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About the Artist:

Soung Hye Ahn is a mother and wife who, after raising her family, rediscovered her lifelong love of painting in her fifties. Her work appears in this volume through her daughter, Rachel Shin, a graduating student of the clinical psychology MA program.

I have enjoyed drawing since I was little. As a child, I loved drawing pretty female dolls. Then, from the age of twelve, I drew many still lifes — sitting with objects and studying them. After that, I would take my paints outside and draw the landscapes spread before my eyes. Although drawing has always brought me joy, I never thought about drawing professionally. After getting married and raising my daughter, I forgot about painting altogether. It was only after my child had fully grown, and I past the age of fifty, that I began picking up the brush again. While I am drawing, I find myself becoming a young girl once more — returning to that innocent, childlike heart — and I am filled with happiness. I truly love to draw.

This painting was inspired by Kim Whan-ki's Moon & Jar, and is my reinterpretation of it in my own colors. The slightly imperfect circular form at the top represents the imperfect beauty of humanity, and the jar form below is a traditional Korean moon jar, symbolizing nature and tradition. I wanted to capture the sense that beautiful, yet imperfect humanity, precious nature, and the vast universe are all connected as one. The yellow filling the background was expresses the countless stars that shine infinitely and eternally — creating light that expands endlessly into the world. The thick, layered blue brushstrokes convey a strong presence, and through the subtle layers of blue, I sought to express a space for quiet contemplation and a vast cosmic sensibility.

Soung Hye Ahn

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MANUSCRIPTS. Manuscript submission for Volume 27 will be handled on a rolling basis. Submit manuscripts according to the submission guidelines printed in this issue. Please email us your manuscript along with a cover letter to gsjp@tc.columbia.edu. For more information on submission process visit www.tc.edu/publications/gsjp.

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Graduate Student Journal of Psychology

FOREWORD

ARTICLES

Graduate Student Journal of Psychology

Letter from the Editors:

With Volume 26, the Graduate Student Journal of Psychology continues its mission of bringing forward emerging scholarship from the next generation of psychological researchers. This edition brings together six thoughtful contributions spanning cross-cultural emotion research, clinical psychopathology, cognitive-affective processes, educational psychology, sociopolitical attitudes, and treatment effectiveness, reflecting the methodological and substantive breadth of contemporary psychological science.

Dave et al. extend Affect Valuation Theory beyond its traditional East Asian–American focus, examining ideal and actual affect among South Asian and American participants and offering new insight into how culture shapes preferences for high- and low-arousal positive emotions. Bates and Barik investigate the often-puzzling relationship between obsessive-compulsive and depressive symptoms in a non-clinical sample, finding that attachment insecurity functions as a partial mediator rather than a moderator—pointing toward attachment-informed approaches as a promising direction in OCD care. Lee and Garagiola turn to graduate education itself, demonstrating that authoritarian maternal parenting predicts greater academic performance anxiety while academic resilience serves as a meaningful protective factor.

Three additional contributions broaden the volume's scope. Li examines how anxiety and depression relate to time perception, finding that depressive symptoms predict greater time underestimation and suggesting that cognitive-affective processes such as rumination and attentional rigidity, rather than arousal alone, may underlie distortions of subjective time. Schmiedehaus et al. apply factor analysis and structural equation modeling to survey data from 587 adults, illuminating how social dominance orientation and sociodemographic characteristics shape beliefs about reproductive rights, LGBTQ+ rights, and election security. Khachumovaa and White offer a PRISMA-guided systematic review of cognitive hypnotherapy research from 2018 to 2023, updating the Australian Psychological Society's 2018 review and supporting the modality as a viable treatment for depression and related concerns.

This edition also marks a transition for our editorial team. We extend our warmest congratulations to Rachel, Camila, and Sima, who are graduating this year. Their dedication, intellectual generosity, and care for the journal have left an enduring mark on GSJP, and we are grateful for the example they have set as they move on to the next stage of their careers. We extend deep gratitude to our contributors, peer reviewers, and faculty sponsor, Dr. Matt Blanchard, for their invaluable support, and to the entire editorial team for the work that brought this volume to print.

We invite you to engage with the research presented in this volume. Connect with us at gsjp@tc.columbia.edu or through our social media platforms. Thank you for your continued support as we advance the field together.

Warm regards,

The Editors

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Attachment Style as a Partial Mediator Between Self-Reported Obsessive-Compulsive and Depressive Symptoms

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Associations between obsessive-compulsive disorder (OCD) and depression are unclear; some individuals' depression and low mood improve once OCD symptoms reduce, while others' depressive symptoms persist. The present study sought to replicate findings that identified a moderating role of attachment style on the relationship between OCD and depression. The present study also tested a novel conceptualisation via which chronic mental distress associated with OCD may be associated with greater insecure attachment, making individuals vulnerable to persisting depressive symptoms . Participants who self-reported a formal or self-identified OCD diagnosis completed validated psychometric measures. Moderation and mediation analyses were conducted to examine the role of self-reported attachment style scores in the relationship between obsessive-compulsive (OC) and depressive symptoms in a non-clinical sample. Contrary to findings from clinical samples, attachment style scores did not significantly moderate the relationship between OC and depressive symptoms. There was a significant indirect effect of attachment style scores on the relationship between OC and depressive symptoms, with greater OC symptom severity being associated with greater insecure attachment scores and greater depressive symptoms. Further research is warranted to better understand how attachment style-related therapies or interventions may benefit individuals with OCD by safeguarding or improving attachment security and, by extension, alleviating depressive symptoms.

Keywords: obsessive-compulsive disorder, depression, attachment style, affective disorders, personality factors

Obsessive-compulsive disorder (OCD) is a serious mental health condition associated with intense anxiety, unwanted or intrusive thoughts, beliefs, or images, as well as compulsive or ritualistic behaviours aimed at alleviating this anxiety (Bisby et al., 2025). The condition is considered chronic (Tibi et al., 2017) and, when left untreated, can significantly reduce a person's quality of life (Masellis et al., 2003). Additionally, OCD is commonly associated with many other neuropsychiatric disorders, including mood disorders, anxiety disorders, neurodevelopmental disorders, and other obsessive-compulsive related disorders generally and depression and low mood being the most commonly associated among adults with OCD (Sharma et al., 2021).

Depression, a state involving hopelessness, low mood, fatigue and an array of cognitive, social, behavioural and biological symptoms/markers (Bernard, 2018). Depression is associated with poorer quality of life and increased risk of suicide and suicidal ideation (a pre-existing risk for individuals with OCD; Albert et al., 2019; Hansson, 2002; Keilp et al., 2012). Furthermore, in terms of recovery and treatment adherence, comorbid depression is associated with increased drop-out rates for therapy (Tibi et al., 2019 and poorer long-term outcomes (Jakubovski et al., 2013). As such, current evidence indicates that OCD with comorbid depression both negatively impacts lived experience, increases risk of suicide, and hinders overall recovery (Albert et al., 2019; Hansson, 2002; Jakubovski et al., 2013; Keilp et al., 2012; Tibi et al., 2019).

While implications for this comorbidity may be relatively well understood, the mechanisms behind the relationship between OCD and depression are less well elucidated (Tibi et al., 2017). One explanation outlined by Tibi et al. (2017) assumes a hierarchical structure to the comorbid relationship, identifying depression as a secondary functional result of the chronic burden of living with OCD through a process known as "delayed demoralisation" (DD). Tibi et al. (2017) demonstrate that a reduction in OCD symptom severity leads to improvements in depressive symptoms. This is in line with research cited by Tibi et al. (2017; Anholt et al., 2011; Meyer et al., 2014; Zandberg et al., 2015; Zitterl et al., 2000), which highlighted that reductions in OCD symptoms reduced depressive symptoms more so than reductions in depression reduced OCD symptoms. Such evidence indicates a unidirectional relationship between OCD and depression. However, contradictory research opposes this unidirectional conceptualisation of the OCD-depression relationship, with some evidence suggesting that reducing or minimising OCD symptoms alone is not sufficient to remedy all comorbid depressive symptoms in all cases (Rickelt et al., 2016). Importantly, Rickelt et al. (2016) raise important concerns regarding the treatment of OCD and comorbid depression, suggesting that this hierarchical conceptualisation of the OCD-depression relationship may not apply to all.

Moderating Role of Attachment Style

One proposed explanation for the disparities in results regarding the OCD-depression relationship relates to the impact of so-called "interpersonal styles" (i.e., attachment style) on the relationship between OCD and depression (Tibi et al., 2017). These attachment styles can be understood as an individual's emotional and behavioural patterns related to interpersonal relationships, often grouped into secure, anxious, or avoidant, and are shaped by early caregiver interactions (Levy et al., 2011). Secure attachment styles are associated with healthier social communication and functioning, while insecure attachment styles (i.e., anxious and avoidant) are associated with the inverse (Levy et al., 2011). Links between OCD and insecure attachment style are relatively well researched, with a meta-analysis of 16 studies indicating that insecure attachment is significantly associated with OCD (van Leeuwen et al., 2020). Moreover, in relation to attachment styles and OCD influencing depressive symptomology, one study identified that insecure attachment style predicted 12.6% of variance in depressive symptoms among individuals with OCD (Khan & Moghal, 2021). This is in alignment with existing research, which implicated attachment style in the onset and maintenance of OCD and subsequent depression (Doron et al., 2012). Furthermore, this paper presented cognitive mechanisms through which views regarding the self and world maintain OCD, going on to suggest that views and beliefs about these domains are driven by attachment style. Doron et al. (2012) found that individuals with OCD reported significantly more attachment anxiety even when controlling for depression. This is in line with the work of Tibi et al. (2017), which identifies that secure attachment protects against OCD symptomology, resulting in reduced depression. Such findings support the delayed demoralization theory by assuming a hierarchical relationship between OCD and comorbid depression when supposing that OCD has a direct effect on depressive symptoms. However, this research also incorporates an indirect effect that is moderated by the psychological profile associated with different attachment styles.

Further research on this exact topic remains lacking. However, conceptual support for the theoretical underpinnings of the hypothesis can be found within the wider literature, which identified the moderating effect of attachment styles between childhood trauma (Cook et al., 2017), sibling bullying (Bar-Zomer & Brunstein Klomek, 2018), childhood maltreatment (Nowalis et al., 2022), and depression. As such, the potential for attachment style to significantly moderate relationships between adverse events/experiences and resultant depression is well established (Bar-Zomer & Brunstein Klomek, 2018; Cook et al., 2017; Nowalis et al., 2022). Moreover, other research evidence has further implicated attachment style as a key factor in OCD development and maintenance (Pozza et al., 2021). This has also included attachment style moderating the relationship between individual factors such as fear of self and OCD symptom severity (Doron, 2020).

Mediatory Role of Attachment Style

A further goal of this study is to explore alternative conceptualisations of the OCD-depression-attachment style relationship. While the moderating role of attachment style remains relatively under-researched, the potential mediatory role of attachment style in the relationship between OC and depressive symptoms — as far as we can discern — has not been researched to date. Unlike the moderation framework from Tibi et al. (2017), which posits that attachment style has a unique, external effect on the OCD-depression relationship, a mediation conceptualisation instead posits that OCD may influence attachment style, which by extension influences depression (see Figure 1).

This proposed relationship may appear incompatible with traditional understandings of attachment style, as attachment styles have been understood to be trait characteristics that are largely constant across a person's lifespan (Allen et al., 2004; Erkoreka et al., 2021; Mõttus et al., 2019). However, even these studies acknowledged that, while predominantly stable, there is some evidence for movement and change among individuals' attachment style over time. Furthermore, recent research has identified that significant life events can influence attachment style over time (Fraley & Roisman, 2019). In particular, research identified that chronic mental health conditions such as OCD may reduce attachment security over time, particularly if symptoms disrupt an individual's close, interpersonal relationships (Ein-Dor et al., 2016). Similarly, other evidence found that chronic health conditions and interpersonal trauma can also reduce secure attachment and increase insecure attachments (Ciechanowski et al., 2004; Davila & Cobb, 2004). The evidence suggests that OCD may be able to actively influence an

individual's attachment style, and thus may leave these individuals more vulnerable to developing depression that persists even after OCD symptoms reduce.

The present study sought to fill two key gaps in the literature. Firstly, Tibi et al.'s (2017) moderation-based approach to the OCD-attachment style-depression relationship centered upon a sample of individuals with OCD recruited through clinical routes, and the present study sought to identify if, and to what degree, this relationship translates to individuals with self-identified OCD recruited through non-clinical routes. It is hypothesized that the relationship between OCD and depressive symptoms will be significantly moderated by attachment style scores, such that the association between OCD symptoms and depressive symptoms will be stronger among individuals with higher insecure attachment scores. Secondly, the present study sought to test a proposed novel conceptualization in which scores on a self-reported measure of attachment style act as a mediator between scores on self-reported measures of OCD and depressive symptoms, an approach which, as far as can be discerned, has not been examined to date. It is further hypothesized that attachment style will significantly mediate the relationship between OCD symptoms and depressive symptoms, such that greater OCD symptom severity will be associated with higher insecure attachment, which will be associated with greater depressive symptoms.

Method

Participants

This study utilised opportunity and snowball sampling techniques to recruit a non-clinical sample into this study's survey. This involved recruiting via social media platforms (e.g., Instagram and Reddit), as well as through the OCD charity 'OCD Action'. A total of 237 participants clicked on the survey, and a total of 123 provided substantial psychometric data. Exclusion criteria included a minimum age of 16. The inclusion criteria stipulated that only individuals with a self-reported OCD diagnosis within three specific categories were able to participate. First of which were those with a self-reported formal diagnosis of OCD from a mental health professional. The second category consisted of individuals with a self-reported "working diagnosis". This would mean a diagnosis provided by a relevant health professional (e.g., GP or therapist) who does not have the ability to provide a full/formal diagnosis and/or an ongoing or preliminary diagnosis from a relevant mental health professional who has the ability to diagnose mental health disorders but at the time of participation had not provided/completed this formal diagnosis. Finally, the third was a self-diagnosis of OCD. This enabled individuals to participate who felt their symptoms aligned with their understanding of what OCD constituted. Justification for self-diagnosed individuals being eligible was two-fold. Firstly, due to restraints on healthcare systems, many individuals lack the ability to access formal diagnoses for mental health conditions, as such, this ensured not to shut out individuals who were not fortunate enough to access a diagnosis (Lowther-Payne et al., 2023). Secondly, as confirmed by prior research, self-diagnoses for mental health conditions can be reliable indicators of underlying conditions (Rutter et al., 2023). Importantly, however, it remains that this self-reported data offers less certainty regarding participants' actual mental health circumstances than if diagnostic assessments were carried out.

After reading the study information documentation, valid informed consent was obtained in writing prior to accessing the study's set of validated psychometric measures. Importantly, within this study, participants provided responses to validated measures of obsessive-compulsive (OC) and depressive symptomology and scores of severity for insecure attachment, as such, all data within the study are self-reported measures of symptoms and not verified by a mental health professional.

Measures

Demographics

Demographic characteristics included age, ethnicity, and diagnosis. Participants were asked to indicate whether they had a full OCD diagnosis from a mental health professional, working diagnosis from a mental health professional or were self-diagnosed.

Yale-Brown Obsessive-Compulsive Severity Scale

To measure OC symptom severity, the Yale-Brown Obsessive-Compulsive Severity Scale (Y-BOCS) (Goodman et al., 1989) was used. As this measure was also utilised by Tibi et al. (2017), this enabled closer alignment with their original model. Moreover, this measure is recognised as a validated and reliable measure of OC symptoms (López-Pina et al., 2015). Participants rate each of the ten items (α = .89) on a

5-point Likert scale, with 1 indicating "*0-1 hours a day, None, Never try completely yield, No control*" and 5 indicating "*More than 8 hours a day, Severe, Always try, Complete control*". Higher scores indicate higher OC symptomology. Items covered obsessive content such as "*How much control do you have over your obsessive thoughts?*", "*How successful are you in stopping or diverting your obsessive thinking?*", and "*Can you dismiss them?*", as well as behavioural/compulsive items such as "*How much time do you spend performing compulsive behaviors?*", *"How much longer than most people does it take to complete routine activities because of your rituals?"*, and *"How frequently do you do rituals?"*

Depression

The present study utilised the Patient Health Questionnaire 8 (PHQ-8; Kroenke et al., 2009) to measure depressive symptoms. Not only is this measure known to be reliable and valid (Shin et al., 2019), it is also shorter than the Beck Depression Inventory (BDI; Upton, 2020), reducing survey fatigue. Furthermore, this measure does not include potentially triggering items relating to self-harm/suicide/suicidal ideation as the BDI does, while being just as effective (Shin et al., 2019). Respondents complete eight items (α = .86), 0-3 Likert scale, with 1 indicating "*Not at all*" and 3 indicating "*Nearly every day*". Higher scores indicate higher depressive symptoms. This questionnaire asks respondents how often in the past two weeks they have been bothered by a specific problem (e.g., "*Feeling down, depressed or hopeless*" and "*Trouble falling or staying asleep or sleeping too much*").

Attachment Style

The Adult Attachment Scale brief version (18 items; Collins & Read, 1990) was used to measure attachment style. Participants receive a total score for their anxious and avoidant attachment styles. The scale utilises a 5-point Likert scale with 1 indicating "*Not at all characteristic of me*" and 5 indicating "*Very characteristic of me*." Within this study, we utilised the two-factor scoring method, in which participants receive a score on an avoidant attachment 12-item (α = .77) subscale and an anxious attachment 6-item (α = .75) subscale. Items included "*I find it relatively easy to get close to others*" and "*I find it difficult to trust others completely*."

Ethics

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013. All procedures involving human subjects/patients were approved by King's College London Research Ethics Committee under study ID: HR/DP-22/23-32992.

Statistical Analyses

Data was cleaned using IBM SPSS Statistics (version 31.0.0.0). This included the removal of participants who did not elect to complete the psychometrics section of a wider survey. In total, 114 cases were removed from an initial sample of 237, resulting in a final sample of 123 participants (n = 123). These excluded participants either did not complete the overall survey or completed the broader survey but did not respond to the psychometrics section.

Missing data were handled using listwise deletion, whereby cases with missing values on any variable included in a given analysis were excluded. As a result, all models included 116 valid cases. The majority of missing data arose from non-completion of the final questionnaire, which appeared at the end of the survey, suggesting that missing data were primarily due to participant attrition rather than random item-level nonresponse. No mean imputation was performed.

Reliability tests were performed (Cronbach's alpha), with each measure passing an ideal threshold (α > .70) as outlined by Tavakol and Dennick (2011), indicating that measures were used reliably in this study. Key assumptions for mediation and moderation analyses were tested in line with Hayes (2022), including linearity, normality of residuals, and homoscedasticity. Descriptive statistics - mean age, percentages of diagnosis categories were completed to understand demographic characteristics within the sample.

For the mediation and moderation analyses, Hayes (2022) was used as guidance to identify the appropriate model that aligned to the theoretical underpinnings of variables. For example, in the case of the mediation analysis, Hayes Model 4 was utilized as this included a predictor (OC symptoms), a mediator (anxious or avoidant attachment scores), and an outcome variable (depressive symptoms). Both the moderation and mediation analyses estimated indirect effects using 5000 bootstrap samples with 95% percentile confidence intervals using the PROCESS macro for SPSS (Version 5.0, Hayes 2022).

Results

Descriptive statistics indicated that the average age of participants was 30.25 (SD = 11.26, range = 16-

56), and ethnicities were relatively diverse (see Table 1). Using the three diagnostic categories, 66.7% self-identified as having a full/formal OCD diagnosis, 19.5% with a working diagnosis, and 13.8% were self-diagnosed.

