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Editorial: Research Participation Pools in Introductory Psychology Classes: Maintaining an Educational Benefit and Avoiding Coercion

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ABSTRACT. Many colleges and universities require students in introductory psychology classes to fulfill a research participation requirement. Recent research has described the common practices used by colleges and universities that require research participation. Several recommendations are provided to encourage departments to follow best practices that enhance the likelihood that students will learn from the experience and support the autonomy of the student participants.

Keywords: research participation, introductory psychology classes, ethics, participant autonomy, pedagogical recommendations

Recruitment from department research participant pools has been a long-standing practice in psychology departments (Sieber & Saks, 1989). This can benefit the student by giving a more accurate understanding of the research process, and it can benefit researchers at the institution by giving them access to a pool of participants for their studies. However, if not conducted thoughtfully, this requirement might simply seem like an additional hoop to jump through, and it might strike the student as being coercive, reducing their sense of autonomy. Departments should follow ethical guidelines outlined by the American Psychological Association (2013), which specify that researchers must take steps to protect student participants from the consequences of declining or withdrawing from research, and that adequate alternate opportunities to research study participation must be provided when research is a requirement for a course. Well-founded principles of voluntary participation dictate that students have autonomy when deciding whether to participate in a research study.

Current Practices of Research Participation Pools

To gain a sense of current practices in this area, Flynn and Rocheleau (2022) replicated the descriptive study of Sieber and Saks (1989), surveying 604 psychology department chairs regarding their use of undergraduate participant pools. Among 4-year institutions, 68%

use a pool, with no variation by geographic location. Institutions with a graduate program are more likely to use a pool (80%) than undergraduate-only departments (59%). Public institutions (81%) are more likely to recruit from pools than are private (58%). The most highly used research activities were participation in an experiment (96%) or a writing assignment (90%); the next most common activity came in a distant third place, which was participation in a simulated study (16%). Over one third of departments also reported that instructors could select additional research options for their class.

On the issue of potential coercion, the extent to which research activity was a requirement of the course and, if so, how research activities influenced the course grade are areas impacting perceived coercion. Of departments utilizing undergraduate participants, 84% required research participation for introductory psychology courses, regardless of geographic location, public/private standing, or presence of a graduate program. How research participation factored into a student's grade varied. The most common practice was that research activity reflected 5% of the total grade, followed by 10% of the total grade. A similar number responded that the completion of research resulted in a pass/fail portion for the class, in that failure to complete the research requirement resulted in a grade of "Incomplete" for the class. The duration of requirements also varied, and the vast majority of responses

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(92%) reported 6 hours or less as the requirement for the course. Extra credit for research participation was also granted by 77% of departments.

The benefits of using an undergraduate research pool typically point to educational goals within psychology. One-third of departments provided an extended debriefing for pool participants, above those required for IRB approval for human subject research to provide a detailed educational component to research participation. However, a mere 16% of departments assessed the educational value of research participation. From a student perspective, undergraduate students writing a reflection on their research activity spontaneously wrote positive to negative learning experiences at a ratio of 5:1, indicating some benefit to student participants (Moyer & Franklin, 2011). However, few departments reported identifying or assessing the expected learning outcomes (Flynn & Rocheleau, 2022). Also, participants in undergraduate research reported a similar level of autonomy in research activities as for exams in the course and reported significantly less pressure for the research activity as compared to a class exam (Rocchi et al., 2016). Undergraduate students also reported that they gained significantly more knowledge from participating in research than in studying for exams. Most students (87%) reported that research participation was worthwhile, whereas 27% reported that the course requirement was coercive (Miller & Kreiner, 2008).

Ethical and Pedagogical Recommendations

The two most likely reasons undergraduate students reported for not partaking in a research activity were that it was not worth the time or effort and that they did not know research was a requirement for the course before they registered for it (Rocchi et al., 2016). These results support that framing a context for a required research activity in a psychology course should be emphasized to enhance the participants' experience. To ensure that research participation has a pedagogical benefit and respects the students' autonomy, researchers can place greater emphasis on identifying educational goals and reducing coercion for those students contributing their time for class requirements.

We recommend the following to ensure that students fully understand the research requirement and comprehend the value of research participation as part of an introductory education in psychology:

1. Instructors should convey the goals of research activities via course syllabi and continuing reminders of this throughout the semester, and they should assess the outcomes of these goals. This should not merely be stated as a requirement, but with an

articulated description of its educational benefit. The sources cited above will support this point.

2. Learning objectives should be developed to enhance student participant expectations of the value of participating. This will also allow for data collection to determine whether or not the stated benefits are actually being fulfilled and, if not, lead to an assessment of how to better incorporate this experience into the class.
3. Undergraduate students must be informed about their role in advancing the field of psychology. This will provide a context for the course requirement and educational expectations.
4. Instructors should set a reasonable number of hours for research participation. Conservative hours of research requirements are prudent given that no research has examined the level or impact of the number of hours required on the educational benefit. Moreover, setting a high number of research hours may lead to feelings of exploitation and perceptions of reduced autonomy to consent and participate.
5. A justified and logical rationale for how research requirements factor into the course grade should be articulated, either in the syllabus or verbally in the class. This should balance between meaningful contributions for students' time yet not overly weighted.
6. If the instructor is collecting data for their own study, research assistants should serve as proxy data collectors in recruiting participants. This will reduce coercion in the power balance between faculty members and undergraduate students and increase autonomy of participants to elect to participate or to withdraw.
7. Debriefing strategies that go beyond typical IRB debriefing should be developed to increase the educational aspects of the required research participation and yield greater benefit to student participants. For example, students could receive information that connects the study they participated in to specific content covered in the textbook or lectures.
8. Educate students about the research benefits that have resulted from the research participation pool. For example, a newsletter or a discussion about the accomplishments of researchers in the department in some of the lectures over the semester would help students understand their role in the research enterprise of the institution.

These efforts can extend a core learning goal of scientific inquiry outlined for undergraduate psychology programs by the APA (2013).

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The Relationship Between Early Life Adversity and Academic Competence in Early Childhood

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ABSTRACT. It is well-documented that early life adversity negatively affects children academically and that these impacts magnify as the number of negative life events (NLEs) they experience increases. However, it is unclear whether the types of NLEs children are exposed to differentially relate to their levels of academic competence, a component of educational functioning. The present study addressed this question by assessing the relationships between different types of early life adversity and academic competence in 4- to 6-year-olds ($N = 111$) using secondary data analyses of parent reports in which respondents indicated children's levels of academic competence and exposure to NLEs. The results showed that family turmoil ($b = -2.31$, 95% CI $[-4.05, -0.57]$, $p = .01$, $f^2 = .07$), poverty ($b = -2.92$, 95% CI $[-4.31, -1.53]$, $p < .001$, $f^2 = .16$), and violence ($b = -3.43$, 95% CI $[-5.14, -1.73]$, $p < .001$, $f^2 = .15$) negatively predicted academic competence, whereas family separation and death/illness did not relate to academic competence. Additionally, poverty negatively predicted academic competence above and beyond family turmoil and violence ($b = -2.36$, 95% CI $[-0.49, 0.72]$, $p = .03$, $f^2 = .04$). These findings demonstrate that some, but not all, types of NLEs negatively predict preschoolers' academic competence, illustrating the differential relationship between different types of early life adversity and academic performance. Moreover, these findings reveal the deleterious impacts of certain types of NLEs on children's academics prior to beginning formal education, suggesting the importance of early intervention targeting family turmoil, poverty, and violence from a young age.

Keywords: early adversity, academic competence, childhood, school, preschool



Diversity badge earned for conducting research focusing on aspects of diversity.

Academic competence refers to the communicative, social, cognitive, and content-related skills, behaviors, and attitudes that empower children to be adept learners in the school classroom (DiPerna & Elliott, 1999). A student's level of academic competence is closely related to their propensity for academic achievement, academic aspirations, and overall quality of school functioning (Widlund et al., 2018). Research indicated that middle- and high-school students with poor academic outcomes (i.e., poor reading and mathematics ability, homework completion, and grades)

are more likely to be convicted of a crime, become pregnant during adolescence, and abuse alcohol or drugs (Kasen et al., 1998). Low-achieving students are also at a heightened risk to drop out of school, resulting in an increased probability of suffering from chronic disease, unemployment, and poverty in adulthood (Kasen et al., 1998; Vaughn et al., 2014). Thus, academic competence is an important area for researchers to study, as it is linked with a variety of educational, psychological, economic, and health outcomes.

Children's academic performance and content-related

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skills can be influenced by a variety of internal and external factors. Individual factors including aggression, delinquency, and substance abuse put adolescents and teenagers at risk for low academic achievement (Magdol, 1992). Moreover, a slew of family (e.g., low parental aspirations), peer (e.g., lack of friends), and school (e.g., ineffective teachers) factors affect students' propensity for academic success (Magdol, 1992). Overall, it is clear that both individual risk factors and early adversity in one's family, community, or school are closely related to academic competence and overall school functioning. However, the topic of unique relationships between particular adverse experiences and school competence in early childhood has received less study, as the majority of work in this area has focused on adolescents. Developing skills that support academic competence in early childhood may be of particular importance, as the preschool years set the foundation for children's educational trajectory and are considered to be a critical period that influence both academic outcomes and school adjustment later in development (Dickinson et al., 2006; Oades-Sese et al., 2011). As prior research has indicated that academic skills prior to beginning Kindergarten predict school success later in life, it is essential to understand factors that impact children's educational functioning during early childhood (Duncan et al., 2007).

The role of specific adverse experiences on children's academic competence is one understudied area that could provide insight into what unique obstacles preschoolers face that impede their educational trajectory. By understanding what factors negatively contribute to children's propensity for academic success, researchers can develop trauma-informed early intervention approaches that ameliorate potential damages of such factors and empower children to become skilled learners. It has been widely documented that early intervention is more effective than late intervention due to a variety of factors, including but not limited to young children's brain plasticity and high levels of parental involvement at this stage of development, further emphasizing the necessity of studying young children specifically (Campbell & Ramey, 1994; Center on the Developing Child, 2007). Thus, the goal of the present study was to examine the relationship between specific types of early adversity and academic competence in 4- to 6-year-old children.

Adverse Childhood Experiences

Early life adversity has been measured by researchers in a number of ways. One commonly used measure is the Adverse Childhood Experiences (ACEs) Questionnaire, which assesses a variety of potentially distressing events in childhood (e.g., parental incarceration, domestic violence). In their foundational study, Felitti et al. (1998)

found that approximately 52% of adult respondents reported being exposed to one or more adverse experiences and that 6.2% were exposed to four or more adverse experiences. Exposure was lower among respondents who were of older age, White or Asian, and who earned a college degree. Results also indicated a clear relationship between adverse experiences and health risk factors; those with an exposure to four or more adverse experiences were more likely to abuse drugs, contract a sexually transmitted infection, suffer from chronic disease (e.g., bronchitis), and have poorer self-rated health during adulthood than those with no exposure (Felitti et al., 1998).

In addition to negatively affecting physical health, adverse experiences can also predispose individuals to a wide variety of poor psychological outcomes. Specifically, prior research found that increased exposure to adverse experiences was positively correlated with depression and suicidality; adverse experiences in any subcategory increased a child's risk for a suicide attempt by 200 to 500% (Anda et al., 2002; Dube et al., 2001). Moreover, elevated exposure to adverse experiences was linked with heightened autonomic physiological stress responses (i.e., hyperactivity in the hypothalamic-pituitary-adrenal axis) and an increased risk of being diagnosed with an anxiety or personality disorder (Chapman et al., 2007).

Adverse experiences have also been found to negatively impact children's academic success. One study found that, as the number of adverse experiences 6 to 17-year-olds were exposed to increased, the likelihood of repeating a grade, not caring about school, and poor homework completion also increased (Robles et al., 2019). Moreover, early adversity has been linked with poor academic functioning in early childhood. Elementary school students with increased exposure to adverse experiences were more likely to have school attendance problems, teacher-reported academic failure, and more internalizing and externalizing behavior problems than their peers who did not experience early adversity (Blodgett & Lanigan, 2018). Research with kindergarteners indicated that increased exposure to adverse experiences was associated with below-average academic skills in a variety of subjects (e.g., reading, social studies, mathematics; Jimenez et al., 2016). Moreover, there is some evidence that adverse experiences positively correlate with aggressive behavior and deficits in attention (Jimenez et al., 2016). However, it is important to note that Jimenez et al. (2016) oversampled for children born to unmarried parents and who were Black or Latinx; thus, the sample was not generalizable to the population of children at large. Nevertheless, research has indicated a clear association between adverse experiences and poor academic functioning in 5-year-olds.

Most prior literature in the field has emphasized the importance of studying children's cumulative exposure

to adverse experiences, as these events often co-occur and jointly contribute to poor academic outcomes. By calculating a child's summed risk score (i.e., total number of adverse events they have experienced), psychologists can try to identify children with the greatest need for academic intervention (i.e., those who experienced the highest count of trauma; Evans et al., 2013). Researchers also highlight a relationship between adverse experiences and children's self-regulation, an important moderator between cumulative exposure to early life adversity and poor academic functioning (Loomis, 2021). Loomis (2021) found that cumulative exposure to adverse experiences contributed to conflictual student-teacher relationships, deficits in emotional self-regulation, classroom conflict, and disciplinary actions (e.g., suspension). Although prior work clearly suggests negative academic outcomes for children as the number of adverse experiences they are exposed to increases, whether there are differences in the relationships between particular types of early adversity and academic competence in early childhood has yet to be thoroughly explored.

Although most prior researchers have utilized a cumulative approach to studying the risk conferred by adverse experiences, it is also essential to study the intersection of early life adversity and academic competence within a categorical framework. Assessing the type, as opposed to strictly the count, of adverse experiences a child has been exposed to accounts for the fact that a child's summed ACE Questionnaire score does not reflect the diversity of trauma they have experienced. For example, a child who has experienced physical and sexual abuse likely has unique academic and psychological deficits from a child who has experienced parental incarceration and mental illness, although both have the same cumulative exposure (i.e., 2). Identifying the specific adverse experiences that have the most detrimental impact on students' academic functioning will allow for psychologists to identify effective early intervention approaches that target the consequences of specific traumatic events.

Types of Adverse Childhood Experiences

Some research on early adversity has focused on categorizing different types of adverse experiences into smaller groups. One measure of early life adversity, the ACEs Questionnaire, organizes types of adverse experiences into interrelated categories, including: physical, emotional, and sexual abuse; household mental illness; household substance use; household domestic violence; incarcerated household member; and parental divorce/separation (Giano et al., 2020). However, it is important to note that the specific categories that experiences

are organized into varies from study to study, as many researchers slightly modify conceptual categories and individual ACE Questionnaire items to best fit their specific research question. Furthermore, although all categories of early life adversity reflect potentially traumatizing events, there is evidence that different types of adverse experiences have different impacts on children's and adults' well-being. For example, Chang et al. (2019) found that different types of adverse experiences had different impacts on mental health outcomes and risk factors in adulthood. Children who reported emotional abuse were 198% more likely to be diagnosed with depression and 192% more likely to be diagnosed with posttraumatic stress disorder in adulthood than those who did not experience such abuse. Based on these findings, subsequent researchers have also assessed whether there are differential relationships between types of adverse experiences and academic success and/or school functioning in children.

Crouch et al. (2019) assessed how different types and quantities of adverse childhood experiences impede academic success in terms of school engagement, attendance, and achievement. These researchers assessed a variety of adverse experiences, including children's experience of parental divorce/separation; parental death; exposure to neighborhood violence; exposure to household mental illness, interpersonal violence, incarceration, or substance abuse; racism; and poverty (Crouch et al., 2019). They then grouped these individual adverse experiences into larger categories, including exposure to violence and living in a disrupted household. Parents also responded to questions indicating their child's school engagement, whether they repeated a grade, and school absenteeism. The researchers found that exposure to violence (in both the community and the home) was highest among children who displayed a lack of school engagement. Moreover, children who lived in a disrupted household (i.e., experienced household incarceration and mental illness) showed higher levels of all challenges to school success. Overall, the researchers found that the relationship between adverse childhood experiences and school success was dependent on the subgroup(s) of adverse childhood experiences that the child was exposed to. Specifically, living in a disrupted household, exposure to violence, and poverty all showed statistically significant relationships with multiple school success factors (Crouch et al., 2019).

However, it is essential to acknowledge the limitations of Crouch et al.'s (2019) work when assessing their findings. The researchers did not group their results by age to examine if adverse experiences impact children differently across developmental stages. Moreover, Crouch et al. (2019) did not include a detailed

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distribution of children's ages in their sample beyond noting that 58.4% of respondents were between 6 and 12 and 41.6% of respondents were between 13 and 17; it is plausible that only a small percentage of participants were 6 years old. Thus, the researchers' findings are not necessarily generalizable to 4- to 6-year-olds. Unlike the current study's sample, Crouch et al. (2019) did not have access to a participant pool experiencing high ACE Questionnaire count; only 7.8% of respondents had experienced ≥ 4 adverse experiences. Although the findings of this study indicated that types of adverse experiences have different relationships with challenges to academic success, it is important to identify whether these relationships are unique in early childhood. It is possible that there are adverse experiences that are particularly relevant in early childhood that are not as impactful during adolescence or vice versa, highlighting the importance of assessing different developmental stages in this line of work. The present study contributed to the literature by specifically assessing young children, to gain clarity as to what specific adverse experiences have a strong relationship with academic competence and negative implications for school success in this pivotal stage of a child's development.

Although there is robust research indicating the negative relationship between exposure to adverse childhood experiences and academic competence, there is a lack of prior literature utilizing the Negative Life Events Checklist (NLE-C), a very similar measure of early life adversity. Kilmer et al. (1998) constructed this 30-item measure, which includes exposure to specific NLEs (e.g., parental death) and chronic, long-term experiences (e.g., parental alcoholism). Like the ACEs Questionnaire and many other measures of early life adversity, the NLE-C groups together individual items to create conceptual categories of NLEs (i.e., family turmoil, poverty, violence, family separation, death/illness; Kilmer et al., 1998). These subcategories create meaningful distinctions between events that have the potential to differentially impact children's academic competence. By categorizing these adverse experiences into more homogeneous categories, researchers can identify whether particular sources of early life adversity have stronger relationships with poor academic outcomes and suggest targeted intervention addressing these categories.

It is plausible that ACE Questionnaire categories differentially impact preschoolers' propensity for academic success, just as they do for 6- to 17-year-old students. However, it is also possible that particular categories that are predictive of poor academic functioning in adolescence are not as salient during early childhood or vice versa. The present study aimed to bring clarity

to this gap in the literature by specifically assessing how the aforementioned five negative-life-event (NLE) categories differentially relate to 4- to 6-year-olds' academic competence. Overall, based on previous literature, we hypothesized that family turmoil (e.g., familial incarceration, mental illness, substance abuse), poverty (e.g., significant financial problems), and violence (e.g., unsafe neighborhood, witnessing physical altercations) would negatively predict children's academic competence. It is also possible that familial separation (e.g., living with a friend, being known to Child Protective Services) and death/illness (e.g., child bereavement) negatively predict academic competence; however, we hypothesized that familial separation and death/illness would not show a statistically significant relationship. The present study is unique in that, to our knowledge, it is the first to assess the relationship between different NLEs and academic competence in 4- to 6-year-olds.

Types of Early Adversity That May Relate to Academic Competence

Family Turmoil

Family turmoil includes a variety of distressing events relating to a child's home environment, including familial incarceration, arguments, mental illness, substance abuse, unemployment, and instability in household occupants. Prior studies indicated that family turmoil was associated with deficits in self-regulation, learned helplessness, heightened physiological stress responses, and sleeping problems in early childhood (Evans, 2003; Evans et al., 2005). Brown and Low (2008) found that sleeping problems partially mediated the relationship between chaotic living conditions and helpless responses to academic challenges in preschoolers experiencing poverty. These findings thus suggest that chaotic living conditions (e.g., residential crowding, familial instability) negatively affect children's quality of sleep, which is essential for optimal academic functioning and alertness throughout the school day. Thus, familial turmoil may be predictive of low levels of academic competence due to its relationship with sleep problems.

Poverty

There is overwhelming evidence indicating that children living in poverty—which can include having serious financial problems, insufficient clothing to wear, and lack of access to food—have lower levels of academic competence as compared to their peers not living in poverty (Cunha et al., 2006). A variety of reasons explain why poverty may negatively relate to children's academic functioning; one possibility is that child poverty is associated with differences in structural brain development (Hair et al., 2015). Hair et al. (2015)

longitudinally assessed this phenomenon via magnetic resonance imaging of children at multiple timepoints across development (i.e., 4–22 years of age). Results demonstrated disrupted gray matter development in children living in poverty; participants below the federal poverty line had regional gray matter (GM) volumes 7 to 10 percentage points below what is considered typical for their age and gender (Hair et al., 2015). Children's structural brain differences occurred in the hippocampus, temporal lobe, and frontal lobes; these brain regions are particularly relevant for cognitive functions necessary for academic success (e.g., long-term memory). Thus, it is plausible that young children living in poverty may show cognitive deficits that contribute to poor school functioning. It is also possible that having a lack of access to nutritious foods and quality healthcare as a result of low socioeconomic status keeps children from optimally functioning from a physical standpoint, which may also impede their academic success.

Violence

Violence refers to exposure to damaging behavior occurring outside of one's home, including seeing someone get injured, being upset by an unsafe neighborhood, witnessing a family member getting robbed, or being exposed to frequent family arguments. The impacts of exposure to community violence have been found to be particularly salient and damaging to optimal academic functioning in elementary school students. Hurt et al. (2001) addressed this phenomenon in a sample of inner-city African American youth (i.e., 7-year-olds). The researchers conducted participant interviews to measure children's exposure to violence (e.g., witnessing gunshots) and subsequent symptoms of distress (e.g., afraid something bad will happen if they go out to play). The results indicated that exposure to community violence was associated with increased rates of anxiety and depression, low self-esteem, low GPA, and increased absenteeism (Hurt et al., 2001). Based on these findings, it is plausible that young children with higher exposure to neighborhood violence will have lower levels of academic competence.

Family Separation

Family separation refers to a child living with a relative or friend, spending time in a foster home, and being known to Child Protective Services. Although long-term foster care may have negative implications for school functioning, the nature in which the present sample was collected likely limits the strength of the relationship between family separation and academic competence. Our data consists of questionnaires completed by a child's primary caregiver, who was their biological

mother in the large majority of cases. Thus, it is highly unlikely that many children in our sample spent a long period of time in foster care or do not primarily live with their biological parent(s). Although it is possible that children in our sample might have lived with a relative or friend for a short period of time, this is not necessarily deleterious to a child's academic functioning. Many reasons can explain why parents may choose to have their child temporarily live with a relative (e.g., out of town, demanding work hours) that do not necessarily point to instability or poor parenting. Thus, we hypothesized that family separation would not show a statistically significant association with academic competence.

Death/Illness

The fifth early life adversity subcategory is death/illness, which refers to a close relative suffering from a serious injury and/or illness, having a physical disability, or dying. Although child bereavement has negative implications for academic achievement, this relationship has been found to be largely mediated by parental adaptability and familial climate (Brent et al., 2012). Thus, although experiencing the death of a close family member has the potential to lead to negative educational outcomes, it is possible that children who experienced grief received adequate counseling and were met with strong parenting skills following their family member's passing, compensating for many ill effects. Moreover, having a relative suffer from a serious injury does not necessarily equate to a traumatizing experience that would negatively impact a child's school functioning. The NLE-C items in this category are somewhat vague, and respondents could have differing interpretations of what constitutes a "serious injury or illness." For example, a parent may consider a close relative battling cancer to be a serious illness; experiencing this chronic form of family illness likely in fact impacts a child's academic functioning. This contrasts with a child's relative breaking a bone, which many parents may also believe to constitute a serious injury. However, having a relative experience this type of injury likely has an inconsequential impact on a child's well-being or academic competence. Thus, we hypothesized that death/illness will not show a statistically significant association with academic competence.

Aims of the Present Study

The goal of the present study was to assess the relationship between different types of potentially distressing events experienced in early childhood (i.e., family turmoil, poverty, violence, family separation, and death/illness) and academic competence in preschool-aged children. Our overall aim was to increase understanding

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of the intersection of early life adversity and academic competence using a categorical approach that assessed for the type, as opposed to strictly the count, of adverse childhood experiences a child is exposed to. Using this qualitative framework allowed us to identify the particular NLEs that are most impairing to preschoolers' academic competence.

Methods

Participants

The present study utilized a dataset from previous work assessing children's development of optimism conducted by the Early Emotional Development Program at Washington University School of Medicine in St. Louis. The study consisted of 289 children between the ages of 3 and 8 from the greater St. Louis area. Children were recruited from 22 local preschools, childcare centers, and elementary schools. Of the 289 total child participants of the Optimism Study, 111 were included

in the present study. Participants were excluded if (a) they were younger than 4 years or older than 6 years, (b) their parent reported that they had major neurological delays, (c) their parent did not complete the NLE-C or (d) their parent did not complete the Academic Competence subscale of the MacArthur Health and Behavior Questionnaire. The final sample was diverse in terms of race, socioeconomic status, and gender (see Table 1). As part of their participation in the Optimism Study, children completed a variety of behavioral tasks that measured their probabilistic reasoning and levels of optimism. The present study, however, drew only on the information children's parents provided in the surveys they completed as part of their parent report. This study was conducted with prior approval from the Washington University School of Medicine in St. Louis institutional review board per #201710071.

Measures

Academic Competence

To measure children's academic competence, parents completed the MacArthur Health and Behavior Questionnaire (HBQ 1.0), a widely used survey that contains items assessing children's physical health, psychological health, social functioning, and school functioning. The present study solely drew on items from the Academic Competence subscale within the school functioning portion of the survey. In this section, parents were asked to respond to questions indicating their child's academic performance (i.e., "how good is your child in math?"), talent they have relative to other students (i.e., "compared to other children, how much innate ability or talent does your child have in math?"), and their performance relative to other children (i.e., "in comparison to other children, how would you evaluate your child's performance in math?"). All of the aforementioned survey items were duplicated and slightly modified to assess children's reading skills, as well. Parents responded on a 7-point Likert scale, and an overall Academic Competence score was computed by calculating a mean of the six items.

Early Life Adversity

To measure children's exposure to adverse experiences, parents completed the NLE-C, a 35-item questionnaire assessing a variety of potentially distressing events experienced during early childhood. This measure was quite similar to Kilmer et al.'s (1998) original NLE checklist, with an additional five items deemed appropriate by the researchers after consulting other life event measures to assess additional adverse childhood experiences that were not fully captured in the NLE-C. These novel items include: "another parent lost his/her job or has

TABLE 1

Participant Demographics

Baseline Characteristic	<i>n</i>	%
Age		
4-year-olds	39	35
5-year-olds	40	36
6-year-olds	32	29
Race		
Asian & Pacific Islander	1	1
Black & African American	41	37
Hispanic	6	5
Native American	0*	0
White (Non-Hispanic)	43	39
Multiracial	19	17
Gender		
Female	54	49
Male	56	51
Total Household Income		
Less than \$10,000	10	9
\$10,000–\$14,999	6	5.5
\$15,000–\$19,999	6	5.5
\$20,000–\$24,999	9	8
\$25,000–\$34,999	7	6
\$35,000–\$49,999	10	9
\$50,000–\$74,999	7	6
\$75,000–\$149,999	21	19
\$150,000 or more	31	28

Note. *One multiracial participant indicated Native American as one of their racial identities.

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been unemployed,” “my child had a serious illness or injury (in hospital),” “my child was very sick or injured (not in hospital),” “my child has experienced a parent marrying, getting engaged, or entering into a serious relationship with someone new,” and “my child has been negatively impacted by teasing or bullying.” These additional items were used when assessing overall NLEs but not in any of the subgroups. See Kilmer et al. (1998) for the 30 primary items included in the measure. The parent was asked to indicate which of these 35 events their child has experienced ($\alpha = .82$). Individual survey items were grouped to reflect five NLE subcategories, and Cronbach's alpha values were calculated for each

group to assess internal consistency: family turmoil (e.g., “a close family member was arrested or in jail”; $\alpha = .74$), poverty (e.g., “our family had serious financial problems”; $\alpha = .71$), violence (e.g., “my child saw someone get badly hurt”; $\alpha = .48$), family separation (e.g., “my child lived with a relative or friend”; $\alpha = .69$), and death/illness (e.g., “my child's parent, brother, or sister died”; $\alpha = .62$).

Results

Descriptive Results

Of the 111 parents who filled out survey data, 109 included information about their children's academic competence. There was a wide range of competence reported by parents; the mean score across all participants was 4.02 with a standard deviation of 1.58. Moreover, our sample showed a range of 6, indicating that participants scored on both the extreme low (i.e., 1) and extreme high (i.e., 7) ends of the Likert scale. Academic Competence showed a weak positive relationship with age, $r(107) = .22$, $p = .02$. See Table 2 for more comprehensive descriptive results concerning Academic Competence scores broken down by age.

