects in previous research, which supports humor as a beneficial coping and self-protection strategy (Fritz et al., 2017; Morgan et al., 2019). One of the possible reasons for this is that humor is often associated with other positive constructs such as cognitive reappraisal, self-efficacy, and mindfulness that can help an individual to interpret a stressful condition as a positive challenge (Kuiper et al. 1993; Marzali et al., 2008; Saricali et al., 2020). Researchers originally characterized humor as positive and beneficial, focusing their studies on the stress-reducing effects of this construct (Abel, 2002; Wooten, 1996). However, not everyone has this experience with stress, as some individuals will use humor to avoid a problem or cope with their emotions negatively (Lazarus, 1996; Stanislawski, 2019). So, although humor can be a beneficial

coping strategy, it also has the potential for negative effects, which makes it important to examine this construct as an adaptive and a maladaptive strategy used to cope with stress.

Stress Coping Styles and Their Relation to Humor as a Multifaceted Coping Strategy

People experience stress differently, and the ways people choose to cope with stressful situations changes over time and with personal experience (Baqtayan, 2015; Sameroff, 2010). Stanislawski (2019) proposed the Coping Circumplex Model (CCM) to address how most ways of coping can serve multiple functions and should not be confined to one category. This model, depicted in Figure 1, focuses on problem coping and emotion coping as being the two main functions of coping. The CCM consists of the following four dimensions: high problem coping (P+), low problem coping (P-), high emotion coping (E+), and low emotion coping (E-). These categories are not mutually exclusive, meaning the coping styles they contain can relate to one dimension or both dimensions of coping. The following eight coping styles were identified: problem solving (P+), problem avoidance (P-), positive emotional coping (E+), negative emotional coping (E-), efficiency (P+ E+), helplessness (P- E-), preoccupation with the problem (P+ E-), and hedonic disengagement (P- E+).

Figure 1*The Coping Circumplex Model.*

Note. This model was produced by Stanislawski (2019) and depicts a comprehensive model of coping based on interrelated categories. From “The Coping Circumplex Model: An Integrative Model of the Structure of Coping With Stress,” by K. Stanislawski, 2019, *Frontiers in Psychology*, 10, 694. Copyright 2019 by Krzysztof Stanislawski.

Mapping these coping styles onto a circular continuum provides a more comprehensive perspective of the differences in how individuals cope with stress. This view can better account for the multidirectional and multidimensional nature of this concept, as an individual’s perception of stress can change directions and exist in multiple domains across development (Baltes, 1987). Applying a similar view to humor can provide a more comprehensive understanding of the various functions it serves in the coping process. Humor possesses both

positive and negative characteristics and is shown to be related to both problem- and emotion-focused coping (Abel, 2002), allowing it to fit into the eight different coping styles identified in the CCM. For example, humor as an adaptive coping strategy would help an individual utilize high problem and emotion coping mechanisms, such as problem solving, efficiency, or positive emotional coping (Kuiper, 2012). In contrast, the use of maladaptive forms of humor would more likely relate to the low problem and emotion coping strategies, including problem avoidance, helplessness, and negative emotional coping (Lazarus, 1996). Since humor can serve different functions in the coping process, it becomes important to develop a comprehensive scale to measure the various ways it can be used.

Development of the Humor Scales to Convey Multifaceted Nature of Coping with Humor

Because using humor as a coping strategy can lead to differing outcomes, researchers have begun to explore the multifaceted nature of humor by better understanding individual differences in the use of this construct (Martin, 1998). For example, Thorson and Powell (1993) developed the Multidimensional Sense of Humor Scale (MSHS) to explore the various elements of humor, rather than considering it as a basic construct. They expanded on this concept by applying a more dynamic perspective, but the MSHS measures six facets of humor that all have positive connotations (*humor production and creative ability, the ability to have a good time, the ability to use humor to achieve social goals, recognition of humor, appreciation of humor, and use of humor as an adaptive or coping mechanism*).

Other common questionnaires such as the Sense of Humor Questionnaire (SHQ; Svebak, 1996), the Sense of Humor Scale (SHS; McGhee, 1999), and the Coping Humor Scale (CHS; Martin & Lefcourt, 1983) are used to assess positive or adaptive aspects of humor. However, some scale items assess humor mechanisms that could also be adopted by individuals who

engage in negative forms of humor such as sarcasm or disparaging humor (Martin et al., 2003). This suggests that it would be beneficial to break down humor into negative and positive subcategories so researchers can discern both types of effects on conditions such as stress.

Martin et al. (2003) developed the Humor Styles Questionnaire (HSQ), which encompasses both positive and negative aspects of humor, since prior self-report measures of humor did not assess uses of humor that are detrimental to psychological well-being. Their 2-factor model of humor functions explores the distinction between positive and negative humor as well as whether humor is used to enhance the self or one's relationships with others. The researchers proposed the following four subscales relating to individual differences in humor use:

1. Affiliative humor is characterized by a non-hostile form of humor used to facilitate relationships.
2. Self-enhancing humor involves maintaining a humorous perspective on life even in the face of stress, which has a more intrapersonal focus.
3. Aggressive humor refers to using disparaging humor that may offend or alienate others.
4. Self-defeating humor is used to amuse others at one's own expense and is characterized by excessively self-disparaging forms of humor. This differs from self-deprecating humor, in which individuals poke fun at themselves in a lighthearted manner and may be a component in other benign forms of humor, such as affiliative humor.

This multifaceted approach to examining coping through humor is important for examining this construct from a resiliency or positive psychology perspective (Kuiper, 2012).

Together, these four subscales (i.e., self-enhancing humor, affiliative humor, self-defeating humor, aggressive humor) provide a way to examine its adaptive and maladaptive qualities, thus allowing for a more comprehensive understanding of humor and how it affects the coping process.

Using Humor to Cope with Stress in Emerging Adulthood

The stress coping process shifts over the lifespan as individuals face different challenges throughout development (Baltes, 1987; Lerner et al., 2011). The dynamic interaction between nature and nurture results in a “developmental recycling” of the stress coping process, in which it is continually revisited over time as people alter their coping methods to fit the demands of their current developmental period (Sameroff, 2010, p. 10). This process becomes important when examining contextual differences that affect the stress coping process in emerging adults, and specifically university students.

Changes in coping over the lifespan correspond to the changing social, physical, and psychological demands of an individual’s environment (Lazarus, 1996; Lerner et al., 2011). As the coping process develops over the life course, the function of humor to cope with stress can depend on various biological and environmental factors such as age, gender, social support, and emotion regulation (Compas et al., 2017; Dumont & Provost, 1999; Lazarus 1996). This can lead to descriptive discontinuity, where an individual adopts a different mechanism for coping, or descriptive continuity and explanatory discontinuity, where an individual uses the same coping method for a different reason (Lerner et al., 2011).

The change in the way an individual copes with their stress throughout life often comes from a change in the context of the individual and the environment. The brain during emerging adulthood is undergoing changes in regions that regulate reward, interpersonal connections, and

self-control, which makes these individuals extremely sensitive to stress (Steinberg, 2014).