A two-way moderation model was tested using Hayes (2022) PROCESS Model 2 (n = 116) to examine whether anxious and avoidant attachment scores moderated the relationship between OC and depressive symptoms. The overall model explained 48.8% of the variance in depressive symptoms. Neither anxious nor avoidant attachment significantly moderated this relationship, and both interaction terms were non-significant (OCD × avoidant attachment: p = .575; OCD × anxious attachment: p = .633), indicating that the effect of OC symptoms on depressive symptoms was consistent across attachment styles.

Two separate mediation models were tested using PROCESS Model 4 (n = 116). In the first model, anxious attachment scores were specified as the mediator. OC symptoms significantly predicted anxious attachment scores (b = .370, p = .003), explaining 7.7% of its variance, and anxious attachment scores in turn significantly predicted depressive symptoms (b = .231, p < .001). The model predicting depressive symptoms accounted for 42.8% of the variance. The indirect effect of OC symptoms on depressive symptoms via anxious attachment scores was significant (Boot *CI* [.021, .166]), indicating partial mediation, although a substantial direct effect of OC symptoms on depressive symptoms remained (b = .558, p < .001).

In the second mediation model, avoidant attachment scores were specified as the mediator. OC symptoms significantly predicted avoidant attachment (b = .539, p < .001), explaining 22.4% of its variance, and avoidant attachment significantly predicted depressive symptoms (b = .348, p < .001). The model accounted for 45.8% of the variance in depressive symptoms. The indirect effect via avoidant attachment was also significant (Boot *CI* [.090, .295]), indicating partial mediation, with a substantial direct effect of OC symptoms on depressive symptoms remaining (b = .456, p < .001).

Overall, these results indicate that both anxious and avoidant attachment scores partially mediate the relationship between OC and depressive symptoms, such that OC symptoms are associated with greater attachment insecurity, which in turn are associated with higher depressive symptoms. Moderation was not supported, suggesting that associations between OC symptoms and depression do not differ in relation to attachment style scores. Detailed coefficients, standard errors, t-values, p-values, and confidence intervals for all paths are presented in Table 2.

Discussion

The current study sought to further explore the moderating effect of attachment style scores on the relationship between OC and depressive symptoms, in particular, how and to what degree this relationship translates to a non-clinical population of individuals with self-reported/identified OCD. Furthermore, the present study tested a novel conceptualisation of the relationship between OC and depressive symptoms, investigating the mediatory effect of attachment style scores.

Moderation

The model explained a substantial proportion of variance in depression scores, however, OC symptoms' direct effect on depressive symptoms only approached statistical significance. This is likely attributable to the inclusion of attachment style variables in the model, which account for shared variance. Nonetheless, the trend towards significance aligns with existing literature indicating that depression is one of the most common comorbidities of OCD (Pastre et al., 2025; Sharma et al., 2021).

Moderation analyses revealed that neither anxious nor avoidant attachment scores significantly altered the relationship between OC and depressive symptoms, as the interaction terms were non-significant. As such, the first hypothesis of the present study was not supported. This indicates that the effect of OC symptoms on depressive symptoms was consistent across anxious and avoidant attachment styles. This is unexpected as Tibi et al. (2017) present strong evidence for the influence of attachment styles being integral to the relationship between OC and depressive symptoms. These differences in findings may be attributed to differences in sample characteristics, such as the use of a non-clinical population or lower symptom severity compared to Tibi. This is supported by research (Yesavage et al., 1982), which found that non-clinical participants reported generally lower scores on the same measures compared to clinical participants. Additionally, as our sample included self-diagnosed individuals, our sample may further diverge from that of Tibi et al. (2017). As such, it may be that, cumulatively, these factors are respon-

sible for the non-significant results from the model.

Beyond sample considerations, it is worth considering theoretical reasons that moderation effects were not detected by the present study. While OC symptoms significantly predicted attachment insecurity, attachment style exists as a broader construct shaped by multiple forces beyond OCD, including early caregiving experiences and adult relationship histories. These external influences may independently maintain attachment security, offsetting OC symptoms' push toward insecurity and rendering moderation effects undetectable in the present sample. Rather than refuting Tibi et al.'s (2017) moderation framework, the present findings may point toward a moderated mediation relationship in which attachment style is both influenced by OC symptoms and exerts an external effect on the relationship between OC symptoms and depressive symptoms. Importantly, this complexity may be better captured through structural equation modelling (SEM), which would allow attachment style to be modelled as having both an endogenous component — shaped by OC symptoms — and an exogenous component — shaped by broader life experiences —, something PROCESS macro is unable to partition. Future longitudinal research employing SEM is therefore recommended to more precisely test this theoretical model.

Mediation

The mediation analyses indicated that OC symptoms were significantly associated with depressive symptoms, accounting for a substantial portion of the variance in scores of depressive symptoms. This aligns with prior research demonstrating strong links between OCD and depression (Pastre et al., 2025; Sharma et al., 2021).

Moreover, both attachment styles were found to partially mediate the relationship between OC and depressive symptoms. Specifically, higher OC scores were associated with greater anxious and avoidant attachment scores, which were associated with higher depressive symptoms. The indirect effects were significant for both attachment styles, indicating that attachment processes may help explain part of the association between OC and depressive symptoms, although substantial direct effects of OC symptoms on depressive symptoms remained. As such, the second hypothesis of the present study is supported.

While causation cannot be assumed by the present study, these findings may suggest that living with OC symptoms may be associated with shifts in relational patterns and greater anxious and avoidant tendencies. Psychological factors commonly associated with OCD - such as low self-esteem (Jaeger et al., 2021), perfectionism (Pinto et al., 2017), and need for control (Moulding & Kyrios, 2007) - may further reinforce these attachment-related behaviours, which may heighten vulnerability to depressive symptoms. Functionally, avoidant attachment may increase likelihood of an individual suppressing emotions and avoiding intimacy (Mikulincer & Shaver, 2007) and experiencing loneliness (Wei et al., 2005). In contrast, anxious attachment may increase worry about relationships (Mikulincer & Shaver, 2007) and impact emotional regulation (Mikulincer & Shaver, 2019), with both forms of attachment being associated with depression (Jinyao et al., 2012; Wei et al., 2005). Broadly, these findings align with Khan and Moghal (2021), who found that dismissive and fearful attachment styles were the strongest predictors of depression, consistent with the present study's finding that avoidant attachment demonstrated a stronger indirect effect than anxious attachment (b = .188 and b = .085, respectively). Research indicates that avoidant attachment behaviours are associated with depression. For instance, social withdrawal is associated with depression in a causal, bi-directional relationship (Zhu et al., 2024). Simultaneously, emotional suppression behaviours are associated with increased depressive symptoms (Cameron & Overall, 2018). In addition, reduced help-seeking seen among individuals with avoidant attachment is also associated with depression (Rickwood et al., 2005). Such findings implicate classic avoidant behaviours as pathways to greater depressive risk. Meanwhile, anxious attachment styles may elicit behaviours that, while still harmful compared to secure attachment in the context of OCD, are less detrimental to mental health than those observed among individuals with avoidant attachment style. For example, concern or worry about relationships seen among individuals with anxious attachment styles may elicit help/reassurance-seeking behaviours that reduce isolation, thus creating a 'buffer' that lessens the association between OC symptoms, attachment style scores and depressive symptoms (Mikulincer & Shaver, 2007). This pathway may help explain the stronger effect of avoidant attachment compared to anxious attachment scores within our sample, however, further research is required with larg-

er, diversified samples to draw more firm conclusions.

Overall, these results highlight the importance of considering attachment styles as a potential mechanism linking OC and depressive symptoms. The results suggest that interventions targeting both anxious and avoidant attachment processes may help mitigate depressive outcomes in individuals with OCD both prior to and after receiving treatment for OCD. Finally, while widely understood to be intransigent, this evidence supports existing work which posits that attachment styles may be susceptible to change under exceptional circumstances, such as chronic mental health conditions (Ein-Dor et al., 2016; Fraley & Roisman, 2019).

Attachment Style

These findings also have broader implications for the attachment-psychopathology literature beyond OCD. Traditional conceptualisations have positioned attachment style as a largely stable trait; however, recent research suggests that state and trait aspects of attachment coexist, with state attachment subject to dynamic influences and change over time (Jennissen et al., 2024; Tammilehto et al., 2025). The present findings are consistent with this view, suggesting that lived experience of psychopathology such as OCD may represent one such dynamic influence on attachment state. The potential coexistence of moderating and mediating effects of attachment style further supports this interpretation, pointing toward latent variable constructs within attachment style that are differentially shaped by distinct types of experience. Specifically, one component may reflect the chronic burden of living with OCD actively shifting relational patterns over time, while another reflects more stable influences rooted in early caregiving experiences and adult relationship histories. Rather than viewing these as contradictory, they may represent complementary dimensions of a more complex attachment system than traditional trait-based conceptualisations allow for. The present study cannot fully disentangle these influences; however, this represents a significant finding with implications for broader understandings of attachment style across psychopathology. Future research employing longitudinal designs and structural equation modelling would be well placed to investigate this.

Limitations and Directions for Future Research

Although the moderation model explained a substantial portion of the variance, key relationships between variables did not reach the threshold of statistical significance. This suggests that the effect may be present, but the present sample size may be insufficient to detect it reliably due to the higher levels of power needed for statistical significance when conducting moderation analyses (Aguinis et al., 2005). This highlights the need for replication with larger samples to clarify whether moderation-based conceptualisations can explain the OCD-depression relationships in non-clinical populations. Furthermore, as Tibi et al. (2017) used cross-lagged, longitudinal methods to study a clinical population, future research should strive to produce similar studies in non-clinical populations.

As the present study utilised a cross-sectional design, future work should seek to identify methods to establish causal relationships between OCD, attachment style, and depression. To understand how OCD may facilitate attachment style changes, researchers should adopt longitudinal methods in order to track attachment style changes over time in relation to OCD.

Utilisation of a variety of recruitment methods to avoid any bias/skew in recruitment would ensure that recruitment is as representative as possible. Additionally, through recruiting both clinical and non-clinical populations, future studies would be able to more effectively compare these groups.

Future studies could reduce data loss due to participant attrition by providing reimbursement or other incentives. Additionally, randomising the order in which questionnaires are presented may help distribute missing data more evenly across the survey, rather than having it cluster at the final measures.

The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989) is usually clinician-administered, considered the gold standard for assessing OC symptom severity. In this study, a self-administered version was used. While self-report adaptations show good reliability and moderate agreement with clinician ratings, some discrepancies exist. Future studies should use a validated self-report YBOCS that has been designed to be self-administered or retain clinician administration to ensure accuracy (e.g., Steketee et al., 1996: Self-report Y-BOCS scale). Finally, these findings support the development of therapeutic interventions that seek to safeguard secure attachment styles among individuals with OCD in order to reduce instances and duration of any depressive symptomology resulting from living with OCD.

Conclusion

Evidence from the moderation model, taken with acknowledgment of potential limitations, indicates that the hypothesized relationship between attachment style scores, OC and depressive symptoms was not supported among our non-clinical population. While this evidence does not refute the existence of the relationship proposed by Tibi et al. (2017), the present study could not provide empirical evidence to support this finding. As such, this specific explanation for how and why some individuals continue to experience depressive symptoms even after receiving treatment cannot be further elucidated by this study. However, through mediation analysis, this study identified evidence for a novel mediatory role of attachment style in the relationship between attachment style scores, OC and depressive symptoms, one in which chronic OC symptoms may be associated with greater insecure attachment, which in turn is associated with increased depressive symptoms. As such, this paper concludes that there is evidence for a hierarchical structure to the relationship between OC and depressive symptoms. Within this relationship, attachment insecurity, potentially exacerbated by living with OC symptoms, may prolong or increase an individual's depressive symptoms, thus helping to explain how and why some individuals experience depression post-treatment. This evidence opens new avenues for future research, not only in relation to how and why OCD may be associated with depression through facilitating changes in attachment style but also regarding the potential fluidity of attachment styles more broadly. Finally, future work may yield benefits from trial-ing OCD interventions which also seek to safeguard secure attachments.

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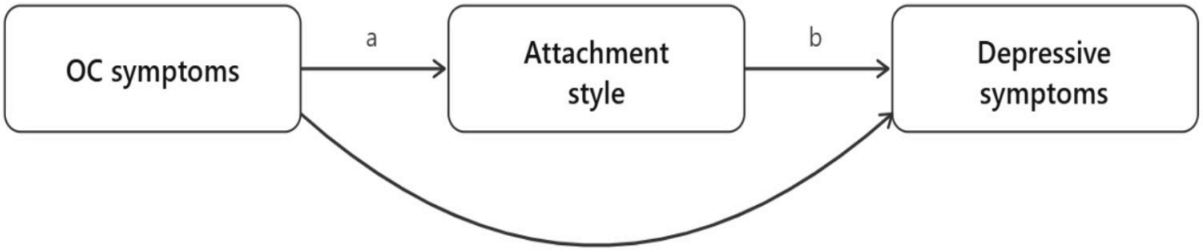
Figure 1.

Proposed Mediation Model of the Associations between OC Symptoms, Attachment Style Scores, and Depressive Symptoms



Note. c' (direct effect)

Table 1.

Participant Ethnicity Data

Ethnicity	Frequency (count)
Asian or Asian British (Indian, Pakistani, Bangladeshi, Chinese, or other Asian background)	5
Black, African, Caribbean, or Black British (African, Caribbean, or other Black/African/Caribbean background)	1
Mixed or Multiple ethnicities (White and Black Caribbean, White and Black African, White and Asian, or other mixed/multiple ethnicities)	10
Other ethnic group	10
White (English, Welsh, Scottish, Northern Irish, British), Irish, Gypsy or Irish Traveller, other white background	97

Table 2.

Summary of Mediation and Moderation Analyses

Analysis	Path / Predictor	b	SE	t	p	95% CI
Moderation (Model 2, Two Moderators)	OCD main effect	0.405	0.206	1.96	.052	[-0.004, 0.814]
	Anxious attachment main effect	0.243	0.194	1.25	.213	[-0.142, 0.628]
	Avoidant attachment main effect	0.157	0.229	0.69	.493	[-0.295, 0.610]
	OCD × Anxious attachment	0.057	0.100	0.56	.575	[-0.142, 0.254]
	OCD × Avoidant attachment	-0.043	0.089	-0.48	.633	[-0.219, 0.134]
Mediation (Model 4, Anxious Attachment)	OCD predicting anxious attachment	0.370	0.120	3.09	.003	[0.132,0.607]
	Anxious attachment predicting depression	0.231	0.060	3.83	.000	[0.112, 0.350]
	OCD predicting depression (direct effect)	0.558	0.080	6.96	.000	[0.399, 0.718]

Table 2 cont.

Summary of Mediation and Moderation Analyses

Analysis	Path / Predictor	b	SE	t	p	95% CI
	Anxious attachment predicting depression	0.231	0.060	3.83	.000	[0.112, 0.350]
	OCD predicting depression (direct effect)	0.558	0.080	6.96	.000	[0.399, 0.718]
	OCD predicting depression (indirect effect via anxious attachment)	0.085	0.037	-	-	[0.021, 0.166]
Mediation (Model 4, Avoidant Attachment)	OCD predicting avoidant attachment	0.539	0.094	5.74	000	[0.353, 0.726]
	Avoidant attachment predicting depression	0.348	0.075	4.66	.000	[0.200, 0.496]
	OCD predicting depression (direct effect)	0.456	0.085	5.35	.000	[0.287, 0.625]
	OCD predicting depression (indirect effect via avoidant attachment)	0.188	0.052	-	-	[0.090, 0.295]

Note. Int_1 = OCD × Anxious attachment; Int_2 = OCD × Avoidant attachment. Bootstrap 95% confidence intervals are reported for indirect effects.

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Understanding Cultural Influences on Ideal Emotions in South Asian and Americans Using Affect Valuation Theory

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Affect Valuation Theory (AVT) proposes that cultural factors influence how individuals ideally want to feel (ideal affect) and how they actually feel (actual affect). Prior research has examined differences in high-arousal positive (HAP) and low-arousal positive (LAP) as well as high-arousal negative (HAN) and low-arousal negative (LAN) affect, mostly between East Asian and American populations, demonstrating that cultural norms shape emotional preferences and experiences. The present study extends this line of research by investigating preferences for LAP and HAP emotions in South Asian and American populations. Participants included 75 Americans and 13 South Asians recruited from Denison University's "Introduction to Psychology" course and through word-of-mouth, as well as 145 participants aged 18 to 35 years from India (part of the South Asian group) recruited via Prolific. Mixed-model ANOVA was used with affect type as a within-subjects factor and culture as a between-subjects factor to analyze the data. The findings showed significance for both HAP and LAP in ideal affect among Americans and South Asians. This study aims to explore cross-cultural variations in affect valuation, focusing on how South Asians differ from previously studied groups in their ideal and actual affective states. Findings contribute to the broader understanding of cultural influences on emotion and expand the scope of AVT to include South Asian contexts.

Keywords: Affect valuation theory, ideal affect, actual affect, arousal

Human geographers have studied "emotional geographies" to highlight the relations among emotions, environments, and representation (Khan, 2015). Most of these emotion studies are Eurocentric and do not involve cultural considerations. Although most people report a desire to feel good (Elliot & Thrash, 2002), people do different things to achieve this. Some individuals may listen to music, play sports, or dance, while others may do community service, take narcotics, or socialize. Many cross-cultural studies of state emotion fail to measure these affective traits and therefore cannot rule out this possibility. Thus, the influence of cultural variables versus affective traits on emotion remains largely unexplored (Pernau, 2021). Taken together, this gap highlights the need for a framework that clearly distinguishes between what people actually feel and what they ideally want to feel across cultures.

Ideal Affect and Affect Valuation Theory

People have certain ideas about how they want to feel, similar to how people act in varying ways to feel good. These ideas depend on an individual's values, preferences, and how they ideally want to feel. *Ideal affect* refers to the emotional state that a person values and ideally wants to feel, essentially describing the desired feelings someone strives to experience, distinct from their actual emotions at any given time. Cultural factors often influence ideal affect and can impact how people respond to events and interact with others (Tsai, 2017). Affect valuation theory (AVT) highlights the importance of people's ideal affect in everyday life (Tsai, 2007, 2017). By "affect," Tsai refers to feeling states that vary along the dimensions of valence (from negative to positive) and arousal (from low to high; Kuppens et al., 2013). High-arousal positive states (HAP) include excitement, enthusiasm, and elation, while low-arousal positive states (LAP) include calm, peacefulness, and relaxation. In this way, AVT provides a structured model for understanding how cultural values shape emotional preferences.

AVT's first premise is that people's "actual affect," or how they actually want to feel, is different from their "ideal affect," or how they ideally want to feel. People's reactions to events or situations are referred to as their actual affect ("How do I feel now? How do I usually feel?"), Ideal affect is a desired state that helps in the interpretation of affective experiences for both individuals and others ("Does this feel right?"). Across various studies, it can be observed that people generally prefer to feel positive states over negative ones, and that people want to feel more positive (like HAP and LAP) and less negative (e.g., high arousal negative states [HAN] like nervousness and low arousal negative states [LAN] like dullness) than they actually feel, in several studies involving a range of cultures (Tsai et al., 2006).