Of the 111 parents who filled out survey data, 85 (76.58%) reported their child experienced ≥ 1 NLE(s), 69 (62.16%) reported their child experienced ≥ 2 NLEs, and 53 (47.75%) reported their child experienced ≥ 3 NLEs. The mean summed NLE score among all participants was 3.36, indicating that the children in our sample were exposed to a substantial number of potentially traumatic experiences. Although the types of NLEs children experienced varied, all five NLE categories were experienced by a portion of participants. The most prevalent types of NLE exposure were family turmoil (59.46%) and death/illness (49.55%). Fewer participants denoted experiencing events related to poverty (27.03%), family separation (9.91%), and violence (21.62%). See Table 3 for more detailed descriptive results concerning the prevalence of each NLE category.

Bivariate correlations were conducted to provide additional information regarding the relationships between different NLE groupings. Family turmoil and poverty showed a strong positive relationship, $r(105) = .68$, $p < .001$, along with violence and poverty, $r(108) = .61$, $p < .001$. However, not all NLE categories were highly correlated; death/illness and poverty showed a weak positive relationship, $r(108) = .28$, $p = .003$, along with death/illness and family turmoil, $r(105) = .30$, $p = .002$. Thus, it was meaningful to draw comparisons between these different NLE groupings in the present study, as they showed clear distinctions from one another. See Table 3 for a comprehensive list of correlations between the different NLE categories.

TABLE 2

Academic Competence Scores and Age

	<i>M</i>	<i>SD</i>	Range
4-year-olds	3.62	1.60	1–7
5-year-olds	4.02	1.60	1–7
6-year-olds	4.52	1.43	1.33–7
Total	4.02	1.58	1–7

Note. This table demonstrates the *M*, *SD*, and range of Academic Competence scores (on a scale from 1–7) of our sample broken down by age group.

TABLE 3

Prevalence of NLE Categories and Correlations Between NLE Categories

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Family Turmoil	66	1.49	1.80	-	.68	.36	.30	.54
2. Poverty	30	0.51	1.00	.68	-	.37	.28	.61
3. Family Separation	11	0.14	0.54	.36	.37	-	.41	.39
4. Death/Illness	55	0.91	1.17	.30	.28	.41	-	.33
5. Violence	24	0.31	0.66	.54	.61	.39	.33	-

Note. This table demonstrates the number of participants who experienced ≥ 1 event in each NLE category, along with a comprehensive list of correlations between the different Negative Life Event (NLE) categories.

TABLE 4

Relationship Between NLEs and Academic Competence

	<i>B / Estimate</i>	<i>SE</i>	<i>p</i>	95% CI		<i>F</i> ²
				LL	UL	
Age (Years)	0.48	0.19	.01	0.10	0.85	.06
Gender	0.09	0.30	.76	-0.51	0.69	
Total NLE	-3.10	1.16	.01	-5.40	-0.81	.07

Note. This table displays the overall relationship between children's summed negative life event (NLE) score and academic competence, while controlling for both age and gender.

Relationships Between Academic Competence and NLEs

A linear regression was conducted to identify the overall relationship between participants' total NLE score and academic competence when controlling for age and gender (see Table 4). Effect sizes were calculated using f^2 , where .02 indicates a small effect, .15 indicates a medium effect, and .35 indicates a large effect. Children's summed NLE score was significantly associated with their academic competence ($B = -3.10, p = .01, f^2 = .07$). Additionally, children's age was significantly associated with their academic competence ($B = 0.48, p = .01, f^2 = .06$). These results indicate that (a) a higher summed NLE score was associated with lower academic competence, (b) older age was associated with higher academic competence, and (c) gender did not significantly relate to academic competence.

A series of linear regressions were conducted to identify the relationships between each NLE category and academic competence (see Table 5). The dependent variable was participants' Academic Competence score (i.e., mean of 6 items in the Academic Competence

subscale of the MacArthur Health and Behavior Questionnaire), the independent variable was NLE category type, and the covariates were age and gender. As predicted, family turmoil ($B = -2.31, p = .01, f^2 = .07$), poverty ($B = -2.92, p < .001, f^2 = .16$), and violence ($B = -3.43, p < .001, f^2 = .15$) negatively predicted academic competence. Also as predicted, family separation ($B = -0.82, p = .47$) and death/illness ($B = 0.10, p = .88$) did not significantly relate to academic competence. Age predicted academic competence regardless of NLE category and gender did not predict academic competence in any model. Importantly, above and beyond age, there was an effect of family turmoil, poverty, and violence on participants' levels of academic competence.

To further probe the three variables that were found to be significant in the prior analyses, a linear regression was then conducted to explore the relative strength between family turmoil, poverty, and violence in predicting academic competence (see Table 6). When put in the same model, poverty ($B = -2.36, p = .03, f^2 = .04$) negatively predicted academic competence, whereas family turmoil ($B = 0.41, p = .73$) and violence ($B = -1.56, p = .19$) did not significantly relate to academic competence. In other words, poverty was found to negatively predict academic competence above and beyond family turmoil and violence.

Discussion

The primary goal of the present study was to identify the relationship between different types of early life adversity (i.e., family turmoil, poverty, violence, family separation, and death/illness) and levels of academic competence in 4- to 6-year-old children. In line with the study's hypothesis, findings revealed that events related to family turmoil (e.g., familial incarceration, mental illness, substance abuse), poverty (e.g., insufficient clothing/food, financial instability), and violence (e.g., unsafe neighborhood conditions, robberies) negatively

TABLE 5

Relationships Between NLE Categories and Academic Competence

	B / Estimate	SE	p	95% CI		f^2
				LL	UL	
Age (Years)	0.41	0.19	.03	0.03	0.78	.04
Gender	0.12	0.30	.70	-0.49	0.72	
Family Turmoil	-2.31	0.88	.01	-4.05	-0.57	.07
Age (Years)	0.50	0.18	.01	0.15	0.86	.07
Gender	0.05	0.29	.87	-0.52	0.61	
Poverty	-2.92	0.70	< .001	-4.31	-1.53	.16
Age (Years)	0.44	0.19	.03	0.05	0.82	.05
Gender	0.18	0.31	.57	-0.44	0.80	
Family Separation	-0.82	1.14	.47	-3.07	1.43	
Age (Years)	0.43	0.19	.03	0.04	0.81	.05
Gender	0.24	0.31	.45	-0.38	0.85	
Death/Illness	0.10	0.66	.88	-1.21	1.40	
Age (Years)	0.53	0.18	.01	0.17	0.89	.07
Gender	0.17	0.28	.54	-0.39	0.73	
Violence	-3.43	0.86	< .001	-5.14	-1.73	.15

Note. NLE = negative life events.

TABLE 6

Strength of Relationships Between NLE Categories and Academic Competence

	B / Estimate	SE	p	95% CI		f^2
				LL	UL	
Family Turmoil	0.41	1.16	.73	0.03	0.78	
Poverty	-2.36	1.06	.03	-0.49	0.72	.04
Violence	-1.56	1.18	.19	-4.05	-0.57	
Age (Years)	0.48	0.18	.01	0.11	0.84	.06
Gender	0.14	0.29	.64	-0.44	0.72	

Note. This table displays the relative strength between family turmoil, poverty, and violence in predicting academic competence. NLE = negative life events.

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predicted children's levels of academic competence as reported by their parent(s) or caregiver(s). Also in line with the present study's hypothesis, events related to family separation (e.g., living with a friend/relative, spending time in foster care) and death/illness (e.g., death or injury of a close relative) did not show a statistically significant relationship with children's levels of academic competence. Overall, our results suggest that experiencing certain, but not all, types of NLEs negatively predict academic competence in young children.

The findings that various types of early life adversity differentially impact children's academic competence align with Crouch et al. (2019), who found that adverse childhood experiences' impact on school success depended on the type of event a child was exposed to. More specifically, living in a disrupted household (i.e., family turmoil), violence, and economic hardship all negatively predicted multiple school success factors (i.e., lack of school engagement, school absenteeism, repeated grade). Crouch et al.'s (2019) sample consisted of a large national dataset of 6- to 17-year-olds. The present study found significant relationships between academic competence and family turmoil, violence, and poverty, thereby extending previous results to 4- to 6-year-olds and further illustrating the deleterious effects of certain types of early life adversity (i.e., family turmoil, violence, and poverty) on young children's academics. The present findings suggest that these types of adverse experiences have detrimental impacts on children's academic competence prior to them even being fully immersed in formal education. Children experiencing events related to poverty, violence, and family turmoil are likely entering kindergarten at a clear disadvantage to their peers not experiencing these forms of early adversity.

The findings that family turmoil negatively predicted academic competence are also consistent with previous literature. Specifically, Brown and Low's (2008) research identified a relationship between one form of family turmoil (i.e., chaotic living conditions) and helpless responses to academic challenge in a sample of low-income and primarily Black 3- to 5-year-olds enrolled in a Head Start preschool. The researchers measured chaotic living conditions via residential crowding, TV background noise, and changes in primary caregiver's romantic partner(s). The present study utilized a wider measure of family instability than Brown and Low (2008), as our parent report included items measuring parental incarceration, unemployment, and psychological problems. Our results extend those of Brown and Low (2008) and indicate not only the negative impacts of changes in household occupants, but

other types of household instability, as well. Further, our dataset included a more racially and socioeconomically heterogeneous sample, generalizing the populations to which previous findings can be considered relevant to.

Our results that neighborhood violence negatively predicted academic competence is in line with prior literature, namely Hurt et al.'s (2001) investigation of the impact of exposure to community violence on children's well-being. The researchers found that increased exposure to community violence (e.g., hearing gunshots, seeing a dead body outside) was linked to poor academic functioning as measured by chronic school absenteeism and low grade point average. The researchers' sample included 7-year-old children of low socioeconomic status, some of whom had in utero cocaine exposure. The present study broadened the scope of Hurt et al. (2001) by including younger children (i.e., 4- to 6-year-olds) with diverse socioeconomic backgrounds. Moreover, our sample did not include a disproportionate number of children exposed to addictive stimulant drugs, a potential third variable in Hurt et al.'s (2001) study. Our findings that neighborhood violence negatively predicted academic competence further demonstrate the extent to which exposure to violent and potentially traumatizing events in one's community limits children's ability to succeed in school settings. One potential explanation is that these academic deficits are due to posttraumatic stress symptoms interfering with children's ability to focus in class.

The findings that poverty was by far the strongest predictor of children's academic competence are also consistent with previous studies. This prior related research focused specifically on neurodevelopmental implications of poverty on children's structural brain development, particularly disrupted gray matter development that may lead to deficits in several cognitions essential for academic functioning (e.g., memory, higher order thinking; Hair et al., 2015). It is possible that abnormal gray matter development and impaired cognitive functioning mediates the relationship between poverty and low levels of academic competence, although this topic requires further research. Poor physical health may also mediate the relationship between poverty and academic functioning. Having inadequate access to pediatricians, psychologists, a nutritious diet, and other medical necessities leaves children vulnerable to suboptimal development and various life-threatening disorders going untreated. These maladaptive physical symptoms (e.g., malnutrition) and conditions (e.g., chronic disease) may contribute to suboptimal academic functioning. Although previous studies have clearly indicated negative physical and neurological implications of poverty, the present study

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was unique in that, to our knowledge, it was the first to identify poverty as a negative predictor of academic competence in 4- to 6-year-olds above and beyond other types of early life adversity. Based on robust findings indicating the neurological consequences of poverty in young children, the mechanisms by which poverty negatively predicts academic competence should be more thoroughly explored.

The findings that experiences of family separation did not significantly relate to children's academic competence are likely reflective of the limited nature in which our sample experienced events in this category. Although family separation (i.e., spending time in foster care, being known to Child Protective Services) has potentially deleterious consequences, the fact that our data relied on parent reports indicates that children in our sample likely only experienced family separation in nonthreatening contexts (e.g., briefly living with a relative) and lived in at least a semistable home environment. Out of the 11 participants who reported event(s) relating to family separation, 8 (72.73%) solely experienced their child living with a relative or friend—their family was not known to Child Protective Services, nor had the child spent time in foster care. It is probable that more chronic forms of family separation (e.g., foster care) in fact negatively predict academic competence, but the nature of our sample limited our ability to capture this relationship.

It is also unsurprising that death/illness did not significantly relate to academic competence given prior research emphasizing the important role of familial climate and parental functioning in insulating children from the negative effects of experiencing loss. Specifically, research conducted by Brent et al. (2012) indicated that the relationship between child bereavement and academic achievement was mediated by both parental adaptability and familial cohesion. Given these findings, we postulate that children in our sample who experienced familial death were met with strong parenting and opportunities for emotional bonding, although we do not have measures identifying these potential mediating variables. Moreover, items in this category could reflect an older adult family member dying, who might have not had an unexpected or highly emotional death with long-lasting consequences for the child. Furthermore, our findings that death/illness do not negatively predict academic competence may be due in part to the heterogeneity and/or vagueness of items in this category, particularly those relating to family injury. It is plausible that the NLE-C captured both acute (e.g., sprained ankle) and chronic (e.g., serious car accident) family injuries, which we believe likely differentially impact academic competence. As nearly

half (49.55%) of the children in our sample experienced death/illness, it is likely that the vagueness of survey items led respondents to endorse normative experiences of family illness and injury. The present findings further illustrate that 4- to 6-year-olds' experiences of death/illness do not negatively predict academics; further research may explore whether the proximity of the deceased family member or seriousness of their injury moderates this relationship.

The fact that children's caregivers can shield them from being made aware of the realities of family members' illnesses/injuries contrasts with the little control adults often have in protecting children from events relating to poverty, violence, and family turmoil. This offers an additional explanation for what differentiates the types of early life adversity that negatively predict academic competence from those that do not. Because children often directly experience events relating to poverty (e.g., malnutrition), family turmoil (e.g., witnessing parent(s)' substance abuse), and violence (e.g., witnessing a robbery), it is rarely possible for their caregivers to shield them from these events as they are able to for familial deaths or illnesses. Children's lack of protection from poverty, family turmoil, and violence may make these events particularly salient in their lives and potentially traumatizing; thus, it is logical they show a capacity to negatively impact children in the school classroom.

Limitations

The present study relied solely on parent reports to quantify students' levels of academic competence via several items assessing perceived math and reading ability. Our data yielded a large range of reported academic competence, suggesting that parents likely communicated about their perceptions of their children's ability honestly. However, these survey items were subjective, and it is possible that this data was not indicative of children's true levels of academic competence. The HBQ 1.0 did not inquire about specific mathematics and reading abilities, but instead asked more subjective questions. Parents are often very involved in their children's academics during early childhood (e.g., helping them with reading). Consequently, parents' perceptions of their children's levels of academic competence are likely highly related to their true abilities. Whereas there is evidence in support of the validity of parental reports of children's academic functioning and behaviors (Guo et al., 2021), parents may not have a holistic and accurate understanding of their children's academic abilities, especially if they are preoccupied with other life stressors (e.g., providing food for their children despite having insufficient financial resources) or personal struggles

(e.g., severe mental illness). Parents' perceptions of their children's academic competence are dependent upon their levels of involvement in their children's academics, which may be particularly low for those dealing with certain types of adverse experiences. Thus, future research might include additional direct measures of children's academic competence, such as teacher reports along with standardized reading and mathematics test scores.

The present measure of early life adversity also solely relied on parent reports of the NLE-C. Although our results indicated a large range of sum NLE scores, it is possible that parents underreported particular items out of fear of social stigma or being deemed an unfit parent. Given the fact that our sample had a mean NLE score of 3.36, it is likely that we captured a fair endorsement of early life adversity and likely did not suffer from chronic underreporting. Additionally, our findings linking higher summed NLE scores with lower levels of academic competence could have reflected a subset of parents who answered the report honestly as opposed to those who indicated their child was not exposed to early adversity and had high levels of academic competence. Further studies should collect data about early life adversity in more comprehensive ways (e.g., child interview). However, due to the fact that our sample consisted of 4- to 6-year-olds, a parent report was the most feasible means of data collection.

Most families in the present study identified as either Black/African American (37%) or White (Non-Hispanic; 39%). Thus, our findings may not be generalizable to preschoolers from racial backgrounds that were not sufficiently represented in our sample (i.e., Asian & Pacific Islander, Native American, Hispanic). Our findings are also not necessarily generalizable to Black/African American and White preschoolers at large, as children in our sample were from urban regions of the St. Louis area. Additional research should be conducted that assesses the impacts of different types of early life adversity on children's academics from a variety of geographic locations and includes rural and suburban communities. Moreover, our dataset also did not include questions about abuse experienced in the home. Although parents might have underreported their child's experiences of abuse, this is an important measure of early life adversity that should be included in future studies. Finally, because survey respondents were children's biological mothers in nearly all cases, we did not have a rich pool of data that accurately reflected children affected by family separation. It is likely that family separation (e.g., spending time in a foster home) negatively predicts academic competence; however, the nature of our dataset limited our ability to accurately measure this area of early life adversity.

Future Directions

Despite the aforementioned limitations, the current study adds valuable information to literature assessing the relationship between different types of early life adversity and academic competence in young children, a population yet to be thoroughly explored. Our work highlights the necessity of studying children prior to them being fully immersed in formal education. The present findings indicate that students as young as 4 years old who are experiencing certain types of adverse experiences (i.e., family turmoil, poverty, and violence) display inferior levels of academic competence as compared to their peers who have not experienced these forms of early life adversity. Within current educational systems, adults seldom focus on the importance of academic competence in such young children and instead place value on growing mathematics and reading skills in elementary school-aged students. However, the present study suggests that particular types of early life adversity may be predisposing young children to display inadequate academic competence later in their educational trajectory.

Based on the present study's findings, future research should assess the efficacy of intervention strategies that target family turmoil (e.g., parent-child interaction therapy), poverty (e.g., free lunch program), and violence (e.g., trauma-focused cognitive behavioral therapy) in insulating children from the negative impacts of these sorts of potentially traumatic experiences. Perhaps offering evidence-based interventions would moderate the relationship between these NLEs and low levels of academic competence. Furthermore, future studies should identify mediating variables that further illuminate the relationship between academic competence and family turmoil, poverty, and violence. Identifying the mechanisms by which these types of early life adversity impact children's academics (e.g., sleeping problems, insecure attachments to parents) would further inform potential intervention efforts in this line of work.

Lastly, additional research is needed to assess the relationship between chronic forms of family separation (e.g., spending time in foster care) and academic competence in 4- to 6-year-olds, as the nature of our sample limited our ability to accurately capture this relationship. Perhaps oversampling for children who have spent prolonged periods of time in foster care or whose families are known to Child Protective Services would allow researchers to more accurately measure family separation. In sum, the present study provides a novel contribution to the fields of school psychology and child development and highlights the grave impacts of early life adversity on children's academics. Looking into the

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future, it is essential to promote access to evidence-based educational and psychological interventions to all youth, who deserve resources that promote educational success.

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Stress and Mental Health Among Racial Historically Marginalized and Advantaged Undergraduate Students

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ABSTRACT. Undergraduate students are a high-stress population with a high prevalence of psychopathology. Further, students from historically marginalized racial groups face additional stressors and challenges. The aim of this study was to investigate the impact of identifying with a historically marginalized racial group on the relationship between stress and mental health outcomes. We used archival data, in which 528 college students were originally recruited to complete surveys on college-related stress and symptoms of psychopathology. Analyses of variance were employed to study differences in rates between a historically marginalized racial group and a historically advantaged racial group. Regression analyses were employed to study the moderating effect of identity group on the relationship between stress and mental health outcomes. The historically marginalized racial group was more likely to report performance stress ($p = .008$) and the historically advantaged racial group was more likely to report internalized symptoms of psychopathology including anxiety ($p = .007$) and depression ($p = .02$). Furthermore, group marginalization moderated the relationship between total stress ($p < .001$), financial stress ($p < .001$), and performance stress ($p < .001$) with symptoms of internalized psychopathology. Our findings may be explained by a difference in resilience, interpretation of stress, or limitations to survey methods. Recommendations for researchers and clinicians are offered.

Keywords: minority stress, college students, marginalization



Diversity badge earned for conducting research focusing on aspects of diversity.

College students experience a high level of stress, which is related to negative health outcomes (Beiter et al., 2015; Hubbard et al., 2018). Prior to the COVID-19 pandemic, 48.6% of college students reported moderate stress, and 27.9% reported high levels of stress over the course of 12 months (American College Health Association, 2020). Stress is not a uniform experience; several domains have been studied among college students, some of which include financial stress (Britt et al., 2016; Jones et al., 2018; Robb, 2017), interpersonal stress (Jones et al., 2018; Pedersen, 2017), performance or academic stress (Beiter et al., 2015; Pedersen, 2017), intrapersonal stress (Hubbard et al.,

2018), and aggregate general stress (Arbona et al., 2018).

The college student population is increasingly diverse in the United States; the number of historic racial minority students in higher education has increased in the last two decades (de Brey et al., 2019). In addition to being vulnerable to general college stress, racial minority college students are subject to what has been referred to as “ethnic minority stress,” a phenomenon separate from general stress (Wei et al., 2011), urging the examination of stress and mental health issues among various diverse groups. Ethnic minority stress describes unique challenges that are associated with being of ethnic or racial minority status, such as experiencing discrimination,

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language barriers, stereotype confirmation concern, or acculturative stress (Arbona et al., 2018; French & Chavez, 2010; Wei et al., 2011). Among college students, experiences of ethnic minority stress are directly related to negative health outcomes (Anderson, 2013; Busse et al., 2017), negative psychological consequences, and worse subjective well-being (French & Chavez, 2010). Notably, ethnic minority stress appears to influence attitudes on college persistence (e.g., dropout rates), which highlights the importance of considering underlying minority status stress in the college mental health literature (Arbona et al., 2018; Wei et al., 2011).

Mental Health Outcomes Among College Students

In addition to stress, college students are vulnerable to symptoms of psychopathology. Over the last decade, rates of mental illness among college students have risen, including symptoms of depression and anxiety (Duffy et al., 2019). Broadly, 41.4% of college students report moderate to severe levels of general psychological distress (American College Health Association, 2020).

Among the general college student population, the relationship between reported stress and mental health outcomes is also well-known. In fact, certain domains of stress have been observed to predict specific mental health outcomes. For example, financial stress has been reported to be associated with poorer subjective well-being (Robb, 2017) and greater anxiety symptoms (Tran et al., 2018), whereas academic stress has been reported to be predictive of substance misuse (Metzger et al., 2017) and depressive symptoms (Acharya et al., 2018). Interpersonal stressors, such as hardships stemming from relationships or social conflict, are related to symptoms of depression and anxiety, in addition to being predictive of binge drinking or other substance use problems (Hubbard et al., 2018; Pedersen, 2017). Other intrapersonal stressors, such as low self-esteem and low confidence, have been shown to be related to symptoms of eating problems, anxiety, and depression (Hubbard et al., 2018).

These observed links between stressors and symptoms have been observed in a broad U.S. student population. Given the increasingly diversified student population and known impact of ethnic minority stress, the relationship between stress and mental health among students identifying with historically marginalized groups warrants investigation. The literature examining the relationship between stress and mental health outcomes specific to racial minorities in college is relatively scarce, although some research supports a link between minority stress and depression (Arbona et al., 2018) and psychological distress in general (French & Chavez, 2010).

Impact of Marginalization

The college student population in the United States is becoming increasingly racially diverse, creating the need and opportunity to distinguish different critical stress and mental health issues among racial groups. Typically racial identity is operationalized as an individual's self-identification of group membership (The California State University, 2020), versus ethnic identity, which refers to cultural and social identity (Kamenou, 2007). Aspinall (2002) posits that operationalized social categories, such as "racial minority" and "racial majority" or "non-White" and "White," serve to group individuals by assumed shared experiences with oppression and power due to appearance or cultural identity, despite being distinct from a group's own internal definition. As racial groups in the United States continue to diversify, the concept of "majority vs. minority" will lose relevance. Further, using the labels of "non-White vs. White" centers Whiteness as normative, which should be avoided (Aspinall, 2002). Many studies refer to "ethnic and racial minorities," "students of color," or utilize other terminology. To group students, we are utilizing "historically marginalized" to recognize both the impact of historical stress and the current growth in population.

Marginalization and Stress

Despite historically marginalized students being at a greater risk for negative outcomes associated with ethnic minority stress, little recent research has identified stress differences between historically marginalized and historically advantaged college students beyond their experiences with ethnic minority stress. Existing literature has shown that students of color have reported greater levels of family and financial stress and less perceived family support compared to their White counterparts (Cadaret & Bennett, 2019). Otherwise, there is a paucity of research examining potential differences in the manifestation of stress between historically marginalized and historically advantaged students.

Present Study

The field of mental health, which traditionally centers Whiteness, would benefit from a focus on the impacts of historic marginalization on emotional wellness. We sought to contribute toward a more nuanced understanding of ethnic minority stress and other experiences of historically marginalized communities.

The current study used archival data to investigate the impact of historic marginalization status on the relationship between stress types and mental health outcomes. Stress types were determined by Hubbard and colleagues (2018), using the same data, and included interpersonal, intrapersonal, financial, and performance

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stressors. Mental health outcomes assessed included symptoms of depression, anxiety, eating problems, and substance use. Although this study was largely exploratory, we hypothesized that historic marginalization status would moderate the relationship between stress and mental health.

Method

Participants

The current study reanalyzed data used in a previous study, which showed gender differences in the relationship between stress and mental health (Hubbard et al., 2018). The original dataset, collected in 2017, included 564 college students enrolled in undergraduate or graduate programs within the United States. IRB approval was granted from the University of Portland for the original study. Participants were recruited from the University of Portland, a private northwestern institution, targeting students in introductory psychology courses for which they received course credit, as well as nationally through Amazon Mechanical Turk, through which participants received a small financial incentive. In preparing the dataset for analysis, 36 participants were excluded for either not being an undergraduate student due to the small number, not reporting racial identity, or having omitted more than three responses from their survey.

Participants were grouped based on their alignment with either a historically advantaged racial culture (White) or historically marginalized racial identities (all other than White) to shed light on the impact of racial marginalization on stress and mental health processes. Thus, for the purpose of delineating experiences of identification with a racial group that has been historically marginalized, groups will cautiously be described as “historically marginalized” and “historically advantaged” in this article. The final sample for the current study contained 528 undergraduate students, 60.6% of whom identified as part of the historically advantaged group, and 39.4% identified as members of the historically marginalized group (17.6% Asian, 11.9% Hispanic or Latino, 5.9% Black, 3.8% Pacific Islander, and 0.2% Native American or Alaska Native). Most participants ($n = 369$; 69.9%) were women; nonbinary and genders other than women and men were not options in the original data collection, which is a limitation to this study. Participants were primarily 18 years old (33.7%), followed by 19 (21.4%), 21 (17.2%), 20 (14.0%), 22 (9.1%), 23 (3.2%), and 24 (1.1%).

Measures

Mental Health Outcomes

The Symptoms and Assets Screening Scale (SASS; Downs et al., 2013) is a self-report measure composed

of 34 items assessing overall psychological distress, well-being, help-seeking behaviors, and symptoms of depression, anxiety, substance abuse, and disordered eating. The current study utilized participants' scores (ranging from 0-15) on the individual mental health outcome items (e.g., “I feel hopeless”); higher scores indicated higher levels of psychopathology. The measure has shown good reliability and validity (Cronbach's α for symptom subscales ranging from .73 to .81; Downs et al., 2013) in assessing constructs consistent with other college mental health literature. In the current study, the SASS demonstrated good internal consistency (Cronbach's $\alpha = .82$).

Stress Types

The Multidimensional Stress Scale (MSS; Hubbard et al., 2018) is a self-report measure created for the original study by Hubbard and colleagues (2018) that is composed of 32 items assessing life stressors experienced by college students. Participants were instructed to read each item and rate how much each of the described stressors (e.g., “Problems with roommates or housemates”) negatively affected their mental health in the past year on a four-point scale; higher scores indicated higher levels of stress. Using exploratory factor analyses with the same sample as the current study, Hubbard et al. (2018) discovered four latent variables and stress categories: interpersonal stress (items related to external social stressors), intrapersonal stress (items related to internal stressors and self-image), performance stress (items related to achievement and productivity), and financial stress (items related to financial wellness and work-related stress). Each of the four factors demonstrated very good internal consistency (Cronbach's α ranging from .71 to .90) and the total stress variable (sum of all 32 items) demonstrated excellent internal consistency (Cronbach's $\alpha = .92$).

Procedure and Design

Data were collected between February 2017 and January 2018 through an online, self-report survey. The sample was recruited nationally with Amazon Mechanical Turk ($n = 216$) and locally from a private university in the northwestern United States using Qualtrics ($n = 348$). At the time of data collection, the local undergraduate study body was primarily identified as White (57%; University of Portland, 2019). No significant differences between the national and local samples on the measures included in the current study were evident (Hubbard et al., 2018).

Several items on the MSS were endorsed by few students in the sample, suggesting that these items have limited relevance to this particular sample; these items included “problems with coworkers” (endorsed by 3.9%),

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“excessive drinking or drug use” (4.4%), “death of a family member, partner, or friend” (11.4%), “issues with sexual or gender identity” (6.3%), “experiencing discrimination” (4.4%), and “feeling like you should be in college” (19.2%). For the current study, we employed a one-way analysis of variance (ANOVA), finding no significant mean differences between the historically marginalized and historically advantaged on these items with the exception of discrimination, $F(1, 525) = 15.98$, $p < .001$. As such, coworker problems, excessive drinking or drug use, death of a family member, partner, or friend, issues with sexual or gender identity, or feeling like you should be in college were excluded from factor analyses. Experiencing discrimination was retained.