Additionally, as an individual develops, the bidirectional relationships and interactions they have in their immediate environment, known as proximal processes, change and become more complex (Bronfenbrenner & Morris, 1998). The increasing complexity of these interactions in different periods of development can explain why children, adolescents, emerging adults, younger adults, and older adults might face different sources of stress (Lazarus, 1996). For example, emerging adults tend to focus on interpersonal connections and social interactions more than older adults (Steinberg, 2014), meaning their social interactions might be more likely to lead to greater levels of stress compared to individuals in other developmental stages. Additionally, different types of humor affect the way an individual is perceived by their peers, with maladaptive humor styles such as aggressive and self-defeating humor having a strong detrimental effect on the perception of an individual (Kuiper & Leite, 2009). Since humor is often a common approach for these individuals to build relationships with their peers (Martin et al., 2003), it can affect their social attractiveness, how they perceive stress, and produce lasting changes in the way their brain processes and deals with stress.

Coping with the COVID-19 Pandemic

The COVID-19 pandemic presents a unique challenge of stress and transition. The global community faced a life-threatening public health crisis that resulted in traumatic conditions such as the loss of loved ones and the threat to safety. People were bombarded with news and updates on most forms of media, which served as a constant reminder of the severity surrounding this situation. Additionally, the COVID-19 pandemic brought on other stressors outside of the public health domain, including unemployment, financial concerns, and decreased social support and communication (Mousavi et al., 2020). As the pandemic progressed, other critical events took

place that exacerbated this changing climate and impacted the well-being of individuals. For example, the racial movements taking place during this time, such as the Black Lives Matter movement, furthered the state of unrest by highlighting social justice as another major concern (Rinfrette, 2021). Worsened mental health was more frequently reported after the onset of the pandemic and seems to particularly impact adolescents and emerging adults (Rinfrette, 2021; Saricali et al., 2020).

University students also experienced a massive shift in multiple domains of life. Universities were closed in response to the threat to public health, resulting in a drastic shift to online learning and new challenges for students such as working from home, technological issues, and lack of social interaction (Sahu, 2020). These circumstances led to heightened levels of stress and uncertainty (Pragholapati, 2020; Voitsidis et al., 2021). The current situation may put university students at heightened risk, as students have reported increased stress levels during the COVID-19 pandemic (Son et al., 2020; Wang et al., 2020). Thus, it becomes important to examine the effectiveness of specific coping strategies such as humor and how they affect students' stress levels.

Humor usage often increases in tragic circumstances and has been linked to lower levels of stress in students in past instances of tragedy or natural disasters, such as the September 11th attacks (Bischetti et al., 2021; Fritz et al., 2017). Consistent with these findings, students have reported more frequent use of coping humor compared to before the pandemic, which is linked to decreased hopelessness about the situation (Saricali et al., 2020; Torres-Marín et al., 2022). However, maladaptive use of humor during the pandemic is associated with higher hopelessness and lower engagement in protective behaviors (Olah & Ford, 2021). Studies examining humor as a coping mechanism show both positive and negative outcomes, and some researchers suggest

that individual differences such as personality factors can influence an individual's interpretation of a situation and how humor can affect that perception (Martin et al., 2003; Olah & Ford, 2021)

The Function of Personality Factors and Humor Styles in Coping during Emerging Adulthood

Though personality is typically viewed as a stable characteristic, the developmental stage of emerging adulthood is marked by patterns of change in personality traits that are unique to this age group (Arnett, 2000; Bleidorn & Schwaba, 2017). Although these traits tend to become more stable over time, these changes are the strongest during emerging adulthood (Roberts & Mroczek, 2008). Adolescent and emerging adults in their late teens and twenties experience stress in various domains, including school, work, personal problems, social relationships, new relationships with friends and romantic partners, newfound independence, financial responsibility, and identity exploration (Arnett, 2000; Steinberg, 2014). Combined with these changes, the volatility of personality can affect exposure and reactivity to stressful events, which in turn influences physical and psychological well-being (Bolger & Zuckerman, 1995).

Extraversion is characterized by positive emotions and affect. People higher in extraversion tend to report fewer stressors and have better stress reactivity, which can serve as a protective factor in highly stressful situations (Xin et al., 2017). Extraversion is also linked to greater well-being and improved mental health compared to individuals scoring lower on this factor (Malouff et al., 2005; Spinhoven et al., 2014). The overall positivity that makes up extraversion lends to the reason that these individuals typically have a better outlook on life, which might be why this personality trait is linked to increased use of self-enhancing humor (Ford et al., 2016). Therefore, extraverts may utilize this style of humor to cope in times of stress and to maintain their positivity in high-stress situations.

Extraversion is also correlated with increased use of affiliative humor, which reflects the social and outgoing features of extraverts (Harris et al., 2017; Tang & Schmidt, 2017).

Individuals scoring higher in extraversion tend to seek out social support in times of high stress, which can provide a stress-buffering effect and lead to better mental health (Swickert et al., 2002). Due to its positive and benign nature, affiliative humor typically leads to decreased stress and better mental health outcomes (Menendez-Aller et al., 2020). Thus, extraverts might find that engaging in affiliative humor can be a way to cope with stress during the pandemic while also utilizing their social support and connections.

Individuals with higher levels of neuroticism, a tendency to experience negative emotions, may be more sensitive to the stress experienced during this stage (Costa & McCrae, 1987; Roberts et al., 2004). Researchers have observed differences between high- and low-neuroticism individuals, in which high levels of neuroticism are linked to greater exposure and increased reactivity to stressful events and conflict, especially in university students (Bolger & Zuckerman, 1995; Sun et al., 2016). This may be influenced by different coping strategies used by high- and low-neuroticism individuals, as individuals high in neuroticism tend to engage in more maladaptive coping strategies (Boyes & French, 2010; Gunthert et al., 1999, Pearson et al., 2013). Similarly, when individuals higher in neuroticism face more negative life events, they tend to behave more aggressively (Sun et al., 2016). Researchers also found that neuroticism is correlated with increased use of self-defeating and aggressive humor and decreased use of affiliative and self-enhancing humor (Greengross et al., 2011; Plessen et al., 2020). These findings could support the hypothesis that the link between neuroticism and stress may be mediated by positive and negative humor styles.

The associations between personality, stress, and types of humor become important when examining how these variables function in university students. University students are already at a greater risk for increased stress levels as they work to meet new academic demands and adjust to the transition from high school to college (Reddy et al., 2018; Talib & Zia-ur-Rehman, 2012). Adjusting to these changes during the COVID-19 pandemic may increase stress in students. However, extraverts tend to maintain their positive outlook, which may reduce the effects of this specific source of stress. Researchers have found that extraversion is linked to increased use of adaptive coping strategies (Penley & Tomaka, 2002), which may extend to the use of the two positive humor styles, affiliative and self-enhancing humor, to cope with a stressful situation. In contrast, high-neuroticism individuals tend to react more to stressors and utilize more maladaptive coping strategies (Bolger & Zuckerman, 1995). Additionally, the combination of high neuroticism and high stress levels has been linked to worse academic performance (Nechita et al., 2015). Therefore, neuroticism might be linked to increased use of maladaptive forms of humor, which are self-defeating and aggressive humor. These styles have been shown to increase stress levels (Menendez-Aller et al., 2020), so individuals who score higher in neuroticism could be at a greater risk for exacerbating their stress by using maladaptive humor styles, especially during a global pandemic.