The second premise of AVT is that cultural factors shape both actual and ideal affect. Sociocultural, political, economic, and individual factors shape individuals' experiences, beliefs, values, and attitudes across different societies. AVT also predicts that cultural factors shape ideal affect more than actual affect. In the same way that culture teaches people which behaviors are desirable, moral, and virtuous (Shweder, 2003), culture also teaches people which emotional states are de-

sirable, moral, and virtuous. Although culture shapes how people actually feel, people's temperament, regulatory abilities, and immediate circumstances strongly influence their actual affect (Diener et al., 2003). Thus, AVT predicts that culture shapes how people want to feel even more than how they actually feel.

Across several studies, Tsai and colleagues (2006; 2007) found that European Americans want to feel HAP more than East Asians, while East Asians want to feel LAP more than European Americans. Moreover, these cultural differences are reflected in the popular media of those cultures, with American media containing more open-mouthed, toothy "excited" smiles and fewer close-mouthed "calm" smiles than Chinese media–including children's storybooks, women's magazines, Facebook photos, and most recently, the official photos of leaders in government, business, and academia (Huang & Park, 2013; Tsai, 2007; Tsai et al., 2007; Tsai et al., 2015; Tsai et al., 2016).

In one of the studies, Tsai et al. (2016) compared the smiles of top-ranked American and Chinese leaders in their official photos to see if their smiles valued excitement and other high-arousal positive states, or if they valued calm and other low-arousal positive states, which reflected cultural differences in Ideal Affect. The photos were taken from the official websites and coded using the Facial Action Coding System (FACS; Ekman & Friesen, 1976), a system used to measure minute facial muscle movement, or action units (AUs), and the occurrence of a smile (excited or calm). The results showed that cultural differences in ideal affect are reflected in the official photos of leaders, where American public leaders showed more excited smiles than Chinese public leaders (Tsai et al., 2016).

In another study, Tsai et al. (2007) looked into children's literature to see if the cultural differences in ideal affect emerge early in life and are acquired through exposure to storybooks. Researchers identified the top 10 best-selling storybooks for children between 4 and 8 years of age in both the United States and Taiwan and compared the characters' faces using the FACS. Results showed a cultural difference in their illustrations; American best-selling storybooks had more excited (vs. calm) expressions, wider smiles, and more emotionally arousing activities (Tsai et al., 2007).

Universality of Affect Valuation Theory

There have been studies comparing Americans and East Asians in ideal affect, but none have examined the South Asian population. A lack of attention has been paid to South Asian Americans or Americans of South Asian heritage (e.g., India, Pakistan, Sri Lanka; Perera et al., 2015). Similarly, there have not been studies done on the South Asian population as a whole. Studying the South Asian population is important because it represents a major gap in understanding how cultural influences shape emotional ideals across a diverse global demographic. Differences among Asian-American subgroups that fall within the same broader ethnic group have received virtually no attention. While there are similarities between East and South Asian cultures, which are both collectivistic cultures, we might see a difference in religious practices, children's upbringing, and interpersonal communication (Chadda, 2013). Seven factors influence the ideal affect: (a) interpersonal communication; (b) parent-child interaction; (c) peer interaction; (d) religion; (e) popular media; (f) magazines; and (g) children's literature (Tsai, 2007). According to Kroeber and Kluckhohn (1952), cultural ideas are instantiated by prevalent practices, institutions, and artifacts. Through exposure to or engagement in these cultural representations, people begin to internalize the cultural ideas they reflect. Research on South Asians can test the universality or specificity of AVT and other cross-cultural frameworks. It can help determine whether current models adequately describe all collectivistic cultures or require adaptation to account for regional differences.

Indian culture emphasizes interpersonal relationships in a much more formal way than the informal and spontaneous form found in the U.S. culture (Sodowsky & Carey, 1988). Affection, particularly between opposite genders, is not openly displayed. Politeness, which includes good manners, quiet speech, a pleasant smile, gracefulness, and modest dressing, is expected. Social relations and closeness highly depend on one's status in the family, sex, and roles performed in society (Sodowsky & Carey, 1988). Similarly, the form of collectivism present in East Asian cultures dictates that individuals control and subdue their emotional expressions to maintain harmonious relationships as opposed to imposing their personal feelings on others (Heine et al., 1999; Markus & Kitayama, 1991). It follows the notion that people in East Asian contexts would place more value on subdued, low-arousal positive affect than on expressive, high-arousal positive affect. As with most of the stud-

ies conducted within cultural psychology, research on ideal affect has focused exclusively on those with East Asian and Euro-American cultural orientations.

Tsai et al.'s (2016) study showed how cultural differences are reflected in popular media, with American content containing more expressivity of positive and negative emotions than Chinese content, which was more neutral and calm. It is widely known that South Asian media, such as Bollywood movies and music videos, are expressive and display a range of emotions (Ganti, 2012). Children's storybooks like the famous "Mahabharata" are very expressive in terms of their facial expressions. South Asians have started using emotions in television commercials, movies, and literature more than they have in the past (Pernau, 2021). This may suggest that South Asians have high arousal positive emotions, as media plays a big part in people's lives, and can be a major influence on how people would ideally want to feel.

There are similarities between South Asians and East Asians, especially considering how both cultures lean towards a collectivist perspective, directly contrasting with Americans, who are more individualistic in terms of their culture. Whereas individualists aim to influence (i.e., have an impact on, change, improve) their environments to fit their own needs, collectivists aim to adjust (i.e., modify, alter, subvert) their own needs to fit those of their environments (Morling et al., 2002; Triandis, 1995; Weisz et al., 1984). Indeed, Schwartz (1992) and Oishi et al. (1998) found that individualists value influence goals (e.g., stimulation, self-direction, power, and achievement) more than collectivists, whereas collectivists value adjustment goals (e.g., conformity and tradition) more than individualists. Few studies have explored whether people from different cultures behave similarly. Collectivist cultures also value interpersonal communication, which brings us to a comparative study between Indian and U.S. participants (Crowe et al., 2012). A higher proportion of Indian than U.S. participants reported motives for controlling their emotions that focused on maintaining interpersonal harmony and others' well-being (i.e., prosocial concerns, or maintenance of social norms). In contrast, a higher proportion of U.S. than Indian participants reported self-focused motives (i.e., desire for privacy or desire to avoid discomfort for self).

With respect to motives for emotional expression, a higher proportion of Indian participants in comparison with those from the U.S.reported relationship-focused motives (e.g., desire to maintain a relationship). Contrary to expectations, a higher proportion of Indian participants also reported a self-focused motive (i.e., expectation of instrumental assistance; Crowe et al., 2012). Yet few studies have explored whether people from different collectivistic cultures think and behave similarly to each other. In this article, I examined preferences for ideal affect among the South Asian population in comparison to two different cultures: Americans and East Asians. We hypothesize that South Asians would display a different pattern of HAP/LAP preference than East Asians and Americans. More specifically, South Asians would seek HAP experiences more when compared to East Asians, but less than Americans.

Method

Participants

Two hundred thirty nine participants were part of our study, of whom 75 were Americans, and 13 were South Asian. Participants were students in the "Introduction to Psychology" course as well as those recruited through campus organizations and email outreach. South Asian participants were recruited via word-of-mouth (i.e., peer referrals), consistent with a snowball sampling approach. These methods were used complementarily to broaden participation, particularly among South Asian students, given their relatively small representation within the Denison University student population. One hundred forty five participants, aged between 18 and 35 years old, who were from India, were recruited through Prolific. All participants spoke English fluently, and there were no significant group differences in age or education.

Six participants who identified as East Asian participated in the study, but due to a small East Asian student population, meaningful statistical comparisons with this group were not possible. Therefore, we focused our primary analyses on South Asian and American participants.

Instruments

To measure ideal affect, participants were asked "how much you would *ideally* [emphasis added] like to feel" the emotions contained in the Affect Valuation Index "on average" on a scale from 1 (*very slightly, not at all*) to 5 (*very much, all of the time*; Tsai et al., 2006). To measure actual affect, participants completed a parallel version of the ideal affect measure, in

which they rated how much they "*typically* feel each of the following items on average". HAP was calculated from participant ratings for "excited," "enthusiastic," and "elated" (α = 0.70 for ideal affect and α = 0.66 for actual affect); LAP from "calm," "at rest," and "serene" (α = 0.79 for ideal affect and α = 0.81 for actual affect). Prolific only included the participants who spoke fluent English for the survey. We had two manipulation check questions in the Prolific survey.

Ethics

This study was approved by the Institutional Review Board of Denison University (SP25#15). All the procedures and data collection were in a manner consistent with the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct.

Procedure

All participants were given an informed consent form before they completed the study. The participants were then given the Affect Valuation Index (Tsai et al., 2006). After completing the assessment, participants were asked demographic questions and given a debriefing form that included details about the study and its goals. Upon returning the survey, Denison students were given 1 SONA credit, and Prolific participants were compensated monetarily ($2 for an 8-10 minute survey). To investigate whether there were cultural differences in ideal affect, we conducted a 2 (Arousal Type: High-Arousal Positive [HAP] vs. Low-Arousal Positive [LAP]) × 2 (Culture: American vs. South Asian) mixed-model ANOVA, with Affect Type as a within-subjects factor and culture as a between-subjects factor.

Results

A 2 (Arousal Type: High-Arousal Positive [HAP] vs. Low-Arousal Positive [LAP]) × 2 (Nationality: American vs. South Asian) mixed-model ANOVA was conducted on ideal affect ratings, with Arousal Type as a within-subjects factor and Nationality as a between-subjects factor.

Main Effects

There was a significant main effect of Arousal Type, $F(1, 231) = 76.41$, $p < .001$, $\eta = .249$, indicating that participants reported significantly different levels of HAP and LAP overall. Across participants, LAP ($M = 4.03$, $SD = 0.84$) was rated higher than HAP ($M = 3.53$, $SD = 0.78$).

There was also a significant main effect of nationality, $F(1, 231) = 11.15$, $p < .001$, $\eta = .046$. Americans ($M = 4.00$, $SE = 0.08$) reported higher overall affect ratings than Indians ($M = 3.67$, $SE = 0.06$).

Interaction Effect

The interaction between arousal and nationality was not significant, $F(1, 231) = 2.29$, $p = .132$, $\eta = .010$, suggesting that the difference between HAP and LAP ratings did not significantly vary by nationality.

Follow-up Comparisons

Descriptive statistics indicated that Americans reported higher ratings than Indians in both conditions. For HAP, Americans ($M = 3.81$, $SD = 0.67$) scored higher than Indians ($M = 3.40$, $SD = 0.80$). Similarly, for LAP, Americans ($M = 4.20$, $SD = 0.64$) scored higher than Indians ($M = 3.95$, $SD = 0.91$; see Table 1). However, given the non-significant interaction, these differences should be interpreted cautiously and not as evidence of differential effects of arousal across nationalities.

Discussion

This study is among the first to examine South Asians through the lens of Affect Valuation Theory (AVT), extending the framework beyond the commonly studied American and East Asian populations. Consistent with our hypothesis, South Asians ideally seek to feel fewer high-arousal positive (HAP) emotions, such as excitement and elation, more than Americans ($M = 3.4$ vs 3.8, $p < .001$, $SD = 0.80$). This supports previous AVT research showing that Western cultures, which emphasize individuality and influence, prioritize HAP states (Tsai et al., 2007). In contrast, collectivist cultures such as those in Asia tend to value emotional moderation and social harmony, which are more aligned with low-arousal positive (LAP) states like calm and peace. Because of a small number of East Asian participants, we could not compare East Asians' and South Asians' Ideal Affect.

Contrary to expectations, however, based on AVT, Americans in our study also reported a significantly greater preference for LAP than South Asians ($M = 4.2$ vs. 3.9, $p = .035$, $SD = 0.64$). This finding diverges from prior research suggesting that East Asians (and by extension, other collectivist cultures) value LAP more than Americans (Tsai et al., 2007).

A meta-analysis on AVT comparing European Americans and East Asians showed that some of the more recent studies suggest that there has been an

increase in LAP preference among European Americans (Tsai et al., 2025). An informal comparison of the means suggested that this was driven by increases in European American ideal LAP, perhaps due to particularly stressful events that have occurred in the United States since 2001–2002, when the first ideal affect data were collected–including the 9/11 attacks, financial crises, gun violence, political polarization, and the spread of negative affect on social media (Knutson et al., 2024; Tsai et al., 2025). This interpretation supports the results of our study on preference for higher LAP than HAP among Americans. Another possible explanation the authors talked about was that, over the past 2 decades, European Americans have had greater exposure to meditation and other practices that have increased their valuation of LAP (Davies et al., 2024). For example, Koopmann-Holm et al. (2013) found that novices in an 8-week meditation program increased the degree to which they ideally wanted to feel calm (and less excited), even though their momentary emotions did not change. In other words, practising Buddhist-inspired meditation made participants see calm as more desirable. This reflects a broader trend: popular mindfulness apps and stress-reduction programs explicitly train people to cultivate LAP states (e.g., calm breathing, body scans). Such practices are now widely offered on U.S. college campuses and in healthcare settings to prevent anxiety and burnout (Aibar-Almazán et al., 2023).

College students in particular have embraced these LAP-oriented wellness practices. The growing cultural emphasis in the U.S. on mindfulness, relaxation, and emotional regulation among college students may increase the desirability of LAP emotions, even among Americans (Borreca et al., 2025). There are workshops offered in schools that focus on mindfulness-based relaxation to decrease stress. Our sample size also consisted primarily of college students, who may be experiencing heightened levels of stress and anxiety. In a fast-paced and uncertain environment, even American students may increasingly idealize feelings of calm and peace. Recent findings on student mental health and emotion regulation preferences could help contextualize this shift (Aibar-Almazán et al., 2023). Meanwhile, South Asians may still associate LAP with passivity or lack of productivity, especially in achievement-oriented contexts. Our results also show no significant cultural differences in actual affect, aligning with AVT's prediction that ideal affect is influenced by cultural values, while actual affect is shaped by temperament and daily experience. This distinction emphasizes the value of measuring both constructs when assessing emotions across cultures.

One limitation of this study is that while Prolific provided a diverse Indian sample, cultural variability within India–such as regional, linguistic, and religious differences–may also influence ideal and actual affect. Future work could explore how these internal cultural distinctions affect emotional preferences. Another potential limitation of the study is sample bias, as participants were primarily recruited from a university population, which may limit the generalizability of the findings. Additionally, the use of course credit or monetary compensation may have introduced beneficial bias, as external incentives could have influenced participants' motivation, level of engagement, or response patterns. Moreover, our study has a small number of East Asian participants, which limits our ability to explore cultural differences in affect valuation between South Asians and East Asians. Future research should aim for more balanced and representative samples across cultural groups to better understand these nuanced differences. Future studies could examine the rise in LAP preference among Americans and the factors that lead to the change in preference. It would be interesting to see how the political and social changes in the world play a role in the preference for the ideal emotional state among different demographics.

Conclusion

The present study aims to understand the role culture plays in how people want to feel, using Affect Valuation Theory. Culture plays an important role in shaping ideal affect, yet psychological theories and interventions have historically centered on Western populations. In this paper, I have focused on expanding the study to include South Asian populations, with the ultimate goal of representing and serving a broader range of cultures. By broadening the cultural lens of affective science, this research contributes to a more inclusive understanding of emotional well-being across diverse communities. The goal is to integrate culturally informed perspectives into theory and practice to ensure that psychological frameworks and interventions are both equitable and globally relevant.

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Table 1.

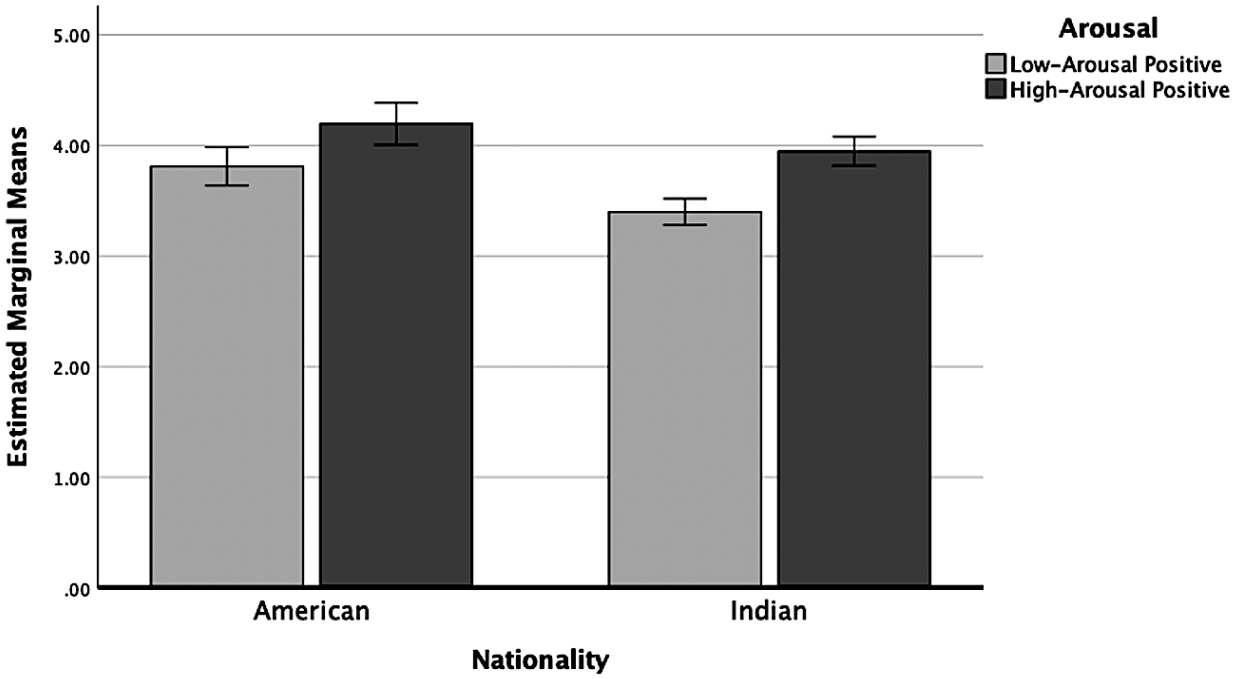
Mean, Standard Deviation, and Mixed-model ANOVA Results for HAPID and LAPID Scores by Nationality

Affect Type	Nationality	*M*	*SD*	*n*	*p*
HAPID (Enthusiastic,	American	3.81	0.67	75	<.001***
Excited, Elated)	South Asian	3.40	0.80	158	<.001***
LAPID (Calm, At rest,	American	4.2	0.64	75	.035*
Serene)	South Asian	3.95	0.91	158	.035*

$^{*}p < .05.$ $^{***}p < .001$

Figure 1.

Graph of South Asians and Americans' Ideal HAP and LAP Emotions



Note. Error bars: 95% *CI*

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Raising the Pressure: How Maternal Parenting Style Relates to Academic Performance Anxiety and Resilience in Graduate Students

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Graduate education demands considerable cognitive, emotional, and social effort, often placing students under substantial pressure to perform. While such environments can support growth, they also increase the risk of academic performance anxiety, which may hinder well-being and achievement. Prior research shows that Baumrind's parenting styles—authoritative, authoritarian, and permissive—shape emotional regulation, motivation, and coping. However, most studies focus on younger populations, collectivist cultures, or outcome-based academic indicators, with limited attention to how maternal caregiving affects psychological functioning in graduate students within individualistic Western contexts. This study examined whether maternal parenting style and academic resilience relate to academic performance anxiety in graduate students. The goal was to understand whether early relational experiences and resilience may shape adulthood functioning in high-pressure performance settings to inform more robust mental health support for graduate students. 53 full-time, graduate students completed an online survey that included the Parental Authority Questionnaire–Maternal Version, the Academic Resilience Scale, and an adapted version of the Sport Anxiety Scale-2 modified for academic settings. Authoritarian maternal parenting significantly predicted higher academic performance anxiety, particularly somatic symptoms and worry. Academic resilience significantly and negatively predicted academic performance anxiety and was associated with fewer somatic symptoms, less worry, and reduced concentration difficulties. These findings suggest that authoritarian caregiving may heighten academic stress, whereas resilience serves as a protective factor. Results underscore the enduring influence of early maternal relationships and highlight the value of resilience-based interventions for supporting graduate student mental health.