Results

A one-way ANOVA showed a significant effect of group identity (i.e., historically marginalized vs. historically advantaged) on levels of anxiety, $F(1, 526) = 7.29$, $p = .007$, $\eta^2 = .01$, and depression, $F(1, 526) = 5.81$, $p = .016$, $\eta^2 = .01$, such that historically advantaged students were more likely to endorse these symptoms of psychopathology. There was also a significant effect of group identity on performance stress, such that the historically marginalized students were more likely to endorse performance stress, $F(1, 526) = 7.12$, $p = .008$, $\eta^2 = .01$. No significant group differences were found among eating problems, $F(1, 526) = 0.00$, $p = .99$, $\eta^2 = .00$, substance problems, $F(1, 526) = 0.06$, $p = .81$, $\eta^2 = .00$, interpersonal stress, $F(1, 526) = 0.04$, $p = .84$, $\eta^2 = .00$, intrapersonal stress, $F(1, 526) = 1.73$,

$p = .19$, $\eta^2 = .003$, or financial stress, $F(1, 526) = 3.15$, $p = .08$, $\eta^2 = .01$. See Table 1 for the means and standard deviations of the MSS variables across group identity.

To explore the impact of historic cultural marginalization on the association between stress and mental health outcomes, the mental health outcome was regressed on a model that included two covariates (age, gender) consistent with other college stress studies (Saleh et al., 2017), two main effect variables (stress, marginal cultural status), and the interaction between stress and marginal cultural status. Marginal status was coded -1 for historically marginalized cultural backgrounds and $+1$ for historically advantaged cultural backgrounds. Stress variables were mean-deviated to center the variable around zero (Vik, 2014). To reduce the risk of type I errors, symptoms of psychopathology, as measured by the SASS, were consolidated into two variables: “internalized symptoms” (totals scores from anxiety and depression subscales) and “behavioral excess” (totals scores from substance use and eating problem subscales). Hubbard et al. (2018) reported statistically significant correlations between all four of these subscales, and a higher correlation coefficient between depression and anxiety specifically.

TABLE 1

Means and Standard Deviations of Mental Health and Stress Variables

Variable	Historically Marginalized Group		Historically Advantaged Group		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Anxiety	5.05	3.60	6.01	4.22	5.63	4.01
Depression	3.89	3.39	4.69	3.88	4.38	3.71
Substance Problems	1.60	2.52	1.55	2.62	1.57	2.58
Eating Problems	5.02	3.11	5.03	3.38	5.02	3.27
Performance Stress	10.84	5.21	9.59	5.22	10.08	5.25
Financial Stress	2.41	2.19	2.08	2.11	2.21	1.44
Interpersonal Stress	5.03	3.34	5.10	3.66	5.07	3.53
Intrapersonal Stress	4.71	3.94	5.14	3.55	4.97	3.71

Note. Historically Marginalized Group ($n = 208$), Historically Advantaged Group ($n = 320$), Total ($N = 528$)

TABLE 2

Moderation Effect of Marginal Status on the Relationship Between Total Stress and Mental Health Outcome

	<i>b</i>	CI (95%)		β	<i>t</i>	r_s^2	<i>p</i>
		Lower	Upper				
Internalized symptoms							
Covariates							
Gender	0.13	−0.80	1.06	.01	0.27	.01	.791
Age	0.34	0.07	0.60	.07	2.52	.07	.012
Marginal Status	−2.03	−2.87	−1.19	−.14	−4.75	−.14	<.001
Total Stress	0.44	0.35	0.52	.92	−2.21	.31	<.001
Total Stress x Marginal Status	−0.06	−0.12	−0.01	−.19	10.60	−.06	.028
Behavioral excess							
Covariates							
Gender	0.00	−0.80	0.75	−.03	−0.06	.00	.950
Age	0.07	−0.02	0.42	.20	1.81	.07	.071
Marginal Status	0.00	−0.67	0.73	.03	0.08	.00	.939
Total Stress	0.57	0.11	0.24	−.00	−0.16	.19	<.001
Total Stress x Marginal Status	−0.02	−0.05	0.04	.17	5.04	−.01	.874

Note. Fit for model predicting internalizing symptoms, $R^2 = .58$, $F(5, 502) = 104.91$, $p < .001$; Fit for model predicting behavioral excess, $R^2 = .31$, $F(5, 502) = 44.38$, $p < .001$.

Total Stress

Internalized Symptoms

When regressed on the covariates, the internalized score was positively associated with age, $\beta = .07$, $F(5, 502) = 6.35$, $p = .01$, but not gender, $\beta = .01$, $F(5, 502) = 0.07$, $p = .79$. A main effect was found for stress, $\beta = .92$, $F(5, 502) = 4.88$, $p < .001$, such that as stress increased, internalized symptoms increased. A main effect was also found for marginalization status, $\beta = -.14$, $F(5, 502) = 22.56$, $p < .001$, such that historically advantaged students reported higher internalizing symptoms than marginalized students reported. The interaction term was statistically significant, $\beta = -.19$, $F(5, 502) = 112.36$, $p = .03$. The positive interaction coefficient indicated that the association between stress and internalizing symptoms was slightly greater for students from historically advantaged cultural backgrounds than those from marginalized backgrounds. See Table 2.

Behavioral Excess

The behavioral excess score was not associated with age, $b = .07$, $F(5, 502) = 3.28$, $p = .07$, or gender, $b = -.00$, $F(5, 502) = 0.00$, $p = .95$. A main effect was found for stress, $b = .57$, $F(5, 502) = 0.03$, $p < .001$, such that as

stress increased, students reported more behavioral excess. Neither the main effect for marginalization status, $b = .00$, $F(5, 502) = 0.01$, $p = .94$, or the interaction term, $b = -.02$, $F(5, 502) = 25.40$, $p = .87$, were statistically significant.

Interpersonal Stress

Internalized Symptoms

The internalized symptoms score was positively associated with age, $\beta = .12$, $F(5, 521) = 12.96$, $p < .001$, but not gender, $\beta = .01$, $F(5, 521) = 0.04$, $p = .85$. A main effect was found for stress, $\beta = .66$, $F(5, 521) = 43.30$, $p < .001$, such that as stress increased, internalized symptoms increased. A main effect was also found for marginalization status, $\beta = -.10$, $F(5, 521) = 9.36$, $p = .002$, such that historically advantaged students reported higher internalizing symptoms than marginalized students reported. The interaction term was not statistically significant, $\beta = -.04$, $F(5, 521) = 0.12$, $p = .73$. See Table 3.

Behavioral Excess

As age increased, behavioral excess scores increased, $\beta = .10$, $F(5, 521) = 7.56$, $p = .006$. Gender was not related to behavioral excess, $\beta = -.40$, $F(5, 521) = 1.04$,

TABLE 3

Moderation Effect of Marginal Status on the Relationship Between Interpersonal Stress and Mental Health Outcome

	<i>b</i>	CI (95%)		β	<i>t</i>	r_s^2	<i>p</i>
		Lower	Upper				
Internalized symptoms							
Covariates							
Gender	0.10	−0.98	1.19	.01	0.19	.01	.852
Age	0.56	0.26	0.87	.12	3.60	.12	<.001
Marginal Status	−1.56	−2.48	−0.54	−.10	−3.06	−.10	.002
Interpersonal Stress	1.35	0.95	1.75	.66	6.58	.22	<.001
Interpersonal Stress x Marginal Status	−0.05	−0.33	0.23	−.04	−0.35	−.01	.726
Behavioral excess							
Covariates							
Gender	−0.39	−1.15	0.37	−.40	−1.02	−.04	.309
Age	0.30	0.09	0.51	.10	2.75	.10	.006
Marginal Status	0.19	−0.49	0.87	.02	0.56	.02	.577
Interpersonal Stress	0.72	0.44	1.00	.55	5.03	.18	<.001
Interpersonal Stress x Marginal Status	0.03	−0.17	0.23	.03	0.30	.01	.763

Note. Fit for model predicting internalizing symptoms, $R^2 = .42$, $F(5, 521) = 75.54$, $p < .001$; Fit for model predicting behavioral excess, $R^2 = .32$, $F(5, 521) = 50.10$, $p < .001$.

TABLE 4

Moderation Effect of Marginal Status on the Relationship Between Intrapersonal Stress and Mental Health Outcome

	<i>b</i>	CI (95%)		β	<i>t</i>	r_s^2	<i>p</i>
		Lower	Upper				
Internalized symptoms							
Covariates							
Gender	1.95	0.80	3.11	.13	3.33	.12	<.001
Age	0.32	−0.01	0.66	.07	1.89	.07	.060
Marginal Status	−1.21	−2.28	−0.14	−.08	−2.23	−.98	.026
Intrapersonal Stress	1.27	0.84	1.70	.66	5.79	.21	<.001
Intrapersonal Stress x Marginal Status	−0.22	−0.51	0.06	−.18	−1.56	−.06	.120
Behavioral excess							
Covariates							
Gender	0.67	−0.11	1.46	.07	1.68	.07	.093
Age	0.15	−0.08	0.38	.05	1.31	.05	.191
Marginal Status	0.38	−0.35	1.10	.04	1.02	.04	.311
Intrapersonal Stress	0.60	0.31	0.90	.48	4.05	.16	<.001
Intrapersonal Stress x Marginal Status	−0.02	−0.22	0.17	−.03	−0.25	−.01	.904

Note. Fit for model predicting internalizing symptoms, $R^2 = .29$, $F(5, 520) = 44.10$, $p < .001$; Fit for model predicting behavioral excess, $R^2 = .22$, $F(5, 520) = 507.15$, $p < .001$.

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$p = .31$. A main effect was found for stress, $\beta = .55$, $F(5, 521) = 25.30$, $p < .001$, such that as interpersonal stress increased, students reported more behavioral excess. Neither the main effect for marginalization status, $\beta = .02$, $F(5, 502) = 0.31$, $p = .58$, or the interaction term, $\beta = .03$, $F(5, 502) = 0.09$, $p = .76$, were statistically significant. See Table 3.

Intrapersonal Stress

Internalized Symptoms

The internalized symptoms score was not related to age, $\beta = .07$, $F(5, 520) = 3.57$, $p = .06$. Internalized symptoms were related to gender, $\beta = .13$, $F(5, 520) = 11.09$, $p < .001$. Main effects were found for stress, $\beta = .66$, $F(5, 520) = 33.52$, $p < .001$, and for marginalization status, $\beta = -.08$, $F(5, 520) = 4.97$, $p = .03$. As stress increased, internalized symptoms increased, and historically advantaged students reported higher internalizing symptoms than marginalized students reported. The interaction term was not statistically significant, $\beta = -.18$, $F(5, 520) = 2.43$, $p = .12$. See Table 4.

Behavioral Excess

The behavioral excess score was not associated with

age, $\beta = .05$, $F(5, 520) = 1.72$, $p = .19$, or gender, $\beta = .07$, $F(5, 520) = 2.82$, $p = .09$. A main effect was found for stress, $\beta = 0.48$, $F(5, 520) = 16.40$, $p < .001$, such that as intrapersonal stress increased, students reported more behavioral excess. Neither the main effect for marginalization status, $\beta = .04$, $F(5, 520) = 1.04$, $p = .31$, or the interaction term, $\beta = -.03$, $F(5, 520) = 0.06$, $p = .90$, were statistically significant. See Table 4.

Performance Stress

Internalized Symptoms

The internalized symptoms score was positively associated with age, $\beta = .12$, $F(5, 520) = 13.25$, $p < .001$. Internalized symptoms were related to gender, $\beta = .10$, $F(5, 520) = 8.24$, $p = .004$. Main effects were found for performance stress, $\beta = .80$, $F(5, 520) = 60.53$, $p < .001$, and for marginalization status, $\beta = -.17$, $F(5, 520) = 25.10$, $p < .001$. As performance stress increased, internalized symptoms increased, and historically advantaged students reported higher internalizing symptoms than marginalized students reported. The interaction term was statistically significant, $\beta = -.21$, $F(5, 520) = 4.24$, $p = .039$. The positive interaction coefficient suggests that the relationship between performance stress and

TABLE 5

Moderation Effect of Marginal Status on the Relationship Between Performance Stress and Mental Health Outcome

	CI (95%)			β	t	r_s^2	p
	b	Lower	Upper				
Internalized symptoms							
Covariates							
Gender	1.55	0.49	2.61	.10	2.87	.10	.004
Age	0.57	0.26	0.88	.12	3.64	.12	<.001
Marginal Status	-2.52	-3.51	-1.53	-.17	-5.01	-.17	<.001
Performance Stress	1.09	0.82	1.37	.80	7.78	.26	<.001
Performance Stress x Marginal Status	-0.20	-0.38	-0.01	-.21	-2.06	-.07	.039
Behavioral excess							
Covariates							
Gender	0.85	0.02	1.68	.08	2.00	.08	.046
Age	0.29	0.05	0.53	.10	2.36	.10	.019
Marginal Status	-0.15	-0.92	0.62	-.02	-0.38	-.02	.702
Performance Stress	0.44	0.22	0.65	.49	3.96	.16	<.001
Performance Stress x Marginal Status	-0.10	-0.25	0.05	-.17	-1.34	-.06	.181

Note. Fit for model predicting internalizing symptoms, $R^2 = .41$, $F(5, 520) = 72.07$, $p < .001$; Fit for model predicting behavioral excess, $R^2 = .14$, $F(5, 520) = 16.27$, $p < .001$.

TABLE 6

Moderation Effect of Marginal Status on the Relationship Between Financial Stress and Mental Health Outcome

	CI (95%)			β	t	r_s^2	p
	b	Lower	Upper				
Internalized symptoms							
Covariates							
Gender	2.48	1.25	3.71	.16	3.96	.16	<.001
Age	−0.10	−0.48	0.28	−.02	−0.51	−.02	.608
Marginal Status	−2.10	−3.25	−0.95	−.14	−3.57	−.14	<.001
Financial Stress	1.99	1.19	2.79	.59	4.87	.19	<.001
Financial Stress x Marginal Status	−0.53	−1.06	0.00	−.23	−1.95	−.08	.052
Behavioral excess							
Covariates							
Gender	1.14	0.29	2.00	.11	2.64	.11	.009
Age	0.01	−0.26	0.27	.00	0.04	.00	.970
Marginal Status	−0.07	−0.87	0.72	−.01	−0.18	−.01	.858
Financial Stress	0.59	0.04	1.14	.27	2.10	.09	.036
Financial Stress x Marginal Status	−0.04	−0.40	0.33	−.03	−0.21	−.01	.836

Note. Fit for model predicting internalizing symptoms, $R^2 = .08$, $F(5, 521) = 9.00$, $p < .001$; Fit for model predicting behavioral excess, $R^2 = .08$, $F(5, 521) = 180.46$, $p < .001$.

internalizing symptoms was slightly greater for historically advantaged students than historically marginalized students. See Table 5.

Behavioral Excess

As age increased, behavioral excess scores increased, $\beta = .10$, $F(5, 520) = 5.57$, $p = .02$. Gender was also related to behavioral excess, $\beta = .08$, $F(5, 520) = 4.00$, $p = .35$. A main effect was found for stress, $\beta = .49$, $F(5, 520) = 15.68$, $p < .001$, such that as performance stress increased, students reported more behavioral excess. Neither the main effect for marginalization status, $\beta = -.02$, $F(5, 520) = 0.14$, $p = .70$, nor the interaction term, $\beta = -.17$, $F(5, 520) = 1.80$, $p = .18$, were statistically significant. See Table 5.

Financial Stress

Internalized Symptoms

The internalized symptoms score was not associated with age, $\beta = -.02$, $F(1, 521) = .26$, $p = .61$, $r_s^2 = -.02$; although it was related to gender, $\beta = .16$, $F(1, 521) = 15.68$, $p < .001$, $r_s^2 = .16$. Main effects were found for financial stress, $\beta = .59$, $F(1, 521) = 23.72$, $p < .001$, $r_s^2 = .19$, and for marginalization status, $\beta = -.14$, $F(1, 521) = 12.75$, $p < .001$, $r_s^2 = -.14$. As financial stress increased, internalized symptoms increased, and historically advantaged students reported higher internalizing symptoms than historically marginalized students reported. The interaction term trended toward statistical significance, $\beta = -.23$, $F(5, 521) = 3.80$, $p = .05$, $r_s^2 = -.08$, suggesting that the relationship between financial stress and internalizing symptoms may be slightly greater for historically advantaged students than historically marginalized students. See Table 6.

Behavioral Excess

The behavioral excess score was not associated with age, $\beta = .00$, $F(5, 521) = 0.00$, $p = .97$. Behavioral excess was related to gender, $\beta = .11$, $F(5, 521) = 6.97$, $p = .009$. Main effects were found for financial stress, $\beta = .27$, $F(5, 521) = 4.41$, $p = .04$. Neither the main effect for marginalization status, $\beta = -.01$, $F(5, 521) = 0.03$, $p = .86$, or the interaction term, $\beta = -.03$, $F(5, 521) = 0.04$, $p = .84$, were statistically significant. See Table 6.

Discussion

The aim of this study was to examine the effects of racial marginalization on the relationship between stress and mental health outcomes. A one-way ANOVA revealed greater instances of performance stress among historically marginalized students. Symptoms of psychopathology also differed between the groups, such that historically advantaged students reported

greater levels of internalized symptoms compared to historically marginalized students. Further, linear regression analyses found a moderating effect of historic marginalization status on the relationship between total stress, performance stress, and financial stress with internalized symptoms of psychopathology. In sum, historically marginalized students report the same level of stress, and more in some cases, compared to historically advantaged students. Stress appears to have less of an impact on internalized mental distress (anxiety and depression) for historically marginalized students than for historically advantaged students.

Differences in Stress

We observed that historically marginalized students reported more performance stress, which includes not having enough time to get everything done, worrying about the future, feeling pressure to succeed, issues with time management, balancing school, work, and life, academic problems, test anxiety, and feeling pressure to be in college (Hubbard et al., 2018), than historically advantaged students. This observation has not been thoroughly addressed in the existing literature. In a study with African American students at several predominantly White universities, researchers found racial discrimination to be associated with several negative outcomes, including performance anxiety and perfectionism, both of which are related to performance stress (Chao et al., 2012). Poor cultural representation in student bodies may leave students from historically marginalized racial groups feeling more stressed to academically perform and presents the opportunity for stereotype threat; expecting negative judgment by majority groups regarding the inferiority of being a minority increases performance stressors by those minority individuals (Owens & Massey, 2011). Further, test anxiety, one of the performance stress factor items, has been shown to generally be higher among Black students compared to White students in various age groups (von der Embse et al., 2018). In general, however, this is an area that research has not thoroughly covered.

Differences in Internalized Mental Distress

The finding that historically advantaged students reported more symptoms of internalized mental distress, which included anxiety and depression, compared to the historically marginalized students is consistent with findings from the National College Health Assessment which revealed that ethnic minority students tended to report fewer symptoms of psychopathology and fewer diagnoses of mental health concerns on a national level (Chen et al., 2019). Notable, however, it is unknown

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if psychopathology is truly lower among minority students or if these students are underdiagnosed. Despite the lower rates of diagnoses, students who identified as multiracial and Asian/Pacific Islander were more likely to experience functionally impairing hopelessness and depression, anger, and suicidality. Additionally, suicide attempts were similarly reported between White, Black, and Hispanic students, despite Black and Hispanic students reporting fewer psychiatric symptoms (Chen et al., 2019). The differences observed in the current study may represent actual differences in psychopathology between historically marginalized and historically advantaged students. However, given the greater rates of suicidal behaviors (ideation and attempts) and functionally impairing depression despite fewer instances of mental health diagnoses, these findings may point to barriers for mental health care or cultural variants in how distress is presented and interpreted. Cross-culturally, depression has been documented to vary in its presentation in regard to somatization, expressions of positive affect, relationship with suicidality, and feelings of guilt (Juhasz et al., 2012). Anxiety disorders have also been shown to vary in presentation across diverse cultures (Marques et al., 2011). It is probable that some measures of depression and anxiety are not sensitive to cultural nuances, despite their use in research and clinical contexts.

Differences in affective disorders between Western and Eastern cultures show similar inconsistencies. Studies utilizing inventories of affective symptoms tend to observe higher rates of negative affect among East Asian and Asian American groups compared to European American groups, but structured diagnostic interviews report higher rates of affective disorders in the United States compared to Asian nations (De Vaus et al., 2018). Rather than an issue of measurement, De Vaus and colleagues (2018) suggest a difference in experiences with emotions, such as variability in ways of thinking and responding to emotions and thoughts. Certain patterns of thinking are more associated with Eastern cultures than Western (e.g., emotions co-occur, emotions change, emotions exist in context) and ways of responding to or coping with thoughts and emotions may protect against affective disorder (De Vaus et al., 2018). In sum, observations of differences in psychopathology across cultural groups may be explained by differences in cultural experiences and interpretations of negative affect.

Moderating Effects of Identity

Despite historically marginalized students reporting stressors at the same rate as historically advantaged students, and at a greater rate in the case of performance stress, stress does not appear to lead to negative affect

at the same rate for the two groups. We observed a moderating effect of marginal status on the relationship between certain stressors (total stress, performance stress, and financial stress) and internalized symptoms (symptoms of anxiety and depression) such that historically advantaged students who endorsed these stressors were more likely to experience internalized symptoms of psychopathology. Various theories may explain these observed findings; we explore outcomes as explained by locus of control and resilience.

Locus of Control

In addition to possible drivers from cultural variants in experiences with negative affect, there may be cultural differences in the prevalence of and experiences with certain risk factors for performance stress. Although we did not study locus of control in this study, previous researchers have observed relevant patterns related to this. One study with college students found that a high external locus of control, defined by believing that one's successes or failures are determined by powerful others or chance, has been shown to predict greater academic stress among college students (Karaman et al., 2019). Its inverse, internal locus of control, is positively related to socioeconomic status, academic performance, and feeling safe at school, which may reduce academic or performance stress (Shifrer, 2018). Llamas et al. (2018) observed that an internal locus of control protected Latino/a college students experiencing interpersonal stress (e.g., intragroup marginalization) from psychological distress. Previous findings have suggested that the way stressors are interpreted by an individual may contribute to mental health outcomes, which may explain the protective factor against psychopathology for historically marginalized students and facilitative factor for historically advantaged students reporting performance stress.

Historic marginal status was also found to moderate the relationship between financial stress and internalized symptoms. Frankham et al. (2020) studied economic locus of control, the degree of control over financial aspects of life, and found that it did not uniquely predict mental health outcomes; however, hope mediated the relationship between subjective financial hardship and depression, and shame mediated the relationship between subjective financial hardship and anxiety. Given these findings, it is plausible that experiences with financial stress (e.g., feeling hopeful, feeling ashamed) protect against or facilitate psychopathology.

Resilience

Another possible explanation for the difference in the impact of stress by historic marginalization status may be resilience. Findings from Hu et al. (2015) suggested

that greater levels of resilience are related to better mental health outcomes. This relationship was shown to be stronger for those who had experienced adversity, suggesting that those who had exposure to adversity had opportunities to build resilience. The chronic stress of marginalization may present opportunities to strengthen resilience, weakening the relationship between stress and psychopathology. However, the extent to which racial stress affects mental health has been shown to differ by racial identity and the level to which one identifies with that given racial group (Woo et al., 2019), and is therefore not generalizable to broad historic marginalization.

Resilience, a buffer against the effects of stress on mental health, is central to minority stress research (Marks et al., 2020; Meyer, 2015). A review of research with Black and African American populations propose a “cultural resilience life stress paradigm” which posits that cultural identity plays a role in resilience against mental distress (Archibald, 2018). Further, another study found that strong cultural identification and expression of cultural heritage enhanced resilience among African American and Latinx adolescents (Wilcox et al., 2021). Shih and colleagues (2019) additionally proposed that identifying with two or more racial groups fosters psychological resilience, supporting the notion that racial identity impacts resilience against mental distress. However, additional research parsing out the impact of resilience in mental health outcomes in college student populations specifically is needed.

Concluding Remarks

Implications of these findings are relevant for researchers and college mental health professionals. Findings from the current study highlight some of the implications historic marginalization may have on college students' experience with certain stressors and mental health outcomes.

Limitations and Recommendations for Future Research

As the primary aim of this paper was to investigate outcomes predicted by experiences with historic marginalization, it is critical to consider the limitations of this study in regard to identity. One limitation to this study was the aggregation of historically marginalized individuals into one category. Research has shown differences in reported psychopathic symptoms between racial groups (Chen et al., 2019); however, sample sizes from the current study were not large enough for independent group analysis. Further, this study required respondents to select only one racial identity, which limited valuable information regarding the nuances of multiracial identities. Holding a biracial identity has been shown to have important implications for stress

that future research should consider (Albuja et al., 2019).

Based on our findings, we provide the following recommendations for researchers and college mental health providers. Specific findings highlighting the relationship between stress, mental health outcomes, and marginalized identities can inform prevention programming and mental health screening to increase awareness of these patterns among students and providers.

Recommendations for Researchers

1. Utilize culturally responsive research methodologies. Tailor recruitment strategies to target low response groups to avoid limitations of aggregating responses. If looking at identity markers, consider expanding racial groups and allowing for multiracial selection.
2. To further examine cultural factors related to stress and mental health, consider including a measure of group affiliation or acculturation for each racial identity endorsed. Forcing participants to choose one racial identity without accounting for variations in levels of cultural affiliation overlooks important factors related to culture's impact on outcome processes.
3. Carefully select measures of holistic mental distress if assessing psychopathology. Consider cultural variants of distress that may not be accounted for in diagnostic criteria but may indicate psychopathology nonetheless.

Recommendations for College Counseling Centers

1. Be mindful of the differences in stress and psychopathology presentations in historically advantaged and marginalized students. Be intentional in measures used to assess global campus wellness, utilizing instruments that demonstrate cultural sensitivity toward the groups who are asked to respond.
2. Be aware of the pressures related to academic performance and achievement that may increase stress among historically marginalized students. Consider surveying students at different times of the year to assess for periods of time when extra support may be appropriate.
3. Prevention programming may consider focusing on the relationship between stress and mental health outcomes while teaching resilience and stress-reduction strategies for all students.

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A Test of a Cognitive Appraisal Model of the Influence of Perceptions of Seriousness and Self-Compassion as Influencing Impostor Experiences

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ABSTRACT. Impostor phenomenon, the feeling of intellectual fraudulence, is commonly experienced by college students and may be predicated in environmental variables. If students feel that others do not take them seriously, they may feel like impostors. Self-compassion is theorized to protect against the effects of impostor phenomenon and negative environmental phenomena. Using cognitive appraisal theory, this study framed the environmental stress of not being taken seriously as possibly resulting in a negative primary appraisal. It was hypothesized that self-compassion and perceptions of seriousness would negatively predict impostor phenomenon. The authors also predicted that self-compassion would moderate the relationship between perceptions of seriousness and impostor phenomenon. Results of a hierarchical regression analysis revealed that increased levels of self-compassion were found to be related to fewer reported impostor experiences, $\Delta F(2, 194) = 76.23, \beta = -.66, p < .001, \Delta R^2 = .31, R^2 = .44, f^2 = .59$, but perceptions of seriousness negatively predicted impostor phenomenon, $F(1, 195) = 23.56, \beta = -.32, p < .001, R^2 = .11, f^2 = .12$. Self-compassion was not found to moderate the relationship between perceptions of seriousness and impostor phenomenon, $\Delta F(3, 193) = 50.62, \beta = .11, p = .75, \Delta R^2 = .00, R^2 = .44, f^2 = .00$. Self-compassion is likely a buffer against the effects of IP, but the connections between perceptions of college campuses and impostor features requires further exploration. Further research regarding how self-compassion and perceptions of seriousness influence impostor features in university students is needed. Limitations, implications, and future directions are offered.

Keywords: impostor phenomenon, campus climate, self-compassion cognitive appraisal

Impostor phenomenon (also known as imposter syndrome¹) is a term used to describe an intrapsychic pattern of perceived inadequacy wherein one struggles to internalize and accept the accomplishments and achievements they have earned and otherwise attribute their success to luck (Clance & Imes, 1978). When experiencing an impostor moment, people often

feel a sense of intellectual fraudulence and worry that they may be “exposed” as being unsuccessful, incapable, and undeserving of the achievements they have earned (Clance & Imes, 1978; Patzak et al., 2017). Impostor phenomenon can be experienced in all domains of life. The literature has documented impostor phenomenon in the workplace, in parenting, and among friend groups (Bravata et al., 2020). However, the present literature on impostor phenomenon is most extensive in discussing the impostor experiences of students in academia. The seminal research on impostor phenomenon focuses on impostor experiences of undergraduate college women and includes some experiences of graduate school and professional women (Clance & Imes, 1978). Since then, the research on impostor phenomenon in college students has expanded to explore the phenomenon

¹Impostor phenomenon and impostor syndrome refer to the same experience and are commonly used interchangeably in the literature. This article will use the term impostor phenomenon to avoid the disparaging and disempowering context that comes with the use of the term “syndrome.” Impostor syndrome is commonly employed in nonpeer-reviewed lay literature on impostor syndrome (see Bravata et al., 2019). Additionally, the term impostor is also spelled as “imposter.” According to linguists, “impostor” is the proper spelling, which is why this spelling is used throughout this article.

across multiple variables, such as race (Bravata et al., 2020; Wei et al., 2020), level in school (Babenko et al., 2018), and generation (Pulliam & Gonzalez, 2018). Specifically, researchers have found that impostor phenomenon in students relates to a reduced sense of belongingness on campus (Graham & McClain, 2019), increased burnout (Villwock et al., 2016), increased depression, increased self-monitoring, and lower self-esteem (Chrisman et al., 1995).