The existing research involving personality, coping strategies, and overall well-being focuses on the adaptive function of humor in the relation between personality and well-being. Specifically, the mediating role of adaptive humor styles was found to explain the positive correlation between neuroticism and satisfaction with life, as well as the positive relation between both extraversion and neuroticism with affective well-being in a sample of young adults (Jovanovic, 2011). Many similar findings support the role of adaptive humor styles as one of the

mechanisms linking personality and well-being. For example, individuals who display a higher sense of humor are more likely to use positive coping strategies (Abel, 2002), which has been shown to reduce stress and increase coping effectiveness (Fritz et al., 2017; Wooten, 1996). However, little research has been done to examine the effect of maladaptive humor styles on these variables in a sample of emerging adults or university students. Since high levels of neuroticism can influence individuals to choose maladaptive strategies when coping with stress, understanding the negative impact of certain coping mechanisms, such as negative humor styles, is just as important as examining positive coping styles to gain a comprehensive perspective on the stress coping process.

Study Overview

The current study investigated how coping with humor mediates the relation between personality factors (i.e., neuroticism and extraversion) and perceived stress in a sample of university students during the COVID-19 pandemic. In the first study, the mediating role of coping humor was assessed. The second study extended these findings by examining the mediating role of four humor styles – affiliative humor, self-enhancing humor, aggressive humor, and self-defeating humor – in the relation between personality factors and perceived stress. It is important to examine how both positive and negative humor styles are related to stress levels in university students to gain a more comprehensive view on all functions of humor and their influences on the stress coping process. Additionally, the COVID-19 pandemic presents a unique opportunity to observe how students are coping during a period of extreme stress and uncertainty, which may reveal the strategies that are most or least effective for coping with high levels of stress.

The current research investigated the following research questions:

1. Does coping humor mediate the relationship between personality, specifically extraversion and neuroticism, and perceived stress in students? It was hypothesized that coping humor would serve as an effective mediator between personality and perceived stress.
2. Do the four humor styles, affiliative humor, self-enhancing humor, aggressive humor, and self-defeating humor, mediate the relation between personality factors and perceived stress? It was hypothesized that the maladaptive humor styles, self-defeating and aggressive humor, would be stronger mediators of the relation between neuroticism and perceived stress and the adaptive humor styles, affiliative humor and self-enhancing humor, would mediate the relation between extraversion and perceived stress.

Study 1

In Study 1, undergraduate students were administered an online survey to assess their stress during the pandemic and how they coped. Extraversion and neuroticism were examined to determine the relation between personality, coping humor, and perceived stress.

Method

Participants

Participants were 354 undergraduate students at the University of North Florida sampled through the university's Student Research Participation System (SONA). Data were collected using Qualtrics online survey software during 2020 (July 2020 – September 2020; $n = 31$), Spring 2021 (March 2021 – April 2021; $n = 257$), Summer 2021 (June 2021 – August 2021; $n = 15$), and Fall 2021 (September 2021 – December 2021; $n = 39$). Students received course credit or extra credit as compensation for their time and participation. Participants with missing data

were removed from analyses, along with participants who were outside of the age range 18-25 years to focus on a sample that represents an emerging adult population. This filtration criteria resulted in a sample of 342 students aged 18-25 ($M = 21.31$, $SD = 4.31$). Most students in this sample are females and juniors, as shown in Table 1. No data was collected from participants who did not complete the informed consent. The University of North Florida's Institutional Review Board (IRB) provided approval for this study. The American Psychological Association (APA) Ethical Principles of Psychologists and Code of Conduct (APA, 2017) was followed to maintain confidentiality, minimize risk, and ensure ethical treatment of participants by keeping survey responses anonymous and not collecting identifying information.

Materials

Participants read and completed a digital informed consent statement that gave them the choice to either participate or not continue in this study. The survey ended for students who opted out of participation, and students who consented were led to a questionnaire containing various measures. Responses remained anonymous, as no identifying information was collected. The survey took about 30 minutes to complete.

Demographics. Students were asked to provide information about their age, gender, and year in school. This included an open-ended question that assessed age and multiple-choice questions that assessed gender and year in college. Frequency reports of this data are displayed in Table 1.

Big Five Inventory. The Big Five Inventory (BFI) is a 44-item scale used to assess five dimensions of personality (John et al., 1991). This scale consists of the following five subscales: extraversion (*e.g., is full of energy*), agreeableness (*e.g., has a forgiving nature*), conscientiousness (*e.g., does a thorough job*), openness (*e.g., is original, comes up with new*

ideas), and neuroticism (*e.g., worries a lot*). Each item is scored on a 5-point Likert scale, ranging from 1 (*disagree strongly*) to 5 (*strongly agree*). Subscale scores are computed by reverse scoring appropriate items and taking participants' mean item responses. The BFI is shown to have good validity in multiple studies and populations of students and adolescents (Balgiu, 2018; Morizot, 2014). Each subscale had good internal reliability in our sample (Extraversion, $\alpha = .85$; Agreeableness, $\alpha = .75$; Conscientiousness, $\alpha = .77$; Neuroticism, $\alpha = .81$; Openness, $\alpha = .73$). The entire scale has an internal validity of .92 (John & Srivastava, 1999).

Coping Humor Scale. The Coping Humor Scale (CHS) is a 7-item inventory examining the degree to which participants use humor to cope with stress (Martin & Lefcourt, 1983). Participants were asked to rate how much they agree or disagree with statements such as, "I often lose my sense of humor when I'm having problems," "I usually look for something comical to say when I am in tense situations," and "I can usually find something to laugh or joke about even in trying situations." All items were scored on a 4-point Likert scale ranging from 1 (*strongly disagree*,) to 4 (*strongly agree*). Scores are computed by reverse-scoring two of the items and summing across items. This scale was found to have lower but acceptable levels of internal reliability, with Cronbach's alpha ranging from .60 to .70 (Martin, 2009). It had good reliability in our study ($\alpha = .74$) and shows good test-retest reliability and construct and discriminant validity (Marziali et al., 2008).

Perceived Stress Scale. The Perceived Stress Scale (PSS) is a 14-item survey measuring the perception of stress and the degree to which events in one's life are interpreted as stressful (Cohen et al., 1994). Participants were asked to rate how often they felt or thought a certain way about statements such as "In the last month, how often have you felt confident about your ability

to handle your personal problems?” and “In the last month, how often have you felt that you were on top of things?” Statements were rated on a 5-point Likert scale ranging from 0 (*Never*) to 4 (*Very Often*). Scores were computed by reverse-scoring the appropriate items and summing across all scale items, where a higher score indicates a higher level of perceived stress. A Cronbach’s alpha value of .83 indicated high internal reliability, and evidence for divergent and construct validity was also supported (Ezzati et al., 2013). For this study, the scale showed acceptable levels of reliability ($\alpha = .73$).

Results

Descriptive analyses and descriptive statistics were conducted using SPSS 27 (IBM Corp, 2019). Mediation analysis was performed using the PROCESS v4 macro for SPSS (Hayes, 2018). Assumptions for linearity, homoscedasticity, normality, and independence were checked and met. Demographic variables that were correlated to variables in the mediation models were included as covariates. Models were run with age and gender as covariates but are not reported because the overall outcome of the results did not change. Correlations, means, and standard deviations for the key variables are shown in Table 2.