Keywords: performance anxiety, graduate education, maternal parenting style, resilience

Graduate school offers the hope of distinction, but often delivers the weight of distress. Within America's most demanding graduate programs, relentless workloads and fierce competition can lead to remarkable levels of stress and anxiety. As a result, the fear of failure and pressure to succeed can negatively impact academic performance and a student's overall well-being. In these high-performance environments, an individual's resilience can differentiate those who responsively adapt under pressure from those who inadvertently unravel under pressure. Considerable attention has been paid to structural and institutional contributors to academic stress, yet far less is known about the developmental antecedents that may predispose individuals to cope effectively, or ineffectively, within high-performance domains. In particular, this study explores the formative impact of maternal parenting style on academic performance.

Review of Existing Literature

Graduate Student Health and Performance Anxiety

Graduate education is widely regarded as a time of intellectual and professional growth, yet mounting evidence reveals that it also elevates anxiety, depression, and emotional distress. Researchers note that graduate students are six times as likely to experience depression and anxiety as compared to the general population (Evans et al., 2018). These statistics stem from a convergence of interrelated institutional, cultural, and economic stressors that gradually erode psychological well-being over time. Students may also struggle to reconcile initial hopes for academic belonging with the isolating, competitive, and evaluative realities of graduate training. These pressures are especially pronounced in health fields such as psychology and medicine, where the stakes of competency, licensure, and ethical responsibility compound layers of profound strain (Ibrahim et al., 2024; Lang & Haugen, 2023).

The focus on graduate students is particularly significant given their unique position within the educational continuum. Unlike undergraduate students, graduate students face heightened professional stakes, greater autonomy requirements, and more intense evaluative pressures that can activate anxiety responses rooted in early developmental experiences. Graduate education represents a critical transition period where individuals must demonstrate mastery-level competence while managing unprecedented academic demands.

The mental health toll of graduate education is further magnified when stress and anxiety have a high

potential to impact academic performance. Across multiple studies, students reported that academic overload, financial strain, a lack of work-school-life balance, and fear of failure were central contributors to stress and quality of life (El-Ghoroury et al., 2012; Ibrahim et al., 2024; Lang & Haugen, 2023). Experiencing such levels of stress and anxiety has even increased graduate students' risk for depression and suicide (Clement et al., 2025). As academic stress persists, it can impair sleep quality, self-esteem, perceived social support, and satisfaction with academic performance (Clement et al., 2025; Ibrahim et al., 2024).

Understanding how early parenting influences manifest in this population provides insight into the long-term developmental impacts of caregiving relationships and informs interventions for a population experiencing disproportionately high rates of psychological distress. Although the intensity of these pressures may vary across fields and institutions, the pattern is consistent: elevated stress, anxiety, and depressive symptoms represent significant threats to graduate students' overall well-being.

Parenting Style as a Predictor of Performance Success

A growing body of literature suggests academic success begins in early caregiving relationships. Childhood experiences of coping with adversity lay the foundation for self-efficacy, motivation, and resilience by shaping emotional regulation, stress responses, and psychological endurance. Among these early influences, parenting style within the caregiving environment is especially formative. Diana Baumrind's work in developmental psychology established a typology of parenting that remains widely recognized and empirically supported. Her framework distinguishes among three primary parenting styles: authoritative, authoritarian, and permissive, which are all based on two core dimensions: responsiveness (e.g., warmth and supportiveness) and demandingness (e.g., control and expectations; Baumrind, 1967, 1971, 1991).

Authoritative parenting is characterized by a balanced blend of warmth, high responsiveness, and clearly defined expectations. This parenting style encourages autonomy while maintaining appropriate structure, fostering both competence and emotional security. Research has demonstrated that authoritative parenting is consistently associated with optimal academic and psychological outcomes for students. Specifically, Hayek et al. (2022) found that authoritative parenting was associated with better academic achievement and higher self-efficacy compared to all other styles. Tiwari (2022) synthesized research on authoritative parenting, noting that it aids in the development of social skills, discipline, and self-esteem. Masud et al. (2014) conducted a systematic review and concluded that authoritative parenting, characterized by both warmth and behavioral control, was the most effective parenting style for enhancing academic achievement among adolescents. Authoritative parenting can also enhance learning motivation, foster academic competence, and influence greater self-efficacy at different developmental stages, such as among fifth-grade students (Cheung & McBride-Chang, 2008) and college students (Turner et al., 2009).

In contrast, authoritarian parenting is defined by high demands coupled with low responsiveness, emphasizing obedience over understanding and control over connection. Research shows that authoritarian parenting, characterized by high control and low responsiveness, has been found to have a negative effect on self-esteem among Brazilian adolescents in academic, social, and familial domains (Martínez et al., 2007).

Finally, permissive parenting reflects an approach of "low demandingness" (Power, 2013), wherein emotional availability is not matched with consistent guidance or boundaries. While permissive parenting includes the emotional warmth that authoritarian parenting lacks, it fails to have the structure necessary for sustained achievement (Hassan et al., 2022), effective self-regulation (Piotrowski et al., 2013), and to build self-confidence (Fitrianto et al., 2025).

Additional research provides further evidence for these differential outcomes, finding that the lack of parental support (Moral-García et al., 2020) or excessive parental control (Pinquart, 2016) are related to poor academic motivation and success (Hassan et al., 2022). Moreover, parenting style not only predicts academic success but also guides career trajectory through internalized values and achievement motivation (Zahed Zahedani et al., 2016). Collectively, this literature demonstrates that parenting styles shape not only immediate academic outcomes but also long-term resilience, motivation, and professional orientation.

Developmental Link Between Parenting Style and Academic Performance Outcomes

Developmental research illustrates how parent-

ing styles influence academic achievement at different stages of childhood and adolescence. In Cheah et al.'s (2009) study, authoritative parenting, characterized by warmth and responsiveness, among Chinese immigrant mothers was found to predict preschoolers' sustained attention and reduce the likelihood of negative evaluative feedback from teachers. Taking this a step further, Tsela et al. (2023) examined two parenting dynamics: parenting style (e.g., positive versus authoritarian) and parenting practices (e.g., parental involvement). They found that authoritative parenting was positively associated with children's school achievement, while authoritarian parenting predicted poorer outcomes. Practices characterized by involvement, firmness, and consistency supported academic success, whereas negligent and coercive practices were linked to lower grades.

A six-month longitudinal study of Lebanese adolescents further demonstrated that authoritative parenting both directly and indirectly predicted higher academic achievement and greater self-efficacy. Adolescents who perceived their parents as authoritative were more likely to hold strong efficacy beliefs, set higher intentions, and achieve better academic outcomes compared to peers of neglectful parents (Hayek et al., 2022).

Although substantial evidence links parenting style to children's emotional and academic outcomes, it is surprising that few studies have examined the distinct influence of each parent individually. Assuredly, the social roles or caregiving patterns of mothers versus fathers are markedly different. Even at a biogenetic level in rats, maternal care has been shown to specifically shape offspring stress responses through epigenetic mechanisms (Weaver et al., 2004). Offspring who received higher levels of maternal care showed increased glucocorticoid receptor expression in the hippocampus and greater glucocorticoid negative feedback sensitivity, leading to a milder hypothalamic-pituitary-adrenal stress response. Therefore, it is possible that children who receive more maternal care will demonstrate lower levels of anxiety later in life. Collectively, these findings underscore the powerful influence of parenting styles on academic performance across developmental stages, from preschool through adolescence.

Resilience in Academic Settings

Resilience, defined as the capacity to adapt effectively in the face of adversity, has become central to understanding students' academic performance, attitudes, and outcomes (American Psychological Association, 2025; Denckla et al., 2020; Southwick et al., 2014). Rather than being a fixed trait, resilience is now recognized as a learnable process of positive adaptation (Denckla et al., 2020; Gillham et al., 2013). Empirical findings support this developmental perspective. Chye et al. (2024) found that undergraduate health professions students cultivated resilience through life experiences, socioeconomic challenges, personal attributes, support systems, and role modeling, and higher resilience was linked to stronger coping skills, emotional regulation, and academic engagement. Similarly, Yamamoto et al. (2023) showed that elementary school students with greater social support from parents, teachers, and peers scored higher on resilience, highlighting the importance of environmental and relational factors.

Across studies, resilience consistently emerges as a protective factor against anxiety and stress. Students with higher self-efficacy exhibited greater academic resilience and lower test anxiety, suggesting that confidence in one's abilities enhances persistence in learning (Hayat et al., 2021). Likewise, students with high academic anxiety but strong mental toughness were less likely to avoid after-school learning (Hasty et al., 2020). Together, these findings demonstrate that resilience can support sustained engagement and better educational outcomes. Given the capacity of resilience to help individuals adapt to stress, there is a compelling case to further examine whether early caregiving environments, particularly those shaped by maternal figures, foster the capacity to thrive and perform effectively in adulthood despite stress or performance demands.

Gaps in Knowledge

Despite a substantial body of research demonstrating the developmental importance of parenting in academic performance, these dynamics remain insufficiently examined among graduate students. Extant literature focuses on academic performance stress within adolescents or undergraduates, where parental influence is assessed in relation to grade point average, learning outcomes, test scores, or motivation (Cheung & McBride-Chang, 2008; Kong & Yasmin, 2022; Shengyao et al., 2024); though, these studies are conducted primarily among Eastern cultures (e.g., Chinese students). While these studies offer valuable insights into cultural conceptions of achievement and success, they provide a limited perspective on how differences in cultural upbringing influence resilience in high-performance situations.

It is important to investigate whether students in Western contexts may experience different outcomes. Research by Luthar et al. (2020) suggests that in the United States, particularly within high-achieving schools, youth can face intense pressure to achieve from family, school, and peers (Luthar et al., 2020). This multi-systemic pressure has led to youth attending high-achieving schools to be considered a group at risk for mental health concerns (Luthar et al., 2020).

Additional research on American graduate students tends to prioritize systemic or institutional stressors over developmental contributors. Articles such as those by Bekkouche et al. (2021), El-Ghoroury et al. (2012), and Evans et al. (2018) emphasize the impact of systemic stressors, financial strain, workload, and a lack of work-school-life balance on graduate students' mental health. However, these findings rarely consider how academic stressors may be mitigated by early childhood attachment experiences or by patterns of emotional regulation modeled during development. Thus, few studies link parenting to emotional resilience or performance anxiety, with most emphasizing motivation or observable performance success measures (e.g., grade point average; Cheung & McBride-Chang, 2008; Mital, 2011). Particularly underexplored is how such early relational dynamics influence the way in which individuals cope with the demands of high-performing professional environments such as graduate school, medicine, athletics, or the performing arts.

Finally, extant literature has not focused specifically on whether maternal parenting has an impact on academic performance anxiety, despite evidence that a mother's parenting positively predicts emotion regulation and psychological well-being in adolescents (Jabeen et. al., 2013). With gaps in the literature, the present study addresses a critical need to understand how early maternal caregiving experiences may influence psychological functioning in graduate students within Western contexts. Specifically, this research examines whether developmental variables, namely maternal parenting, continue to shape academic coping strategies and anxiety responses in high-pressure graduate environments, and whether resilience moderates these relationships. By focusing on performance anxiety rather than academic achievement outcomes, this study advances existing literature to examine the affective physiological dimensions of academic functioning. Understanding these relationships is essential for developing targeted interventions to support graduate student mental health and academic success.

Present Study

This study examines associations between maternal parenting style, academic performance anxiety, and academic resilience among graduate students, addressing an important gap in understanding how early developmental experiences relate to adult functioning in high-pressure academic environments. Specifically, this study addresses three primary research questions: (1) Does maternal parenting style predict academic performance anxiety in graduate students? (2) Is academic resilience associated with academic performance anxiety? (3) Does parenting style moderate the relationship between academic resilience and academic performance anxiety?

This study also tests the hypothesis that authoritarian maternal parenting will be positively associated with academic performance anxiety. It is further hypothesized that academic resilience is negatively associated with academic performance anxiety, such that higher resilience corresponds to lower anxiety. Finally, it is posited that maternal parenting style will moderate the relationship between academic resilience and academic performance anxiety. Findings may inform intervention strategies in graduate student mental health services by identifying resilience and early relational experiences as targets for support.

Methods

Participants

Participants (n = 68, M_{age} = 26.5 years, 75.5% female) were recruited from Teachers College, Columbia University in New York City, through snowball sampling, community flyers, social media postings, and program Listservs. Teachers College offers graduate programs across education, psychology, health, and applied fields, thus providing a diverse academic context for examining performance anxiety across disciplines. Eligibility criteria required participants to be at least 18 years old, English speaking, and currently enrolled full-time in a graduate-level program at the time of data collection. Participants were excluded if one or more eligibility criteria were violated, or if submissions were left blank or incomplete. Analytic sample sizes varied across analyses due to different patterns of missing data: n = 53 for the primary resilience-anxiety analysis, n = 52 for resilience predicting anxiety subscales, and n = 50 for all parenting style analyses. The sample size was de-

termined pragmatically based on participant availability, recruitment feasibility, and the constraints of the study period rather than by an a priori power analysis.

Materials

Data were collected via an online Qualtrics survey, which included demographic questions, the Parental Authority Questionnaire-Pertaining to Mothers (PAQ-M; Buri, 1991), the Academic Resilience Scale (ARS-30; Cassidy, 2016), and the Sports Anxiety Scale-2 (SAS-2; Smith et al., 2006) modified for academic contexts. All measures used in this study were publicly available and free to use for research purposes. Written permission was obtained from the original authors of the PAQ (Buri, 1991) and SAS-2 (Smith et al., 2006) to use and adapt the instruments where necessary.

PAQ-M

The PAQ-M (Buri, 1991) is a 30-item self-report instrument designed to assess individuals' perceptions of their mothers' parenting style. It is based on Baumrind's (1971) theoretical framework of parenting, which outlines three primary parenting styles: authoritarian, authoritative, and permissive. The PAQ-M includes 10 items per subscale, each rated on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Authoritative style is characterized by high responsiveness and high demandingness, reflecting warmth, reasoning, and autonomy-granting. Authoritarian style reflects high demandingness with low responsiveness, emphasizing control, obedience, and punitive discipline. Permissive style reflects high responsiveness with low demandingness, indicating indulgence and a lack of clear boundaries or rules.

The PAQ-M has demonstrated strong psychometric properties across multiple validation studies. Buri's (1991) original validation with 127 college students established construct validity through factor analysis, confirming the three-factor structure corresponding to Baumrind's (1967, 1971, 1991) parenting typology. Concurrent validity was demonstrated through significant correlations with theoretically related constructs, including parental nurturance and control measures. This instrument has also shown consistent factor structure across diverse samples and cultural contexts (Reitman et al., 2002; Rinaldi & Howe, 2012), supporting its cross-cultural validity. Test-retest reliability over 2-week intervals ranged from .77 to .92 across subscales (Buri, 1991), indicating stable measurement properties. The PAQ-M has demonstrated strong internal consistency in the current sample: Authoritative (α = .885), Authoritarian (α = .925), and Permissive (α = .852), consistent with previous validation studies (Buri, 1991).

ARS-30

The ARS-30 is a 30-item self-report measure designed to assess students' adaptive and maladaptive responses to academic adversity. Developed by Cassidy (2016), the scale presents participants with a vignette describing an academic failure scenario, followed by items representing cognitive-affective and behavioral responses. Participants rate the likelihood of each response on a 5-point Likert scale (1 = *very unlikely* to 5 = *very likely*).

Cassidy's (2016) validation study with 532 undergraduate students revealed a three-factor structure: perseverance (27% of variance), reflecting and adaptive help-seeking (9.1% of variance), and negative affect and emotional response (5.5% of variance). However, robust inter-factor correlations (r = .39–.71) supported the use of a global academic resilience score, with Cassidy (2016) noting that "dimension scores can be combined to represent a meaningful unitary global academic resilience score" (p. 8). The original validation demonstrated strong internal consistency for the global scale (α = .90), concurrent validity through significant correlations with academic self-efficacy (r = .49), and discriminant validity via significant differences between personal versus peer adversity vignettes (d = 0.98).

Items were developed to reflect domains grounded in self-efficacy (Bandura, 1997), self-regulated learning (Zimmerman & Schunk, 2001), and resilience theory. The ARS-30 demonstrated strong internal consistency in the current sample (α = .86), supporting the psychometric integrity of the global score approach used in our analyses.

Modified SAS-2

The SAS-2 (Smith et al., 2006) is a 15-item self-report instrument originally designed to assess performance anxiety in athletic contexts, capturing cognitive and somatic dimensions of anxiety. The original SAS-2 demonstrated strong construct validity through confirmatory factor analysis, supporting the three-factor structure (somatic anxiety, worry, concentration disruption) and convergent validity with other anxiety measures (r = .65–.78 with STAI-T). For the purposes of the current study, the SAS-2 was modified to assess anxiety in academic performance

contexts among graduate students. Specifically, the instructions were adapted to prompt responses within the academic domain by asking participants to respond to each item while considering: "When I am at school or completing school-related tasks...". All 15 original items were retained, with wording minimally adjusted to reflect academic situations (e.g., "test, quiz, or important task" in place of "competition"). These modifications preserved the underlying psychological constructs while making the items contextually relevant to academic performance situations. Written permission was obtained from the original authors to adapt the instrument for academic contexts. While formal validation of this academic adaptation was not conducted, the strong reliability coefficients suggest the modifications preserved the instrument's psychometric properties.

Participants responded using the original 4-point Likert scale (1 = *not at all* to 4 = *very much*). The scale consists of three subscales: Somatic Anxiety (e.g., "My body feels tense"), Worry (e.g., "I worry that I will not perform my best"), and Concentration Disruption (e.g., "It is hard to concentrate on the test, quiz, or important task").

The modified version of the SAS-2 demonstrated strong internal consistency reliability across all subscales in the present sample: Somatic Anxiety (α = .860), Worry (α = .933), and Concentration Disruption (α = .907). These reliability coefficients are comparable to or exceed those reported in the original validation study (Smith et al., 2006), suggesting that the adaptation maintained the instrument's psychometric integrity. Adapting the SAS-2, rather than selecting a different measure, allowed the study to retain its established factor structure while making it suitable for use in academic settings.

Procedure

This cross-sectional, self-report study was completed remotely on Qualtrics from March through April of 2025. After reviewing and indicating agreement on the informed consent form, participants completed a four-part survey, which took approximately 10 minutes to complete. No compensation was provided for participation. To address potential psychological discomfort, contact information for mental health resources was provided to all participants at the conclusion of the survey. No formal debriefing process was implemented. However, participants were provided with mental health and emergency hotline resources as part of the informed consent materials.

Ethics Statement

This study was approved by the Institutional Review Board at Teachers College, Columbia University (Protocol #25-232).