A considerable body of research has been conducted on impostor phenomenon, but little has been done on how to address it. Bravata et al. (2020) conducted a meta-analysis that looked at the recommendation for mental healthcare professionals on how to treat impostor phenomenon. None of the 66 valid articles included in the meta-analysis recommended specific treatment modalities (e.g., interpersonal process therapy or cognitive behavioral therapy) for managing impostor symptoms. Matthews and Clance (1985) used qualitative methods to document how they treated 41 patients experiencing impostor phenomenon. They recommended validating and addressing patients' doubts and fears, and support groups to help them feel less isolated. Their study did not include data on treatment intensity, duration, or symptom change. Bravata et al. (2020) found that much of the nonpeer-reviewed lay literature included recommendations on how to treat impostor phenomenon, whereas none of the peer-reviewed academic articles had recommendations for treating impostor phenomenon. This disparity suggests a need for the academic community to consider ways of treatment and prevention of impostor phenomenon. Addressing this need in the literature could provide a more holistic way of addressing impostor phenomenon in students. Specifically, there are two variables in the literature, which may be related to impostor phenomenon: perceptions of seriousness and self-compassion.

Perceptions of Seriousness

The effect of the institutional climate of the college campus (i.e., campus climate) on student well-being has been well-documented in several research studies (Jensen & Deemer, 2019; Morris & Daniel, 2008). Specifically, students' perception of their campus climate will influence their perceptions of the types of overt and covert messages they receive when interacting in that space, which can influence their social and academic performance. For example, if the environment is perceived to be "chilly" (e.g., unwelcoming, exclusionary, complicit) this may influence their perceptions of themselves (Jensen & Deemer, 2019; Morris & Daniel, 2008; Reid & Radhakrishnan, 2003). Perceptions of campus climate vary based on the different identities that students hold.

For instance, students of color at a predominantly White campus may find the lack of diversity and inclusion efforts on campus to be exclusionary and may perceive the campus to be chilly (Reid & Radhakrishnan, 2003). The perceived lack of support may influence their ability to develop a sense of belonging and connect with others with similar racial identities as them, which can lead to feelings of isolation (Graham & McClain, 2019; Puckett & Lewis, 2022). Alternatively, sexist microaggressions about women's academic abilities from staff and faculty could make women feel marginalized (Bernard et al., 2017; Hill, 2020). They may internalize these messages to be truths about their academic abilities, which may influence retention and their choice of career path.

Poor perceptions of campus climate can be related to a poor sense of belonging (Wells & Horn, 2015) and poor identity development (Jensen & Deemer, 2019), both of which are associated with impostor phenomenon (Chakraverty et al., 2022; Graham & McClain, 2019). It could be that being in an environment that one perceives to be threatening could lead to negative outcomes (e.g., poor identity development and sense of belonging), which may mediate or moderate the increased presence of impostor phenomenon.

There are many aspects that comprise campus climate, one of which is perceptions of seriousness. Perceptions of seriousness, as operationalized in Reid and Radhakrishnan (2003) describes the feelings that students may have when they perceive that students, staff, and faculty do not take them seriously as students. This aspect of campus climate was selected in this study as it appears to be theoretically related to impostor phenomenon. Specifically, if people perceive that others in their academic environment do not take them seriously as students, this could result in them internalizing these perceptions. This could aid in the development and maintenance of impostor phenomenon, wherein they feel they are not "real" scholars and that they do not belong on campus.

Self-Compassion

Self-compassion involves directing compassionate feelings and behaviors instead of harsh criticism to oneself, particularly in times of perceived inadequacy, failure, or distress (Neff, 2003). Self-compassionate individuals view their experiences to occur as part of the larger human experience instead of isolated incidents; hold painful thoughts in mindful awareness instead of over-identifying with them; and treat themselves with kindness instead of judgment (Neff, 2003). Research has indicated that self-compassion helps people manage burnout (Babenko et al., 2018), motivation and achievement goals (Breines & Chen, 2012), perfectionism

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and depression (Abdollahi et al., 2020), and poor life satisfaction (Yang et al., 2016), all of which are associated with impostor phenomenon as symptoms, predispositions, and outcomes (Chrisman et al., 1995; Cokley et al., 2017; Henning et al., 1998; Vaughn et al., 2020; Villwock et al., 2016). As such, self-compassion might be a positive resource to protect against the effects of impostor phenomenon (Patzak et al., 2017; Wei et al., 2020). Self-compassion may help combat fear of failure, may help people view themselves with kindness, and could encourage students to hold their successes and shortcomings in balanced awareness (Neff et al., 2005).

Although self-compassion is theorized to be a personality trait that is based in early childhood attachment (Pepping et al., 2015; Wei et al., 2011), it is not a fixed trait. Specifically, it is also perceived to be a skill that can be developed (Smeets et al., 2014). In this article, self-compassion is referred to as a personality characteristic, given the cross-sectional design of the study, with the potential for it to be further developed as a skill.

Self-compassionate people are not immune to impostor experiences. However, they could use their self-compassion to protect themselves from the negative effects of impostor phenomenon. When experiencing an impostor moment, a person feels disconnected from others and feels that they are alone in their inadequacies (Patzak et al., 2017). A person often feels overly engrossed in their perceived inadequacy, which may lead them to exaggerate their suffering. When over-identifying with their pain, a person experiencing an impostor moment may respond to their suffering with harsh-self judgment and criticism (Patzak et al., 2017). In contrast, a self-compassionate person understands that inadequacies, shortcomings, and failures are a part of the human condition, which decreases feelings of isolation and increases feelings of interconnectedness (Neff, 2003). Self-compassion leads people to mindfully hold their failures and successes in a balanced awareness and to respond to their pain with kindness, care, and understanding (Neff, 2003). As such, self-compassion might be a healthy resource for combatting impostor phenomenon (Chandra et al., 2019).

The empirical evidence to support these claims is scant, but studies that have been conducted in this area have yielded robust findings. A study by Patzak et al. (2017) yielded results indicating that self-compassion was negatively correlated with impostor phenomenon. Specifically, impostor phenomenon was positively correlated with the negative components of self-compassion, such that higher impostor phenomenon scores yielded higher scores of self-judgement, isolation, and over-identification. Impostor phenomenon scores were negatively correlated with the positive components of self-compassion, such that lower

scores on impostor scores were related to higher scores of self-kindness, common humanity, and mindfulness. As impostor phenomenon increases in intensity, self-compassion decreases. Patzak et al. (2017) suggested that students who experience impostor phenomenon often lack self-compassion.

Additionally, Wei et al. (2020) collected data on self-compassion and impostor phenomenon. Their correlational results corroborated the results obtained in Patzak et al. (2017). Furthermore, they found that self-compassion mediated the relationship between shame and impostor phenomenon. Specifically, greater self-compassion weakened the relationship between shame and impostor phenomenon. They suggested that self-compassion acted as a resource for students. The same measures in Wei et al. (2020) can be analogous to the threat appraisal in this study. One drawback of the Wei et al. (2020) and Patzak et al. (2017) studies is that they did not consider the impact of environmental stressors on increasing impostor experiences. The present study attempted to fill in this gap by suggesting that perceptions of campus climate can influence impostor phenomenon.

Cognitive Appraisal Theory

The impact of chilly campus climates on impostor experiences is unclear and has yet to be explored in the literature. Cognitive appraisal theory (CAT) can be used to understand the relationship between campus climate (as evaluated by perceptions of seriousness), self-compassion, and impostor phenomenon. CAT describes the process by which a person evaluates the significance of an event based on how meaningful and impactful it is to their own well-being (Lazarus & Folkman, 1984). According to Lazarus and Folkman's (1984) transactional model of stress, cognitive appraisal occurs in two steps: primary appraisal and secondary appraisal. In primary appraisal, the individual interprets the stressors as positive, irrelevant, or dangerous (e.g., challenging, threatening, harmful). If the event is interpreted as dangerous, then the person makes a secondary appraisal wherein they analyze their available resources to address the environmental threat. If a person feels they have insufficient resources to address the threat, then this will produce a stress response. If the person feels they have sufficient resources, this will prevent the stress response from occurring. In sum, Lazarus and Folkman (1984) posited that a person must create primary and secondary appraisals of the environmental threat before experiencing stress. Research that has used CAT has conceptualized the environmental aspect of CAT in many ways, including threats of viruses and efficacy of vaccines (So et al., 2016) and perceptions of tourist sites (Choi & Choi, 2019).

According to CAT, impostor feelings should conceptually represent a stress response to having inadequate resources to address dangerous or threatening stimuli in the environment (Lazars & Folkman, 1984). Moreover, it was expected that, when people perceive that others in their academic environment do not take them seriously as students, they may cognitively appraise those perceptions as a threat. If students do not have adequate resources to deal with the chilly climate (e.g., low self-compassion), this may evoke a stress response in the form of impostor phenomenon. However, if students have adequate resources, such as self-compassion, to address the threat, impostor response may be avoided.

Hypotheses

Researchers have only recently begun to consider the positive effects of self-compassion and impostor phenomenon (Patzak et al., 2017). The present study augmented this movement by suggesting that self-compassion could serve as a positive resource to protect against impostor experiences when perceiving the campus climate to be negative and threatening.

First, it was hypothesized that perceptions of seriousness and self-compassion would be significant predictors of impostor phenomenon in students. Specifically, the more students reported being self-compassionate and being viewed as serious students, the lower impostor phenomenon will be. As such, this study sought to add to the limited but strong extant literature suggesting the existence of a relationship between levels of self-compassion and the intensity of impostor phenomenon (Patzak et al., 2017; Wei et al., 2020). Next, it was hypothesized that perceptions of seriousness and self-compassion would significantly predict impostor phenomenon. Lastly, it was hypothesized, according to CAT, that there would be a significant interaction between perceptions of seriousness and self-compassion, wherein strong perceptions of seriousness have their harmful impact only when self-compassion is low.

Method

Participants

Data were collected from 801 participants who received emails through the campus data collection office inviting them to participate in a study regarding student experiences on college campuses and intrapsychic factors. Informed consent and IRB number were given in the invitation email and first page of the Qualtrics survey. Anonymity was ensured as personal identifiers were not collected. When reviewing the data for nonserious answering behavior, 344 participants were eliminated based on incomplete data or data that suggested that the students did not take the survey seriously (e.g., students

who responded “1” to each of the items throughout the questionnaire), although most of the deleted cases were people who simply opened the survey but did not start it. A total of 457 participants remained. These data were taken from a larger sample collecting data from graduate and undergraduate students. The Perceptions of Seriousness Scale (Reid & Radhakrishnan, 2003) is only validated for use on undergraduate students. After removing the graduate students from the analyzed data, 195 of the valid 457 cases were undergraduate students.

The roughly half of respondents ($n = 108$; 55.4%) identified as women, with the next largest group identifying as men ($n = 80$; 41.0%), followed by nonbinary ($n = 5$; 2.6%), gender nonconforming ($n = 1$; 0.5%), and other ($n = 1$; 0.5%). Of the racial groups, the White/European American group had the most representation (78.9%) respondents, followed by Asian/Asian American/Pacific Islander (10.8%), Latinx (4.4%), Black/African American (3.4%), Middle Eastern North African (1.5%), and Native American/Alaskan Native (1.0%). Regarding enrollment status, most respondents were full-time ($n = 190$; 97.9%). The sample also consisted of students enrolled in science, technology, engineering, and math (STEM) programs ($n = 156$; 79.2%). The average age of the sample was 20 ($SD = 2.55$).

Measures

Clance Impostor Phenomenon Scale

The Clance Impostor Phenomenon Scale (CIPS) is a 20-item scale from Chrisman et al. (1995), which measures the frequency of impostor experiences. In the current study, internal consistency for the CIPS was strong ($\alpha = .90$) and consistent with what was reported in Chrisman et al. (1995; $\alpha = .89$). Responses were provided on a 5-point scale (1 = *not at all true*; 5 = *very true*). Scores were calculated by taking the sum of the 20 items. Possible scores ranged from 20 to 100, with lower scores suggesting less frequent impostor experiences and higher scores suggesting more frequent impostor experiences. A sample item is: “I sometimes think I obtained my present position or gained my present success because I happened to be in the right place at the right time or knew the right people.”

Perceptions of Seriousness Scale

The Perceptions of Seriousness Scale (PSS) for undergraduate students was a six-item subscale from the Campus Climate Scale (Reid & Radhakrishnan, 2003) that explored the degree to which students feel their peers and faculty view them as serious students. Reid and Radhakrishnan (2003) reported an alpha coefficient of $\alpha = .75$. In the present research, internal consistency was .77. Responses were provided on a 7-point scale (1 = *strong agreement*;

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7 = *strong disagreement*). Scores were calculated by taking the average of the six items. A sample item is: "My instructors view me as a serious student."

Self-Compassion Survey

The Self-Compassion Survey (SCS) is a 26-item scale developed by Neff (2003). The six components of self-compassion, and their Cronbach's alpha values in the present study are as follows: Mindfulness ($\alpha = .76$; 4 items), Self-Kindness ($\alpha = .77$; 5 items), Common Humanity ($\alpha = .70$; 4 items), Over-identification ($\alpha = .84$; 4 items), Self-Judgement ($\alpha = .79$; 5 items), and Isolation ($\alpha = .81$; 4 items). Internal consistency for the full scale was $\alpha = .90$. The observed alpha values for the present study are similar to what was reported in the initial validation of the scale (Neff, 2003). Responses were provided on a 5-point scale (1 = *almost never*; 5 = *almost always*). Scores were calculated by averaging the means of the six subscales. A higher score represented higher self-compassion. A sample item is: "I try to be loving towards myself when I'm feeling emotional pain."

Procedure

After institutional review board approval (IRB 2020-066) was given, data were collected from a large public Midwest university in March 2020 before the

campus closed for the COVID-19 pandemic. All data were collected from an online survey. The survey was distributed via an office on campus that provides a random sample of university emails based on the participant eligibility qualifications that the researcher specifies (educational level, age, race, etc.). To be eligible for participation, respondents must have been at least 18 years old and currently enrolled as college students. Within the survey, students were asked to reflect on their experiences as a student on campus. Students were not compensated for their time. Based on a test trial before sending to participants, it was estimated that respondents would take about 20 minutes to complete the items. The surveys were presented in the following order: SCS, CIPS, and PSS. Respondents completed items assessing for eligibility before the SCS (i.e., age, enrollment status) and other demographic information (e.g., year in school, gender identity) after the PSS.

Results

Statistical Method

To examine the unique contribution of perceptions of seriousness and self-compassion in the explanation of impostor phenomenon in undergraduate students, a three-step hierarchical multiple regression analysis was performed. In Step 1, impostor phenomenon was the dependent variable, and perceptions of seriousness was the independent variable. In Step 2, self-compassion was entered as a predictor into the regression equation. In Step 3, the perceptions of seriousness-self-compassion interaction term (PS x SC) was entered to test the possibility of self-compassion being a moderating variable. The variables were entered in this order because, according to CAT, cognitive appraisal begins with perceptions of threats from the environment (i.e., perceptions of seriousness) and continues to perceptions of resource availability (i.e., levels of self-compassion), which will determine whether the stress response (i.e., impostor phenomenon) occurs.

Preliminary Analyses

Before the hierarchical multiple regression analysis was performed, the independent variables were examined for distribution and collinearity. Table 1 reports the summary of the descriptive statistics for the CIPS, SCS, and PSS, respectively. The statistics indicate that the distribution of impostor phenomenon, self-compassion, and perceptions of seriousness are mostly symmetrical in the sample, as evidenced by the low skewness and low standard error. The negative skew on the CIPS indicates a slight left skew; the positive skew on the SCS and PSS indicate a slight right skew. This indicates that the data for these measures provide a reliable picture of

TABLE 1

Variable Descriptive Statistics

Variable	<i>M</i>	<i>SD</i>	Variance	Skewness	Kurtosis
Impostor phenomenon	53.83	13.08	171.29	0.11	-0.61
Self-compassion	3.33	0.71	0.43	-0.29	0.34
Perceptions of seriousness	3.09	1.19	1.41	0.47	0.19

TABLE 2

Results of Hierarchical Regression Analysis Predicting Impostor Phenomenon With Self-Compassion as a Moderator

Predictor	<i>B</i>	<i>SE</i>	β	<i>p</i>	ΔR^2	<i>R</i> ²
Step 1						
Perceptions of seriousness	-3.61	0.74	-.32	<.001		.11
Step 2						
Perceptions of seriousness	-1.38	0.63	-.13	.02		
Self-compassion	-12.12	1.13	-.61	<.001	.31	.44
Step 3						
Perceptions of seriousness	-2.34	3.20	-.21	.46	.00	.44
Self-compassion	-12.97	3.01	-.65	<.001		
Perceptions of seriousness x self-compassion	0.28	0.91	.11	.75		

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self-compassion in this sample, wherein the observed scores, E , are close to the respondents' true score, T .

Results of the variance inflation factor (all less than 1.5) and collinearity tolerance (all greater than .9) suggest that the estimated β s are well-established in the following regression model. These conclusions suggest that the variance of the coefficients was not inflated by multicollinearity. This means that the independent variables are not too closely related to where only one should be used in the subsequent analyses.

Main Analyses

The hierarchical multiple regression revealed that, at Step 1, perceptions of seriousness contributed significantly to the regression model, $F(1, 195) = 23.56$, $\beta = -.32$, $p < .001$, $R^2 = .11$, $f^2 = .12$, accounting for 10.8% of the variation in impostor phenomenon (see Table 2).

Introducing self-compassion at Step 2 explained an additional 33.2% of variation in impostor phenomenon. The Step 2 model indicated that this change in R^2 was significantly different from zero, $\Delta F(2, 194) = 76.23$, $\beta = -.66$, $p < .001$, $\Delta R^2 = .31$, $R^2 = .44$, $f^2 = .59$. When self-compassion was entered in Step 2, perceptions of seriousness remained a significant predictor of the outcome ($\beta = -.13$, $p = .02$), but was not as robust a predictor as it was in Step 1 ($\beta = -.32$, $p < .001$). Together, self-compassion and perceptions of seriousness accounted for 44% of the observed variance in impostor phenomenon.

The addition of the Perceptions of Seriousness x Self-Compassion interaction term in Step 3 did not yield any improvement in the model fit, $\Delta F(3, 193) = 50.62$, $\beta = .11$, $p = .75$, $\Delta R^2 = .00$, $R^2 = .44$, $f^2 = .00$, nor did it account for any of the observed variance in the outcome variable. Self-compassion remained a significant predictor of impostor phenomenon ($\beta = -.65$, $p < .001$), but perceptions of seriousness no longer predicted the outcome ($\beta = -.21$, $p = .46$).

Discussion

Impostor phenomenon, the difficulty to internalize success (Clance & Imes, 1978), is an emerging area of research as investigators continue to understand its manifestation. The positive effects of self-compassion on impostor phenomenon is an emerging area of research (Patzak et al., 2017; Wei et al. 2020). However, researchers have not fully considered the impact of environmental stressors on impostor experiences. The goal of the study was to fill this gap in the literature by suggesting that self-compassion could be a positive resource to protect against impostor experiences when perceiving the campus climate to be negative and threatening.

The data supported the hypothesis that perceptions of seriousness would be a significant negative predictor of impostor phenomenon in students. Specifically, students who reported that they were not taken very seriously by others also reported increased impostor experiences. As such, perceptions of seriousness seem to play a small yet significant role in impostor phenomenon. These claims and findings appear to be congruent with the implications drawn from Ferrari and Thompson (2006) wherein impostors try to appear capable and successful to feel that they have the respect of others. It may be that, when a student perceives that other students and faculty on campus do not take them seriously, they could internalize those perceptions, which can influence existing impostor experiences. If a student feels they are not viewed seriously by others, this may influence their thoughts of feeling like a phony or a fake. Ferrari and Thompson (2006) also concluded that impostors do not prefer to be in situations where real or perceived personal faults could be noticed by others. This conclusion may explain why the amount of variance in impostor phenomenon by perceptions of seriousness was so small. It is likely that people with impostor experiences may avoid those who make them feel less respected. This may be viewed as a self-preserving behavior.

The data suggested that more self-compassion likely leads to less impostor experiences. This conclusion is consistent with other research exploring these variables. Existing literature (Patzak et al., 2017; Wei et al., 2020) has suggested that self-compassionate people are more likely to have healthier coping mechanisms during an impostor moment. In an impostor moment, people with little self-compassion can feel alone in their struggles, feel wrapped up in their pain, and treat themselves with judgment. On the other hand, people who are more self-compassionate experience impostor moments respond differently. Specifically, they understand that they are not alone in their suffering because other people are experiencing similar feelings, they mindfully view their experiences in balanced awareness, and they treat themselves with kindness and gentleness (Neff, 2011). As such, the basic tenants of self-compassion contrast with how people react in impostor moments.

The third hypothesis was that perceptions of seriousness and self-compassion would interact in predicting impostor phenomenon, such that self-compassion would moderate the relationship between perception of seriousness and impostor phenomenon. The third model, which explored the interaction of the predictor variables (i.e., self-compassion and perceptions of seriousness), did not receive support because the data did not show an interaction between the predictor variables. These findings contrast with available research (Anjum

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et al., 2020) suggesting self-compassion does moderate environmental and intrapsychic variables. It could be that the hypothesis could be supported in a different sample. Specifically, several studies of campus climate tend focus on specific groups of historically minoritized and disadvantaged students (Graham & McClain, 2019; Jensen & Deemer, 2019). Specifically, in these studies, researchers have found that students who do not favorably view university spaces they occupy are likely to feel a lack of belonging and representation, which has shown to increase feelings of impostor features (Burt et al., 2018; Graham & McClain, 2019; McGee et al., 2022). The university where students were recruited from is a predominantly White institution, which is reflected in the mostly White sample collected in this study. Impostor phenomenon has been shown to be influenced by racial discrimination in minoritized groups (Cokley et al., 2013; McGee et al., 2022; Stone et al., 2018). However, this occurrence may not be seen in a majority White sample. Subsequent research should replicate these findings with racial minorities at predominantly White institutions to determine if students from historically minoritized and disadvantaged backgrounds may perceive that they are not taken as seriously by others and what coping mechanisms they employ to prevent impostor phenomenon.

More research is needed to understand the relationship between perceptions of seriousness and self-compassion. Specifically, it may be beneficial to identify if perceptions of seriousness from certain groups of people (e.g., peers, faculty, support staff) are more or less impactful for students and if there are differences in the moderation effect of self-compassion in these domains.

There are factors which limit the claims made in this study. However, it may be that addressing these limitations opens several directions for future research. First, these data were collected at a large predominantly White institution in a rural midwestern state. Future research should consider if differences in campus sizes, demographics (e.g., Historically Black Colleges and Universities, Hispanic Serving Institutions, women's colleges), region type (e.g., metropolitan), or type of college (e.g., community college, trade school) affect how students perceive their campuses. It would be unwarranted to assume that these data characterize all students in all contexts. Using different identity groups and college settings could help to understand how perceptions of seriousness, impostor phenomenon, and self-compassion intersect.

Second, the study design was cross-sectional, so inferences cannot be drawn about the changes in the variables over time. Other researchers may consider a longitudinal study to measure the development of these variables over

time. Some research has suggested that self-compassion and impostor phenomenon have a developmental process. Self-compassion specifically is suggested to be rooted in early attachment behaviors (Mikulincer et al., 2005; Neff & Beretvas, 2013; Pepping et al., 2015; Wei et al., 2011). A developmental model of impostor phenomenon in African American youth has been created by Bernard and Neblett (2018). They identified factors, such as academic context, parenting variables, and racial discrimination, as contributing to the development of impostor phenomenon in African American youth. Longitudinal research exploring cognitive appraisal and impostor phenomenon should consider the tenets presented in Bernard and Neblett (2018).

Next, these claims were based on mean group values, and cannot account for individual experiences. Further, the data were based off self-reported attitudes, so these data could have been subject to social desirability bias. A portion of the data was removed due to incomplete responses and answering patterns, which reflected nonserious answering techniques (e.g., answering "1" for all items). Relatedly, cases in which the surveys were opened but never started were removed. This meant that much of the data was eliminated before data analysis. Future research should consider using a social desirability scale and validity questions to help determine response seriousness. Lastly, selection bias might have been a contributing factor, wherein people who were more interested in the topic might have been more likely to participate in the study.

Research in impostor phenomenon has largely utilized survey-based research paradigms (Bravata et al., 2020; Stone-Sabali et al., 2023). A qualitative design could provide more nuance to this topic, wherein self-compassion, impostor phenomenon, and perceptions of seriousness could be better assessed in a small group setting where the researcher(s) could probe for more detail and clarification from the participants' experiences. Future researchers conducting impostor research should look to past examples of qualitative IP research (Campion & Glover, 2017; Chakraverty, 2019; Harris 2016; Stone et al., 2013) to determine how to include more qualitative methodologies in their work.

Since self-compassion is a skill that can be developed (Smeets et al., 2014), the hypotheses presented in this paper could be better tested in a randomized control trial. Specifically, students could be broken into treatment-waitlist groups to see if the development of self-compassion may influence impostor phenomenon and if an interaction could be observed between perceptions of seriousness and self-compassion. Future research might employ the Mindful Self-Compassion Program (Neff & Germer, 2013), which is an eight-week workshop to teach participants how to cultivate self-compassion. This

could help determine if changes in impostor features and perceptions of campus climate change after learning how to be more self-compassionate. In a randomized control trial with college students, Haukaas et al. (2018) found that the program increased posttreatment self-compassion scores and reduced posttreatment anxiety and depression scores. The changes were maintained at a six-month follow-up.

In sum, further research is needed to better understand how the environment promotes feelings of impostor phenomenon. Research ought to consider what skills students can cultivate to protect themselves against the negative outcomes of impostor features. This study highlights the continued need for an in-depth understanding of self-compassion, perceptions of seriousness, and the degree to which they work together or independently to influence impostor phenomenon in students.

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The Cost of Snooping: How Reading Others' Personal Correspondences Divides Attention

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ABSTRACT. Given the prevalence of public use of devices to send private messages, these messages are prone to be snooped upon by others. Advances in technology have raised privacy concerns, however, little is known about what is typically sought after and the characteristics of those more likely to snoop. People are socially curious and drawn to gossip, suggesting that personal information that is dramatic or salacious may be more tempting for individuals to access when given the opportunity. In addition, certain personality characteristics relate to negative behaviors online, however, it is unknown what individual differences are related to snooping behaviors. Therefore, we designed novel studies in which participants watched videos where pop-up text message notifications, supposedly for the researcher, appeared. Using eye-tracking, we assessed what factors led to fixation on these fake texts. Results showed participants were more likely to fixate on gossipy texts during passive videos ($Z = 303.50, p = .01, d = 0.48$), and higher conscientiousness was related to lower snooping, $r(26) = -.50, p = .01, 95\% \text{ CI } [-.78, -.22]$. Further, individual fear of missing out predicted higher fixation only of gossipy texts, $r(22) = .55, p = .01, 95\% \text{ CI } [.15, .79]$, but independent of text type, greater fixation to texts led to divided attention and poorer memory of video content, $r(46) = -.50, p < .001, 95\% \text{ CI } [-.73, -.33]$. Together, data suggest that there are costs to private information being made public, both to the individual whose information is on display and the snooper.

Keywords: text snooping, gossip, attention, FOMO, eye tracking

Individuals must learn information about others in order to build relationships (Renner, 2006), and this basic human need fosters the desire to acquire personal information about others (Litman & Pezzo, 2012). Historically, this sharing of information occurred through in-person communication (Levin & Arluke, 1987), however advances in technology make it simultaneously easy to gain access to others' personal information and difficult to maintain personal privacy (Friedewald & Pohoryles, 2013). Due to the ever-increasing use of technology, broader access to private information, and negative consequences from these trends (Moore, 2011), there is a critical need to learn more about what types of personal information individuals are interested in, and what factors increase individual spying of others' personal information.

When individuals actively seek information about

others, they are particularly drawn by hearsay and gossip (Malamut et al., 2018). Gossip builds community, fosters group cohesion, and even activates the brain's reward pathway (Gabriels & De Backer, 2016; Peng et al., 2015), all despite it being judged as immoral (Foster, 2004). Gossipy information fuels top-down attention, particularly when information is framed in a negative or salacious manner (Anderson et al., 2011). In addition, immorally themed gossip produces rapid bottom-up attention (Peng et al., 2017), all suggesting that the content of private information matters when individuals spy on others. Therefore, a primary goal of our experiments was to characterize the effects of information content on attention, specifically whether private information is gossipy. To do so, participants engaged in visual tasks during which fake private texts meant for the researcher repeatedly appeared on the

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computer screen. To assess attention, we measured fixations using eye tracking technology, validated to quantitatively assess overt attention toward visual stimuli (Hollingworth & Bahle, 2020), and determined if text content affects snooping behavior.