Correlations Between Variables

Bivariate correlations were computed to assess the associations between extraversion, neuroticism, coping humor, and perceived stress. Extraversion and neuroticism had a weak negative correlation, which suggests that these two dimensions of personality are distinct constructs and is consistent with prior research (Kolnes et al., 2021). Extraversion was positively correlated with coping humor ($p < .001$) and negatively correlated with perceived stress ($p < .001$). Neuroticism was negatively correlated with coping humor ($p < .001$), positively correlated with perceived stress ($p < .001$), and negatively correlated with age $r(295) = -.16, p = .001$.

Neuroticism also differed across genders, with females ($M = 3.37$, $SD = 0.73$) scoring higher than males, ($M = 2.99$, $SD = 0.64$), $t(303) = -3.37$, $p < .001$. Perceived stress was negatively correlated with age, $r(290) = -.14$, $p = .016$ and differed across genders, $F(2, 545) = 7.60$, $p < .001$, with females ($M = 44.27$, $SD = 6.68$) being higher on perceived stress than males, ($M = 41.21$, $SD = 5.45$), $t(298) = -3.00$, $p = .003$. However, no differences in perceived stress are seen based on year in college.

Simple Mediation Analysis

A simple mediation analysis (Hayes' Model 4) was used to assess the mediating role of coping humor in the relation between personality dimensions and perceived stress. Two mediation analyses were conducted with both dimensions of personality, extraversion and neuroticism, as the main predictor variables. Both models included perceived stress as the outcome variable and coping humor as the mediating variable (Figure 2; Table 3).

Extraversion and neuroticism had significant direct effects on perceived stress, even after controlling for the mediator. Both personality dimensions also were significant predictors of coping humor, where extraversion predicted greater levels of coping humor, and neuroticism predicted less coping humor. However, coping humor was not a significant mediator because the b pathway between coping humor and perceived stress was not significant. Thus, coping humor did not explain the relation between personality dimensions and perceived stress. The total and direct effects were of almost identical magnitude, which indicates that there were no significant indirect effects (Table 3).

Discussion

Study 1 examined the role of coping humor in the relation between personality factors and perceived stress. Contrary to the hypothesis, the results demonstrated that coping humor did

not significantly mediate that relation. Though coping humor was not related to perceived stress, the personality dimensions of extraversion and neuroticism were significant predictors of coping humor and perceived stress. Higher levels of extraversion predicted an increased use of coping humor and decreased stress. Higher levels of neuroticism predicted a decrease in coping humor and increased perceived stress. Coping humor as a construct may be too broad to see a significant relationship with stress, as it encompasses both negative and positive factors (Fritz et al., 2017; Martin et al., 2003). Exploring the multidimensional nature of humor might reveal a more intricate relation between these variables.

Study 2

Study 2 extended the findings of Study 1 by looking further into humor as a coping mechanism. The HSQ was used to assess humor as both an adaptive and maladaptive strategy by dividing humor into four different styles. This study examined the mediating role of humor styles in the association between two personality factors, extraversion and neuroticism, with perceived stress in a sample of undergraduate students.

Method

Participants

Undergraduate students at the University of North Florida completed a survey using Qualtrics online survey software and were sampled through the university's Student Research Participation System (SONA). Students were compensated for their participation by receiving course credit or extra credit. Data were collected in Spring 2022 (February – April, $n = 165$) and Fall 2022 (September – December, $n = 146$). Participants with missing data were removed from analyses, along with participants who were outside of the age range 18-25 years to focus on a sample that represents an emerging adult population. This resulted in a sample of 311 students

aged 18-25 ($M = 19.67$, $SD = 1.41$). Most students in this sample are White, females, and juniors as shown in Table 4. No data was collected from participants who did not complete the informed consent. The University of North Florida's Institutional Review Board (IRB) provided approval for this study. The APA Ethical Principles of Psychologists and Code of Conduct (APA, 2017) was followed to maintain confidentiality, minimize risk, and ensure ethical treatment of participants by keeping survey responses anonymous and not collecting identifying information.

Materials

Participants read and completed a digital informed consent statement that gave them the choice to either participate or not continue in this study. The survey ended for students who opted out of participation, and students who consented were led to a questionnaire containing various measures. Responses remained anonymous, as no identifying information was collected. The survey took about 30 minutes to complete.

Demographics. Students were asked to provide information about their age, gender, year in school, relationship status, and race/ethnicity. This included open-ended questions that assessed age and multiple-choice questions that assessed gender, race/ethnicity, and year in college. Frequency reports of this data are displayed in Table 4.

Big Five Inventory. The Big Five Inventory (BFI) is a 44-item scale used to assess five dimensions of personality (John et al., 1991). This scale consists of the following five subscales: extraversion (*e.g., is full of energy*), agreeableness (*e.g., has a forgiving nature*), conscientiousness (*e.g., does a thorough job*), openness (*e.g., is original, comes up with new ideas*), and neuroticism (*e.g., worries a lot*). Each item is scored on a 5-point Likert scale, ranging from 1 (*disagree strongly*) to 5 (*strongly agree*). Subscale scores are computed by reverse scoring appropriate items and taking participants' mean item responses. The BFI is

shown to have good validity in multiple studies and populations of students and adolescents (Balgiu, 2018; Morizot, 2014). Each subscale has good internal reliability in our sample (Extraversion, $\alpha = .87$; Agreeableness, $\alpha = .74$; Conscientiousness, $\alpha = .76$; Neuroticism, $\alpha = .82$; Openness, $\alpha = .73$). The entire scale has an internal validity of .92 (John & Srivastava, 1999).

Humor Styles Questionnaire. The Humor Styles Questionnaire (HSQ) is a 32-item scale that assesses individual differences in humor (Martin et al., 2003). It measures the following four subscales of humor: *self-enhancing* (adopting a humorous outlook on life to enhance the self in a benign way that is tolerant and non-detrimental to others), *affiliative* (using humor to enhance one's relationships with others in a benign and self-accepting way), *aggressive* (using humor to enhance the self in a hostile way at the detriment of one's relationships with others), and *self-defeating* (using humor to gain the approval of others at one's own expense and detriment).

Participants were asked to rate the degree to which they agree or disagree with statements such as "If I am feeling depressed, I can usually cheer myself up with humor" (self-enhancing humor), "I enjoy making people laugh" (affiliative humor), "If I don't like someone, I often use humor or teasing to put them down" (aggressive humor), and "I let people laugh at me or make fun at my expense more than I should" (self-defeating humor). Items were scored using a 7-point Likert scale, ranging from 1 (*totally disagree*) to 7 (*totally agree*). Each subscale consists of 8 items, and the scores are computed by reverse-scoring appropriate items and taking the mean score of the item responses. Three of the four subscales show adequate internal reliability (Affiliative humor, $\alpha = .80$; Self-enhancing humor, $\alpha = .73$; Self-defeating humor, $\alpha = .85$), which is consistent with previous studies (Martin et al., 2003). Aggressive humor had low

reliability, with a Cronbach's alpha of .53. The scales also demonstrated good discriminant and construct validity (Martin et al., 2003; Tsuawaki & Imura, 2021).