Data Analysis

Statistical Software

IBM SPSS Statistics (Version 30) was used for descriptive analyses, assumption testing, and multiple regression analyses. Hayes' PROCESS macro version 4.2 was employed for moderation analyses using Model 1 to test simple moderation effects. PROCESS macro was employed because it provides heteroscedasticity-consistent standard errors (HC3) that are robust to violations of homoscedasticity and normality assumptions, and it automatically handles multicollinearity through mean-centering of continuous variables.

Primary Analyses

Multiple regression analyses were conducted to examine the relationship between maternal parenting styles (authoritative, authoritarian, and permissive) and academic performance anxiety. Linear regression tested the relationship between academic resilience (predictor) and academic performance anxiety (criterion). Subsequently, three separate moderation analyses were conducted using PROCESS Model 1 to examine whether each parenting style (authoritative, authoritarian, or permissive) moderated the relationship between academic resilience and total anxiety. Each analysis included the main effect of academic resilience, the main effect of the specific parenting style, and the interaction term between resilience and parenting style.

Statistical Assumptions and Robustness

PROCESS macro automatically addresses potential assumption violations by: (1) providing heteroscedasticity-consistent standard errors (HC3) that are robust to violations of homoscedasticity and normality assumptions, and (2) automatically mean-centering continuous variables prior to analysis, which reduces multicollinearity between main effects and interaction terms. Given the sample size limitations (n = 50–53), we acknowledge the study may be underpowered to detect small interaction effects and therefore emphasize effect sizes and confidence intervals alongside significance testing.

Missing Data

Missing data were minimal in this study. Of the 53 participants, 50 (94.3%) had a complete set of

data on all measures. The remaining 3 participants had missing data in clear patterns: 2 participants were missing all parenting style scores, and 1 participant was missing all anxiety scores. No participants had partial missing data within measure sets.

To preserve statistical power, analysis-specific listwise deletion was used, resulting in sample sizes of n = 50–53 depending on the variables analyzed. This approach maximized the available data for each research question rather than excluding participants who had a complete set of data for some analyses but not others.

Results

Sample Demographics

Of the 68 total survey submissions, 15 were excluded due to blank or incomplete responses, yielding 53 participants with usable data. Due to variable-specific missing data, final analytic sample sizes ranged from n = 50 to n = 53 across analyses. Specific sample sizes are noted for each analysis below. Participants ranged in age from 21 to 47 years (M = 26.5, SD = 4.9). The majority identified as female (75.5%), followed by male (20.8%), with smaller proportions identifying as non-binary (1.9%) or preferring not to disclose gender (1.9%). Most participants identified as non-Hispanic/Latinx (90.6%), with 9.4% identifying as Hispanic/Latinx. In terms of race, 50.9% identified as White, 28.3% as Asian, 9.4% as Black, and 11.3% as Other. Demographic characteristics are summarized in Table 1.

Maternal Parenting and Academic Performance Anxiety

A multiple regression analysis was conducted (n = 50) to examine whether maternal parenting style, as measured by PAQ-M subscales, predicted graduate students' academic performance anxiety, as measured by the Modified SAS-2 total score.

The overall model was statistically significant, $F(3, 46) = 5.12$, $p = .004$, $R^2 = .25$, indicating that 25% of the variance in academic performance anxiety scores was explained by the parenting styles. Among the predictors, authoritarian parenting was a significant positive predictor of academic stress ($\beta = .56$, $p = .014$), while authoritative ($\beta = -.06$, $p = .728$) and permissive parenting ($\beta = .14$, $p = .483$) were not significant predictors (see Table 2).

To further examine the effects of maternal parenting style on academic performance anxiety among graduate students, separate regression analyses were conducted (n = 50) for each of the SAS-2 subscales: somatic anxiety, worry, and difficulty concentrating. For somatic anxiety, the overall model was statistically significant with maternal parenting styles explaining 20% of the variance ($F(3, 46) = 3.83$, $p = .016$, $R^2 = .20$). Authoritarian parenting emerged as a significant positive predictor of somatic anxiety ($\beta = .56$, $p = .017$), while authoritative and permissive parenting styles were not significant predictors.

Similarly, for worry, the model was statistically significant, explaining 26% of the variance ($F(3, 46) = 5.46$, $p = .003$, $R^2 = .26$). Authoritarian parenting was again a significant positive predictor ($\beta = .70$, $p = .002$), indicating that higher levels of authoritarian parenting were associated with increased worry. Neither authoritative nor permissive parenting significantly predicted worry. For the difficulty concentrating subscale, the overall model was statistically significant ($F(3, 46) = 3.64$, $p = .019$, $R^2 = .19$); however, none of the individual parenting styles—authoritative, authoritarian, or permissive—were significant predictors (all ps > .05). See Table 3.

Academic Resilience and Academic Performance Anxiety

A linear regression (n = 53) examined whether academic resilience, as assessed using the ARS-30 total score, predicted academic performance anxiety using the SAS-2 total score. The model was statistically significant ($F(1, 51) = 12.28$, $p < .001$, $R^2 = .20$, Adjusted $R^2 = .18$), indicating that resilience accounted for approximately 20% of the variance in performance anxiety. The regression coefficient was negative and statistically significant ($B = -0.72$, $SE = 0.21$, $\beta = -0.44$, $t = -3.50$, $p < .001$), showing that higher academic resilience was associated with lower academic performance anxiety.

Follow-up univariate analyses (n = 52) demonstrated that academic resilience significantly and negatively predicted all three SAS-2 subscales: somatic anxiety, worry, and concentration disruption. Specifically, academic resilience negatively predicted Somatic Anxiety, ($F(1, 50) = 8.87$, $p = .004$, $\eta^2_p = .15$), Worry ($F(1, 50) = 6.43$, $p = .014$, $\eta^2_p = .11$), and Concentration Disruption ($F(1, 50) = 10.80$, $p = .002$, $\eta^2_p = .18$). Detailed results are in Table 4.

The Moderating Effect of Parenting Style

Three moderation analyses (n = 50) were conducted using PROCESS macro (Model 1; Hayes, 2022) to examine whether parenting style moderated the rela-

tionship between academic resilience and total anxiety, with statistical assumptions evaluated for each analysis. Variables were automatically mean-centered by PROCESS prior to analysis, which reduces multicollinearity between main effects and interaction terms. The analyses used heteroscedasticity-consistent standard errors (HC3) to provide robust parameter estimates. Each moderation model included academic resilience as the predictor variable, one parenting style as the moderator, and their interaction term, with total academic performance anxiety as the outcome variable. The three models tested were: (1) Academic Resilience × Authoritative Parenting, (2) Academic Resilience × Authoritarian Parenting, and (3) Academic Resilience × Permissive Parenting.

For all three moderation models, the interaction terms were not statistically significant: Authoritative × Resilience ($B = -0.15$, $SE = 0.29$, $p = .615$), Authoritarian × Resilience ($B = -0.03$, $SE = 0.18$, $p = .871$), and Permissive × Resilience ($B = -0.06$, $SE = 0.20$, $p = .761$). The confidence intervals for all interaction effects included zero, indicating no significant moderation. Thus, parenting style did not moderate the protective effect of academic resilience.

Moreover, descriptive statistics and bivariate intercorrelations among study variables are presented in Table 6. Authoritarian parenting showed significant positive associations with total anxiety ($r = .49$, $p < .001$) and all anxiety subscales, while authoritative parenting and academic resilience were negatively correlated with anxiety outcomes. Notably, authoritarian and authoritative parenting were strongly inversely correlated ($r = -.63$, $p < .001$), reflecting the expected divergence between these styles.

Discussion

Summary of Key Findings

In examining the effects of maternal parenting style on academic performance anxiety, results indicated that authoritarian parenting was a significant positive predictor of anxiety. Specifically, it predicted higher levels of somatic anxiety and worry, though it did not significantly predict concentration disruption. Authoritative and permissive parenting styles were not significant predictors of academic anxiety or any of its subcomponents. Interestingly, the overall model predicting concentration disruption was statistically significant, despite none of the individual parenting styles emerging as significant. This finding likely reflects the high intercorrelations among the three parenting styles subscales, which makes it difficult to isolate the unique contributions of any single parenting style. Future research with larger samples may distinguish the overlapping contributions.

Additionally, academic resilience was a significant negative predictor of academic performance anxiety. Higher levels of academic resilience were associated with lower scores across all three anxiety subscales: somatic anxiety, worry, and concentration disruption. Finally, moderation analyses examined the interaction between maternal parenting style and academic resilience on academic anxiety, which revealed no significant interaction effects. That is, the protective effect of academic resilience on academic anxiety did not differ by maternal parenting style, suggesting that resilience operates as a consistent buffer against academic stress regardless of caregiving environment. These findings should nevertheless be interpreted with care, as conducting three separate analyses may have inflated Type I error, thereby increasing the likelihood of false positive results. Therefore , the pattern of significant effects should be viewed as preliminary until they are replicated in future, larger samples.

Interpretation of Results

Given that authoritarian maternal parenting significantly predicted heightened academic performance anxiety, both somatically and cognitively, our first hypothesis is substantiated. This evidence suggests that strict, controlling, and low-warmth care cultivates an individual's baseline sense of internalized pressure, potentially upregulating autonomic arousal. Such unintentional conditioning may predispose students to perseverate on fear of failure, develop obsessive perfectionistic tendencies, and formulate unattainable standards of success. Moreover, the significant positive associations with both the somatic symptoms and worry subscales suggest that authoritarian parenting is linked to cognitive aspects of anxiety, such as apprehension about performance outcomes, as well as physiological responses, including muscular tension and autonomic stress reactivity during academic tasks.

Unexpectedly, neither authoritative nor permissive parenting styles demonstrated significant negative associations with performance anxiety, suggesting that warmth with structure (authoritative) and warmth without structure (permissive) do not meaningfully

modulate academic performance anxiety within this graduate student sample. It is possible that, because these individuals were not conditioned to chronic criticism, threat sensitivity, or hypervigilant self-monitoring in early development, their baseline stress responses remain comparatively neutralized. This finding was particularly surprising given the extensive literature demonstrating that authoritative parenting promotes emotional regulation and reduces anxiety in younger populations (Jabeen et al., 2013; Jin & Chen, 2024; Li et al., 2023; Mortazavizadeh et al., 2022). We had anticipated that authoritative parenting would show protective effects against academic anxiety, similar to its established benefits for academic competence and self-efficacy (Masud et al., 2014; Mital, 2011).

Consistent with this study's second hypothesis, academic resilience negatively predicted academic performance anxiety. As greater resilience is associated with diminished performance anxiety, students exhibiting higher resilience likely possess more robust coping repertoires, greater adaptability to adversity, and more established capacities for emotional and cognitive regulation under academic stress. Thus, resilience can be confidently conceptualized as a protective factor against the physiological, cognitive, and attentional expressions of anxiety. No moderation effect was found between parenting style and resilience, signifying that resilience functions as a universal buffer irrespective of early maternal experiences. This absence of moderation has several important theoretical and clinical implications that warrant detailed consideration.

First, these findings challenge developmental models that position early caregiving as the primary determinant of adult coping capacity. While authoritarian parenting predicted higher anxiety levels, resilience's protective effects remained consistent across all parenting styles. This suggests that resilience may be more malleable and context-dependent than previously assumed, operating through mechanisms that are at least partially independent of early relational programming. The universality of resilience's protective effects indicates that individuals can develop adaptive coping strategies regardless of whether they experienced supportive, controlling, or permissive maternal caregiving.

Second, the lack of moderation supports contemporary conceptualizations of resilience as a dynamic process rather than a fixed trait established in childhood. These findings align with intervention research demonstrating that resilience skills can be effectively taught and strengthened throughout adulthood, even among individuals with adverse childhood experiences. The consistent protective effect across parenting styles suggests that resilience-building interventions may be equally effective for all graduate students, regardless of their developmental history.

These findings attenuate assumptions that resilience is solely cultivated during early developmental periods. Rather, they reinforce prior literature conceptualizing resilience as an evolving construct that adapts to unique challenges across the lifespan (MacLeod, 2016). For this study in particular, resilience was associated with reduced somatic anxiety, worry, and concentration difficulties in response to academic performance demands.

Contextualized in Prior Literature

The present finding that authoritarian maternal parenting style is significantly correlated with academic worry and somatic anxiety supports Pinquart's (2016) meta-analysis findings that authoritarian parenting (and permissive parenting) were associated with lower academic performance. However, the unexpected null findings for authoritative parenting warrant particular attention, as they diverge from established literature showing protective effects of warm, structured caregiving. For example, Turner et al. (2009) found that parental support and warmth continue to influence academic outcomes among female first-year college students. Similarly, Cheung and McBride-Chang (2008) claimed that parental support and encouragement are notable contributors to academic motivation in fifth-grade students. However, in our graduate student sample, authoritative parenting (e.g., high warmth, high demandingness) was not significantly related to reduced performance anxiety. One possible explanation is developmental timing: authoritative parenting may exert its strongest protective effects during childhood and adolescence, which is when parental involvement directly shapes coping and regulatory skills. However, its influence may diminish in adulthood. At later stages, institutional demands, individual coping resources, and broader social support may become more critical in shaping anxiety outcomes.

Our study also revealed no significant relationship between permissive parenting and academic performance anxiety. This finding may reflect the distinct au-

tonomy and self-direction of graduate students, who are less dependent on parental structure. By the time students reach graduate school, the heightened costs and risks associated with extending their education may foster greater intrinsic motivation, even among those who lacked structured encouragement during childhood.

While parenting styles have been widely studied in relation to academic outcomes such as grades, motivation, or competence, there has been far less attention to their links with performance anxiety. By focusing on the psychological manifestations of academic anxiety, this study broadens the literature across performance psychology, school psychology, and family psychology, with particular emphasis on maternal parenting patterns.

Implications

Collectively, these findings reinforce that early maternal caregiving fundamentally shapes emotional regulation under academic performance pressure. Notably, there are enduring and detrimental impacts of authoritarian parenting, which can undermine well-being in high-demand environments where downregulation, self-efficacy, and adaptive problem-solving are essential. The absence of a moderation effect suggests that resilience functions as a universal protective factor, with interventions targeting resilience likely to benefit students regardless of their maternal parenting history.

For clinicians working with graduate students, these results underscore the importance of considering early caregiving experiences when conceptualizing performance-related anxiety. Understanding how authoritarian parenting may contribute to internalized pressure, perfectionism, and maladaptive coping can inform targeted and effective interventions. In particular, this study highlights the need to integrate resilience-building approaches to fortify adaptive coping alongside broader therapeutic care. Interventions might include cognitive restructuring to challenge fear-based achievement beliefs, skills training to enhance emotion regulation under pressure, and mindfulness or acceptance-based practices to mitigate somatic anxiety during academic tasks. Fostering self-compassion and helping students recognize the limits of parental influences can cultivate greater psychological flexibility and autonomy. Furthermore, exploring the developmental origins of achievement-related fears can deepen the therapeutic alliance by validating clients' histories while empowering them to build resilience as a dynamic, lifelong resource in their academic and professional pursuits.

The null moderation findings also carry broader implications for understanding resilience development and intervention design. The universal protective effect of resilience suggests that graduate programs and mental health services can implement resilience-building initiatives without needing to tailor approaches based on students' early family experiences. This universality supports the implementation of interventions such as resilience workshops, stress management training, and mindfulness-based programs, which can benefit all students regardless of developmental background.

Limitations

This study has several limitations to consider. First, the sample size is small (n = 50), limiting statistical power and generalizability. As a result, some associations may have gone undetected due to insufficient sensitivity. For example, the absence of a link between authoritative parenting and performance anxiety may reflect a limited sample size rather than a true null effect. Furthermore, conducting moderation analyses with an underpowered sample increases the risk of unstable parameter estimates and Type II errors, which should be considered when interpreting these findings.

Given the non-significant interactions observed and the sample size constraints, the study was powered to detect only large effects and may have missed smaller, yet potentially meaningful, moderation effects. To address potential assumption violations with the limited sample size, we employed PROCESS macro with heteroscedasticity-consistent standard errors and mean-centered variables, which provides more robust estimates than traditional regression approaches.

Second, the sample was largely composed of graduate students from a single, urban institution in the Northeastern United States, which limits the generalizability of findings to broader or more diverse graduate student populations. However, the institution from which the sample was drawn is academically competitive, and recruitment from this context was intentional, given evidence that performance anxiety is often heightened in such environments. Coupled with this, all measures were self-reported and retrospective, which could have introduced recall bias or social desirability effects, particularly in the assessment of maternal parenting style. Our survey also used the term 'mother' without further specification of the

type of maternal relationship (e.g., biological, adoptive, stepparent), thus potentially introducing variability in how participants interpreted and responded to parenting-style questions. Similarly, although our modification of the SAS-2 demonstrated strong psychometric properties, the use of an adapted version rather than the originally validated and worded items may require additional methodological consideration.

Lastly, our study did not examine a wide variety of demographic differences in our primary analysis, which would have provided additional insights into how parenting influences vary across diverse groups. Some additional demographic questions could have included participants' specific academic programs, prior academic performance, or educational backgrounds, which could inform understanding of how academic history interacts with parenting influences. However, the decision to omit these analyses reflected the exploratory nature of the study and the constraints of the sample size, as including additional covariates may have reduced statistical power and limited interpretability. Finally, our survey did not account for confounding effects such as current mental health support or broader social determinants that may impact both academic resilience and anxiety.

Future Directions

Future research should continue to expand on the influence of early caregiving experiences on academic resilience and anxiety. They would benefit from larger and more diverse samples to fully capture cultural variability in parenting perceptions and include participants from a range of geographical settings. Adequate statistical power will also be essential in future work, with larger samples ($n > 100$) recommended to detect small to moderate interaction effects. The use of bootstrapping procedures would further enhance the stability and robustness of estimates.

Moreover, future investigations should explore whether parenting styles moderate the relationship between resilience and specific dimensions of anxiety (e.g., somatic symptoms, worry, concentration disruption) to provide a more nuanced understanding of protective mechanisms. Additional studies could focus more specifically on paternal parenting styles or extend inquiry to the roles of other caregivers, such as grandparents, siblings, aunts, and uncles, in order to capture a broader range of familial influences on resilience, anxiety, and academic performance. Finally, employing longitudinal designs would be especially valuable for clarifying how parenting styles, resilience, and academic anxiety unfold and interact across different stages of education. Ultimately, such work is aimed at making the future of graduate education healthier and more sustainable.

Conclusion

This study found that authoritarian maternal parenting is associated with greater academic performance anxiety in graduate students, while academic resilience serves as a protective factor. Notably, parenting style did not moderate the relationship between resilience and anxiety, suggesting that resilience serves as a protective factor regardless of early maternal caregiving style. Altogether, these findings underscore the importance of promoting resilience-based interventions in high-pressure academic settings and highlight early relational experiences as meaningful, though not determinative, influences on students' capacity to manage academic performance anxiety. Looking ahead, future research should carefully investigate how family dynamics and individual coping mechanisms interact to shape resilience, anxiety, and success in the demanding context of graduate education.

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Table 1.

Demographic Characteristics of the Participants

Demographic	*n*	*%*
Gender	53	100.0
Male	11	20.8
Female	40	75.5
Non-Binary	1	1.9
Prefer not to say	1	1.9
Ethnicity	52	98.1
Hispanic/Latinx	4	9.4
Non-Hispanic/Latinx	48	90.6
Race	53	100.0
White	27	50.9
Black	5	9.4
Asian	15	28.3
Other	6	11.3

Note. Demographic characteristics were obtained through a self-report questionnaire. Analytic sample sizes varied by analysis due to missing data patterns depending on participants.

Table 2.