In addition to how information content can influence snooping, there may be individual differences in personality that predict spying behavior. The specific personality factors we investigated were conscientiousness, risk-taking, and fear of missing out (FOMO). Conscientious individuals are less likely to gossip and more self-aware about their use of technology (Babalola et al., 2019; Devaraj et al., 2008), suggesting that conscientiousness negatively associates with information spying. Risk-taking personality involves impulsive decision-making across many domains, social relationships being one of them (Tsukayama et al., 2012). As there is an inherent risk in spreading gossip (Grosser et al., 2010), those higher in risk-taking are more comfortable both spreading gossip and engaging in antisocial behaviors online (Nwanosike et al., 2022). Increased technology and social media use is associated with increased feelings of FOMO, while feelings of FOMO also predict problematic uses of social media (Abel et al., 2016; Buglass et al., 2017; Dempsey et al., 2019). Therefore, high susceptibility to FOMO likely predicts behavior of invading someone else's privacy in an online setting.

In addition to these personality variables, we investigated the more cognitively associated variables distractibility and cognitive absorption. Those higher in distractibility, enhanced by social use of technology and texting (Levine et al., 2012, 2013), often have lapses in attention, resulting in being less able to sustain attention amid distractions (Harriott et al., 1996). Thus, higher propensity toward lapses in attention will likely have more divided attention to gossip information. Last, cognitive absorption is described as a profound preoccupation with technologically involved tasks, particularly when they encapsulate social curiosity (Agarwal & Karahanna, 2000). Cognitive absorption is accompanied by enhanced perceived reward on social media and minimized perceived risk of privacy concerns (Alashoor & Baskerville, 2015), allowing someone to override immoral feelings of spying on others' personal information.

Whatever factors contribute to snooping behaviors, if attention is divided between a task and acquiring personal information, it should lead to poorer task performance. People have trouble ignoring irrelevant distractors while completing tasks (Ophir et al., 2009), leading to an increased use of multitasking with technology and increased time to complete tasks (Bowman et

al., 2010). Not only does multitasking lead to increased completion time, but multitasking with instant messaging decreases memory of task content and is predictive of lower academic achievement (Dietz & Henrich, 2014; Junco, 2012). The cognitive costs of technological distractions by accessing others' personal information are heavy, thus the final goal of this research was to determine the extent to which divided attention through spying on others' correspondences related to loss of performance on an active cognitive task.

The overall purpose of these studies was to measure how participants' conscientiousness, risk-taking, FOMO, distractibility, and cognitive absorption associate with their fixation on others' supposed private information (both gossip and mundane) using eye tracking technology and whether their fixation divided their attention enough to perform worse on a simple cognitive task. We hypothesized that gossip text messages would garner more visual attention, and that fixation would negatively correlate with conscientiousness and positively correlate with risk-taking (Study 1). Further, we also hypothesized that enhanced fixation toward gossip text messages would produce impaired performance on a cognitive task and that high FOMO, distractibility, and cognitive absorption would all positively correlate with divided attention through fixation on the text messages (Study 2).

Study 1

In Study 1, participants were asked to pay attention to soothing nature videos while fake text messages of varying content, supposedly for the researcher, popped up on screen. Participant fixation on text messages were assessed compared to conscientiousness and risk-taking personality.

Method

Participants

Fifty participants from Belmont University introductory psychology courses were recruited to participate in Study 1 through Sona Systems (<https://www.sona-systems.com/>) in exchange for course credit. Participants were excluded if they wore eyeglasses for corrected vision to ensure proper eye tracking. Additionally, two participants were excluded after recruitment due to failure to calibrate to eye tracking software properly. Therefore, a total of 48 participants (41 women, 7 men; age: $M = 19.56$, $SD = 2.49$) completed the study. The sample population was predominantly White (38 White or European American, 4 Black or African American, 1 Hispanic or Latinx, 1 Middle Eastern, and 4 prefer not to answer/no response). All studies were approved by the Belmont University Institutional Review Board.

Experimental Design

Through informed consent, participants were told the effects of personality on visual attention would be measured on two relaxing videos, however they were unaware that a fake text message would pop up as a computer notification during each video. We utilized a within-subjects design to test the effects of fake text content (mundane and gossipy) on participant fixation, with video presentation order counterbalanced between participants. Additionally, participants took personality scales to measure conscientiousness and risk-taking to associate with text fixation.

Materials and Procedure

Text Message Manipulation. To initiate the manipulation, the researcher greeted the participant in the testing room by asking them to wait a minute while the researcher pretended to write a text message to a friend on the computer through the Android text messaging website. After minimizing the texting website window, the researcher set up the participant for eye tracking, as outlined below. The researchers in the study were all college-aged women, similar in age and demographics to the participants. The main difference between the researchers and participants in the experiment was that the researchers were upper level majors in psychological science whereas participants were all taking introductory psychology courses as new majors in psychological science or for general education credit. The researchers wore casual clothing and, outside of the research scripts, were friendly and engaging with participants. This was chosen because previous research has suggested that college-aged participants are more likely to gossip about peers and friends who are similar to them (McAndrew et al., 2007), so we wanted the researchers to come across as peers to participants.

After setting up the participant, the researcher left the testing room and allowed the participant to complete the experiment in private. Two separate 5-minute videos of relaxing nature scenes were shown to participants in a random order with a short break in-between each video. One video was edited to have a fake text notification through the Android app appear in the lower right corner of the screen from "Sara" that contained mundane content about a future grocery store trip. The other video was edited to have a fake text notification from "Babe" that contained gossipy content about the researcher being accused of being seen with another man at a party the night before. Both fake texts appeared around halfway through the video for a duration of 4 seconds before disappearing.

Eye Tracking. Participants sat down at a table in front of a computer monitor with iMotions software

and an S1 eye tracker (Miramatrix) across the bottom of the computer screen. Participants rested their face on a table-mounted chin rest (Good-Lite) 60 cm from the screen, and the researcher positioned the participant's seat and chin rest height so that the participant's eyes were in the middle of the screen and iMotion's eyefinder feature detected both eyes. Eye movements were sampled at 60Hz, and 12-point calibration was performed before starting each participant. Calibration was attempted up to three times to achieve "good" or "excellent" calibration, and if the participant failed to achieve "good" calibration after three attempts, their participation was discontinued. Overhead lights in the room remained on and a small broadcast lighting kit (Lime Cube) added nonfluorescent lumination to the participant's face to enhance contrast for eye tracking calibration.

All eye tracking data was collected via iMotions 9.0 software. For each video, an area of interest (AOI) was drawn over the area in the bottom right corner where the text message appeared. Gaze data in AOIs were extracted using a velocity-threshold identification (I-VT) filter to classify as fixation, suggesting captured visual attention and not just saccades through the AOI. Time to first fixation was measured to make sure that participants were watching the video and not looking around the screen before the text message appeared, and total fixation was collected as a dependent measure of visual attention to the text message.

Personality Scales. After watching both videos, participants took two scales to assess conscientiousness and risk-taking. They first took the 45-item Big Five Inventory (Goldberg, 1992), although our primary factor of interest were the 9 items pertaining to conscientiousness, measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*) with scores ranging from 9–45 and high values reflecting high conscientiousness. The other factors of extraversion, agreeableness, neuroticism, and openness were also scored and analyzed for exploratory analysis. Goldberg (1992) reported an alpha of .85 for conscientiousness and in the present study; we found an alpha reliability coefficient of .82.

Participants also took the 30-item Domain-Specific Risk-Taking Scale (Blais & Weber, 2006) asking participants how likely they were to engage in risks across five different domains. Statements were assessed on a 7-point Likert scale from 1 (*extremely unlikely*) to 7 (*extremely likely*) with scores ranging from 30–210 with high scores reflecting high risk-taking. Blais and Weber (2006) reported a range of alpha for risk-taking from .71–.86, and in the present study, we found an alpha reliability coefficient of .77.

Following these scales, participants completed a brief posttest credibility survey, asking participants

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if they believed the text messages were real or not, and completed demographic information. Finally, participants were debriefed to close their participation in the study.

Results

Participants Fixate More on Gossipy Texts

To test how fake text content drove visual attention, we measured the effect of text type on total fixation time. The distribution of fixation data did not appear to be normally distributed, so Shapiro-Wilk tests were performed. Both fixation for mundane ($W = 0.93, p = .01$) and gossipy texts ($W = 0.89, p < .001$) were nonnormal, so nonparametric tests were run to analyze both sets of hypotheses. Participants fixated more on the gossipy text ($Mdn = 1.33$ s, $SD = 1.25$) than on the mundane text ($Mdn = 0.98$ s, $SD = 0.79$), shown by a significant Wilcoxon Signed-Ranks Test ($Z = 303.50, p = .01$, Cohen's $d = 0.48$, 95% CI = [0.18, 0.78]; see Figure 1A). This suggests that participants were more distracted by gossipy information.

Conscientiousness Predicts Low Text Fixation

Although attention was higher for gossipy texts, mundane and gossipy text fixations were strongly correlated within participants, Spearman's $r(47) = .59, p < .001$, 95% CI [.34, .73] (see Figure 1B), suggesting participants are more or less prone to snooping on others' texts regardless of content. To test how personality characteristics relate to text fixation, we measured the correlation between conscientiousness or risk-taking and fixation by first totaling text fixation across both conditions per participant. One participant did not complete the conscientiousness scale, so they were excluded from conscientiousness analysis. Taking all other participants into account, there was no significant correlation between conscientiousness and

fixation, Spearman's $r(46) = -.24, p = .10$, 95% CI [-.50, .04]. However, according to postexperimental surveys, 26 participants (55%) self-reported that they believed the texts were real. When analysis was reran on only those participants, a significant negative correlation emerged between conscientiousness and fixation, Spearman's $r(26) = -.50, p = .01$, 95% CI [-.78, -.22] (see Figure 1C), suggesting that conscientious individuals look away from others' private information only when they believe to truly be looking at private information.

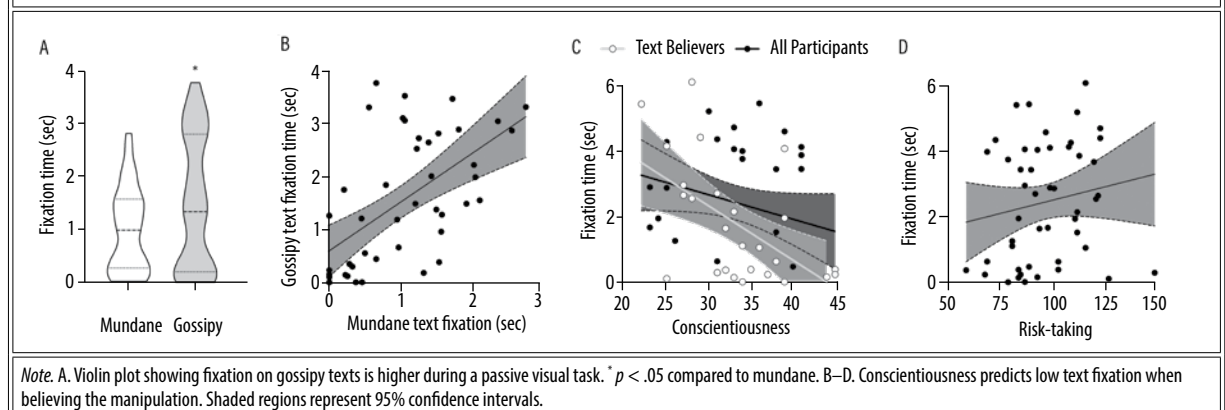
By contrast, risk-taking was not correlated with fixation, Spearman's $r(47) = .21, p = .15$, 95% CI [-.12, .43] (see Figure 1D), and was not affected when only looking at those who believed the texts were real. Although our main variable of interest from the Big Five Inventory was conscientiousness, exploratory analysis also examined extraversion, agreeableness, neuroticism, and openness as well. Like risk-taking, none of the other Big Five personality traits were correlated with fixation: Extraversion, Spearman's $r(47) = -.06, p = .60$, 95% CI [-.21, .36]; Agreeableness: Spearman's $r(47) = -.07, p = .64$, 95% CI [-.36, .23]; Neuroticism: Spearman's $r(47) = .07, p = .66$, 95% CI [-.23, .35]; Openness: Spearman's $r(47) = -.04, p = .79$, 95% CI [-.33, .26].

Summary From Study 1

Together, the data from Study 1 suggest that gossipy information about a person is more attention-grabbing than mundane information and low conscientiousness predicts snooping behavior. However, as participants were just passively watching relaxing videos, there was little competing for attention on the fake texts. Given this limitation, Study 2 was designed to incorporate a more active attentional task that could also measure divided attention through task performance. Specifically, Study 2 examined whether fake text messages would divide

FIGURE 1

Study 1



attention of participants away from a more active task: paying attention to a video story they knew they would be tested on later.

Study 2

In Study 2, participants were asked to pay attention to a video actor telling a fairy tale while a similar series of fake text messages popped up on screen. Participant fixation on text messages was assessed and associated with divided attention through recognition of fairy tale details. To see how additional personality characteristics relate to text snooping, fixation was associated with propensity toward FOMO, distractibility, and cognitive absorption.

Method

Participants

Fifty-five participants from Belmont University introductory psychology courses were recruited to participate in Study 2 through Sona Systems in exchange for course credit with identical exclusion criteria as Study 1. Due to COVID-19 social distancing procedures (see below), participants calibrated themselves to the eye tracker. Consequently, eight participants had eye tracking failures and had to be excluded from data analysis. Therefore, a total of 47 participants completed the study (36 women, 11 men; age: $M = 19.32$, $SD = 1.82$). Consistent with Study 1, the majority of study participants identified as White (36 White, 5 Black or African American, 6 Hispanic or Latinx). All studies were approved by the Belmont University Institutional Review Board.

Experimental Design

Study 2 had a similar design to Study 1 with a few differences. Primarily, all participants were told to pay close attention to the same video of an actor telling the story of an obscure fairy tale, during which multiple fake texts popped up in a similar manner. To measure the effects of text content (mundane or gossip) on both fixation and divided attention, we utilized a between-subjects design where participants were randomly assigned to either the mundane ($N = 25$) or gossip ($N = 22$) text conditions, and memory of the fairy tale content was assessed using a multiple-choice test. Additionally, participants took personality scales to measure propensity toward FOMO, lapses in attention for distractibility, and cognitive absorption to associate with text fixation. Demographics of participants were similar for those who saw either the mundane or gossip texts.

Materials and Procedure

Fairy Tale Video and Fake Texts. As participants arrived, the researcher greeted them by asking them to wait a minute while the researcher wrote a text through

the Android text message website. The researcher had the same characteristics and similarity to participants as the researchers in Study 1. Due to COVID-19 policies, social distancing was maintained between researcher and participant at all times, so the participant stayed in the doorway to the testing room while the researcher got the setup ready. After minimizing the texting website window, the researcher disinfected and readied the eye tracking station. After the researcher exited the room, the participant watched one of two identical 10-minute videos of a female theatre student reciting a little-known Norwegian fairy tale, Tatterhood (Asbjørnsen & Moe, 1859/2001). For each video, a series of 10 texts popped up for four seconds each at random intervals. The mundane texts from "Sara" asked about a future trip to the grocery store and discussed different shopping items that they might buy for their apartment. The gossip texts from "Babe" accused the researcher of being seen with another man and escalated as "Babe" became frustrated by the researcher's lack of answer. Both videos had their texts appear for a total of 40 seconds and were written to contain the same number of words across conditions.

Eye Tracking. Participants sat down at the eye tracking station, rested their head into the chin rest, and personally calibrated themselves at the verbal instructor of the researcher, who was socially distanced. Calibration occurred in the same manner with identical room setup and eye tracking settings to Study 1. All eye tracking data was collected via iMotions 9.0 software. For both videos, 10 separate AOIs were drawn over the area in the bottom right corner where the text messages appeared to match when texts appeared and disappeared. Fixation data in AOIs were extracted using an I-VT filter, and total fixation for each video was measured as the sum of all AOIs together.

Psychological Scales. After watching the video, participants took three scales to assess propensity toward FOMO, distractibility, and cognitive absorption. They first took the 10-item Fear of Missing Out Scale (Abel et al., 2016), asking how frequently they experienced feelings related to FOMO measured on an 8-point scale from 1 (*never*) to 8 (*always*) with scores ranging from 10–80 and high values reflecting feelings of FOMO. Abel and colleagues (2016) reported alpha values from .69–.88 for the components of the FOMO scale, and in the present study, we found an alpha reliability coefficient of .83.

To measure distractibility, we assessed participant propensity toward lapses in attention through the 25-item Cognitive Failures Questionnaire (CFQ; Broadbent et al., 1982). The CFQ asks participants how frequently they commit minor mental mistakes in everyday scenarios on a 5-point Likert scale (0 = *never*; 1 = *very rarely*; 2 = *occasionally*; 3 = *quite often*; 4 = *very often*) with scores ranging from 0–100. High scores

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resemble lapses in attention and are strongly correlated with both behavioral and psychometric measures of distractibility (Wallace et al., 2002). Items from the original scale were mostly untouched, but some were slightly updated to account for differences in technology and common use of objects from the 1980s to the 2020s. Broadbent and colleagues (1982) reported an alpha of .89, and in the present study, we found an alpha reliability coefficient of .91.

Last, participants took the 33-item Tellegen Absorption Scale (Tellegen & Atkinson, 1974), measuring the trait of having all-consuming attention to stimuli. Each item is scored at 1 (*false*) or 2 (*true*) depending on whether participants generally feel each statement is true or false of them. Scores range from 33–66 and high values reflect higher propensity toward absorption. Tellegen and Atkinson (1974) did not report Cronbach's alpha, but in the present study, we found an alpha reliability coefficient of .76.

Story Recall. After taking the three scales, participants took a 13-item multiple-choice test on plot content of Tatterhood to assess the degree of attention they gave the presented story. Correct answers were summed and a recall accuracy (% correct) was calculated for each participant.

Finally, participants completed a brief posttest credibility survey, asking participants if they believed the text messages were real or not, completed demographic information, and were debriefed to close their participation in the study.

Results

Text Fixation Predicts Low Story Recall

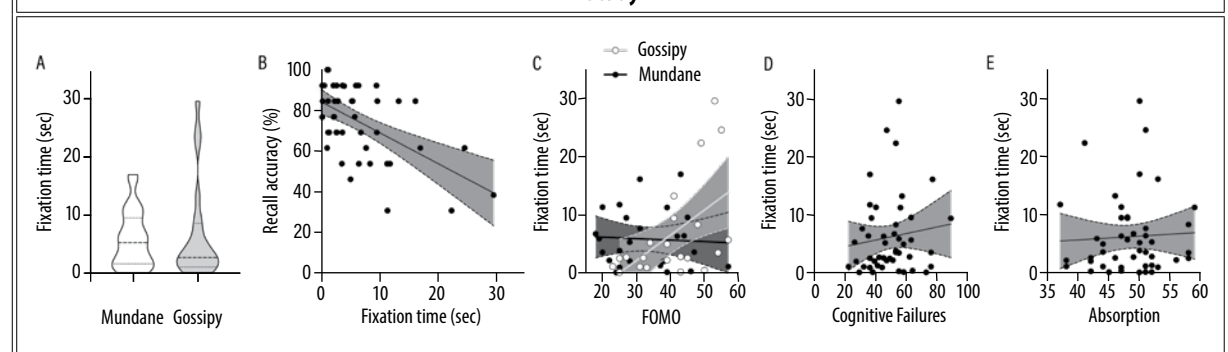
The total time fixated on texts were high in Study 2, however, there were 10 texts in Study 2 versus only one per video in Study 1. On average, fixation per text was

almost 50% less for Study 2 ($M = 0.62$ s/text) than Study 1 ($M = 1.23$ s/text). Shapiro-Wilk tests showed fixation was not normally distributed ($W = 0.80$, $p < .001$), so nonparametric tests were run to analyze all hypotheses. Unlike in Study 1, gossipy texts ($Mdn = 2.77$ s, $SD = 8.40$) did not garner more fixation than mundane texts ($Mdn = 5.33$ s, $SD = 4.90$), shown by an insignificant Mann-Whitney test ($U = 251.00$, $p = .61$, Cohen's $d = -0.11$, 95% CI = $[-0.69, 0.46]$; see Figure 2A). It is unknown why the gossipy texts did not evoke more fixation in Study 2, but there are multiple possibilities. Almost all participants (91%) stated they believed the text messages were real, and results remained when excluding those that claimed otherwise, so credibility of the manipulation likely did not affect fixation results from Study 1 to Study 2. Otherwise, the texts themselves could be less distracting, the video could be more absorbing, or participants could have had stronger selective attention, knowing they would be tested on the material. Because there were multiple texts in Study 2, we also analyzed fixation across individual texts with a 2×10 (Text Content $\times$ Text Order) multifactorial ANOVA. Fixation did not significantly change from text to text, $F(9, 405) = 1.62$, $p = .15$, $\eta^2 = .04$, nor was this relationship impacted by whether or not texts were mundane or gossipy, $F(9, 405) = 1.30$, $p = .26$, $\eta^2 = .03$. For simplicity, we ran all other comparisons using overall text fixation per participant.

Further, text content did not affect story recall. Participants who saw mundane ($M = 77\%$, $SD = 17.28$) and gossipy texts ($M = 73\%$, $SD = 18.82$) had similar recall performance, $t(45) = 0.74$, $p = .47$, Cohen's $d = 0.21$, 95% CI = $[-0.36, 0.79]$. However, increases in text fixation were significantly correlated with lower recall of the fairy tale content, Spearman's $r(46) = -.50$, $p < .001$, 95% CI $[-.73, -.33]$; Figure 2B). This negative correlation held independent of text content, suggesting

FIGURE 2

Study 2



Note. A. Violin plot showing no effect of text content during an active visual task. B–E. Fixation on texts predicts low video recall. Feelings of missing out (FOMO) predicts fixation on gossipy texts only. Shaded regions represent 95% confidence intervals.

that divided attention to texts of any type was detrimental for recall of the video material.

FOMO Predicts Fixation on Gossipy Texts

To test if propensity toward FOMO, distractibility, and cognitive absorption related to text fixation, Spearman correlational coefficients were measured for each scale versus text fixation. Aggregating across all participants, FOMO was not correlated with text fixation, Spearman's $r(46) = .10, p = .49, 95\% \text{ CI } [-.20, .39]$. This was apparent for participants looking at mundane text messages, Spearman's $r(24) = -.06, p = .76, 95\% \text{ CI } [-.46, .35]$, but for participants looking at gossipy text messages, higher FOMO was significantly associated with higher text fixation, Spearman's $r(22) = .55, p = .01, 95\% \text{ CI } [.15, .79]$ (see Figure 2C). However, neither distractibility, measured by lapses in attention in the CFQ, Spearman's $r(47) = .13, p = .37, 95\% \text{ CI } [-.17, .41]$ (see Figure 2D), nor cognitive absorption, Spearman's $r(47) = .07, p = .65, 95\% \text{ CI } [-.23, .36]$ (see Figure 2E) were correlated with fixation, and both null correlations held when looking at mundane versus gossipy texts, individually.

General Discussion

The two present studies demonstrated the types of private text messages on which snooping may divert attention from a visual task and personality characteristics that predict individual differences in snooping. Study 1 measured the effects of both mundane and gossipy text messages in a within-subjects design where text messages popped up during relaxing videos. Study 2 attempted to measure the attentional costs of snooping on texts. It also measured the effects of both mundane and gossipy text messages, but in a between-subjects design where a series of text messages popped up during the telling of a story whose content participants would be later tested on. The results suggest that gossipy text messages garner more attention, but primarily when the visual task at hand is passive, not active. Fixation on texts, in general, varied between participants, however, higher fixation was related to poorer recall of story details. Although conscientiousness predicted low fixation, propensity toward FOMO predicted higher fixation when text messages were gossipy in content. Overall, the results suggest that some personality and situational differences interact to influence snooping of others' private messages and that paying attention to those messages divides attention from whatever the task is at hand.

People are drawn toward gossipy information about others (Malamut et al., 2018), but our results suggest that gossipy texts were only more fixated on in Study 1, when participants were passively watching

a relaxing video, rather than actively watching a more cognitively demanding storytelling video. This follows the load theory of attention, which shows that irrelevant distractors are more likely to be ignored when perceptual load is high (Lavie et al., 2003). Participants fixated less on average for each text in Study 2 than the one text per video in Study 1. Anecdotally, all participants were aware that the texts popped up, and participants in Study 2 uniformly believed their credibility, but if less overt attention was paid to text messages in Study 2, participants might have been relatively ignorant of the text content itself, and this ignorance might have produced a null effect of gossipy content.

There are a few reasons why attention might have been diverted away from the texts in Study 2. First, compared to a related variable, social curiosity, propensity to gossip is more about entertainment value for the receiver than building social connection (Hartung & Renner, 2013). This suggests that perhaps participants were more fixated on gossipy texts in Study 1 for their entertainment value. However, the content of the text messages was similar in both studies, suggesting that participants in Study 1 might have been more drawn to the texts because, by contrast, the videos they watched were boring. Although watching an actor tell a fairy tale is not intrinsically salient, stories are largely attention-grabbing based on their novelty (Wu & Huberman, 2007). Therefore, the little-known Norwegian folk tale, Tatterhood, was likely novel enough to engage participants more fully away from text messages for a short amount of time. In addition, the constant presence of a face in Study 2, compared to nature scenes in Study 1, likely recruited more overt attention to the center of the video and away from the edges where the texts appeared (Kuhn et al., 2016).

Another likely reason participants paid less attention to the texts in Study 2 is that there was more extrinsic incentive for participants to pay attention to the video in Study 2. In Study 1, participants were only told to pay attention to the relaxing videos with no further instructions, but in Study 2, they were explicitly told that they would be tested on the plot content of the story video. Although there were no consequences for doing well or poorly on the retention test, knowing there will be a test is enough to enhance selective attention to media (Lee et al., 2012). Likewise, because the videos in Study 1 contained no language components, the texts offered little competition for participants' working memory. On the other hand, if participants diverted attention to reading the texts in either condition of Study 2, it competed with language comprehension and task performance (Martin, 1977; Oliver et al., 2020). Together, there was top-down demand to ignore the distracting texts that

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were irrelevant for the task at hand. Research has shown that irrelevant distractors do compete for attention but can be ignored when perceptual load is high enough (Forster & Lavie, 2008), suggesting that text content can more easily be ignored when load of the task is higher, like that seen in Study 2 in both language and task demand.

Finally, one important variable that differentiated Study 1 from Study 2 was that Study 1 was completed before the COVID-19 pandemic began and Study 2 was completed a few years into the COVID-19 pandemic when in-person experimentation was freshly reapproved by Belmont's Institutional Review Board. As gossip may be sought after to help relieve negative feelings from social isolation (DiFonzo & Bordia, 2007), any potential social isolation due to health policies and behavioral choices during the pandemic may impact snooping on others' private texts. During the time of Study 2, Belmont University was fully in-person, and undergraduate students who participated in this study were living communally in dorms and apartments and regularly attending class in large groups, so real-time isolation was likely no more of a factor for the participants in Study 2 over Study 1. However, coming off of multiple years of social isolation and a migration to online learning could have profound impacts on cognitive control and social curiosity in students. Isolation during the COVID-19 pandemic has been linked to general cognitive impairments, changes in emotional and social decision-making, and engagement during virtual learning (Bland et al., 2022; Ingram et al., 2021; Mesghina et al., 2021). Therefore, the effects of the COVID-19 pandemic and its lasting effects cannot be ruled out, and future studies should be planned with a specific focus on how policies and behaviors during the pandemic might have shifted virtual behaviors.

Even though fixation overall was lower in Study 2, those participants higher in FOMO were more likely to fixate, but only for the gossipy texts, suggesting that, for some participants, they read texts enough to understand their content. Low FOMO in college students is associated with higher selective attention to lectures amid distractors (Al-Furaih & Al-Awidi, 2021), suggesting that participants lower in FOMO were able to dismiss the text messages as irrelevant, regardless of content. FOMO leads to surveillance and stalking of others' activities online (Tandon et al., 2021; Throuvala et al., 2019), so those higher in FOMO may be more likely to notice the texts and read them initially. When the text content is boring and does not feed their FOMO, participants can choose to ignore them and pay more attention to the video on hand. However, when the content is gossipy, higher FOMO may fuel being nosy and more absorbed

by how the text conversation progresses, despite loss of attention to the video. Individuals high in FOMO have difficulty regulating concerns about their own privacy online when searching for information (Westin & Chiasson, 2021), and they likely find it more difficult to regulate any concerns about the private information of others as well. In addition, forced separation from the internet to perform tasks only increases feelings of FOMO (Milyavskaya et al., 2018), so those already higher in FOMO may have been even more tempted to snoop on gossipy information while they cannot use their own devices. Lastly, social isolation during the COVID-19 pandemic has been shown to have increased problematic phone usage—an effect mediated by high FOMO (Brailovskaia et al., 2021; Gioia et al., 2021), suggesting that our effects may be related to a larger issue in how emerging adults treat online communication in the modern post-COVID world.