Perceived Stress Scale. The Perceived Stress Scale (PSS) is a 14-item survey measuring the perception of stress and the degree to which events in one's life are interpreted as stressful (Cohen et al., 1994). Participants were asked to rate how often they felt or thought a certain way about statements such as "In the last month, how often have you felt confident about your ability to handle your personal problems?" and "In the last month, how often have you felt that you were on top of things?" Statements were rated on a 5-point Likert scale, ranging from 0 (*Never*) to 4 (*Very Often*). Scores were computed by reverse-scoring the appropriate items and summing across all scale items, where a higher score indicates a higher level of perceived stress. A Cronbach's alpha value of .83 indicated high internal reliability, and evidence for divergent and construct validity was also supported (Ezzati et al., 2013). For this study, the scale showed acceptable levels of reliability ($\alpha = .76$).

Results

Mediation analysis was performed using the PROCESS v4 macro for SPSS (Hayes, 2018). Assumptions for linearity, homoscedasticity, normality, and independence were checked and met. Demographic variables that were correlated to variables in the mediation models were included as covariates. Models were run with age and gender as covariates but are not reported because the overall outcome of the results did not change. Correlations, means, and standard deviations for the key variables are shown in Table 5.

Correlations Between Variables

Bivariate correlations were computed to assess the associations between extraversion, neuroticism, perceived stress, and the four subscales of humor (affiliative humor, self-enhancing

humor, aggressive humor, and self-defeating humor). Consistent with prior research, extraversion was positively correlated with affiliative humor and self-enhancing humor and was negatively correlated with perceived stress (Mendiburo-Seguel et al., 2015; Plessen et al., 2019). Neuroticism was negatively correlated with self-enhancing humor and positively correlated with self-defeating humor (Dionigi et al., 2021; Mendiburo-Seguel et al., 2015). Perceived stress showed a negative correlation with extraversion and a positive correlation with neuroticism.

Parallel Multiple Mediation Analysis

A parallel mediation analysis (Hayes' Model 4) was used to assess the mediating role of the four humor subscales in the relation between personality and perceived stress. Two mediation analyses were conducted with both dimensions of personality, extraversion and neuroticism, as the main predictor variables. Both models included perceived stress as the outcome variable and the four humor styles as the mediating variables (Figure 4).

Extraversion and neuroticism had significant direct effects on perceived stress, even after controlling for the mediator, which was also shown in Study 1. Extraversion significantly predicted three of the four humor styles, with higher levels of extraversion predicting affiliative, self-enhancing, and aggressive humor. However, extraversion did not predict self-defeating humor. Higher levels of neuroticism predicted lower levels of self-enhancing humor and higher levels of self-defeating humor but had no association with affiliative or aggressive humor. Three of the four humor styles were related perceived stress. Affiliative and self-defeating humor predicted higher levels of perceived stress, self-enhancing humor predicted lower levels of perceived stress, and aggressive humor was not related to stress (Table 6).

These results indicate that there was an indirect association of extraversion with perceived stress through affiliative humor and self-enhancing humor. The indirect effect of

extraversion with perceived stress was $a_1b_1 = .07$ (95% CI [0.03, 0.11]) through affiliative humor and $a_2b_2 = -.09$ (95% CI [-0.15, -0.03]) through self-enhancing humor, which are moderate effect sizes (Kenny, 2018). Neuroticism also had an indirect association with perceived stress through two of the mediators. The indirect association of neuroticism with perceived stress was $a_2b_2 = .05$ (95% CI [0.01, 0.09]) through self-enhancing humor and $a_4b_4 = .05$ (95% CI [0.06, 0.08]) through self-defeating humor. These effects partially accounted for the association between neuroticism and stress as the direct effect was still significant when controlling for the mediators.

Pairwise contrasts of the indirect effects of the mediators indicated that affiliative humor was more effective than self-enhancing humor (contrast = 1.25, 95% CI [0.61, 2.01]), aggressive humor (contrast = 0.59, 95%CI [0.17, 1.03]), and self-defeating humor (contrast = 0.71, 95% CI [0.21, 1.26]) in mediating the relation between extraversion and perceived stress. In the relation between neuroticism and perceived stress, self-enhancing humor proved to be more effective than affiliative humor (contrast = 0.44, 95% CI [0.05, 0.91]) and aggressive humor (contrast = 0.43, 95% CI [0.12, 0.79]). Self-defeating humor was also more effective than affiliative humor (contrast = 0.44, 95% CI [0.09, 0.84]) and aggressive humor (contrast = 0.43, 95% CI [0.13, 0.80]) in mediating the relation between neuroticism and perceived stress.

Discussion

Study 2 examined the mediating role of humor in the relation between personality factors and perceived stress. However, this study extended the results of Study 1 by employing a multidimensional sense of humor measure comprised of four humor styles (affiliative humor, self-enhancing humor, aggressive humor, and self-defeating humor). In this analysis, some aspects of humor were significant mediators. Extraversion was related to perceived stress through the two positive styles of humor, affiliative and self-enhancing humor. Higher levels of

extraversion predicted an increased use of both styles of humor. Self-enhancing humor predicted decreased perceived stress, and affiliative humor predicted increased perceived stress.

Neuroticism was related to perceived stress through the two intrapersonal styles of humor, self-enhancing and self-defeating humor. Higher levels of neuroticism predicted a decreased use of self-enhancing humor, which led to increased perceived stress. However, higher levels of neuroticism also predicted an increased use of self-defeating humor, which led to increased stress. Thus, higher levels of neuroticism resulted in increased perceived stress through the decreased use of self-enhancing humor and the increased use of self-defeating humor.

General Discussion

The results of both studies provide support for the theory of humor as a multifaceted construct (Fritz et al., 2017; Martin et al., 2003; Overholser, 1992). In Study 1, coping humor did not significantly mediate the relation between personality factors and perceived stress, which demonstrates that studying humor as a broad construct may encompass too many aspects to reveal clear findings. However, Study 2 examined humor through four different styles with unique attributes, which revealed the aspects of humor that indirectly link personality factors and stress. Thus, results from both studies provide support for the differences in humor depending on personality factors and support the view of humor as a multidimensional construct.

Individuals scoring higher in extraversion reported lower levels of stress compared to those scoring higher in neuroticism, which is consistent with previous research (You et al., 2020). Extraversion predicted an increased use of both positive styles of humor, which reflects how people who score higher in extraversion tend to be happier and have more positive emotions (Ford et al., 2016). Self-enhancing humor predicted decreased perceived stress, which aligns with earlier research on the stress-reducing effects of this humor style (Fritz et al., 2017; Plessen

et al., 2020). This style of humor acts as one way to promote warmth and positivity through a humorous attitude about stressful events and adversity. The outgoing and social nature of extraverts can explain why this personality factor predicted increased use of affiliative humor. Additionally, emerging adults tend to place a higher focus on interpersonal relationships with peers compared to people in other developmental stages (Arnett, 2000). Because extraversion is already characterized by being outgoing and social, emerging adults who are also extraverted may be more inclined to seek out social connections. Affiliative humor predicted increased perceived stress among extraverts, which contradicts prior research where affiliative humor predicts decreased anxiety and depression (Di Fabio & Duradoni, 2020; Menendez-Aller et al., 2020) and has a stress-buffering effect (Fritz et al., 2017).