Maternal Parenting and Academic Performance Anxiety Among Graduate Students

Maternal Parenting Style	β	*t*	*p*	95% CI
Authoritative	−.06	−0.35	.728	[−0.35, 0.25]
Authoritarian	.56	2.57	.014*	[0.09, 0.76]
Permissive	.14	0.71	.483	[−0.27, 0.56]

Note. n = 50. The maternal parenting style was assessed using the PAQ-M, which includes authoritative, authoritarian, and permissive subscale scores. Academic performance anxiety was assessed using the total Modified SAS-2 score.

*$p < .05$

Table 3.

Multiple Regression Analyses on Maternal Parenting Style and Subscales of Academic Stress: Somatic Anxiety, Worry, and Difficulty Concentrating (n = 50)

Variable	Somatic Anxiety		Worry		Difficulty Concentrating	
	β	*p*	β	*p*	β	*p*
Authoritative	−.13	.463	.20	.235	−.24	.174
Authoritarian	.56	.017*	.70	.002**	.21	.363
Permissive	.33	.112	.12	.546	−.04	.833
R^2	.20		.26		.19	
F	3.83*		5.46**		3.64*	

Note. Maternal parenting style was assessed using the PAQ-M. Academic stress subscales were assessed using the SAS-2 Modified. All regression models had degrees of freedom (3, 46).
*$p < .05$. **$p < .01$

Table 4.

Summary of Univariate Effects of Academic Resilience on Anxiety Subscales: Somatic Anxiety, Worry, and Difficulty Concentrating

Dependent Variable	$F(1,50)$	p	η^2_p	Observed Power
Somatic Anxiety	8.87	.004**	.15	.83
Worry	6.43	.014*	.11	.70
Concentration	10.80	.002**	.18	.90

Note. n = 52. All regression models had degrees of freedom (1, 50). Observed power calculations were performed using α = .05.
*p < .05. **p < .01

Table 5.

Parenting Style as a Moderator of the Relationship Between Academic Resilience and Anxiety

Parenting Style	*B*	*SE*	*t*	*p*	95% CI
Authoritative × ARS	−0.15	0.29	−0.51	.615	[−0.74, 0.44]
Authoritarian × ARS	−0.03	0.18	−0.16	.871	[−0.39, 0.34]
Permissive × ARS	−0.06	0.20	−0.31	.761	[−0.46, 0.34]

Note. $n = 50$. Interaction terms test whether the association between academic resilience (ARS) and total anxiety varies by parenting style. All confidence intervals include zero, indicating no significant moderation effects. p-values are uncorrected.

Table 6.

Descriptive Statistics and Intercorrelations Among Study Variables

Variable	*n*	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Authoritative Parenting	51	3.27	0.82	–							
2. Authoritarian Parenting	51	2.85	0.97	-.63**	–						
3. Permissive Parenting	51	2.59	0.72	.52**	-.77**	–					
4. Academic Resilience	53	3.73	0.44	.39**	-.12	.14	–				
5. Somatic Anxiety	52	2.01	0.72	.31*	.38**	-.16	-.39**	–			
6. Worry	52	2.47	0.90	-.18	.48**	-.31*	-.34*	.67**	–		
7. Concentration Disruption	52	2.08	0.90	-.40**	.40**	-.33*	-.42**	.57**	.59**	–	
8. Total Anxiety	52	2.19	0.72	-.34*	.49**	-.32*	-.44**	.84**	.88**	.85**	–

Note. Parenting style subscales are from the PAQ-M (range: 1–5). Academic Resilience is from the ARS-30 (range: 1–5). Anxiety subscales and total are from the Modified SAS-2 (range: 1–4).
*$p < .05$. **$p < .01$

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The Influence of Anxiety and Depression on Time Perception: A Cognitive and Affective Perspective

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Objective: Anxiety and depression are prevalent mental health conditions associated with disruptions in cognitive processes, including time perception. Guided by Arousal Level Theory, this study examined how anxiety and depressive symptoms, along with physiological arousal (heart rate), relate to subjective time perception. ***Method***: A sample of 45 graduate students completed the Beck Anxiety Inventory (BAI) and Beck Depression Inventory-II (BDI-II), underwent heart rate measurement, and performed time production tasks (10- , 30-, and 60-second intervals). ***Results***: Contrary to predictions derived from arousal-based models, depressive symptoms were associated with greater time underestimation (p = .019), suggesting a faster internal clock. Anxiety showed a marginal association (p = .055), and heart rate was not significantly related to time perception. ***Conclusions***: These findings suggest that arousal-based explanations alone may be insufficient to account for time perception distortions in depression. Instead, cognitive and affective processes, such as rumination and attentional rigidity, may play a more central role. Findings should be interpreted cautiously, given the correlational design and limitations of the mood induction procedure.

Keywords: time perception, internal clock, depression, anxiety, arousal theory, cognitive processes

Time is perhaps one of the most debated constructs in both philosophy and science. One influential perspective comes from Immanuel Kant, who argued that time is not an objective property of the external world but rather an a priori structure of human cognition that organizes experience (Kant, 1781). Regardless of whether time exists independently of perception, it is well established that subjective time varies across individuals. The present study examines how two highly prevalent mental health conditions—anxiety and depression—shape this subjective experience of time.

A central concept in this study is the inner clock, defined as the internal cognitive mechanism through which individuals estimate temporal intervals (Burle & Casini, 2001). This construct is conceptually related to, but distinct from, the pacemaker component described in scalar expectancy theory. In the present framework, the inner clock serves as an interpretive model linking observable behavior to underlying temporal processing. Specifically, an accelerated inner clock results in time underestimation (i.e., producing shorter intervals than intended), whereas a decelerated inner clock results in time overestimation (i.e., producing longer intervals than intended). This terminology is used consistently throughout the manuscript to reduce ambiguity and ensure clarity in interpreting results.

Multiple theoretical accounts have been proposed to explain time perception, including Arousal Level Theory, the attentional gate model, and scalar expectancy theory. Arousal-based models suggest that physiological activation directly modulates the speed of internal timing mechanisms (Grondin, 2001; Mioni et al., 2016). In contrast, the attentional gate model proposes that time perception depends on the allocation of attentional resources, such that reduced attention to time leads to underestimation (Zakay & Block, 1997). Scalar expectancy theory conceptualizes timing as a pacemaker–accumulator system, in which pulses generated by an internal clock are accumulated and compared against stored representations (Gibbon et al., 1977).

The present study adopts Arousal Level Theory as the primary framework, as it provides clear, testable predictions regarding how anxiety and depression should influence internal clock speed. The attentional and scalar expectancy accounts are acknowledged as complementary models but are treated as secondary frameworks that may help interpret findings that are not fully explained by arousal-based mechanisms.

Anxiety and depression are among the most prevalent mental health disorders globally, affecting substantial proportions of the population (World Health Organization, 2017). Both conditions are associated with disruptions in cognitive processes, including attentional control, working memory, and information processing. Anxiety has been linked to attentional biases toward threat-related stimuli, which may impair attentional control (Pike et al., 2020). Depression is associated with deficits in concentration, decision-making, and cognitive flexibility (Pike et al., 2020). Because time perception relies on sustained attention and working memory, these disruptions may contribute to distortions in temporal processing.

Time perception plays a critical role in daily functioning, influencing how individuals coordinate tasks,

regulate behavior, and interact with their environment. Although objective time remains constant, subjective time perception is shaped by psychological and physiological states. Prior research has documented time perception distortions in depression, including alterations that affect daily functioning and quality of life (Thönes & Oberfeld, 2015). However, findings across studies have been inconsistent, partly due to differences in how temporal distortions are defined and measured.

The inner clock framework is introduced in the present study to provide a consistent interpretive structure for these findings. Rather than describing time as "speeding up" or "slowing down," which can be conceptually ambiguous, this framework links behavioral outcomes directly to internal timing mechanisms. This approach allows for clearer interpretation of whether distortions reflect acceleration or deceleration of internal temporal processing.

In addition to psychological mechanisms, physiological processes may also influence time perception. The Heart Rate Theory proposes that internal bodily rhythms, such as heartbeats, may contribute to time estimation. Although this account has received limited empirical support, heart rate is included in the present study to evaluate whether physiological arousal contributes to temporal distortions. This allows for a more comprehensive assessment of the relative contributions of psychological and physiological factors.

Based on Arousal Level Theory, the present study tests the following hypotheses. Anxiety, characterized by heightened arousal, is expected to accelerate the inner clock, leading to time underestimation. Depression, often associated with reduced arousal, is expected to decelerate the inner clock, resulting in time overestimation. At the same time, emerging evidence suggests that cognitive and affective processes—such as rumination and attentional rigidity—may also influence time perception. These mechanisms are therefore considered exploratory and secondary to the primary arousal-based account.

Previous research using time production and reproduction tasks has found that individuals with anxiety tend to underestimate time intervals, whereas individuals with depression tend to overestimate them (Mioni et al., 2016; Thönes & Oberfeld, 2015). However, few studies have simultaneously examined affective symptoms and physiological measures, such as heart rate, within the same design.

The present study addresses this gap by examining how symptoms of anxiety and depression, alongside heart rate, relate to time perception within an integrated framework. By focusing on symptom dimensions rather than categorical diagnoses, this study aims to clarify how psychological and physiological processes contribute to variability in the inner clock. This approach may help refine theoretical models of time perception and inform future research on cognitive and affective influences on temporal processing.

Methods

Participants

A total of 45 graduate students (aged 18–35 years) were recruited for the study. Participants were recruited through the Teachers College listserv and on-campus advertisements. Inclusion criteria included fluency in English and no history of cardiovascular disease, neurological or developmental disorders (e.g., ADHD, autism), psychotic disorders, or recent substance use that could affect physiological or cognitive functioning within the past week. Individuals currently using alpha- or beta-blockers were excluded to minimize potential confounding effects on heart rate.

These criteria were selected to ensure a relatively homogeneous sample in terms of cognitive and physiological functioning, thereby reducing variability unrelated to the primary variables of interest. The sample consisted of healthy young adults, which allowed for greater experimental control but may limit the generalizability of the findings to broader or clinical populations.

Measures

Anxiety and Depression Symptoms

Anxiety and depressive symptoms were assessed using the Beck Anxiety Inventory (BAI; Beck et al., 1988) and the Beck Depression Inventory–II (BDI-II; Beck et al., 1996). Both instruments are 21-item self-report measures widely used to assess the severity of affective symptoms and demonstrate strong reliability ($\alpha > .90$) and validity.

These measures were selected because they assess symptom severity dimensionally and have been frequently used in research examining the relationship between affective states and time perception. Prior studies have shown that higher anxiety levels are associated with faster perceived time (Mioni et al., 2016). Similarly, higher depressive symptom severity has been

linked to distortions in time estimation, including underestimation and increased temporal inaccuracy (Di Lernia et al., 2018; Gil & Droit-Volet, 2009).

The use of these measures allows for the examination of continuous variation in anxiety and depressive symptoms, rather than relying on categorical diagnoses, which is consistent with the study's aim to investigate symptom-level influences on time perception.

Heart Rate

Heart rate was measured using a non-invasive pulse oximeter finger sensor (Zacurate/500BL). Baseline measurements were obtained prior to task administration, and follow-up measurements were recorded after the mood induction and time perception tasks.

Heart rate was included as a physiological index of arousal to examine whether variations in autonomic activity contributed to individual differences in time perception. This allowed for the assessment of whether observed temporal distortions were primarily associated with psychological factors or whether they were partially explained by physiological arousal.

Time Perception Task

Participants completed a time production task using the pen-drop method. In each trial, participants held a pen and were instructed to say "start" when ready, prompting the experimenter to begin timing. Participants then dropped the pen when they believed the target interval (10 s, 30 s, or 60 s) had elapsed.

Time production tasks are widely used in time perception research to assess internal timing mechanisms, as they require individuals to generate a temporal interval based on their internal representation of time, rather than relying on external cues. Compared to reproduction or estimation tasks, time production tasks provide a relatively direct measure of internal clock functioning by minimizing reliance on memory retrieval and comparison processes (Mioni et al., 2016).

The pen-drop method was selected because it imposes minimal motor and cognitive demands, reducing the influence of extraneous factors such as working memory load or complex motor coordination. This allows for a more direct assessment of subjective time perception. Although this method has been used in prior research (Wahl & Sieg, 1980), its simplicity also makes it suitable for isolating internal timing processes in non-clinical samples.

The selected intervals (10 s, 30 s, and 60 s) represent short-to-moderate durations commonly used in time perception research. These intervals are long enough to engage internal timing mechanisms while minimizing reliance on long-term memory or strategic estimation. Using multiple intervals also allows for the assessment of consistency in timing performance across durations.

Performance was quantified using relative error (RE), calculated as the difference between produced time and target time divided by the target time. Positive RE values indicate overestimation (i.e., a slower inner clock), whereas negative RE values indicate underestimation (i.e., a faster inner clock).

For each participant, RE values across the three intervals were averaged to generate an aggregate measure of time perception. This aggregation reduces variability associated with individual trials and provides a more stable estimate of internal timing performance. Interval-specific analyses were also conducted to examine consistency across durations.

Mood Induction

Participants were randomly assigned to view a 1-minute video intended to induce either a positive (happy) or negative (sad) emotional state. The video stimuli were not drawn from standardized or pre-validated mood induction sets. Instead, participants provided subjective ratings of the extent to which the videos were perceived as funny or sad immediately after viewing.

This approach was adopted to provide a brief and low-burden manipulation of affective state within the constraints of the study design. However, because the stimuli were not validated and the manipulation relied on subjective ratings, the strength and consistency of the induced emotional states may have varied across participants. As a result, mood condition effects should be interpreted with caution, particularly in comparisons between experimental conditions.

The inclusion of mood induction was intended to explore whether transient emotional states would influence time perception in addition to baseline symptom levels. Given the potential variability in manipulation strength, analyses focusing on mood condition are treated as secondary to the primary symptom-based analyses.

Procedure

The study employed a quasi-experimental design conducted in a controlled laboratory setting. Upon arrival, participants completed a demographic questionnaire, followed by baseline assessments of anxiety and depressive symptoms (BAI and BDI-II). Resting heart rate was recorded prior to task administration.

Participants first completed the time production task under a neutral condition to establish a baseline measure of time perception. They were then exposed to a mood induction procedure (happy or sad video) and immediately completed the same time perception task again. Heart rate was recorded following the task to capture post-manipulation physiological activity.

This procedure allowed for the comparison of time perception across baseline and post-induction conditions, while also examining the influence of individual differences in anxiety and depressive symptoms on timing performance.

Statistical Analysis

Data were analyzed using SPSS (Version 27). The primary outcome variable was relative error (RE) in the time production task, representing deviations between produced and target intervals. For each participant, RE values were averaged across the 10 s, 30 s, and 60 s intervals to create an aggregate measure of time perception performance.

Primary (Confirmatory) Analyses

The primary analyses examined whether anxiety and depressive symptom severity predicted time perception performance. A multiple linear regression model was conducted with BAI scores, BDI-II scores, and mood condition as predictor variables, and the aggregate RE score as the dependent variable. Statistical significance was set at $p < .05$.

These analyses were designed to test the study's primary hypotheses derived from Arousal Level Theory regarding the effects of anxiety and depression on internal clock speed.

Secondary (Exploratory) Analyses

To further examine the relationship between depressive symptoms and time perception, exploratory analyses were conducted at both the subscale and item levels of the BDI-II.

First, separate regression models were conducted using BDI-II subscales (cognitive, affective, and somatic; Buckley et al., 2001) as predictors of time perception. Second, exploratory item-level analyses were performed to identify whether specific depressive symptoms were associated with timing performance. Given the large number of comparisons, these analyses were considered exploratory and interpreted with caution.

Because multiple statistical tests were conducted across BDI-II items, the risk of Type I error is increased. No formal correction (e.g., Bonferroni or false discovery rate) was applied due to the exploratory nature of these analyses; therefore, findings should be interpreted as preliminary and hypothesis-generating rather than confirmatory.

Additional Analyses

A hierarchical multiple regression was conducted to examine whether co-occurring moderate-to-severe anxiety and depressive symptoms explained additional variance in time perception beyond depression alone. In Model 1, BDI-II scores were entered. In Model 2, a binary comorbidity variable (1 = BDI-II ≥ 20 and BAI ≥ 16; 0 = otherwise) was added. These thresholds were based on established severity cutoffs.

To evaluate potential physiological moderation effects, interaction terms between heart rate and symptom measures (BAI × heart rate; BDI-II × heart rate) were included in regression models.

Mood-induced changes in time perception were examined by calculating a difference score (post-induction RE minus baseline RE), allowing for the assessment of within-subject changes following the mood manipulation. Given the limitations of the mood induction procedure, these analyses were considered secondary.

Ethical Considerations

The study protocol was reviewed and approved by the Teachers College Institutional Review Board (IRB Protocol #24-477). All participants provided written informed consent prior to participation and were informed of their right to withdraw from the study at any time without penalty.

To protect participant confidentiality, all data were anonymized and stored securely. To minimize potential risks, participants were debriefed immediately following the study, and those who experienced discomfort were provided with referrals to appropriate mental health resources.

Results

Descriptive Statistics

Participant demographic and experimental characteristics are presented in Table 1, and descriptive statistics for continuous variables are presented in Table 2.

Participants (N = 45) were aged 20–29 years (M = 23.62, SD = 1.79). The sample was predominantly female (68.9%) and Asian (66.7%). Participants were randomly assigned to either the sad (46.7%) or funny (53.3%) video condition.

Mean depressive symptom severity was in the

mild range (M = 12.18, SD = 9.28), and anxiety levels were moderate (M = 15.40, SD = 11.13). Baseline heart rate (M = 76.58 bpm, SD = 11.70) and post-induction heart rate (M = 77.82 bpm, SD = 11.38) were comparable, indicating minimal physiological change following the task.

At baseline, participants slightly underestimated the 10 s interval (M = 9.71, SD = 2.31), showed moderate variability at 30 s (M = 32.38, SD = 8.50), and slightly overestimated the 60 s interval (M = 65.32, SD = 17.04). Following mood induction, time estimates increased modestly across intervals (e.g., 10 s: M = 11.34, SD = 2.88), but overall changes were small.

Relative error (RE) values indicated slight underestimation at baseline (M = 0.07, SD = 0.27) and a small increase post-induction (M = 0.14, SD = 0.32), suggesting minimal shifts in overall timing performance.

Subjective ratings of the video stimuli were low for both conditions (sad: M = 2.66, SD = 3.22; funny: M = 3.09, SD = 3.24), indicating a weak mood induction effect.

Effects of Mood Condition

There were no significant differences between the sad and funny video conditions in time perception performance, $t(43) = 1.15$, $p = .26$. Given the low subjective ratings of the videos, these findings suggest that the mood manipulation had limited impact on timing behavior.

Depressive Symptoms and Time Perception

Depressive symptoms significantly predicted time perception performance. Higher BDI-II scores were associated with greater time underestimation (i.e., a faster inner clock), B = -0.010, p = .019. The model explained 12.1% of the variance in relative error (R^2 = .121, $F(1, 43) = 5.89$, p = .019).

This effect was consistent across individual time intervals. Higher depressive symptom severity was associated with shorter produced durations at 10 s (B = -0.425, p = .004), 30 s (B = -0.346, p = .020), and 60 s (B = -0.319, p = .033), indicating a stable relationship across durations.

Anxiety Symptoms and Time Perception

Anxiety symptoms showed a marginal association with time perception. Higher BAI scores were associated with a tendency toward time underestimation, but this effect did not reach statistical significance (B = -0.330, p = .055).