Regardless of text content, individual differences in conscientiousness were associated with text fixation, with higher conscientiousness predicting less fixation. This matches previous research that conscientious individuals are less likely to gossip themselves (Babalola et al., 2019). Conscientiousness has not been found to be related to privacy concerns over personal information (Bansal et al., 2016), but conscientious individuals are strict rule followers (Roberts et al., 2014). Although there were no explicit rules from the researchers to ignore distracting information during the videos, engaging in gossip can be seen as violating social norms related to privacy (Cole & Scrivener, 2013). Therefore, for those who did not believe the texts were real, there was no “rule” to follow in choosing to read or not read the texts, and conscientiousness was not predictive of fixation. However, for those that did believe the texts were real, those higher in conscientiousness did not fixate on the texts, suggesting that they were more concerned about violating social norms related to the researcher's privacy. Conscientiousness seems to be protective against developing negative social media usage related to internet addiction (Stavropoulos et al., 2016), and our results also suggest that conscientiousness seems to be protective against snooping on private information of others.

We did find a cost to snooping, as the greater participants fixated on texts of any content in Study 2, the worse their accuracy of plot details from the spoken story. Pop-up texts have previously not affected speech recall performance (Cohen & Gordon-Salant, 2017), but the texts in that study were irrelevant and uninteresting. Even in the mundane condition of our study, the texts that participants read were believed to be personal information about the researcher, and social information gathering is both interesting and a crucial

motivation behind why people gossip (Beersma & Van Kleef, 2012). Somewhat supporting this idea that social information is more interesting, research has shown that, during a visual search task, the addition of people into a competing, distracting visual scene caused more visual attention to the distractor (Doherty et al., 2017). And importantly, memory in the visual search task at hand was more impaired with these social distractors than control distractors with equal visual salience. Thus, attention drawn to the fake texts in our study divided attention from the story they were asked to pay attention to instead. This is important, as college students are often distracted by many pieces of information on their devices while they are trying to pay attention to classwork (Glass & Kang, 2019; Mokhtari et al., 2015). In naturalistic studies in classrooms, students pay less attention to class activities while multitasking with media (May & Elder, 2018), so any divided attention to media, either one's own or someone else's can hinder real-time performance.

Limitations

Although belief in the text message manipulations was low in Study 1, we hypothesized that this was due to separate, single text messages appearing once randomly within each video, largely seen by participants as too coincidental to be true. By changing the study design to be between-subjects and the text messages to be more indicative of a one-sided conversation, we think the fake text messages worked well as a credible manipulation. However, a central limitation across both studies is the incentive for participants to pay attention to the videos. As hinted above, there are many real-world ramifications for being distracted by social media or gossipy content about others, in the classroom, during interpersonal conversations, and while working or studying (Arikewuyo et al., 2021; Dontre, 2021; Oh et al., 2019; Yemoh & Amitai, 2022). By contrast, there is little significant cost for diverting attention as a participant in our studies. To address this, future studies could enhance incentive through experimental means or using a more naturalistic environment. Incentive to pay attention to the video could be enhanced by offering monetary compensation for performance on a recall test or having the researcher conduct the recall test through an oral exam to enhance social pressure. Additionally, similar manipulations could occur in real classroom environments using confederates placed throughout a classroom during a guest lecture. This would also ask whether proximity to distractions on someone's private computer affects snooping.

Our participant samples in both studies were predominantly White and women. This is problematic

for reliability and generalization of these results to other populations. In addition to impairing the diversity of our sample, this is important for a number of reasons. First, potential gender effects on both gossipy behaviors and online distractibility have been described and likely relate to our results. Research has suggested that women are more likely to engage in gossip than men (Davis et al., 2018). However, men and women both spend the majority of their conversations discussing social topics (Dunbar et al., 1997), and likely engage in gossip at similar rates (Foster, 2004). The difference may be that women are more likely to appraise their conversations as gossipy, whereas men use other terms for their social conversations (Foster, 2004). In judging gossip scenarios, men are more likely to approve of confrontation and disapprove of inaction toward gossip, which suggests that men and women perceive gossip differently (Wilson et al., 2000). Men are also more likely to use gossip as a means of attaining power, whereas women are more likely to use gossip to build intimacy and closeness (Watson, 2012). In all, this suggests that men and women respond to situations involving gossip differently, and our sample does not allow us to determine if gender differences exist in this specific scenario. In addition, propensity toward FOMO and problematic social media usage is higher in women (Casale et al., 2018; Elhai et al., 2018), so future studies should specifically examine gender as an important variable mediating the factors associated with snooping on others' information and the reasons for doing so, particularly when that information is gossipy.

Feelings of FOMO are also higher in people identifying as White, compared to racial or ethnic minorities (Debb et al., 2022; Elhai et al., 2018). This suggests that there likely exist cultural differences that feed snooping on others' private information that we were unable to measure with a relatively homogenous sample. In addition to gaining information and power over others, gossip has been proposed to promote cohesion and bonding, especially within social groups (Baumeister et al., 2004). For minority groups, gossip helps to maintain group connection and harmony while living in another majority's culture (Lu, 2015), and in multiethnic communities, gossip also occurs routinely across ethnic groups to facilitate social cohesion of the community at large (Driel & Verkuyten, 2022). As snooping behaviors on cell phones are common, similar to verbal gossip (Derby et al., 2012), there are likely cultural differences in the purpose and tendency to snoop as well. Some individuals snoop to gain information about romantic partners because of lack of trust (Arikewuyo et al., 2021), whereas snooping could alternatively be seen as a more technologically advanced form of gossip for the sake of

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social knowledge and group cohesion. Future studies should specifically investigate these potential cultural differences. Importantly, some evidence from workplace environments has suggested that minority individuals are more likely to be the target of gossip from individuals identifying as White (Carrim, 2016), suggesting that the demographics of both the snooper and target matter. As all researchers (the target of snooping in our study) were White women, this is a factor we were unable to explore, however future studies should study these effects to better understand the role of race and ethnicity in actions of gossip and snooping.

One last generalizability concern worth mentioning is age of the participants, most of whom were 18–22 years old. This matters for a few reasons related to our study. Younger women are more likely to gossip, particularly with negative gossip or when information is about romantic drama (Hess & Hagen, 2021; Massar et al., 2012). This fits theories that the role of social gossip relates to resource acquisition (Massar et al., 2012), and young women more in need of finding a mate may be more likely to participate in gossip about romantic drama. However, fixation on texts in our sample was similar among different ages, suggesting that these age effects in gossip are more likely generational. In addition to gossip, texting as a form of communication is viewed more favorably and used more frequently in younger generations (Kuerbis et al., 2017), which extends to computer mediated forms of texting. Familiarity with technology likely produces automatic attention toward features while using it. Because of all of this, we would expect generational differences in our study that we were unable to measure due to the limited sample population. As older women are only more likely to engage in gossip that is positive for the target (Hess & Hagen, 2021) and use texting technology less frequently, it is presumed that older participants would be less likely to fixate on the gossipy texts from our study.

Conclusions

These studies utilized eye tracking to monitor participants' snooping on supposed personal correspondences of the researcher that popped up while participants were supposed to be paying attention to experimental videos. Overall, the results suggest that, when the primary task is passive, higher attention is paid to fake texts that are gossipy in content. Further, individual differences in conscientiousness and feelings of FOMO associated with fixation toward text messages and higher fixation to text messages divided attention and predicted worse comprehension of the primary video task. These findings extend the literature on both the traits of individuals and what information they fixate on by engaging in both

gossip and spying on others' private information. In addition, the data apply the literature on multitasking between a primary task and distracting media toward the type of activities prevalent in classroom and work environments. As personal devices continue to be used in public settings where others have the ability to gain access to private information, these types of manufactured snooping and gossiping become more relevant to everyday life. Our results suggest that there is a cost to private information being made publicly available through use of computers and other personal devices: first, to the individual whose private information is now accessible to others who may choose to snoop, and second, to the spy whose attention will be diverted to the accessible information of others.

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The Relationship Between Social Connectedness and Mental Health in Those With Epilepsy

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ABSTRACT. Individuals with epilepsy are at a much greater risk of developing depression than the general population (Butler et al., 2019). We sought to understand the relationship between epilepsy, social connectedness, and depression. Specifically, we examined the degree to which an individual's sense of connection to their friends and family predicts depressive symptoms among those with and without epilepsy. We analyzed data from the National Longitudinal Study of Adolescent to Adult Health Wave IV dataset, which included 5,114 individuals aged 24–32. Seventy-one of the participants in this sample reported an epilepsy diagnosis, and we randomly selected 71 participants without epilepsy from the dataset to serve as controls. We used stepwise multiple regression analyses to examine the extent to which epilepsy, friend connectedness, and family connectedness predicted depression, $F(3, 76) = 7.51$, $p < .001$, $R^2 = .23$. Epilepsy significantly predicted depression, $\beta = .81$, $p < .001$. Friend connectedness was also a significant predictor of depression, $\beta = -.23$, $p = .03$, but family connectedness was not, $\beta = -.11$, $p = .30$. This pattern of results seems to hold for participants with and without epilepsy. We conclude that friend connectedness is an important factor to consider when working with individuals with epilepsy who experience depressive symptoms. Further research is needed to fully understand the factors that contribute to depression in those with epilepsy.

Keywords: epilepsy, depression, social connectedness, friend connectedness, family connectedness



Diversity badge earned for conducting research focusing on aspects of diversity.

Individuals with epilepsy are more prone to depression than the general population, likely due to the biological mechanism of epilepsy and the social and emotional factors that those with epilepsy face (Butler et al., 2019; Catena-Dell'Osso et al., 2013). A large portion of those with epilepsy suffer from anxiety and depression, making it even more difficult to cope with the disorder (Butler et al., 2019). As a result of this and other factors of the illness, those with epilepsy are significantly less likely to graduate from high school, attain a job, and are more likely to need public assistance (Maslow, Haydon, Ford et al., 2011). Those who graduate high school and move

onto college are also less likely to graduate from college, and those who get a job have a lower mean income than the general population (Maslow et al., 2011). They are also significantly more likely to die from suicide than the general population (Catena-Dell'Osso et al., 2013). On top of this, children with epilepsy report higher rates of vulnerability, disempowerment, and discrimination (Chong et al., 2016). This leads to the question of which factors of epilepsy make people with it more prone to these negative consequences. By identifying these factors, we may find ways to lower the risk for these consequences.

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Epilepsy and Depression

Depression is the most common comorbidity of epilepsy and affects up to 62% of patients (Błaszczyk & Czuczwar, 2016). In those with epilepsy, the more intense the epilepsy is, the more intense the depression is as well (Reilly et al., 2019). To examine this relationship, Reilly et al. (2019) tested a group of individuals who underwent surgery as epilepsy treatment on the presence of depression and anxiety before and after the surgery. The more the surgery decreased seizures, the better the improvements were in mental, emotional, and behavioral functioning (Reilly et al., 2019). It is possible that this is because the severity of epilepsy relates to the level of stress felt by the patient, and chronic stress has a strong tie to depression (Błaszczyk & Czuczwar, 2016). Treating depression in those with epilepsy has been shown to greatly improve their quality of life, even if no epilepsy symptoms were treated (Gilliam et al., 2019).

When trying to treat both epilepsy and depression simultaneously via vagus nerve stimulation surgery, a method that has been shown to improve symptoms for both illnesses, those who underwent surgery had fewer depressive symptoms regardless of the type and severity of depression and experienced a 50% seizure reduction (Spindler et al., 2019). Therefore, surgically altering one area of the brain can help treat both epilepsy and depression. This suggests that perhaps the same regions in the brain could be active in both epilepsy and depression. The location of the epilepsy, specifically if in the limbic area, can make patients more susceptible to depression (Henning & Nakken, 2011). Depression in these patients also tends to be highly correlated with the seizure frequency and severity but can also be independent from how the seizures present (Henning & Nakken, 2011). Treating depression in those with epilepsy is critical, as managing mood symptoms is an important factor for helping those with epilepsy (Conway et al., 2018).

Social Connectedness and Depression

A variable that may be an important predictor of depression outcomes among individuals with epilepsy is their level of social connectedness. Social connectedness has to do with one's amount and quality of relationships with others and significantly affects individuals' health and well-being (Lamblin et al., 2017). Weak friend and family connectedness are associated with depressive symptoms in the general population (Ge et al., 2017). Those who experience social isolation are also much more likely to be diagnosed with depression (Ge et al., 2017). Strong social connectedness with one's parents and friends is associated with a decrease in social anxiety and depressive symptoms (Ge et al., 2017). Because many depression and anxiety disorders are characterized

by perceived social disconnection, researchers exposed participants to sessions of positive activity intervention as an attempt to increase perceived social connection and decrease negative affect, which included anxiety and depressive symptoms (Taylor et al., 2020). Positive activity intervention involved group-administered strategies designed to mimic the thought patterns and behaviors of happy people, with the goal of increasing happiness in the participants. Consistent with previous research, Taylor et al. (2020) found that, as perceived social connectedness increased, negative affect decreased.

Epilepsy and Social Connectedness

Unfortunately, those with neurological disorders have consistently reported being less socially connected than the general population (Willard et al., 2019). Because those with epilepsy who report being more connected to friends show higher levels of social functioning, it is critical that researchers aim to better understand the relationship between social connectedness and epilepsy (Willard et al., 2019). To explore this relationship, a sample of individuals with either epilepsy, cancer, diabetes, or heart disease were assessed on their relationships with their parents, their religious organization, and their peers at school (Maslow et al., 2012). Those with high levels of school connectedness were more likely to graduate and attain a job; this relationship was not seen in parent or religious group connectedness. This is important, as the outcome of graduation and job attainment rates are challenges for those with epilepsy. Interestingly, individuals with epilepsy tend to feel socially disconnected from their peers without neurological disorders, but not from their peers with a similar neurological disorder (Willard et al., 2019). Unfortunately, there is a lack of research examining how levels of social connectedness differ between those with epilepsy and the general population, and how this in turn affects the mental health of the patient.

Epilepsy, Social Connectedness, and Depression

The strong correlations between these different factors leads one to wonder how epilepsy and social connectedness relate to depression. Engel et al. (2021) assessed anxiety symptoms, depressive symptoms, beliefs about their illness, family functioning, social stigma, and connectedness among a group of participants with epilepsy. They found that anxiety and depression are very high among those with epilepsy compared to the control group and have a strong correlation to their view of their illness, their relationship with their families, and the social stigma among their peers. The authors concluded that those with epilepsy could be more likely to suffer from depression due to low self-esteem. If this low self-esteem

comes in part from the negative interactions with their peers due to the stigma of epilepsy, it could be that positive interactions with family and peers may be especially important for these individuals. Public stigma on illness is positively correlated to self-stigma (Schorr, 2016), so having a strong relationship with family and peers could be especially important among individuals with epilepsy.

Because strong relationships with one's family seems to be a positive factor against depression, some researchers have asked the question of what it is about these relationships that are helpful. For those with epilepsy, people who were able to talk to their family openly about their illness and how they are feeling had lower stress levels and better ways of handling their stress than those who did not communicate well with their family (Chew et al., 2018). Negative interactions with family members have also been shown to be related to lower quality of life in those with epilepsy (Han et al., 2015). Even the way that the family views epilepsy is related to behavioral problems in children with epilepsy, as the stigma could be associated with parenting decisions (Carlton-Ford et al., 1997). Because those with epilepsy tend to have poorer psychosocial outcomes than their peers, family connectedness is very important. These findings may suggest that social connectedness to family could help explain the relation between epilepsy and depression, but looking at family connectedness as a mediator has yet to be examined.

Our goals were to gain a better understanding on which aspects of social connectedness are most related to depression in those with epilepsy—specifically, whether connectedness to friends or family has a stronger association with depression symptoms among those with and without epilepsy. Research has evaluated how social connectedness with friends and family leads to different career outcomes in those with epilepsy, but not how it affects their mental health outcomes. We hypothesized that epilepsy and friend and family connectedness would significantly predict depression. We also hypothesized that friend and family connectedness would be better predictors of depression for those with epilepsy than those without. We predicted friend and family connectedness would mediate the relationship between epilepsy and depression, thus offering insight into the established connection between these two variables. By understanding this relationship, researchers might be able to find ways to improve levels of social connectedness among those with epilepsy, which may be associated with decreased depressive symptoms.

Methods

Add Health

We analyzed data from Wave IV of the National Longitudinal Study of Adolescent to Adult Health

(Add Health) data set, accessed via the Passion Driven Statistics (Dierker, 2019) platform. Add Health is a school-based study designed to examine the developmental and health trajectories across the life course of adolescence into young adulthood (Harris, 2009). The Add Health researchers collected the Wave IV data via in-home interviews. We did not require institutional review board approval because we used archival, publicly available data.

The participants included 5,114 individuals, mean age 29.00 years; $SD = 1.78$; range = 24–32. The majority of the sample (62.40%) identified as White, 23.03% as Black or African American, 5.06% as multiple races, 3.23% as Asian or Pacific Islander, 0.92% as American Indian or Native American, and 5.36% as other. A large portion of the participants' highest level of education was a high school diploma (16.3%). Many completed up to technical training (9.9%). The majority went to some college (34.3%). A large amount completed up to a bachelor's degree (19.4%), and some completed a master's degree (5.0%), or a doctoral degree (0.7%).

Seventy-one of the participants reported an epilepsy diagnosis. We randomly selected 71 of the participants with no epilepsy diagnosis to serve as the control group in our study, in order to maintain groups of equal sample size. The participants in our sample with epilepsy were 51.6% female and 48.4% male, and the participants without epilepsy were 50.70% female and 49.3% male, $\chi^2(142) = 0.11$, $p = .74$. One participant chose not to answer. There was no age difference between the two groups, epilepsy, $M = 29.18$, $SD = 1.72$, and no epilepsy, $M = 28.85$, $SD = 1.92$, $t(140) = -1.11$, $p = .27$.

Social Connectedness

We calculated family connectedness by combining participants' scale responses to: "How often do you and your (mother figure) see each other?", "How often do you and your (mother figure) talk on the telephone, exchange letters, or exchange email?", "You are satisfied with the way your (mother figure) and you communicate with each other" (reverse coded because the original Likert response scale was 1 = *strongly agree* to 5 = *strongly disagree*), "How close do you feel to your (mother figure)?" and all of the same questions but with "father figure" in the place of "mother figure." Dias et al. (2018) used similar variables for their measures of social connectedness, specifically the number and quality of interactions with members of one's family. See Table 1 for means and standard deviations of the family connectedness composite variables by epilepsy group. Because the variables were on different scales (see Table 1), we converted each of the raw scores to a z score so that we could then compute a mean family

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connectedness composite score. Higher scores indicate higher family connectedness.

We measured friend connectedness by participants' response to: "how many close friends do you have? (Close friends include people whom you feel at ease with, can talk to about private matters, and can call on for help)". Participants responded using the following scale: 1 = none; 2 = 1 or 2 friends; 3 = 3 to 5 friends; 4 = 6 to 9 friends; 5 = 10 or more friends. Hodge et al. (2013) also used the number of close friends as a measure of how connected one is to their friends. They found that the more friends an individual has, the more socially connected

they perceive themselves to be. Higher scores indicate greater friend connectedness. See Table 1 for the mean and standard deviation of the friend connectedness variable by epilepsy group.

Depression

We calculated a depression score by combining participants' responses to Add Health questions modeled on the Center for Epidemiologic Studies - Depression (CES-D) scale (Radloff, 1977). These questions asked how often in the past seven days the participants felt sad, felt like people disliked them, enjoyed life, felt happy, felt depressed, had the blues, felt just as good as other people, had a hard time staying focused on what they were doing, and felt bothered. Each variable's scale was 0–3. Three items were reverse-scored: "I was happy," "I enjoyed life," and "I felt I was just as good as other people." We averaged the raw scores to form a composite depression variable. Higher values indicated greater depression. See Table 2 for means and standard deviations of the depression composite variables by epilepsy group.

Results

Family Connectedness

The correlation between depression and family connectedness was $r = -.15$, $p < .001$. We conducted a multiple-regression analysis to test whether epilepsy and family connectedness predicted depression. We used the "linear regression" function in the R-based statistical program, jamovi. Depression was the dependent variable. We entered epilepsy (coded 1 = *epilepsy*, 0 = *no epilepsy*) and family connectedness as predictors. As shown in Table 3, having epilepsy significantly predicted depression; however, family connectedness did not. The overall model was statistically significant, $F(2, 78) = 8.50$, $p < .001$, $R^2 = .18$, which suggested that family connectedness and epilepsy together accounted for about 18% of the variance in depression. We ran a follow-up up regression model in which we added the interaction term of epilepsy x family connectedness to the model to test whether family connectedness differentially predicted depression for those with and without epilepsy, but the interaction term was not significant.

Finally, we ran a mediation analysis to test whether family connectedness mediated the relationship between epilepsy and depression. We conducted the mediation analysis using the medmod module of the R-based statistics program jamovi. We estimated the standard errors using bootstrapping from 1,000 samples. We found a significant direct relationship between epilepsy and depression (Estimate = 0.50, SE = 0.13, 95% CI = [.26, .78], $p < .001$), but the indirect relationship

TABLE 1

**Means and Standard Deviations
(in Parentheses) of the Different Factors
of Social Connectedness Among Those
With and Without Epilepsy**

	Variable Scale	Epilepsy	No Epilepsy	Cohen's <i>d</i>
Number of friends	1–5	3.00 (1.02)	3.06 (1.06)	0.06
Frequency talk to father figure	0–5	3.10 (1.53)	3.67 (1.29)	–0.41
Frequency talk to mother figure	0–5	4.44 (0.75)	4.16 (1.15)	0.29
Satisfied communication with father figure	1–5	4.04 (1.19)	4.02 (1.32)	0.02
Satisfied communication with mother figure	1–5	4.53 (0.74)	4.30 (0.98)	0.26
Frequency sees father figure	0–5	3.00 (1.53)	2.82 (1.35)	0.12
Frequency sees mother figure	0–5	3.21 (1.32)	3.12 (1.30)	0.07
Closeness to father figure	1–5	3.90 (1.24)	4.17 (1.10)	–0.23
Closeness to mother figure	1–5	4.62 (0.69)	4.44 (0.90)	0.22

TABLE 2

**Means and Standard Deviations
(in Parentheses) of the Different Factors
of Depression Among Those
With and Without Epilepsy**

	Epilepsy	No Epilepsy	Cohen's <i>d</i>
Felt sad	0.82 (0.85)*	0.56 (0.63)*	0.34
Felt depressed	0.70 (0.96)*	0.35 (0.61)*	0.44
Felt disliked	0.49 (0.83)	0.30 (0.57)	0.27
Felt the blues	0.61 (0.93)*	0.30 (0.62)*	0.39
Felt bothered	0.76 (0.92)*	0.45 (0.67)*	0.39
Enjoyed life	0.86 (0.87)*	0.59 (0.69)*	0.34
Felt happy	1.07 (0.87)	0.86 (0.76)	0.26
Just as good	1.19 (1.03)	0.89 (0.89)	0.31
Ability to focus	1.24 (0.89)*	0.86 (0.82)*	0.45

Note.* $p < .05$.

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between epilepsy and depression, mediated by family connectedness, was not significant (Estimate = 0.002, SE = 0.02, 95% CI = [-.04, .04], $p = .91$).

Friend Connectedness

The correlation between depression and friend connectedness was $r = -.19$, $p < .001$. Using the same method employed in the previous multiple-regression analysis, we found that epilepsy and friend connectedness were both significant predictors of depression. The overall model was statistically significant, $F(2, 133) = 12.19$, $p < .001$, $R^2 = .16$, which suggested that friend connectedness and epilepsy together accounted for approximately 16% of the variance in depression. See Table 4 for regression results. We ran a follow-up regression in which we added the interaction term (Epilepsy x Friend Connectedness) to the model, but the interaction was not significant.

We then ran a mediation analysis to test whether friend connectedness mediated the relation between depression and epilepsy. Using the same method as in the previous mediation analysis, we found a significant direct relationship between epilepsy and depression (Estimate = 0.30, SE = 0.09, 95% CI = [0.13, 0.47], $p < .001$), but the indirect relationship between epilepsy and depression, mediated by friend connectedness, was not significant (Estimate = 0.01, SE = 0.03, 95% CI = [-0.05, 0.07], $p = .75$).

Comparing Family and Friend Connectedness

We also included both family and friend connectedness variables in the same regression model to allow us to compare the relative influence of these two variables in predicting depression. We ran two stepwise regression models. In both models, we entered epilepsy in Block 1. In the first model, we next entered friend connectedness in Block 2 and family connectedness in Block 3. In the second model, we entered family connectedness in Block 2 and friend connectedness in Block 3. In model 1, epilepsy and friend connectedness were significant predictors, but family connectedness was not and added only .01 to R^2 . See Table 5. However, after controlling for epilepsy and family connectedness in model 2, friend connectedness accounted for a significant amount of variance and added .05 to R^2 .

Discussion

We investigated the degree to which social connectedness and epilepsy predicted depression among young adults. We specifically examined whether an individual's sense of connectedness to their friends and family played a similar role in predicting depression for individuals with and without epilepsy. Consistent with previous

research, we found epilepsy to be a significant predictor of depression, meaning those with epilepsy were more prone to depression than the general population (Bazarnik, 2018; Błaszczyk & Czuczwar, 2016; Butler et al., 2019; Gilliam et al., 2019). Additionally, friend connectedness predicted depression, but family connectedness did not. The interaction between friend connectedness and epilepsy was not a significant predictor of depression, nor was the interaction between family connectedness and epilepsy significant. This means that friend and family connectedness play a similar role in predicting depression for those with and without epilepsy.

Furthermore, we examined whether friend and/or family connectedness mediated the relationship between depression and epilepsy. Because friend and family connectedness play such a large role in depression in general

TABLE 3

Regression Results of the Relationship Between Epilepsy and Family Connectedness on Depression

	B	SE B	β	95% CI	<i>t</i>	<i>p</i>
Epilepsy	0.50	0.13	.83	0.42 1.23	4.02	<.001
Family Connectedness	-0.09	0.09	-.10	-0.30 0.10	-0.97	.33

TABLE 4

Regression Results of the Relationship Between Epilepsy and Friend Connectedness on Depression

	B	SE B	β	95% CI	<i>t</i>	<i>p</i>
Epilepsy	0.30	0.09	.54	0.23 0.86	3.40	<.001
Family Connectedness	-0.15	0.04	-.28	-0.44 -0.12	-3.48	<.001

TABLE 5

Stepwise Regression Results of the Relationship Between Epilepsy, Friend Connectedness, and Family Connectedness on Depression

	R^2	B	SE B	β	95% CI	<i>t</i>	<i>p</i>
Model 1							
Step 1: Epilepsy	.17	0.50	0.13	.81	0.40 1.22	3.94	<.001
Step 2: Friend Connect	.22	-0.15	0.07	-.23	-0.43 -0.03	-2.28	.03
Step 3: Family Connect	.23	-0.09	0.09	-.10	-0.30 0.10	-1.01	.32
Model 2							
Step 1: Epilepsy	.17	0.50	0.13	.81	0.40 1.22	3.94	<.001
Step 2: Family Connect	.18	-0.10	0.09	-.11	-0.31 0.10	-1.05	.30
Step 3: Friend Connect	.23	-0.15	0.07	-.23	-0.43 -0.03	-2.25	.03

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(Ge et al., 2017), and those with epilepsy are more prone to depression (Błaszczyk & Czuczwar, 2016), we were curious to see if connectedness was partially responsible for the overlap between them. We predicted that strong connectedness to family and friends could potentially explain a significant difference in the level of depression for those with epilepsy. Our results did not support this idea; neither friend nor family connectedness mediated the relation between epilepsy and depression. Therefore, friend and family connectedness did not explain why those with epilepsy are more prone to depression.

Consistent with previous literature, friend connectedness significantly predicted depression (Ge et al., 2017; Nguyen et al., 2019). Kail and Carr (2020) showed that those who are removed from their usual daily life circumstances, are more likely to experience isolation and depression. Specifically, they tested individuals who were adjusting to retirement and found that retirement itself did not significantly predict a change in depressive symptoms, but that social support from friends did. This suggests that friend connectedness is extremely critical for one's well-being and can be a significant predictor of whether an individual will develop symptoms of depression. This is especially relevant to those with epilepsy, as they are more likely to be hospitalized and separated from their usual surroundings than their peers.

Contrary to our hypothesis, family connectedness did not significantly predict depression. Family connectedness has been shown to negatively correlate with depression and suicidal ideation (Arango et al., 2019). Our results did indicate a significant negative correlation between family connectedness and depression; however, family connectedness no longer predicted depression once we added epilepsy to the regression model. Thus, our study contributed to the literature by suggesting that family connectedness can be an important predictor of depression, but that this relation might be less informative in the context of other variables. Future studies should examine the strength of the relation between family connectedness and depression when other physical health conditions are considered.