The relations among extraversion, affiliative humor, and perceived stress could have been a lasting impact of the pandemic. Sociability was linked to exacerbated stress during the pandemic due to the difficulty to maintain social connections during this time (Bellengtier et al., 2021). When the social aspect of their environment is removed, extraverts may be less effective at controlling their emotions, resulting in higher levels of stress (Abbott et al., 2008; Liu et al., 2021). Though this data was collected when people began to socialize again, the pandemic has had lasting effects on the way we interact with each other. Zoom meetings, working from home, and online classes are still more prevalent than they were before the pandemic (Lal et al., 2021). Thus, more effort to cope with the pandemic using an interpersonal, social form of humor might be difficult when social connections are still often formed and maintained through online formats. This can emphasize the distance felt during this time and potentially lead to increased stress (Liu et al., 2021). Therefore, affiliative humor, which is used to strengthen social bonds,

might be ineffective or even maladaptive for extraverts in situations where social connections are impaired.

Individuals who scored higher in neuroticism generally reported increased stress during the pandemic, which is consistent with prior research (Michinov & Michinov, 2021; Sebri et al., 2021). These individuals also react to stress with more severe emotions and report more stressors (Suls & Martin, 2005). Neuroticism was linked with two humor styles that were focused on the self. Individuals who score higher in neuroticism also exhibit high self-focus and self-criticism (Fetterman & Robinson, 2012), which might explain why they tended to utilize more self-focused humor, such as self-enhancing and self-defeating humor. Neuroticism predicted an increased use of self-defeating humor, which is consistent with the tendency for individuals who are high in neuroticism to poorly cope with stress and react by using maladaptive strategies that exacerbate their stress (Gunthert et al., 1999). Neuroticism is also linked to avoidance coping (Afshar et al., 2015), which may explain why these individuals utilized fewer adaptive humor styles such as self-enhancing humor that protect against the effects of stress.

These results demonstrate differences in coping that exist among various personality factors. This can have implications on the coping styles that might help certain individuals while being ineffective or even harmful to others. It seems that individuals who score higher in neuroticism have difficulty coping in stressful situations and might even use coping strategies that worsen stress and mental health (Besser & Shackelford, 2007; You et al, 2020). This has been shown to negatively impact academic performance and worsen mental health among this group (Bhagat & Nayak, 2014; Zacher & Rudolph, 2021). Those higher in extraversion seem to partially rely on social relationships for support during stressful times (Jia et al., 2015), which can become problematic in situations where they do not have access to others.

Strengths, Limitations, and Future Directions

This study had many strengths, such as the collection of data from students in different time periods during the pandemic. This method of data collection allowed for a comprehensive picture of stress and coping with humor throughout various time points when circumstances of the pandemic changed. However, one limitation was the use of different humor scales at those time points. Though the Coping Humor Scale was included throughout the entirety of data collection, the Humor Styles Questionnaire was not added until February 2022. Another limitation is that the Humor Styles Questionnaire does not encompass some aspects of humor. Thus, personality and stress could be related through other types of humor which are not captured by the HSQ. Recent studies have revealed five other styles of humor encompassing qualities including wit, irony, satire, and sarcasm that can be combined with the humor styles from the HSQ (Heintz & Ruch, 2019). Future research is necessary to further examine the relations between personality and these other humor styles.

This study has the methodological limitation of relying exclusively on self-report surveys and cross-sectional data. Future studies might include direct observation of behaviors as well as additional measures of stress, mental health, and well-being. Experimental research on personality and humor would provide insight into causal effects of these variables on stress, which is an important point for future research. Additionally, a longitudinal study would provide more insight to these relations over time. Though this study also added to the existing literature by demonstrating the mediating role of humor, using cross-sectional and non-experimental data from different time points can produce biased estimated of the direct and indirect effects of the mediators (Cain et al., 2017). However, despite these limitations, these findings were consistent with previous research conducted on personality, humor, and perceived stress.

Extraversion might be linked to positivity in other coping strategies outside of humor. Similarly, individuals who score higher in neuroticism could gravitate toward intrapersonal styles of coping other than humor. These distinctions may also exist for the other three factors of personality. Additional studies should examine if these findings can extend to other forms of coping and the remaining aspects of personality. More research is also needed to see if affiliative humor can sometimes be harmful to individuals higher in extraversion, specifically in situations where social connections are restricted or limited.

These findings can be generalized to emerging adults who were students between February 2022 and December 2022 during the COVID-19 pandemic. During this time period, COVID-19 was less severe and resulted in fewer mortalities compared to 2020 and 2021. There were no variations that resulted in a wave of major cases (Centers for Disease Control and Prevention, 2022). COVID-19 became less of a disruption, which allowed people to return to pre-pandemic activities like going to school in-person without having to wear a mask. However, the omicron variant, which emerged in late 2021, was still active in January and February of 2022 due to high transmission rates regardless of vaccination or having already contracted COVID-19 (Centers for Disease Control and Prevention, 2022).

Though this study provides useful information about students' coping methods during the pandemic, individuals in other developmental stages might use different strategies to cope with the various stressors presented in different life stages. Students might function differently than individuals who are not in school, and there might be an age difference in humor styles that are used and how this affects personality, stress, and coping. Thus, future studies should examine if these findings can be replicated in a different demographic.

Conclusion

Overall, these findings support the multifaceted view of humor and the personality differences in using humor to cope with stress in a college student sample. In summary, extraversion was associated with both positive styles of humor, but only one of these styles—self-enhancing—led to a reduction in perceived stress. Neuroticism was associated with both intrapersonal humor styles, but the decreased use of self-enhancing humor proved to be detrimental to stress levels. There are several important implications for these findings to be applied to practical settings. These results can inform the development of humor-based interventions administered by counseling centers at academic institutions. Stress management for those higher in neuroticism might be improved by helping them steer away from maladaptive coping strategies such as self-defeating humor and directing them towards more benign forms of humor, like self-enhancing humor. Extraverts might experience increased stress when socially restricted, so finding creative ways for them to maintain connections could be beneficial.

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Table 1*Summary of Participant Demographics (N = 342)*

	<i>n (%)</i>	<i>M (SD)</i>
Age (years)		21.31 (4.31)
Gender		
Male	50 (15.9%)	
Female	261 (82.9%)	
Other	4 (1.3%)	
Academic Level		
Freshman	60 (19.1%)	
Sophomore	67 (21.3%)	
Junior	117 (37.3%)	
Senior	70 (22.3%)	

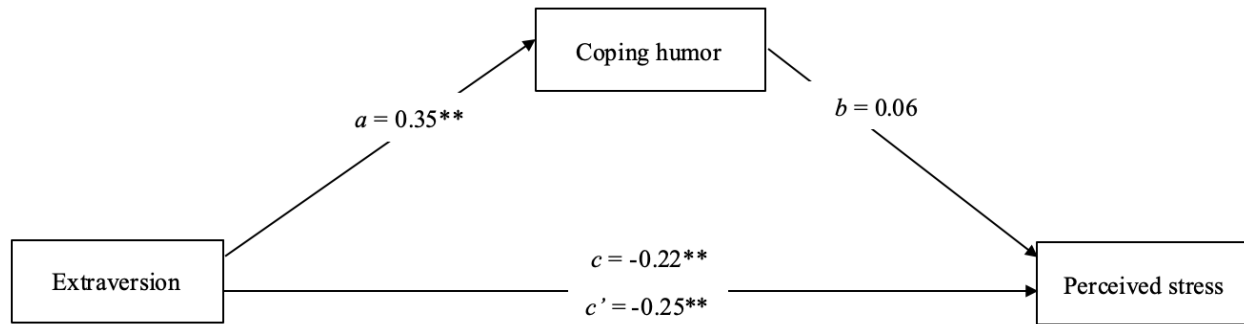
Table 2*Bivariate Correlations and Descriptive Statistics of Key Variables in the Coping Humor Study*