Demographic and Physiological Factors

Demographic variables were not significantly associated with time perception. Age (B = -0.216, p = .189) and gender (B = -0.053, p = .742) did not predict relative error.

Heart rate was also unrelated to time perception (B = -0.079, p = .612), suggesting that physiological arousal did not account for variability in timing performance.

Exploratory Analyses: BDI-II Subscales

Exploratory analyses examined whether specific depressive symptom domains predicted time perception. Cognitive symptoms significantly predicted relative error (B = -0.020, p = .013, R^2 = .135), indicating that greater cognitive impairment was associated with faster internal clock speed.

Affective symptoms were also significant predictors (B = -0.039, p = .045, R^2 = .090). In contrast, somatic symptoms showed a non-significant trend (B = -0.023, p = .065, R^2 = .077).

Exploratory Analyses: Item-Level Associations

Item-level analyses identified specific depressive symptoms associated with time perception. Agitation (B = -0.225, p = .016) and indecisiveness (B = -0.085, p = .022) were associated with time underestimation, whereas sleep disturbances (B = 0.178, p = .009) were associated with time overestimation.

Given the number of comparisons conducted, these findings should be interpreted as exploratory.

Additional Analyses: Comorbidity Effects

A hierarchical regression examined whether co-occurring anxiety symptoms explained additional variance beyond depression alone. Adding the comorbidity variable did not significantly improve model fit ($\Delta R^2 \approx 0$, $\Delta F(1, 42) = 2.09$, p = .066), indicating that anxiety did not meaningfully alter the relationship between depression and time perception.

Discussion

Overview

The Arousal Level Theory that we built our hypothesis on proposes that heightened physiological arousal accelerates internal temporal processing, thus resulting in time underestimation, whereas reduced arousal slows it, thus leading to time overestimation (Gable et al., 2022; Grondin, 2001; Mioni et al., 2016). Based on this framework, we hypothesized that anxiety—characterized by physiological hyperarousal (Pike et al., 2020)—would speed the inner clock, while depression—often associated with hypoarousal and blunted reactivity (Xie et al., 2024)—would slow

it. This prediction aligns with prior findings showing time underestimation in anxiety (Bar-Haim et al., 2010; Mioni et al., 2016) and time overestimation in depression (Bschor et al., 2004; Thönes & Oberfeld, 2015).

However, our results suggest that arousal-based mechanisms alone may not fully explain time perception distortions in mood disorders. While anxiety showed a marginal trend toward a faster inner clock (B = -0.330, p = .055), consistent with previous models, depression was associated with time underestimation (B = -0.010, p = .019), suggesting a speeding of the inner clock. This pattern differs from theoretical predictions and earlier findings that link depressive states to slowed temporal processing.

This discrepancy suggests that additional cognitive and affective mechanisms may be influencing time perception in depression. Factors such as impaired attentional control, decision-making difficulties, and self-focused processing may disrupt internal timekeeping in ways that arousal alone does not account for. Notably, these findings are consistent with phenomenological accounts of depression, where individuals often describe the external world as slowing down—an experience that could reflect a faster-running internal clock (Ratcliffe, 2012). Empirical evidence also suggests that depressed individuals report time dragging or becoming overly salient (Thönes & Oberfeld, 2015; Vogel et al., 2018), further supporting this interpretation.

To explore these dynamics in more detail, we conducted symptom-level analyses, which suggested that specific cognitive and affective symptoms—not overall depression severity—were most predictive of inner clock acceleration. This pattern aligns with cognitive models emphasizing attentional rigidity (Clark & Watson, 1991) and rumination (Nolen-Hoeksema, 2000), both of which propose that difficulty disengaging from internally generated thoughts may interfere with temporal tracking, leading to distortions in time perception.

Taken together, these results suggest that an integrative framework may be needed to fully understand time distortions in mood disorders. While arousal-based models provide an important foundation, they may need to be expanded to incorporate the roles of executive function, attention, and self-referential processing. A multidimensional perspective that includes both physiological and cognitive-affective components may better capture the complex ways in which individuals with anxiety and depression experience the passage of time.

Cognitive Deficits and the Accelerated Internal Clock in Depression

Our study's findings emphasize the role of cognitive processes in time perception among individuals with depression, with indecisiveness emerging as a key predictor of time underestimation. Indecisiveness is a well-documented symptom of depression and is frequently linked to executive dysfunction and cognitive rigidity (Beevers, 2005; Snyder, 2015). Depressed individuals often exhibit difficulties in decision-making, characterized by prolonged deliberation, reduced confidence, and heightened self-doubt (Koster et al., 2011; Van Randenborgh et al., 2010).

This indecisiveness is closely associated with rumination—a hallmark feature of depression in which individuals engage in repetitive, passive contemplation of distressing thoughts rather than taking action (Nolen-Hoeksema, 2000; Whitmer & Gotlib, 2013). Rumination has also been shown to interfere with cognitive processing and flexibility, contributing to persistent negative thinking patterns and impaired problem-solving. As a result, attention may become overly focused on internal states, potentially disrupting temporal tracking.

The connection between rumination, indecisiveness, and time perception distortions may be related to differences in how individuals monitor time. Depressed individuals who struggle with indecision may rely more heavily on structured or effortful internal counting strategies. While such strategies may be intended to increase control or accuracy, they may also alter attentional allocation during timing tasks, potentially contributing to systematic biases in time estimation.

Although direct empirical evidence linking specific time-monitoring strategies to internal clock speed remains limited, research on cognitive load provides a plausible explanatory framework. Studies have shown that increased cognitive load is often associated with time underestimation, a phenomenon commonly referred to as time compression (Brown, 1997; Zakay & Block, 1997). More recent work suggests that cognitive and emotional processes—such as attention, working memory, and motivation—jointly influence temporal perception. When cognitive resources are occupied, attention may be diverted away from temporal processing, resulting in shorter perceived durations (Matthews & Meck, 2014).

In the present study, the time production task was designed to minimize cognitive demand. However, it is possible that some participants engaged in more effortful or rigid internal strategies, effectively increasing cognitive load during the task. This interpretation is consistent with the observed association between depressive symptoms and time underestimation, although it cannot be directly tested within the current design. Recent evidence also suggests that depression may disrupt the typical relationship between emotional experience and time perception, further implicating cognitive processes in temporal distortions.

Taken together, these findings suggest that cognitive processes such as rumination and indecisiveness may contribute to time perception distortions in depression. Rather than indicating a purely physiological acceleration of the internal clock, these results point toward the potential role of attentional and executive processes in shaping temporal experience. This highlights the importance of considering cognitive mechanisms alongside arousal-based accounts when interpreting time perception in mood disorders.

Affective Symptoms and the Phenomenological Discussion

Affective state is a crucial factor shaping time perception, with early research indicating that negative emotions can distort internal timing mechanisms (Angrilli et al., 1997; Droit-Volet et al., 2004; Noulhiane et al., 2007). Conventional models have proposed that negative emotions tend to slow the inner clock, leading to time overestimation. However, more recent motivation-based theories suggest a more nuanced pattern: whether time speeds up or slows down depends on the motivational direction of the emotion—specifically, whether it is approach- or withdrawal-oriented (Carver, 2004; Gable & Harmon-Jones, 2013; Gable et al., 2022).

Our findings are broadly consistent with this motivation-based framework. Depressive symptoms, typically associated with withdrawal motivation, were linked to time underestimation, suggesting an accelerated inner clock. This interpretation aligns with prior work linking withdrawal-related states, such as depression and anhedonia, to altered temporal processing and the subjective experience of time dragging (Kent et al., 2019; Thönes & Oberfeld, 2015).

Depression is widely characterized as a withdrawal-oriented state, marked by disengagement, passivity, and reduced goal-directed behavior (Koster et al., 2011; Nolen-Hoeksema, 2000). Withdrawal-related emotions such as sadness, guilt, and hopelessness have also been shown to influence time perception. For example, Matsuda et al. (2020) found that guilt can lead to the experience of time passing more slowly, which may reflect changes in internal timing processes. Similarly, prior work has documented that depressed individuals often report time as dragging or becoming overly salient (Thönes & Oberfeld, 2015; Vogel et al., 2018).

To maintain conceptual clarity, we use the term *time underestimation* to refer to the production of shorter intervals than the target duration, a pattern associated with an accelerated internal clock. This terminology avoids ambiguity and is consistent with conventions in the time perception literature.

Prior research also suggests that sadness may function as either an approach- or withdrawal-motivated emotion depending on context (Gable et al., 2016). In its approach-oriented form, sadness may slow the inner clock by directing attention toward external goals (Gable & Poole, 2012). In contrast, when characterized by passivity and helplessness, it may heighten internal focus and alter temporal processing (Droit-Volet & Gil, 2016; Gil & Droit-Volet, 2009). Our findings are consistent with the latter pattern, suggesting that depression, as a chronic withdrawal state, may be associated with systematic biases in time perception.

Although the present study did not directly examine suicidality, exploratory analyses of BDI-II Item 9 (suicidal thoughts) showed a marginal association with time perception (p = .080). Given the exploratory nature of this finding and the lack of statistical significance, it should be interpreted with caution.

Taken together, these findings suggest that affective experience, particularly within withdrawal-oriented states, may influence subjective time perception. While arousal-based models provide an important foundation, these results further support the role of motivational and affective processes in shaping temporal experience.

Anxiety's Limited Role and Physiological Factors

Anxiety's minimal influence highlights its distinction from depression in temporal cognition. Although anxiety showed a marginal association with time perception, this effect did not reach statistical significance, suggesting that its influence may be weaker or more variable in this sample. Only BAI items related to physiological arousal (e.g., "I feel my

heart pounding") showed tentative associations with time perception, consistent with the primarily somatic nature of anxiety symptoms (Pike et al., 2020).

Physiological arousal, as indexed by heart rate (M = 76.58 pre-task, SD = 11.70), was not significantly associated with time perception, nor did it moderate the relationship between affective symptoms and temporal distortion. This finding provides limited support for the Heart Rate Theory and suggests that heart rate, at least as measured in this study, may not be a sensitive indicator of temporal processing differences.

This pattern is consistent with prior research indicating that while anxiety is associated with heightened arousal, its impact on time perception is less consistent than that of depression (Mioni et al., 2016). The absence of significant physiological effects suggests that cognitive and affective processes may play a more prominent role in shaping time perception in this context.

Limitations

Several limitations should be considered when interpreting the findings of this study. First, the mood induction procedure had a relatively weak effect, as indicated by low subjective ratings. Because the video stimuli were not drawn from validated mood induction sets, the strength and consistency of the induced emotional states may have varied across participants. This likely contributed to the minimal differences observed between the sad and happy conditions and limited conclusions regarding the causal impact of transient emotional states on time perception.

Second, the sample size, while adequate for initial analyses, was relatively small and may have limited statistical power to detect more subtle effects, particularly with respect to anxiety. In addition, the sample was relatively homogeneous, consisting primarily of Asian female graduate students from Teachers College. This may limit the generalizability of the findings to broader or more diverse populations.

Third, although some participants reported elevated levels of anxiety and depressive symptoms, the sample was not clinically diagnosed. As a result, the findings may not fully generalize to clinical populations, where symptom severity and associated cognitive and affective processes may differ.

Finally, the study employed a time production task (pen-drop method) that was intentionally designed to be low in cognitive demand. While this allows for a relatively direct assessment of internal timing processes, it is possible that other timing paradigms—such as time estimation or reproduction tasks under higher cognitive load—may be more sensitive to mood-related differences. This represents an important methodological consideration for future research.

Future Directions

The speculative nature of some discussions in this study, particularly those regarding the psychological impact of time-related desires, suggests a clear avenue for further empirical investigation. It is recommended that subsequent research explicitly examines how motivational states related to temporal dynamics, such as urgency or procrastination, influence cognitive processing of time.

Expanding the sample size and ensuring diversity in future studies will be important to improve the robustness and generalizability of the findings. Research incorporating varied demographic profiles, including more balanced gender representation and broader cultural backgrounds, may provide a more comprehensive understanding of the cognitive and affective dimensions of time perception.

Additionally, future research could examine how affective and cognitive attitudes toward time influence time estimation. Our findings suggest that individuals experiencing withdrawal-related distress (e.g., depression) may subjectively perceive external time as dragging due to an accelerated internal clock. However, it remains unclear whether this effect is driven by passive cognitive distortion or by active cognitive processes related to temporal expectations.

One potential direction is to examine whether an individual's desire for time to pass faster (or slower) is associated with systematic biases in time estimation. For example, future studies could assess participants' subjective attitudes toward time using items such as "I wish this moment would end" or "I want this moment to last," and examine how these attitudes relate to performance on time perception tasks.

Furthermore, such research could provide insight into the role of top-down influences on time perception, where higher-order cognitive and affective processes shape the perception of temporal intervals (Gilbert & Li, 2013). While most models of time perception emphasize bottom-up mechanisms, such as arousal and pacemaker speed, this approach may help clarify how cognitive expectations contribute to temporal distortions.

If such effects are observed, they would support the idea that time perception is influenced not only by passive emotional states but also by active cognitive processes. This may have implications for clinical interventions, as modifying cognitive perspectives on time (e.g., through cognitive restructuring or mindfulness-based approaches) could potentially help regulate distorted time experiences in individuals with depression.

Conclusion

Depression, more than anxiety, was associated with an accelerated internal clock, driven not by autonomic arousal, as previous research has suggested (Mioni et al., 2016), but more closely associated with cognitive factors such as rigid time monitoring, rumination, and disengagement. Anxiety showed only minimal effects, and heart rate was unrelated to time perception.

These findings suggest the need to move beyond purely arousal-centric models toward more integrative frameworks that incorporate cognitive and affective dimensions of time perception. Clinically, interventions aimed at enhancing cognitive flexibility (Lau et al., 2021) may help mitigate time perception distortions and improve everyday functioning for individuals experiencing depressive symptoms.

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Table 1.

Participant Demographic and Experimental Characteristics

Variable	*n (%)*
Gender	
Male	14 (31.1)
Female	31 (68.9)
Ethnicity	
Asian	30 (66.7)
White	8 (17.8)
Hispanic/Latino	3 (6.7)
Black/African American	2 (4.4)
Middle Eastern	1 (2.2)
Native American	1 (2.2)
Video Condition	
Sad Video	21 (46.7)
Funny Video	24 (53.3)

Note. Percentages are based on the total sample ($N = 45$). Video condition reflects random assignment to mood induction groups (sad vs. funny). Categories are mutually exclusive.

Table 2.

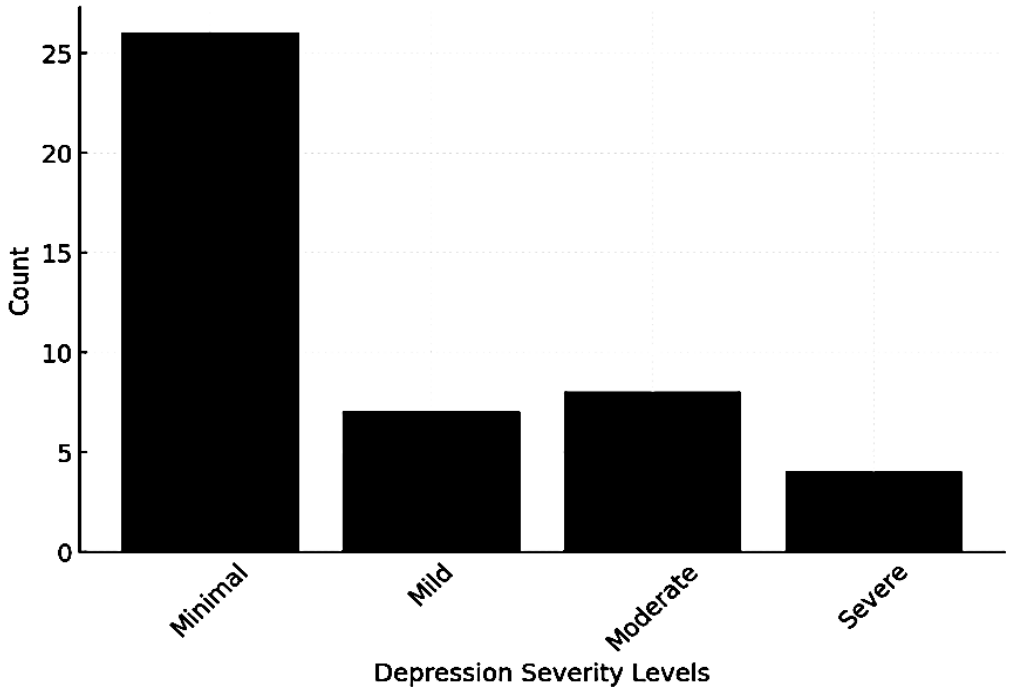
Descriptive Statistics for Continuous Study Variables

Variable	*N*	*Min*	*Max*	*M (SD)*
Age	45	20	29	23.62 (1.79)
Heart Rate (Baseline)	45	61	108	76.58 (11.70)
Heart Rate (Post-Induction)	45	60	112	77.82 (11.38)
BDI-II Total	45	1	36	12.18 (9.28)
BAI Total	45	0	50	15.40 (11.13)
Time Perception (Baseline)				
10s	45	2.32	13.75	9.71 (2.31)
30s	45	9.24	56.16	32.38 (8.50)
60s	45	20.25	109.57	65.32 (17.04)
Time Perception (Post-Induction)				
10s	45	3.08	16.65	11.34 (2.88)
30s	45	9.51	98.18	35.47 (13.61)
60s	45	22.01	128.18	66.77 (19.13)
Derived Measures				
Time Perception (Baseline RE)	45	-0.68	0.74	0.07 (0.27)
Time Perception (Post RE)	45	-0.65	1.02	0.14 (0.32)
Time Perception Difference	45	-0.23	0.63	0.06 (0.17)
Video Ratings				
Sad Rating	45	0	9	2.66 (3.22)
Funny Rating	45	0	8.5	3.09 (3.24)

Note. $N = 45$ for all variables. BDI-II = Beck Depression Inventory–II; BAI = Beck Anxiety Inventory; RE = relative error. Time perception values are reported in seconds unless otherwise indicated. Relative error (RE) represents the proportional deviation between produced and target intervals, with negative values indicating underestimation (faster inner clock) and positive values indicating overestimation (slower inner clock). Ratings reflect participants' subjective evaluations of the mood induction stimuli.

Figure 1.