Our study did have many limitations. We were limited to the questions included in the Add Health dataset and could therefore not choose from the most accurate measures found in the literature. Due to the variables we were able to include in our family connectedness and our depression measure, the study was likely not fully representative of everything that family connectedness and depression consist of. We were not able to conclude whether our measures were valid and future studies are therefore necessary to confirm our results. We were also limited because a relatively small proportion of the Add Health sample was diagnosed with

epilepsy, which decreased our statistical power. Another limitation of our study is that there are many differences among the participants, and it would be a leap to assume that all of our findings were due only to the factors we were assessing. Our models accounted at most for 23% of the variance in depression. This means that there is a large portion of the variance in depression unaccounted for and thus our models fail to include many variables that could explain why those with epilepsy are significantly more prone to developing depression.

This limits the extent to which our results can be generalized to the population of those with epilepsy, especially because our sample size of those with epilepsy was small. We also cannot generalize beyond American culture. Other cultures may espouse different views toward physical and/or mental health, and these views likely shape the experiences and outcomes of individuals diagnosed with epilepsy. Additional cross-cultural research is necessary to generalize results to those with and without epilepsy. Overall, the need for future research cannot be emphasized enough in order to test our conclusions.

Our results show that friend and family connectedness affect individuals with and without epilepsy similarly. Research on increasing social connectedness could be applied to populations with epilepsy as well as the general population. Our data showed a significant relationship between epilepsy, depression, and friend connectedness, suggesting that friend connectedness could be an important predictor of depression in those with epilepsy. However, friend connectedness played a small role in the overall variance in depression in those with and without epilepsy so further research is needed to fully understand why those with epilepsy have higher rates of depression than the general population. Specifically, future research should seek to find which aspects of friend and family connectedness are the strongest in terms of increasing perceived social connectedness. By gaining a better understanding in this area, we would be able to find the most effective ways to target social connectedness and in turn, ways to target depression.

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Author Note

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Positionality Statement: Naomi and Amanda identify as heterosexual, cisgender White women. All authors are nondisabled and do not have epilepsy and acknowledge that their perspectives are influenced by their positions within all of these dimensions of identity.

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Risk Perceptions, Health Attitudes, and Individual Differences During the COVID-19 Pandemic

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ABSTRACT. Throughout the last several years, there have been varying responses to the COVID-19 pandemic. This study ($N = 211$) explored individual differences (i.e., health anxiety, education, and age) as correlates of COVID-19 risk perceptions, the relationship of these risk perceptions with attitudes toward cautionary behaviors, such as masking and vaccination, and examined how political beliefs—specifically liberalism—influenced those relationships to better understand the varying responses to the pandemic and how certain demographic groups differ in their COVID-19 risk perceptions. COVID-19 risk perception had significant positive correlations with health anxiety ($r = .37$, $p < .001$), education ($r = .21$, $p = .003$), attitude toward masking ($r = .40$, $p < .001$), attitude toward the COVID-19 vaccination ($r = .27$, $p < .001$), and liberalism ($r = .36$, $p < .001$), but not age. Liberalism moderated the relationship between COVID-19 risk perceptions and attitude toward masking ($p = .02$, $f^2 = .02$) and the relationship between COVID-19 risk perceptions and attitude toward vaccination ($p = .02$, $f^2 = .02$). Lastly, regarding demographic group differences, we found that COVID-19 risk perceptions differed by age ($p = .04$, $d = 0.24$) and gender ($p < .001$, $d = 0.50$), but not by education. Results support previous research and provide new insights regarding perceived COVID-19 risk and attitudes toward cautionary behaviors, stressing the impact of individual differences on responses to public health emergencies such as COVID-19. Implications and suggestions for future research are discussed.

Keywords: COVID-19, risk perception, cautionary attitudes, health behaviors, individual differences



Diversity badge earned for conducting research focusing on aspects of diversity. Open Data badge earned for transparent research practices. Data are available at <https://osf.io/cfky9/>

In March 2020, the World Health Organization declared a pandemic caused by the novel SARS-CoV-2 virus (COVID-19) prompting a lockdown in the United States during which many Americans were required to stay home and refrain from unnecessary contact with others. The COVID-19 virus poses physical threats due to its contagious nature along with psychological threats due to its potential to provoke fear and distress (Courtney et al., 2020). Throughout the pandemic, a wide variety of

responses have been witnessed among different groups of individuals. Given the breadth of responses to the pandemic that have been seen and the importance of understanding how psychological factors impact health behaviors, it is important to examine the factors that impact these responses and behaviors and how they vary in different groups.

Perhaps one of the most important factors to consider is individual risk perception. The threat of the

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COVID-19 virus has led to the study of COVID-19 risk perception as its own variable. Olapegba et al. (2020) operationalized COVID-19 risk perception by examining individuals' perceived risk of contracting COVID-19 along with how risky the individual perceived the virus to be. The main purpose of the current study was to explore relationships between health attitudes and individual differences with COVID-19 risk perception.

An individual's attitude toward cautionary behaviors (e.g., wearing protective face masks, social distancing, vaccination) is arguably one of the most evident responses to the threat posed by the COVID-19 virus. Numerous studies have been conducted throughout the COVID-19 pandemic to explore factors that may impact one's attitudes toward these types of behaviors. The link between risk perception and behaviors that protect oneself from the risk of disease have often been studied with illnesses such as influenza, SARS, and Ebola (Bruine de Bruin & Bennett, 2020; Iorfa et al., 2020; Lu et al., 2021; Majid et al., 2020). In fact, Majid et al. (2020) found that in a meta-analysis of 149 studies, risk perception was the most prominent predictor of how individuals feel about and engage in cautionary behaviors. Denial of personal risk may lead to refusal to conform to health mandates such as mask wearing, social distancing (Sleigh & Nelson, 2020), or even getting a vaccination, as it may be perceived as unnecessary (Lacey & Rivera, 2022). In relation, COVID-19 vaccination intent has been shown to correlate with high levels of risk perception (Haneda et al., 2022). However, regardless of disparities in risk perception, those who perceive greater risk associated with COVID-19 are more likely to express willingness to engage in cautionary behaviors (Bruine de Bruin & Bennett, 2020).

In one study, Vieites et al. (2021) found that individuals who wore masks were more likely to believe they would not contract COVID-19 once they were made aware that mask wearing decreases risk of contracting the virus, however, these individuals were also more likely to take greater risks; this study demonstrates how complex the relationship between risk perception and attitudes toward cautionary behaviors may be. Furthermore, Alqahtani et al. (2021) called for further investigation into the relationship between COVID-19 risk perception and participation in cautionary behaviors due to the impact of cultural and societal factors. Upon reviewing evidence of this complex relationship, we decided to not only explore the relationship between COVID-19 risk perception and attitudes toward cautionary behaviors such as wearing a mask and getting vaccinated against COVID-19, but also to explore potential moderators in this relationship.

In addition to risk perception, health anxiety–anxiety

characterized by being preoccupied with having or developing a serious illness and maintained by behaviors that alleviate distress while increasing or maintaining symptoms or feelings of anxiety (Haig-Ferguson et al., 2021)—may be an important factor in understanding individual responses to the pandemic. Taylor (2019) asserted that the anxiety surrounding COVID-19 would be an adaptive response to the threat of the virus, which may provide motivation for partaking in cautionary behaviors related to COVID-19. It is perhaps unsurprising then that those who had health anxiety prior to the pandemic are more at risk of considering COVID-19 a critical situation that may trigger health-related worries (Haig-Ferguson et al., 2021). For the purpose of this study, we focused on exploring how health anxiety relates to COVID-19 risk perceptions; however, we also suspect that health anxiety may have a relationship with attitudes toward cautionary behaviors based on previous findings.

Health attitudes appear to be related to COVID-19 risk perception, but individual differences likely play an important role in understanding COVID-19 risk perceptions as well. Interestingly, one's worldview beliefs may facilitate or undermine their health behaviors (Pyszczynski et al., 2020). Worldview consists of value and belief orientations which have been suggested as factors that influence individual risk perceptions (Siegrist & Bearth, 2021). It has been found that when people are faced by threats to their well-being and livelihood—such as that posed by the COVID-19 virus—they often cope by behaving in ways which work to confirm and strengthen their worldview (Guan et al., 2020; Pyszczynski et al., 2020). Pyszczynski et al. (2020) explain that under the umbrella of worldview, political ideology plays a central role in how people respond to these threats to well-being and livelihood and often leads to greater differences in individuals with opposing worldviews. Thus, it is unsurprising that individual belief systems such as political beliefs have been found to impact responses to the COVID-19 pandemic (Iorfa et al., 2020; Sleight & Nelson, 2020).

Considering that worldviews are important in understanding individual behaviors, it is necessary to explore how some aspects of individual worldview beliefs shaped responses to the COVID-19 pandemic. High politicization was a major factor influencing these responses in the United States as the increased involvement of politics in determining protective measures within the country may very well have influenced risk perceptions and attitudes (Bruine de Bruin et al., 2020). The highly politicized environment led to tensions between opposing political groups—particularly those identifying as Democrat or liberal and those identifying as Republican or conservative. Prior to the pandemic,

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political beliefs were found to predict perception of scientific findings in that Republicans were more likely to express disbelief toward scientific studies than Democrats (Broomell & Kane, 2017). Thus, it may be unsurprising that Bruine de Bruin et al. (2020) found Democrats to have higher COVID-19 risk perception in addition to being more likely to express willingness to participate in cautionary behaviors than Republicans. Along these lines, studies have found that liberals have higher risk perceptions associated with COVID-19 (Pyszczynski et al., 2020; Wolaver & Doces, 2022). Additionally, one's political beliefs may impact their confidence in the decisions of their political leaders (Shao & Hao, 2020) as well as lead to differences in trust they have in the government (Chilanga et al., 2022), both of which have been found to impact COVID-19 risk perceptions. Together these findings lead us to explore how political beliefs work with COVID-19 risk perception in understanding behaviors.

Like political beliefs, education may be important in understanding COVID-19 risk perception given the role of trust in science. Plohl and Musil (2021) found that education was positively correlated with trust in science and trust in science was positively correlated with COVID-19 risk perception, although the authors called for further investigation given the weak association found between education level with perceived risk and compliance with COVID-19 prevention guidelines. Although other research has suggested that those who attended or completed postsecondary education were more likely to express willingness to engage in cautionary behaviors (Vally, 2020), there is a lack of research specifically examining education level and perceived COVID-19 risk. Given these ambiguous preliminary findings, we believed it to be important to include education in our exploration of COVID-19 risk perceptions.

Previous research has also indicated that gender is another major individual difference that may impact one's COVID-19 risk perceptions. Lu et al. (2021) found that being female was a significant predictor of higher risk perception compared to being male. Additionally, men and women have been shown to express different responses to high-risk situations, with women having higher risk responses compared to men (Finucane et al., 2000). Women have also been found to express more fear and worry in relation to COVID-19 (Prati et al., 2021). Because of this, we were interested in how gender differences might impact COVID-19 risk perceptions.

Differences in age may also play a role in how individuals engage in certain health behaviors and account, in part, for the wide variety of responses seen during the pandemic. Previous research suggests that health-promoting behaviors increase with age,

though the relationship may be complicated (Bozo et al., 2009). For instance, Lu et al. (2021) found that older age predicted higher COVID-19 risk perception, and Bechard et al. (2021) found that middle-aged and older adults were more likely to express concern for health impacts of COVID-19 relative to young adults; however, it may be that individual and systemic factors impact health-related worries related to COVID-19 in younger populations, thus impacting their responses to the pandemic. Nonetheless, it seems that in general, older populations demonstrate more favorable attitudes toward cautionary behaviors due to greater risk for being negatively impacted by COVID-19 (Biro et al., 2021). Given these findings, we expected that age differences may also impact, and be related to, COVID-19 risk perceptions.

Purpose

The physical and psychological threats posed by the COVID-19 virus necessitate investigatory research to inform not only how individuals respond to COVID-19 and provide a framework for understanding the diverse set of reactions witnessed during the pandemic, but also to add to the body of research looking at how individual and psychological factors impact health-related behaviors in different groups. As such, the purpose of the present study was to explore the correlates of COVID-19 risk perceptions, the relationships of these risk perceptions with cautionary attitudes, examine how worldview beliefs—specifically liberalism—influence those relationships to gain a better understanding of the mechanisms behind COVID-19 reactions, and determine if certain groups of individuals differed in their COVID-19 risk perception. Specifically, the following research questions were investigated: (a) How is COVID-19 risk perception related to age, attitude toward masking, attitude toward the COVID-19 vaccination, education, health anxiety, and liberalism?; (b) Does liberalism moderate the relationship between COVID-19 risk perception and attitudes toward masking and the COVID-19 vaccine?; and (c) Are there differences in COVID-19 risk perception when considering individual differences such as age, education, and gender identification?

Method

Procedure and Participants

After gaining approval from the Lorain County Community College Institutional Review Board, an electronic link to the self-report survey was distributed in two ways. First, we used a convenience sample approach and recruited introduction to psychology students at a midwestern community college who were given extra credit for their voluntary participation.

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Recent previous research regarding electronic media use and the COVID-19 pandemic (Wright et al., in press) and health, well-being, and social media use (Wright et al., 2020) have demonstrated that the college student population is important to study. Second, in hopes of diversifying the demographics of our sample, participants were recruited for voluntary participation via Facebook and Reddit through a post that detailed the topic and purpose of the study as well as assurance of confidentiality and anonymity. No compensation was provided for participating in the study, regardless of the recruitment source. Participants signed an informed consent which disclosed the purpose of the survey and ensured appropriate handling of data. Upon completion, participants were provided with online resources for emotional help and information pertaining to the COVID-19 virus, including SAMHSA's national helpline (U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, 2021), the World Health Organization's COVID-19 pandemic informational website (World Health Organization, 2021), and the Centers for Disease Control and Prevention COVID-19 informational website (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2021). Data was collected in April 2021 from 243 participants; however, 32 of those participants were excluded for being under 18 years old.

The average age of the voluntarily recruited participants ($N = 211$) was 25.77 years ($SD = 10.88$) and ranged from 18 to 72 years. Most (85.80%) of the sample were introduction to psychology students and the rest (14.20%) were recruited via social media and may or may not have been college students. The sample was predominantly women (72.00%), with 23.70% identifying as men, 2.30% identifying as transgender or gender nonconforming, and 1.90% not identifying their gender. Most participants (79.10%) identified as White or European American, followed by Hispanic or Latino (6.60%), Asian or Asian American (3.80%), African American or Black (3.80%), and Biracial or Multiracial (3.30%). Regarding religious affiliation, 51.20% of the sample identified as Christian, 15.20% as Agnostic, 13.30% as unsure or undecided, 6.60% as Atheist, 2.80% as Muslim, 0.90% Buddhist, and the remainder reported some other religion or preferred not to answer. Regarding political identity, 37.40% of the participants identified as Democrat, 24.20% as Independent, 17.10% as Republican, 16.10% preferred not to answer, and 5.20% reported "other." Of our sample, 49.30% reported at least some college as the highest level of education completed, 14.20% have completed an associate's degree, 8.00% have completed

their bachelor's degree or some graduate level work, and some have completed a high school degree (18.50%) or are still in high school (3.80%). Most worked 25 hours or more per week (58.80%) or less than 25 hours per week (18.00%), and 18.00% of the sample was unemployed at the time of data collection. According to a post hoc power analysis using G*Power (Faul et al., 2007), our sample of 211 participants was sufficient to detect a small to medium effect for moderation with one predictor and one moderator.

Measures

Attitudes Toward Cautionary Behaviors

We were interested in the participants' attitudes toward certain cautionary behaviors, specifically wearing a mask and getting the COVID-19 vaccine and assessed this using two self-reported items. First, using a 5-point scale from 1 (*very comfortable*) to 5 (*not at all comfortable*) we asked participants, "When the mask mandate is lifted, how comfortable will you feel not wearing a mask?" Second, using a 5-point scale from 1 (*definitely will not get the vaccine*) to 5 (*definitely will get the vaccine/I have already received the COVID-19 vaccine*) we asked participants, "When the vaccine that will help to prevent against COVID-19 becomes available to you, will you get the vaccine?" Each of these questions were used independently with high scores reflecting a more preventative attitude toward COVID-19 cautionary behaviors.

COVID-19 Risk Perception

An individual's perception of perceived COVID-19 threat was measured using Olapegba et al.'s (2020) 9-item COVID-19-Related Risk Perception scale. Using a 7-point scale from 1 (*not at all*) to 7 (*extremely worried*), participants responded to questions such as, "How worried are you about contracting the Coronavirus?" Research has demonstrated acceptable reliability ($\alpha = .76$) of the measure (Olapegba et al., 2020) and the coefficient alpha reliability in our sample was .84. High scores indicate a higher perception of risk for COVID-19.

Health Anxiety

An individual's health anxiety was assessed using the 14-item Health Anxiety Inventory (Salkovskis et al., 2002). Participants were provided 4 statements and selected the one with which they most agreed. An example of four statements within an item is, "I do not worry about my health," "I occasionally worry about my health," "I spend much of my time worrying about my health," "I spend most of my time worrying about my health," scored as 0, 1, 2, and 3, respectively. The 14-items were summed to create one health anxiety score for each participant. Salkovskis et al. (2002) reported a

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coefficient alpha reliability of .95 and criterion validity of the measure. For our sample we found a coefficient alpha reliability of .85. High scores reflect more health-related anxiety.

Political Beliefs

Political beliefs were measured using the 6-item Liberal subscale of the Political Belief Scale (Webber et al., 2018) to assess the extent of an individual's liberal stance on various political topics. Participants used a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*) to items such as, "There should be a ban on the sale of all firearms." Research has demonstrated acceptable reliability ($\alpha = .72$) of this subscale (Webber et al., 2018). We found a coefficient alpha reliability of .77, with higher scores indicating more liberal political beliefs.

Results

Descriptive statistics and coefficient alphas (see Table 1) and intercorrelations among all study variables (see Table 2) are provided. All variables have reasonable means and variability, and all coefficient alphas were within an acceptable value of .70 or higher (Nunnally, 1978). Notably, our sample reports a relatively low average health anxiety score, which is not surprising considering the average age of our sample is 25.77

TABLE 1

Descriptive Statistics and Coefficient Alphas for all Study Variables

Variable	<i>M</i>	<i>SD</i>	Range	Minimum	Maximum	Coefficient α
Attitude-Masking	2.84	1.39	1.00–5.00	1.00	5.00	N/A
Attitude-Vaccine	3.91	1.46	1.00–5.00	1.00	5.00	N/A
COVID-19 Risk Perception	4.13	1.10	1.00–7.00	1.00	7.00	.84
Health Anxiety	12.69	5.62	0.00–42.00	1.00	33.00	.85
Political Beliefs	3.50	1.35	1.00–7.00	1.00	6.67	.77

TABLE 2

Intercorrelations for Study Variables

Variable	1	2	3	4	5	6	7
1. Age	-						
2. Attitude-Masking	.04	-					
3. Attitude-Vaccine	.15*	.31**	-				
4. COVID-19 Risk Perception	.12	.40**	.27**	-			
5. Education Level	.36**	.09	.15*	.21**	-		
6. Health Anxiety	-.05	.22**	.11	.37**	.13	-	
7. Political Beliefs	-.21**	.47**	.34**	.36**	.10	.18**	-

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

years. Correlational analysis was used to explore the relationships between COVID-19 risk perception and age, attitude toward masking, attitude toward the COVID-19 vaccination, education, health anxiety, and liberalism. Results found that COVID-19 risk perception had significant positive correlations with attitude toward masking, $r(209) = .40, p < .001$, attitude toward the COVID-19 vaccination, $r(209) = .27, p < .001$, education, $r(209) = .21, p = .003$, health anxiety, $r(209) = .37, p < .001$, and liberalism, $r(209) = .36, p < .001$, demonstrating moderate effect sizes (Cohen, 1992). COVID-19 risk perception was not significantly correlated with age.

Hierarchical linear regression analysis was conducted to explore whether liberalism was a moderator to further understand the relationship between COVID-19 risk perceptions and cautionary attitudes. The data showed that liberal political beliefs moderated the relationship between COVID-19 risk perceptions and attitude toward masking, $\Delta R^2 = .02, F(1,207) = 5.66, p = .02, f^2 = .02$ (see Figure 1). Liberalism also moderated the relationship between COVID-19 risk perceptions and attitude toward getting the COVID-19 vaccine, $\Delta R^2 = .02, F(1,207) = 5.14, p = .02, f^2 = .02$ (see Figure 2). These moderators show a small effect size (Cohen, 1992).

Further, we wanted to explore potential individual differences in COVID-19 risk perceptions, specifically if these risk perceptions differed by age, education, and gender. Using independent-groups *t* tests, we found that COVID-19 risk perceptions significantly differ by age, $t(209) = -1.74, p = .04, d = 0.24$, showing participants 21 years and older ($M = 4.24, SD = 1.11$) had significantly higher average COVID-19 risk perception than those under 21 years old ($M = 3.98, SD = 1.06$). COVID-19 risk perceptions also significantly differ by gender identity, $t(209) = -3.08, p < .001, d = 0.50$, showing females ($M = 4.28, SD = 1.04$) had significantly higher average COVID-19 risk perception than males ($M = 3.74, SD = 1.15$). COVID-19 risk perceptions did not differ by education. These significant findings each indicate a small to medium effect size, respectively (Cohen, 1992).

Discussion

Statistical analysis in relation to the first research question indicated that education and health anxiety were significantly positively correlated with COVID-19 risk perception, a finding that expands the literature regarding our understanding of what impacts an individual's assessment of perceived risk. Participants who were more educated or had greater health anxiety were more likely to perceive COVID-19 as a risk. Finding that education significantly related to COVID-19 risk addresses Plohl and Musil's (2021) call for further investigation into the role of education in COVID-19

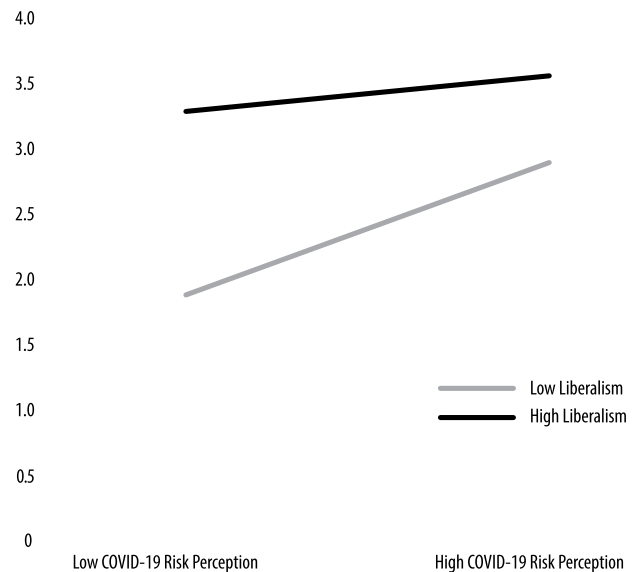
risk perception and advances our understanding that more educated individuals tend to perceive greater risk. This may relate back to their findings that education was positively correlated with trust in science (Plohl & Musil, 2021) and informs how, moving forward, education is an important individual difference variable for understanding why some individuals perceive risk in a health crisis and why others do not. Furthermore, our results indicate that the more health anxiety a person has, the more likely they are to perceive COVID-19 as a risk, which aligns with Haig-Ferguson et al.'s (2021) finding that those who had health anxiety prior to the pandemic were at more risk of seeing COVID-19 as a serious situation, triggering health worries. Knowing that health anxiety matters can help health care professionals understand how to discuss crises such as the pandemic and potentially alleviate unnecessary anxiety to allow focus on important health-related actions that can keep people safe and healthy.

Alqahtani et al. (2021) called for further investigation into the relationship between COVID-19 risk perception and participation in cautionary behaviors, and although we focused on a person's attitude toward cautionary behaviors, we found that COVID-19 risk perception was significantly positively correlated with both attitude towards masking and vaccination, specifically that greater perceived COVID-19 risk led to increased beliefs related to masking and getting the COVID-19 vaccine. These findings align with previous research wherein those who reported higher COVID-19 risk perceptions were more willing to engage in cautionary behaviors (Bruine de Bruin & Bennett, 2020; Haneda et al., 2022) and denial of risk may lead to not adhering to health mandates such as masking (Sleigh & Nelson, 2020) and vaccination (Lacey & Rivera, 2022). It appears that risk perception is an important factor that impacts how individuals feel about engaging in cautionary behaviors and something that needs to be considered as we continue to deal with COVID-19 illness and consequences as well as inform future medical crises. Ensuring people understand the proper amount of risk during a health crisis can help increase willingness to follow health mandates such as masking and vaccination.

Continuing our exploration of individual differences regarding perceived risk of COVID-19, our results that indicate individuals who are more liberal in their political views were more likely to perceive higher COVID-19 risk supports much previous research regarding the impact of individual belief systems on responses to the pandemic (Iorfa et al., 2020; Sleight & Nelson, 2020). As discussed previously, there was a highly politicized environment in the United States

FIGURE 1

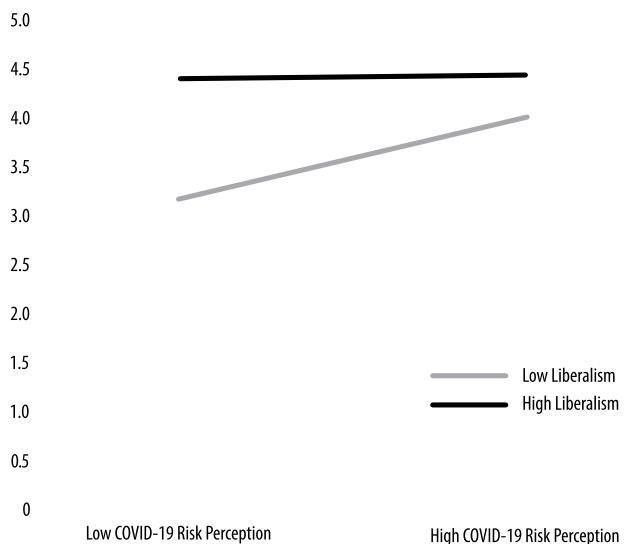
Plot of Interaction Between COVID-19 Risk Perception and Liberalism in Predicting Attitude Toward Masking



Note. Liberal beliefs significantly moderate the relationship between COVID-19 risk perceptions and attitude toward masking. Individuals high in liberalism have similar cautious attitudes toward masking regardless of their COVID-19 risk perceptions. But when low in liberalism, those with high COVID-19 risk perceptions have more cautious attitudes toward masking than those with low COVID-19 risk perceptions.

FIGURE 2

Plot of Interaction Between COVID-19 Risk Perception and Liberalism in Predicting Attitude Toward the COVID-19 Vaccine



Note. Liberal beliefs significantly moderate the relationship between COVID-19 risk perceptions and attitude toward the COVID-19 vaccine. Individuals high in liberalism have similar attitudes toward the COVID-19 vaccine (likely to get the vaccine) regardless of their COVID-19 risk perceptions. But when low in liberalism, those with high COVID-19 risk perceptions report a more likely attitude for getting the vaccine than those with low COVID-19 risk perceptions.

during the COVID-19 pandemic that may have influenced risk perceptions and attitudes, specifically that Democrats (Bruine de Bruin et al., 2020) and liberals (Pyszczynski et al., 2020; Wolaver & Doces, 2022) had higher COVID-19 risk perceptions. Worldviews, such as political alignment, are an important consideration when learning about why some individuals perceive more risk than others, particularly when a health crisis becomes politicized.

Beyond understanding the correlates of COVID-19 risk perceptions, we aimed to learn more about how these perceptions might influence pandemic-related cautionary attitudes such as masking and vaccines through our second research question. Our analysis found that political beliefs, specifically liberalism, moderated the relationship between COVID-19 risk perception and cautionary attitudes, both attitude toward masking and attitude toward getting the COVID-19 vaccine. Participants who scored higher in liberalism engaged in more cautionary attitudes than those low in liberalism (regardless of COVID-19 risk perceptions); however, when low in liberalism, those with high COVID-19 risk perceptions were more cautious in their attitudes than those with low COVID-19 risk perceptions (see Figure 1). These findings are consistent with previous research wherein Democrats and Liberals expressed more perceived risk associated with COVID-19 (Bruine de Bruin et al., 2020; Pyszczynski et al., 2020) and were more likely to believe in and engage in cautionary behaviors such as mask wearing and social distancing (Bruine de Bruin et al., 2020). These differences may be due to the political views of each party in that Democratic (or liberal) ideology tends to favor a focus on community responsibility and belief in scientific studies (Broomell & Kane, 2017) and lower liberalism is related to higher confidence in political leaders (Shao & Hao, 2020) which may be more influential than one's risk perceptions. As such, differences in liberalism matter and seem to work with perceptions of COVID-19 risk when a person is deciding their willingness to engage in cautionary behaviors such as masking and vaccination.