	1	2	3	4
1. Extraversion	.85	-.33**	.35**	-.21**
2. Neuroticism	-	.82	-.18**	.61**
3. Coping Humor	-	-	.74	-.04
4. Perceived Stress	-	-	-	.73
<i>M</i>	3.02	3.31	22.88	43.81
<i>SD</i>	0.79	0.73	4.62	6.61

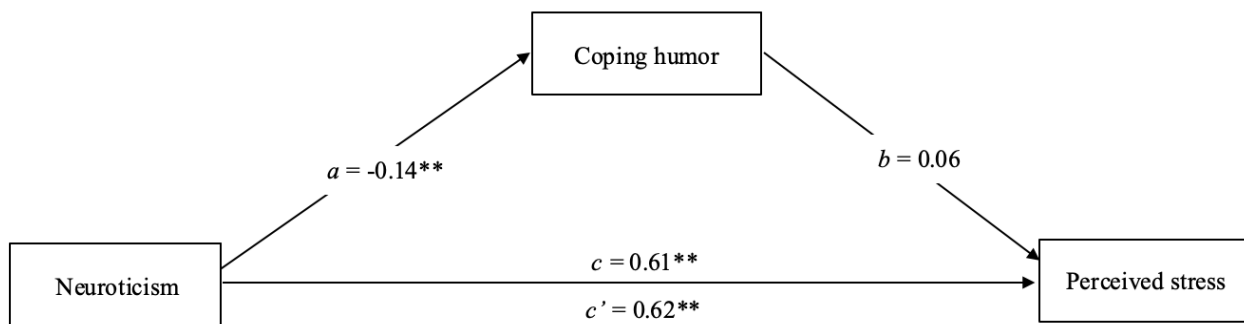
Note. Cronbach's alpha is reported along the diagonal in italics.* $p < .05$, ** $p < .001$

Figure 2

Statistical Diagrams Representing Coping Humor Mediating the Relation Between Personality and Perceived Stress



$*p < .05$, $**p < .001$



$*p < .05$, $**p < .001$

Table 3*Regression Coefficients, Standard Errors, and Model Summary Information for Coping Humor**Mediating the Relation Between Personality and Perceived Stress*

Antecedent		Consequent						
		M (COPING HUMOR)			Y (PERCEIVED STRESS)			
		Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>	
					<i>c</i>	-1.80	0.47	< .001
<i>X</i> (EXTRAVERSION)	<i>a</i>	1.98	0.32	< .001	<i>c'</i>	-1.91	0.50	< .001
<i>M</i> (COPING HUMOR)		—	—	—	<i>b</i>	0.06	0.09	.506
constant	<i>i_M</i>	17.90	0.99	< .001	<i>i_Y</i>	48.24	2.14	< .001
$R^2 = 0.114$					$R^2 = 0.047$			
$F(1, 302) = 49.954, p < .001$					$F(2, 301) = 7.45, p < .001$			
					<i>c</i>	5.52	0.42	< .001
<i>X</i> (NEUROTICISM)	<i>a</i>	-1.03	0.36	.005	<i>c'</i>	5.62	0.42	< .001
<i>M</i> (COPING HUMOR)		—	—	—	<i>b</i>	0.09	0.07	.174
constant	<i>i_M</i>	27.30	1.22	< .001	<i>i_Y</i>	23.04	2.30	< .001
$R^2 = 0.026$					$R^2 = 0.043$			
$F(1, 302) = 8.15, p = .004$					$F(2, 301) = 89.25, p < .001$			

Table 4*Summary of Participant Demographics (N = 311)*

	<i>n (%)</i>	<i>M (SD)</i>
Age		21.10 (4.80)
Gender		
Male	41 (14.0%)	
Female	248 (84.6%)	
Other	4 (1.4%)	
Academic Level		
Freshman	80 (27.4%)	
Sophomore	66 (22.6%)	
Junior	104 (35.6%)	
Senior	42 (14.4%)	
Race/Ethnicity		
White	182 (62.1%)	
Hispanic/Latino/Latina/Latinx	28 (9.6%)	
Black/African American	42 (14.3%)	
Asian or Pacific Islander	16 (5.5%)	
Multi-ethnic/Biracial	16 (5.5%)	
Other	9 (3.1%)	

Table 5*Bivariate Correlations and Descriptive Statistics of Key Variables in Humor Styles Study*

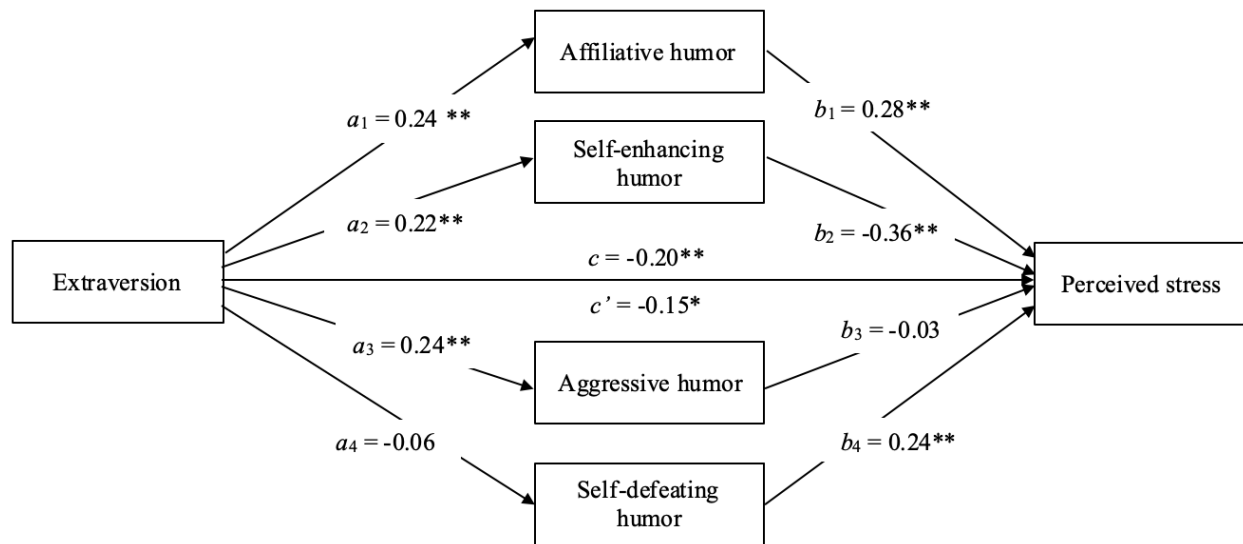
	1	2	3	4	5	6	7
1. Extraversion	<i>.87</i>	<i>-.33**</i>	<i>.24**</i>	<i>.22**</i>	<i>.24**</i>	<i>-.06</i>	<i>-.21**</i>
2. Neuroticism	-	<i>.83</i>	<i>-.02</i>	<i>-.22**</i>	<i>.03</i>	<i>.29**</i>	<i>.65**</i>
3. Affiliative Humor	-	-	<i>.83</i>	<i>.42**</i>	<i>-.06</i>	<i>-.03</i>	<i>.07</i>
4. Self-enhancing Humor	-	-	-	<i>.77</i>	<i>.10</i>	<i>.06</i>	<i>-.25**</i>
5. Aggressive Humor	-	-	-	-	<i>.57</i>	<i>.25**</i>	<i>.01</i>
6. Self-defeating Humor	-	-	-	-	-	<i>.86</i>	<i>.29**</i>
7. Perceived Stress	-	-	-	-	-	-	<i>.76</i>
<i>M</i>	3.01	3.33	43.87	36.09	26.90	29.07	43.82
<i>SD</i>	.82	.75	8.10	7.70	6.96	10.34	6.85

Note. Cronbach's alpha is reported along the diagonal in italics.

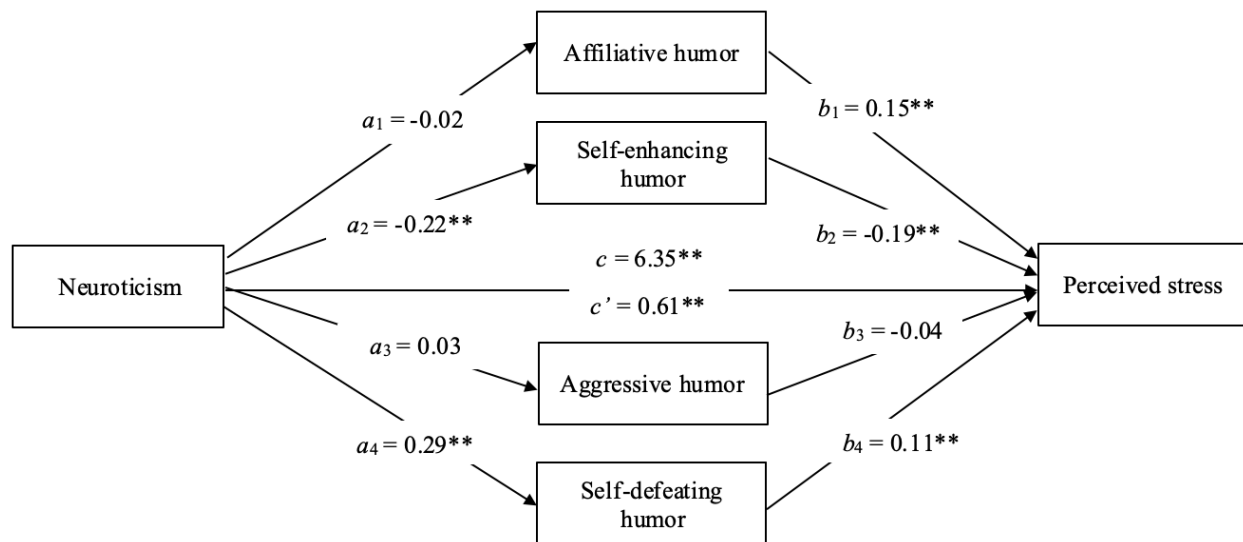
* $p < .05$, ** $p < .001$

Figure 4

Statistical Diagrams Representing Humor Styles Mediating the Relation Between Personality and Perceived Stress



* $p < .05$, ** $p < .001$



* $p < .05$, ** $p < .001$

Table 6*Regression Coefficients, Standard Errors, and Model Summary Information for Humor Styles**Mediating the Relation Between Personality and Perceived Stress*

Antecedent	Consequent						
	M (HUMOR STYLES)			Y (PERCEIVED STRESS)			
	Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>	
<i>X</i> (EXTRAVERSION)				<i>c</i>	-1.63	0.51	.002
				<i>c'</i>	-1.25	0.50	.012
<i>M</i> (AFFILIATIVE HUMOR)	<i>a</i> ₁	2.24	0.58	< .001	—	—	—
	—	—	—	—	<i>b</i> ₁	0.24	0.05
	constant	<i>i</i> _M	37.22	1.78	< .001	<i>i</i> _Y	43.25
						2.98	< .001
$R^2 = 0.056$							
$F(1, 253) = 15.076, p < .001$							
<i>M</i> (SELF-ENHANCING HUMOR)	<i>a</i> ₂	1.99	0.55	< .001	—	—	—
	—	—	—	—	<i>b</i> ₂	-0.36	0.06
	constant	<i>i</i> _M	30.16	1.70	< .001	<i>i</i> _Y	43.25
						2.98	< .001
$R^2 = 0.049$							
$F(1, 253) = 13.152, p < .001$							
<i>M</i> (AGGRESSIVE HUMOR)	<i>a</i> ₃	1.92	0.50	< .001	—	—	—
	—	—	—	—	<i>b</i> ₃	-0.03	0.06
	constant	<i>i</i> _M	21.20	1.53	< .001	<i>i</i> _Y	43.25
						2.98	< .001
$R^2 = 0.056$							
$F(1, 253) = 14.963, p < .001$							
<i>M</i> (SELF-DEFEATING HUMOR)	<i>a</i> ₄	-0.69	0.76	.363	—	—	—
	—	—	—	—	<i>b</i> ₄	0.24	0.04
	constant	<i>i</i> _M	31.12	2.34	< .001	<i>i</i> _Y	43.25
						2.98	< .001
$R^2 = 0.003$				$R^2 = 0.246$			
$F(1, 253) = 0.829, p = .363$				$F(5, 249) = 16.275, p < .001$			

<i>X</i> (NEUROTICISM)					<i>c</i>	6.35	1.40	< .001
					<i>c'</i>	5.56	0.43	< .001
<i>M</i> (AFFILIATIVE HUMOR)	<i>a₁</i>	-0.19	0.65	.773		—	—	—
		—	—	—	<i>b₁</i>	0.15	0.04	< .001
	constant	<i>i_M</i>	44.49	< .001	<i>i_Y</i>	23.45	2.72	< .001
$R^2 = 0.000$								
$F(1, 253) = 0.084, p = .773$								
<i>M</i> (SELF-ENHANCING HUMOR)	<i>a₂</i>	-2.19	0.60	< .001		—	—	—
		—	—	—	<i>b₂</i>	-0.19	0.05	< .001
	constant	<i>i_M</i>	43.39	< .001	<i>i_Y</i>	23.45	2.72	< .001
$R^2 = 0.050$								
$F(1, 253) = 13.223, p < .001$								
<i>M</i> (AGGRESSIVE HUMOR)	<i>a₃</i>	0.27	0.56	0.626		—	—	—
		—	—	—	<i>b₃</i>	-0.04	0.05	.394
	constant	<i>i_M</i>	25.99	< .001	<i>i_Y</i>	23.45	2.72	< .001
$R^2 = 0.000$								
$F(1, 253) = 0.239, p = .626$								
<i>M</i> (SELF-DEFEATING HUMOR)	<i>a₄</i>	3.86	0.79	< .001		—	—	—
		—	—	—	<i>b₄</i>	0.11	0.03	.001
	constant	<i>i_M</i>	16.19	< .001	<i>i_Y</i>	23.45	2.72	< .001
$R^2 = 0.086$					$R^2 = 0.537$			
$F(1, 253) = 23.73, p < .001$					$F(5, 249) = 57.679, p < .001$			