In regard to individual differences in COVID-19 risk perceptions, we explored gender, age, and education differences. Statistical analysis related to gender showed that females had significantly higher COVID-19 risk perceptions than males. This finding aligns with the results of several studies focused on gender differences and risk perceptions, particularly that being female was a significant predictor of higher COVID-19 risk perception (Lu et al., 2021) and that females express more fear and worry in relation to COVID-19 (Prati et al., 2021). We also found that

COVID-19 risk perception differed by age, but not by education level. Age seems to be part of one's identity that can be directly impacted by COVID-19 because of immune system concerns. At the time of our data collection, the media was consistently broadcasting the case and death count due to COVID-19, and many medical professionals were articulating who was at most risk of serious illness or death, including older adults. Therefore, it seems understandable that older people's perceived risk of contracting COVID-19 could be significantly different compared to younger people. Previous research has shown similar findings regarding the importance of age in COVID-19 risk perception (Bechard et al. 2021; Lu et al., 2021). On the contrary, level of education was not prevalently discussed in the media as being a primary risk factor of contracting severe illness due to COVID-19, thus not showing a difference in risk perception. Furthermore, if one goal during a health crisis is to encourage people to take cautionary actions, we know older populations have more favorable attitudes toward cautionary behaviors due to greater risk for being negatively impacted by COVID-19 (Biro et al., 2021), so keeping individual differences in mind, such as age and gender in regard to perceptions of risk, might help.

Limitations and Suggestions for Future Research

As with all research, this study is not without limitations. Given the ever-changing nature of the COVID-19 pandemic, results may reflect the time frame in which data was collected and therefore may not be congruent with results from data collected at another time during the pandemic. Thus, it is important to keep in mind that our data was collected in April 2021 when the COVID-19 vaccine was becoming more widely available and cautionary guidelines were becoming more relaxed. Many people stopped social distancing, wearing masks, and began viewing COVID-19 as less risky than at the height of the shutdown. This was prior to the emergence of COVID-19 variants, which began to be addressed in the United States in July 2021 by the CDC, who encouraged similar practices exhibited during pandemic lockdown conditions (Centers for Disease Control and Prevention, 2021).

Regarding limitations due to sample homogeneity, 71.60% of our participants were female, 79.30% identified as White, and the median age was 21 years old. Additionally, our statistical analysis indicated that health anxiety resulted in a relatively low mean score, possibly due to the age of our sample. Perhaps our results for the first research question in relation to COVID-19 risk perception and health anxiety would have been even stronger if our sample had a greater age range. Our study

has limited external validity and should be interpreted primarily with respect to college aged individuals. This is an important population to understand in a health crisis like COVID-19 even if younger people perceive less risk; in general, they may not be as greatly affected by COVID-19 but could bring the illness to someone in their life with a compromised immune system or advanced age. Understanding what drives younger college students' COVID-19 risk perceptions and why they may or may not be willing to adhere to cautionary practices is therefore very important. Still, it would be interesting to replicate the present study with a more diverse sample to determine how age, gender identity, education level, and other relevant individual differences may impact our understanding of COVID-19 risk perceptions and attitudes toward cautionary behaviors. Future research can use a more targeted approach to recruiting individuals of specific ages and potentially varied educational levels.

Additional limitations concern specific measurements employed in our study. In the time since we collected data, additional COVID-19 risk perception measures have been developed and validated (e.g., Capone et al., 2021), offering more ways for future research to garner an individual's perceived risk. We used single-item measures of attitude with masking and attitude with getting the COVID-19 vaccination, and future research may want to investigate willingness to engage in these cautionary behaviors with more robust measures. Furthermore, the self-report nature of the survey poses limitations regarding the accuracy of potentially sensitive questions; however, we make the assumption that participants understand their own perceptions and can report without bias or social desirability.

Further research might focus on a deeper understanding of how worldview impacts individual responses. For example, a recent study found those identifying with an individualistic worldview were less likely to follow COVID-19 restrictions than those with a collectivist worldview (Siegrist & Bearth, 2021) and another found that a reason for differences in risk perceptions seen in more liberal individuals may be due to having a communal orientation (Wolaver & Doces, 2022). It has also been found that the media may play a significant role in influencing one's views relating to the pandemic, as misinformation is highly prevalent due to politicization which may misconstrue the risk posed by COVID-19 (Anderson & Sivakumar, 2021). Additional research may benefit from examining individuals' preferred source of news and media, which is likely influenced by worldview and may provide insight as to the role of media in influencing risk perceptions and willingness to engage in cautionary behaviors.

Finally, now that we are learning more about what impacts COVID-19 risk perceptions, future research can continue to focus on these perceptions as well as attitudes toward and use of cautionary behaviors and the role of perceived risk and other individual difference variables. For example, females have been found to express more fear and worry in relation to COVID-19 and therefore are more likely to believe in cautionary behaviors (Prati et al., 2021; Rana et al., 2021), whereas research by Howard (2021) revealed that males are more likely to view mask wearing as a violation of their independence and freedom, suggesting that they are less likely to believe in cautionary behaviors. Together with our findings, these studies indicate that gender differences related to health decisions may go beyond differences in risk perception. As we continue to move through the impact of the COVID-19 virus, we need to understand perceptions of illness risk and how to encourage cautionary behaviors when they promote health benefits. This, in turn, can inform future health crises.

Implications

The present study demonstrates important contributions to health psychology research regarding the COVID-19 pandemic. Specifically, our findings that education and health anxiety were positive correlates of COVID-19 risk perception advances the literature regarding what factors impact perceived risk of illness. Our results showing positive correlations between liberalism, attitude toward masking, and attitude toward the COVID-19 vaccination with perceived COVID-19 risk complement and expand the literature as well. Age and gender differences in perceived COVID-19 risk further help in understanding why some individuals perceive COVID-19 as more of a threat than others.

The importance of worldview on attitudes such as mask wearing and seeking vaccination is another major takeaway of this study. We found that liberalism worked with COVID-19 risk perceptions to influence willing attitudes toward cautionary behaviors during the pandemic. This may be due to the increased participation in activities that strengthen one's worldviews when confronted by threats that raise awareness of one's own mortality, such as the threat posed by the COVID-19 virus (Courtney et al., 2020; Goldenberg & Arndt, 2008). Knowledge of factors that impact perceptions and attitudes toward cautionary behaviors may be useful in messaging about and guidelines for not only COVID-19, but potentially for future health crises as well.

Lastly, this research stresses the importance of time and context for research relating to unforeseen crises such as a global health pandemic. Given the rapid evolution of the pandemic, context during each phase of

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the pandemic is significant in understanding the changes that took place in attitudes toward the COVID-19 virus (such as cautionary behaviors and protocols in place). Therefore, it is necessary to have research from these different phases to continue growing an entirely novel body of research that may not be fully understood for years to come.

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Dark Tetrad and Empathy: The Interrelationship of Narcissism, Psychopathy, Machiavellianism, and Sadism With Affective and Cognitive Empathy

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ABSTRACT. The Dark Triad, coined by Paulhus and Williams in 2002, consists of nonclinical psychopathy (violent tendencies and a lack of remorse), nonclinical narcissism (entitlement and need for admiration), and Machiavellianism (ruthlessness and exploitation) and others expanded it to include a fourth construct of sadism (pleasure in other's suffering). Although the common unpinning of the Dark Tetrad is a lack of empathy, little empirical research has investigated the interrelationship among the components of the Dark Tetrad once empathy is delineated into affective (feeling another's emotions) and cognitive (understanding another's emotions) aspects. The purpose of this study was to determine the interrelationship of the Dark Tetrad and affective and cognitive empathy. Over 250 participants completed measures used to assess these constructs. We hypothesized that the Dark Tetrad would be inversely related to affective empathy, but Machiavellianism and narcissism would be positively related to cognitive empathy. The hypotheses were partially supported. Sequential (hierarchical) multiple regression yielded psychopathy, $\beta = -.29$, $t(259) = -3.97$, $p = .001$, narcissism, $\beta = .20$, $t(260) = 3.26$, $p = .001$, and Machiavellianism, $\beta = -.17$, $t(259) = -2.46$, $p = .02$, were significant negative predictors of affective empathy. Multiple linear regression yielded psychopathy, $\beta = -.31$, $t(260) = 4.01$, $p < .001$, was a negative predictor whereas narcissism, $\beta = .13$, $t(260) = 2.10$, $p = .04$, was a positive predictor of cognitive empathy. Theoretical explanations to account for both negative and positive associations of the Dark Tetrad include empathic inducement or the ability to manipulate others by overwhelming them with emotions to solicit a sympathetic response. Future research should seek to examine the differing relationships among these traits, specifically narcissism as it manifests both negative and positive attributes of empathy simultaneously.

Keywords: dark tetrad, narcissism, psychopathy, Machiavellianism, sadism, empathy

What makes a person harm another? Why do some people enjoy witnessing someone suffer? These are some of the questions that drive scholars to explore the *dark side* of personality as a potential explanation for evil behavior. Among a long history of research, three personality traits consistently emerged, resulting in the *Dark Triad* (Paulhus & Williams, 2002), which consists of narcissism, psychopathy, and Machiavellianism. As first suggested by Chabrol et al. (2009), Buckels et al. (2013) further corroborated that this model should be

expanded to include sadism to form the Dark Tetrad. Each component of the Dark Tetrad centers on a socially deviant and malevolent cluster of personality traits that are reflected in inappropriate thoughts, deviant behavior, and harmful interpersonal relationships (Cooke et al., 2004; Dăderman & Ragnestål-Impola, 2019; Dow, 2022; Somma et al., 2022; Stead et al., 2012; Walker et al., 2022a; Walker et al., 2022b). Yet each component has unique attributes. Narcissism is characterized by a manipulative collection of behaviors that include grandiosity, entitlement, superiority, anger, and

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attention-seeking behaviors (Miller et al., 2021; Paulhus, 2014; Paulhus & Williams, 2002; Sauls & Zeigler-Hill, 2020). Additionally, recent research has suggested that a crucial facet of narcissism is an exploitative nature in order to fulfill self-serving interests, further one's personal goals, or preserve oneself (Liao et al., 2019; Perrotta, 2020; Steinberg et al., 2022). The authors suggested that empathic inducement, the ability to manipulate others by emotionally overwhelming them, is commonly used by narcissists in order to exploit others for personal gain. Psychopathic personalities display high impulsivity, thrill seeking behaviors, callousness, superficial charm, impulsiveness, irresponsibility, and remorselessness (Hare, 2003; Jakobwitz & Egan, 2006; Paulhus & Williams, 2002; Thomas & Segal, 2005; Walker et al., 2022a). Machiavellianism refers to a manipulative personality reflective of Niccolò Machiavelli's political philosophies and statements (Christie & Geis, 1970; Paulhus & Williams, 2002). These personality traits are typified by a duplicitous interpersonal style, which revolves around prevailing cynical beliefs and a pragmatic, even unethical, sense of morality (Jones & Paulhus, 2009). Furthermore, those who tend toward high levels of Machiavellian triads engage in the exploitation of others due to various motivations, such as a fear of being exploited themselves, lack of control, or lack of concern regarding consequences for others (Abell et al., 2016; Aldousari & Ickes, 2021; Ashton et al., 2000; Bekiari & Spanou, 2018; Paal & Bereczkei 2007). Jones and Mueller (2022) suggested that Machiavellians are unique due to environmentally adaptive impulse control; thus using antisocial behaviors when benefits outweigh the costs, a characteristic that separates Machiavellianism from psychopathy. Lastly, is sadism, the enjoyment of other people's suffering (Paulhus & Dutton, 2016).

Sadism is a distinct dark trait characterized by aggression, cruelty toward others, intentionally inflicting pain, and an assertion of dominance (Foulkes, 2019; O'Connell & Marcus, 2019; Pineda et al., 2021; Thomas & Egan, 2022). Although sadism was thought to be limited to sexual and criminal activities, researchers now theorize that it is a common evolutionary behavior and can be demonstrated in many aspects, such as politics, sports, and interpersonal relationships (Baumeister & Campbell, 1999; Nell, 2006; Taylor, 2009).

Given that the core of the Dark Tetrad is a lack of empathy, it is worthwhile to understand the relationship of empathy and these personality traits. Empathy, in a broad sense, is the reaction to another individual's emotions and experiences (Davis, 1983). In a specific sense, empathy consists of two subcomponents: affective, which is feeling another individual's emotions, and

cognitive, which is understanding another person's emotions. In an epistemological review of empathy, sympathy, and pity, Gerdes (2011) teased through the historical and ambiguous uses of these terms, suggesting that empathy and sympathy are often erroneously interchangeable. According to modern definitions, sympathy refers to a reflection of affective sharing or feeling with another person, an externally focused ability (Gerdes, 2011). Whereas, de Waal (2008) defined empathy as the capacity to be affected by another person's emotional state, while demoting the reasoning behind these feelings and further adopting these feelings, as cited in Gerdes (2011). Furthermore, Cuff et al. (2016), Thiriaux et al. (2014), and Vossen et al. (2015) corroborated that empathy is multidimensional because it is inclusive of cognitive processes, but sympathy is primarily affective. Empathy and sympathy are often conflated, yet are uniquely distinct based on the multidimensional view, as used in this paper, that empathy includes cognitive processes that are more extensive than required by sympathy.

There is debate, among researchers, regarding the nature of the interrelationship among the Dark Triad and empathy. Schimmenti et al. (2019) and Turner et al. (2019) suggested that Dark Triad traits as a whole are negatively associated with affective and cognitive empathy. However, Wai and Tiliopoulos (2012) suggested that, although all Dark Triad traits are associated with a reduction in affective empathy, the traits do not impact cognitive empathy (Heym et al., 2019; Puthillam et al., 2021). Yet Giammarco and Vernon (2014) found that Machiavellianism and psychopathy were inversely related to cognitive empathy (as measured by perspective taking) and affective empathy (as measured by empathic concern). Furthermore, they postulated that cognitive and affective empathy partially served as mediators between both Machiavellianism and forgivingness and also between psychopathy and forgivingness. In a recent meta-analysis of 70 studies, Blötner et al. (2021) found that Machiavellianism was inversely correlated with all facets of empathy. Further complicating the pattern, Jonason et al. (2013) suggested that low empathy rates were related to narcissism in women, but psychopathy in men.

Proceeding to the Dark Tetrad, which includes the fourth component of sadism, while there is less literature, researchers have suggested that sadism behaves in a similar, yet distinct, pattern as other Dark Triad traits (Mededović & Petrović, 2015). This distinction is primarily seen in active behavior to target a person, or passive behavior to observe others suffering (Dow, 2022). More recently, studies have concluded that sadism is inversely related to both cognitive and affective empathy (Velimirović et al., 2018). Pajević et al. (2018) concluded that all four components of the Dark Tetrad are inversely

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related to both cognitive and affective empathy, barring a positive correlation between narcissism and cognitive empathy. Thus, sadism may result in an empathic deficit in which there is a division between cognitive and affective pitfalls. Similarly to the design of Pajevic et al. (2018), we explored the relationship between the Dark Tetrad and the two-dimensional model of empathy in a large sample by performing homogenous statistical analyses. However, our study is unique due to sampling a different profile of dark traits, which are believed to predict cognitive and affective empathy. Beyond the general acceptance of deficits related to the Dark Tetrad, there is little consensus on which aspects of empathy have a relationship with each trait.

Extant research appears to suggest ambivalent findings with regard to the relationship between the Dark Tetrad and empathy; thus, the problem driving the present study was to further investigate and clarify this relationship. The question driving this research was to what extent is the Dark Tetrad related to affective and cognitive empathy? We hypothesized that all components of the Dark Tetrad would be negatively related to affective empathy, but both narcissism and Machiavellianism would be positively related to cognitive empathy due to their shared manipulative traits. With current study, we sought to advance the broader line of malevolent research by attending to the interrelationships between empathy and dark traits.

Methods

Participants

For sample size estimation, a priori power analysis was conducted using G*Power version 3.1 (Faul et al., 2009) and Cohen's (1988) criteria of effect sizes. A series of power analyses on nonpublished pilot study data, which compared empathy on the Dark Triad, yielded sample sizes ranging from 189 to 263. Thus, the obtained sample size of 265 liberal-arts undergraduate students was deemed sufficient to test our current hypotheses. Descriptive statistics and frequency analyses were conducted on the demographic data gathered. Of the total participants, 216 identified as women and 49 identified as men. The race distribution of the participants was: 215 (81.1%) White, 15 (5.7%) Hispanic, 13 (4.9%) Asian American, 9 (3.4%) African American, and 13 (4.9%) identified as other race. The average age of the students was 19.62 years with a standard deviation of 1.20 years and a minimum of 18 and maximum of 25 years. Participants were recruited using the SONA Systems research software at their university with most coming from an introductory psychology course. Students were incentivized to complete the study for course credit.

Procedure and Measures

Institutional review board approval (#1554685-2) was given prior to the collection of any data. Students first completed a consent form, then were presented with questions regarding demographics, followed by various questionnaires regarding empathy and the Dark Tetrad.

Empathy Quotient

To assess empathy, participants completed a truncated version of Baron-Cohen and Wheelwright's (2004) Empathy Quotient (EQ). A total of 10 items were presented to each participant. For each item, participants were asked to rate their level of agreement with each statement on a 4-point scale ranging from *strongly agree* to *strongly disagree* (Baron-Cohen & Wheelwright, 2004). A sample item from the EQ is as follows: "Indicate your agreement with the following statement: I find it hard to know what to do in a social situation" (Baron-Cohen & Wheelwright, 2004). The EQ was measured via adding one or two points to a total score based on the question number, indicative of reverse coding.

Commonly used measures include Hogan (1969), which emphasizes the cognitive perspective of empathy; Mehrabian and Epstein (1972), which view empathy as purely affective; and Davis (1983), which incorporates both cognitive and affective perspectives of empathy (Neumann et al., 2015). Much of the ambiguity surrounding the measurement and understanding of empathy stems from the historically vague and obscure definitions of empathy (Neumann et al., 2015). Historically, empathy has been viewed as a binary construct; however, empirical investigations, such as Baron-Cohen's (2012), have begun to measure empathy as a continuum. We used the EQ in the present study due to robust levels of reliability and validity, succinctness, and accessibility. Baron-Cohen and Wheelwright (2004) reported a Cronbach's alpha of .92 for the EQ, but other researchers tended to report alpha levels ranging from .78 to .93 (Neumann et al., 2015). Similarly, Baron-Cohen and Wheelwright (2004) reported a high test-retest reliability of .97 for the EQ (Neumann et al., 2015). The internal reliability of the EQ used in the current sample was .63; however, we argue that the scale is situationally specific to an interpretation of internal processes. This study was conducted during the COVID-19 pandemic when arguably students faced higher levels of stress, a factor which has been shown to cause dysfunction in empathy (Barbosa et al., 2013; Music, 2014; Nitschke & Bartz, 2023; Shirtcliff et al., 2009). Furthermore, the low internal reliability present might have been caused by the disproportionate number of female participants in the current study, due to sex differences that have been exhibited by the EQ (Neumann et al., 2015).

Short Measure of the Dark Triad

Jones and Paulhus' (2014) short measure of the Dark Triad was used to assess corresponding, nonclinical, dark personality traits. The scale consists of 27 total items divided into three subscales of narcissism, Machiavellianism, and psychopathy, each containing nine items. Students were asked to rate their agreement or disagreement with each item on a 5-point scale which ranges from 1 (*strongly disagree*) to 5 (*strongly agree*; Jones & Paulhus, 2014). A sample item from the Short Dark Triad is as follows: "Rate your level of agreement or disagreement with the following statement: 'Many group activities would be dull without me'" (Jones & Paulhus, 2014). The mean score of the nine items in each subscale were calculated respectively. Cronbach's alphas of the three subcomponents (narcissism, Machiavellianism, and psychopathy) ranged from .76 to .82, indicating good to strong reliability.

Varieties of Sadistic Tendencies Scale

Lastly, to measure various subcategories of sadism, we used Buckels' (2009) Varieties of Sadistic Tendencies Scale, which was used in the original testing for the Dark Tetrad. The scale consists of 18 total agreement items, which are divided into three subcategories: relational sadism, vicarious sadism, political sadism. Seven items were categorized as relational sadism, six as vicarious sadism, and five as political sadism. Participants were asked to rate their level of agreement or disagreement on a 5-point scale, which ranges from 1 (*strongly disagree*) to 5 (*strongly agree*; Buckels, 2009). A sample item from the scale is: "Rate your level of agreement with the following statement: 'I dominate others using fear,'" (Buckels, 2009). The total sadism score and subscores were calculated and analyzed. Cronbach's alphas of the three subcomponents (relational, vicarious, and political sadism) ranged from .62 to .75, indicating fair to good reliability.

Results

Preliminary Correlations

Pearson's r correlations were conducted to assess the interrelationship among the variables. Gender (female coded as 1 and male as 2) was positively related to psychopathy ($r = .21, p < .001$), and sadism ($r = .41, p < .001$), and inversely related to affective empathy ($r = -.15, p = .02$). Gender was not related to narcissism ($p = .74$), narcissism ($p = .74$) Machiavellianism ($p = .10$), nor cognitive empathy ($p = .55$). All components of the Dark Tetrad correlated together ($r = .24$ to $.53, p < .001$). Psychopathy ($r = -.35, p < .001$), Machiavellianism ($r = -.28, p < .001$) and sadism ($r = -.25, p < .001$) were inversely related to affective empathy, but only psychopathy ($r = -.27, p < .001$) and

Machiavellianism were inversely related to cognitive empathy ($r = -.15, p = .02$; see Table 1). Overarching hypotheses were supported by results such that each of the Dark Tetrad traits, excluding narcissism, were inversely related to affective empathy. Surprisingly, psychopathy and Machiavellianism were both negatively correlated to cognitive empathy, opposing original hypotheses.

Multiple Regressions

A sequential (hierarchical) multiple regression was calculated to predict affective empathy based on gender and the Dark Tetrad (psychopathy, narcissism, Machiavellianism, and sadism). For affective empathy, gender was entered into the equation first, $F(1, 263) = 5.85, p = .02, R^2 = .02, \beta = -.15, t(260) = -2.42, p = .02$, followed by the Dark Tetrad, $F(5, 259) = 11.23, p < .001, R^2 = .18$. Psychopathy, $\beta = -.29, t(259) = -3.97, p = .001$, narcissism, $\beta = .20, t(260) = 3.26, p = .001$, and Machiavellianism, $\beta = -.17, t(259) = -2.46, p = .02$, were statistically significantly to the prediction, however sadism, $\beta = -.05, t(259) = -0.70, p = .49$, was not. According to the hypotheses, psychopathy and Machiavellianism were accurately predicted to be negatively correlated to affective empathy. However, narcissism showed an unpredicted positive correlation with affective empathy, but sadism showed no significant correlation.

Given no statistical correlation for gender and cognitive empathy, a linear multiple regression was calculated to predict cognitive empathy based solely on the Dark Tetrad, $F(4, 260) = 6.46, p < .001, R^2 = .09$. Psychopathy, $\beta = -.31, t(260) = 4.01, p < .001$, and narcissism, $\beta = .13, t(260) = 2.10, p = .04$, were statistically significantly to the prediction, however Machiavellianism, $\beta = -.04, t(260) = -.58, p = .57$, and sadism, $\beta = .40, t(260) = .03, p = .69$, were not. Both psychopathy and narcissism were significant to the prediction of cognitive empathy; however, both traits tended to be predictive in the opposite direction than anticipated (e.g., psychopathy was a positive predictor of

TABLE 1

Means, Standard Deviations, and Correlations

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Narcissism	2.90	0.57						
2. Psychopathy	1.76	0.55	.31**					
3. Machiavellianism	3.02	0.60	.30**	.52**				
4. Sadism	1.76	0.36	.24**	.53**	.41**			
5. Affective empathy	4.00	0.43	.04	-.35**	-.28**	-.25**		
6. Cognitive empathy	3.75	0.47	.03	-.27**	-.15*	-.12	.57**	
7. Gender	1.18	0.39	.02	.21**	.10	.41**	-.15*	-.04

Note. * $p < .05$. ** $p < .01$. $df = 263$

empathy, but narcissism was negative). Machiavellianism and sadism were not significant to the prediction of cognitive empathy, opposing original hypotheses.

Discussion

The purpose of this study was to help clarify the relationship between the Dark Tetrad and affective and cognitive empathy. The findings suggested that, although the components of Dark Triad were inversely related to affective empathy, sadism was not related. For cognitive empathy, only psychopathy was inversely related, but narcissism was positively related. Deficits in cognitive empathy, as the result of psychopathy, tend to have negative impacts on social interactions. For example, the lack of cognitive empathy that accompanies psychopathy could result in callousness, cruelty, or intentional social harm to others. Theoretical explanations to account for this dual nature of narcissism include empathic inducement and the negation of cognitive empathy and affective empathy. Empathetic inducement is the ability to overwhelm others with emotions or feelings, with the ultimate goal of gaining sympathy from or manipulating others. A factor that seemingly contributes to this ability to influence others was exploitativeness, a common characteristic of narcissists (Dow, 2022). Konrath et al. (2014) found that narcissists can “read people like a book,” yet they may use this ability to manipulate others for their own nefarious gain. Narcissistic character traits may impact social interactions such that an individual with high levels of narcissism will work to ensure that their needs are fulfilled before considering others. As a result of this intentional self-centeredness, others may be unintentionally harmed, offended, or put down by a narcissist’s behaviors.

To explain the null findings of sadism for both affective and cognitive empathy, it was possible empathy consists of a continuum with affective and cognitive empathy residing on the end points of the linear scale. The extremes (affective and cognitive) ultimately will come to an equilibrium point in which there is very little or low empathy that leans slightly toward one direction. Thus, they could potentially be neutralizing each other if both cognitive and affective empathy are on the same continuum. However, if they are thought to be orthogonal dimensions and not ends of a continuous dimension, they may act independently, suggesting that another variable was mediating the relationship between sadism and empathy. The authors theorize that culture could potentially mediate the relationship between sadism and empathy. It is possible that aggressive and cruel behaviors that are not tolerated in one culture, are condoned, or even praised, in another culture. These cultural difference may manifest in different acceptable behaviors in sports, politics, social relationships, or

group dynamics. Based on the current findings, it would appear that sadism is a separate construct than the Dark Triad traits due to the null relationships found between cognitive and affective empathy. However, additional research is needed to determine if sadism should still be included in the Dark Tetrad.

The current study expanded upon and challenged aspects of previous research. For example, the current study results suggest that high levels of psychopathy and Machiavellianism are correlated with low levels of affective empathy, similar to Turner et al. (2019). Similarly, the current study found no relationship between narcissism and affective empathy, whereas Turner et al. (2019) found a weak inverse correlation. Further, the current research expanded upon these findings via the inclusion of sadism, which tended to be inversely related to affective empathy and showed no correlation with cognitive empathy. However, with regard to cognitive empathy, the current study challenged findings presented in Turner et al. (2019). For example, the current study results suggest that psychopathy and Machiavellianism are inversely associated with cognitive empathy, although narcissism is unrelated, opposing findings from Turner et al. (2019). Furthermore, Petrides et al. (2011) offered nuance, via the study of emotional intelligence, to the findings, which are highlighted in the current research. Emotional intelligence refers to individuals’ perceptions of their own emotional capabilities (Petrides et al., 2011). According to Petrides et al. (2011), emotional intelligence is negatively associated with psychopathy and positively associated with narcissism. Individuals with high emotional intelligence tended to view themselves as “empathic and good-natured” while exhibiting hubris. The findings of Petrides et al. (2011) mirror what the authors believe to be true of narcissism, that is those who have narcissistic tendencies would believe that they have high emotional intelligence due to the grandiose sense of self commonly associated with narcissists. We found that narcissism positively predicted affective empathy whilst negatively predicting cognitive empathy. Thus, narcissists may have the capacity to feel for others, and believe they empathize to a strong degree, yet they lack the ability to understand others’ emotions due to a self-centered fixation on themselves.

Our current study is not without its limitations. The assessments included subclinical measures from a predominantly White college sample; thus, the scope of generalization based on race is limited. However, within the racially homogenous sample population, universal generalizations cannot be made due to a large proportion of female participants. Extant research states that men or those with masculine traits tend to score higher

than women on dark personality traits, such as those in the Dark Triad (Gluck et al., 2020; Hartung et al., 2022; Jonason & Davis, 2018; Pineda et al., 2018). Hence, the current study may be limited by an overrepresentation of female participants; thus, misrepresenting levels of dark traits among college students. To better represent a collegiate population, additional research is needed to determine the extent to which these findings expand to a more racially and gender diverse sample. Further, this study may be limited by the mediating impact of age on Dark Triad Traits. Extant research has suggested that age and dark traits have an inverse relationship, such that as age increases, levels of dark traits decrease due to growth beyond egocentrism (Barlett, 2016; Barlett & Barlett, 2015; Carter et al., 2015; Hartung et al., 2022; Kawamoto et al., 2020). Thus, this study could report inflated levels of dark traits that are not generalizable to populations outside of the college-aged sample. Additionally, due to the self-report nature of this study, results may be weakened by a lack of introspective capacity.

The current study sought to address the role of Dark Tetrad with empathy. Once omitting sadism, the Dark Triad did appear to have a relationship with both affective and cognitive empathy. In particular, narcissism and psychopathy were traits that influenced both types of empathy. These findings mirror and oppose some of the results presented in previous studies. With the advancement of this line of research, a better understanding of dark personality traits and the impact their presentation may have on society will help us to understand why people harm others or enjoy observing suffering. Future research may expand upon the findings by addressing the variable that may be mediating the relationship between empathy and sadism. Gaining a greater understanding of this relationship can help predict the behavioral patterns that impact interpersonal relationships and influence malevolent activity.

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