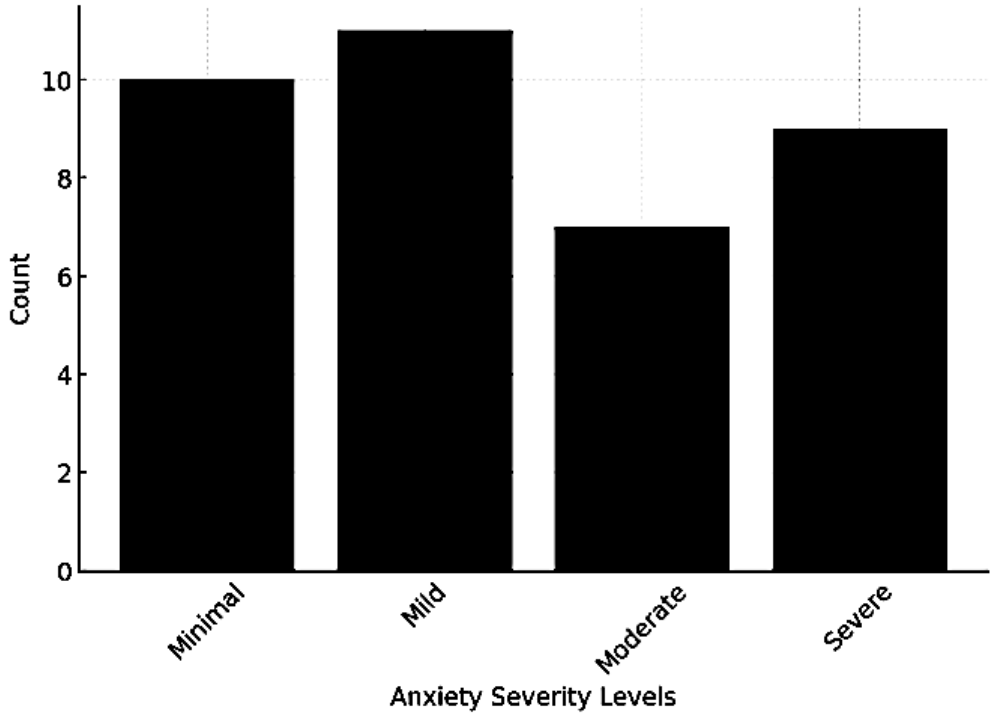
Descriptive Statistics for Continuous Study Variables



Note. The y-axis represents the count of participants, and the x-axis categorizes severity levels into Minimal, Mild, Moderate, and Severe based on Beck Depression Inventory-II (BDI-II) scores.

Figure 2.

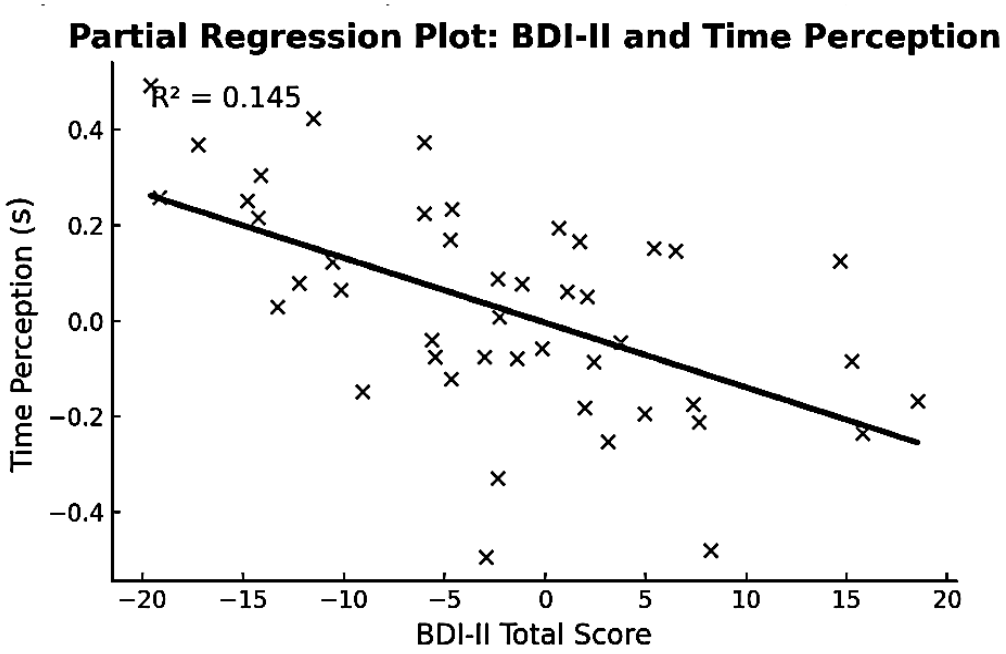
Distribution of Anxiety Severity Levels among Participants



Note. The y-axis represents the count of participants, and the x-axis categorizes severity levels into Minimal, Mild, Moderate, and Severe based on Beck Anxiety Inventory (BAI) scores.

Figure 3.

Partial Regression Plot of BDI-II Scores vs. Time Perception (RE)



Note. Higher depression severity predicts greater time underestimation (faster inner clock).

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Social Dominance Orientation, Sociopolitical Attitudes, and Beliefs on Current Political Issues

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This study investigates the relationship between social dominance orientation (SDO) and sociopolitical beliefs, focusing on issues such as reproductive rights, LGBTQ+ rights, and election security. It also examines the indirect effects of sociodemographic characteristics, including age, gender, religion, race, education, and employment. An online survey was conducted with 587 adults who completed questionnaires on demographic characteristics, social dominance orientation, and current political beliefs. Factor analysis was used to identify key sociopolitical belief factors, and structural equation modeling assessed the relationships between SDO, sociodemographic characteristics, and political beliefs. The analysis revealed four main factors of sociopolitical beliefs: general political issues, women's/LGBTQ+ rights, fraud/power, and bias/appeal to emotions. SDO was significantly associated with all four factors, showing negative relationships with general political issues and women's/LGBTQ+ rights, and positive relationships with fraud/power and bias/appeal to emotions. Sociodemographic characteristics such as age, gender, religion, and education also showed significant associations with SDO and political beliefs. The findings highlight the complex interplay between SDO, sociodemographic characteristics, and sociopolitical beliefs. However, limitations related to sample demographics, recruitment via social media, and the use of a shortened SDO scale should be considered when interpreting the generalizability of findings. Understanding these relationships can inform the design and implementation of social policies aimed at addressing hierarchical social ordering and promoting egalitarian values.

Keywords: social dominance orientation (SDO), hierarchical social ordering, equality, sociopolitical beliefs, sociopolitical attitudes, voter participation

According to the Pew Research Center (2023), approximately 66% of eligible voters participated in the 2020 presidential election, marking the highest turnout in 120 years (Green et al., 2023). While the Pew Research Center has not yet published data for the 2024 election, initial findings from the University of Florida Election Lab (2024) indicate a comparable turnout of 64%. This trend of increased voter participation is evenly distributed across party lines, with Democrats accounting for 49% and Republicans 50% of the vote in the 2018-2022 election cycles (Green et al., 2023). Although the Pew study did not identify specific causes for this rise, motivational factors such as party affiliation, policy preferences, and the desire to maintain the status quo or advance societal change may play a role. Some voters may vote along party lines as a default, while others choose candidates who best represent their sociopolitical beliefs and policy goals.

Voting along party lines may appear to be little more than a superficial gesture of loyalty to familiar Democratic and Republican ideologies. However, contained within those ideologies are other, more nuanced factors, like advancing specific policy initiatives such as those pertaining to the omnipresent pro-choice – pro-life controversy, with potential to influence both political decision-making and access to health care. Ideologies and belief systems are powerful motivational forces because they function both epistemically and as justificatory frameworks for advancing particular social policies (Ho et al., 2012). As an example, conservatism–a traditional Republican ideology–has been associated with authoritarianism, the preservation of the societal status quo, and a system of governance that consolidates power and the control of resources within the dominant class (Jost et al., 2003; Sidanius & Pratto, 1999). On the other hand, liberalism and Democratic ideologies are associated with social policies like affirmative action, in which power and resources are more likely to be shared amongst citizens (Sidanius & Pratto, 1999).

Both political ideologies and concomitant systems of governance are representative of disproportional social ordering wherein some groups are situated in a dominant role with greater access to opportunity and the ability to control resources, in contrast to subordinate groups and subpopulations who have fewer opportunities and limited ability to control and distribute resources (Ho et al., 2012; Sidanius & Pratto, 1999). Disproportionate social ordering is a central tenet of Social Dominance Theory (SDT) and related concepts like Social Dominance Orientation (SDO), a measure of individual receptivity to dominant social ordering (Prati et al., 2022; Sidanius & Pratto, 1999). The present study aims to examine associations between SDO, sociopolitical beliefs, and attitudes on current political issues, which can illuminate factors associated with growing trends like increased voter participation.

Social Dominance Theory

Group-based hierarchies are an anticipated and enduring feature of human social ordering. Social dominance the-

ory (SDT) examines the tendency for human beings to organize societies as group-based social hierarchies (Sidanius & Pratto, 1999; Sidanius et al., 2004). Group-based hierarchies occur broadly across societies regardless of cultural distinctions (Sidanius & Pratto, 1999). Hierarchical social ordering can manifest as either a single dominant group or multiple hegemonic groups positioned at the top of society, relegating other groups to subordinate roles. Some researchers (e.g., Jost et al., 2003; Pratto, 1999; Sidanius & Pratto, 1999) suggest that dominant group members navigate society with considerably more power and have a greater degree of access, control, and ability to manage and distribute resources to their advantage, especially when contrasted against subordinate group members who are limited in opportunities to enjoy the same benefits. Additionally, dominant group members are recognized as having a greater degree of *positive social value*, frequently distinguished by the attainment of a prestigious education, more desirable occupations, wealth accumulation, positive health outcomes, and high social status (Sidanius & Pratto, 1999; Sidanius et al., 2004). To the contrary, subordinate group members are characterized as having *negative social value* and are subordinated to a lower social status, yielding fewer positive outcomes pertaining to education, occupational opportunities, and health care (Sidanius & Pratto, 1999; Sidanius et al., 2004).

Most human societies contain three distinct but interconnected *hierarchical systems*: age, gender, and "arbitrary sets" (Sidanius & Pratto, 1999; Sidanius et al., 2004). Age-based hierarchical systems assess societal worth based on assumptions related to age. For example, younger workers are often seen as productive contributors to the economy, while older individuals may be perceived as an economic burden due to declining health and cognitive abilities (Zubielevitch et al., 2023). Although ageist thinking can lead to discrimination against older persons, researchers like Zubielevitch et al. (2023) have found evidence supporting the cultural assumption that older people may exhibit higher levels of prejudice. Consequently, they may be more accepting of hierarchical social ordering and undesirable outcomes associated with concepts like right-wing authoritarianism.

Gender-based hierarchical systems ascribe different levels of worth to men and women, traditionally placing men in dominant and higher-status roles, especially in patriarchal societies, in contrast to more egalitarian ones (Sidanius & Pratto, 1999). Legitimizing beliefs associated with gender-based hierarchies are expressed and justified using both benevolent sexism (e.g., women are nurturers and require protection) and hostile sexism, which can be experienced as overt verbal and physical attacks against women (Barbeitos & Modesto, 2023). Non-binary and trans individuals also experience subordination within gender hierarchies, facing significant prejudice, discrimination, and invalidation of their identities. Research indicates that these experiences contribute to higher risks of psychological distress, depression, and anxiety among non-binary people (Budge et al., 2013).

Arbitrary sets, the third hierarchical system, are contextually dependent and arbitrarily defined social distinctions based on such factors as ethnicity, culture, race, class, caste membership, tribe, nation, religious affiliation, and other social constructs (Van Laar & Sidanius, 2001). Like the other two hierarchical systems, arbitrary set factors are interconnected and mutually interdependent structural components of social life. Gender and age hierarchies are universal across societies, whereas arbitrary set hierarchies occur more frequently in societies in which people can generate and sustain economic surplus (Sidanius & Pratto, 1999). Sidanius and Pratto (1999) emphasize the conditions of economic surplus, which frequently lead to role specialization, the formation of male-based coalitions, and the creation of arbitrary-set hierarchies. Arbitrary-set social hierarchies reappear and recreate themselves over time, culture, and geography, and are therefore an anticipated and sustaining feature found across diverse societies.

SDT posits that societies develop ideological belief systems to mitigate conflict and maintain social order. These systems promote legitimizing myths and cultural narratives that justify and sustain hierarchical structures favoring dominant groups (Pratto, 1999; Sidanius, 1993; Sidanius & Pratto, 1999). Such myths shape cognition, attitudes, behaviors, and decision-making at both individual and group levels (Mathews et al., 2009). Sidanius (1993) identified three main types: 1) paternalistic myths, which portray subordinate groups as dependent and incapable; 2) reciprocal myths, which frame intergroup relations as cooperative and mutually beneficial; and 3) sacred myths, which attribute social hierarchies to divine or natural order (Jost et al., 2003; Sidanius, 1999). These myths anchor ideologies like conservatism, which aim to preserve existing power structures and social inequalities (Jost et al., 2003).

Sidanius and Pratto (1999) distinguish between two types of cultural ideologies: hierarchy-enhancing (HE) and hierarchy-attenuating (HA). HE ideologies support social hierarchies, while HA ideologies promote greater equality. These ideological orientations are reflected not only in institutional structures but also in the sociopolitical beliefs individuals endorse. For example, beliefs that emphasize law

and order, traditional family roles, or national superiority often align with HE ideologies, reinforcing existing power structures, whereas beliefs that advocate for social justice, minority rights, and redistributive policies tend to reflect HA ideologies, challenging hierarchical norms (Sidanius & Pratto, 1999). These ideologies also manifest in institutional roles: HE institutions, such as banks, insurance companies, and real estate firms, have historically contributed to systemic discrimination, whereas HA institutions are more likely to invest in programs that support marginalized communities and promote equity (Sidanius et al., 2004). Additionally, religious ideologies, particularly those that emphasize tradition, authority, and exclusivity, can function as hierarchy-enhancing belief systems, reinforcing group-based dominance and resistance to egalitarian change (Sidanius & Pratto, 1999). Importantly, HE ideologies are not exclusive to dominant groups–subordinated individuals may also endorse them. This acceptance often stems from perceived lack of alternatives or fear of reprisal for challenging the status quo (Jost et al., 2003; Sidanius & Pratto, 2009; Tesi et al., 2019). Such dynamics can foster a "norm of compliance", where inequality is passively accepted. Ultimately, HE ideologies are complex belief systems that reinforce structural inequality and group-based subordination.

Social-cognitive research highlights how intragroup favoritism and psychological biases contribute to discrimination against outgroups (Matthews et al., 2009). These biases often arise from efforts to reduce uncertainty, perceived threat, and anxiety related to intergroup conflict. Consequently, individuals may stereotype others, reinforce social boundaries, and uphold hierarchical structures. While such behaviors can be shaped by learning and experience, sociopolitical belief systems–such as authoritarianism or social dominance orientation–can play a significant role in sustaining hierarchical norms. Understanding these belief systems is essential for evaluating individuals' receptivity to social inequality and resistance to change.

Social Dominance Orientation

Social Dominance Orientation (SDO) refers to an individual's attitudinal preference for hierarchical versus egalitarian social structures (Pratto et al., 1994). Those high in SDO tend to endorse hierarchy-enhancing (HE) ideologies and legitimizing myths, while those low in SDO are more supportive of hierarchy-attenuating (HA) values and policies. SDO influences not only ideological alignment but also the social roles individuals pursue and the institutions they affiliate with, as those higher in SDO often gravitate toward roles and organizations that reinforce inequality.

To assess individual receptivity to social hierarchy, Pratto et al. (1994) developed the Social Dominance Orientation scale, a psychometrically validated tool with strong internal consistency, temporal reliability, and both predictive and discriminant validity. Predictive validity refers to the scale's ability to forecast attitudes and behaviors associated with social dominance, such as support for nationalism, sexism, punitive policies, and opposition to social welfare. In contrast, discriminant validity ensures that SDO is distinct from other psychological constructs. For example, while both SDO and authoritarianism may predict conservative attitudes, the SDO scale uniquely captures preferences for group-based hierarchy, independent of personality traits like agreeableness and openness, or values like empathy and altruism.

SDO has been associated with a variety of sociopolitical attitudes, including nationalism, sexism, cultural elitism, and policy preferences related to welfare, civil rights, and military intervention (Pratto et al., 1994; Sidanius et al., 1999). However, less is known about how SDO relates to contemporary sociopolitical beliefs frequently discussed in public discourse. To address this gap, the present study introduces a novel questionnaire assessing beliefs on topics such as reproductive rights, LGBTQ+ rights, election integrity, education, and economic policy. Items like "Roe v. Wade is a constitutional right" and "CRT should not be taught in schools" aim to capture current ideological divides and explore how these beliefs correlate with SDO and demographic variables such as age, gender, and education. Drawing on the theoretical framework of Social Dominance Theory and the literature reviewed above, the present study tested several hypotheses.

Hypotheses

Based on Social Dominance Theory and prior research on Social Dominance Orientation (SDO), the following hypotheses were proposed:

H1: Individuals with higher levels of SDO will be more likely to endorse hierarchy-enhancing sociopolitical beliefs, such as support for election fraud narratives, resistance to progressive education policies (e.g., CRT bans), and emotionally-charged or conspiratorial political rhetoric.

H2: Individuals with higher levels of SDO will be less likely to endorse hierarchy-attenuating sociopolitical beliefs, such as support for reproductive rights, LGBTQ+ rights, and egalitarian policy positions.

H3: Sociodemographic characteristics (e.g., age, gender, race, education, employment) will have indirect effects on sociopolitical beliefs through their influence on SDO, such that individuals from dominant social groups or with higher socioeconomic status will exhibit higher SDO and,

in turn, greater endorsement of hierarchy-enhancing beliefs.

By integrating novel belief items and underrepresented demographics, this research seeks to expand the SDO literature and inform future investigations into political behavior and social policy development.

Methods

Participants and Procedure

This study recruited participants using Facebook Sponsored Ads in Fall 2022. A total of 821 participants agreed to participate in the online, anonymous, cross-sectional study. Participants were allowed to skip any items they did not feel comfortable answering. Of those who completed the survey items, 587 participants were included in the analyses for this study. The ages ranged from 18 to 92, and the mean age was 60.2 (SD = 18.0). For this sample, 61.5% (n = 356) reported being female, 37.0% (n = 214) reported being male, and 1.6% (n = 9) reported being non-binary or other. The racial/ethnic breakdown of this sample is 83.6% (n = 491) white; 2.2% (n = 13) black; 4.6% (n = 27) Hispanic; 2.6% (n = 15) Asian or Pacific Islander; 1.4% (n = 8) American Indian or Alaskan Native; and 5.6% (n = 33) Mixed or Additional Race/Ethnicity. This study was approved by the Institutional Review Board.

Measures

Demographic Information

Participants provided information about their age, gender identity, sexual orientation, race, ethnicity, marital status, religion, education level, and employment status.

Social Dominance Orientation Scale – Modified Version

The Social Dominance Orientation Scale (SDO) examines social dominance orientation, specifically the endorsement of social hierarchies and the endorsement of egalitarian beliefs (Sidanius, 1999). The modified SDO (Mata et al., 2010) consists of five items measuring the endorsement of social hierarchies and the endorsement of egalitarian beliefs. Items were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Example items include: "If certain groups stayed in their place, we would have fewer problems." Items were scored such that higher scores indicated greater SDO. The SDO shows good reliability (Cronbach's α = .83; M = 63.1, SD = 11.8).

Beliefs about Current Political Issues

The BCPI measure was developed by a panel of researchers in this study to examine beliefs about reproductive health, LGBTQ+ issues, election security, school-related issues, economic topics, and general political issues. The measure includes 30 statements to which participants indicated their level of agreement using a 9-point Likert scale from 1 (strongly disagree) to 9 (strongly agree). Example statements include: "Voter fraud is an important issue" and "States should decide abortion laws."

Data Analytic Strategy

The factor structure of the political beliefs items was first examined through factor analytic procedures. First, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser & Rice, 1974) and Bartlett's test of sphericity (Bartlett, 1951) established the suitability of these data for factor analysis. An exploratory factor analysis (EFA) with oblimin rotation was then conducted to determine the best-fitting factor structure. To identify the optimal number of factors, eigenvalues, the scree plot, 1,000 random dataset parallel analyses, and Velicer's minimum average partial (MAP) test (Zwick & Velicer, 1986) were examined. Ultimately, the number of suitable factors was determined through examination of significant loadings across possible models to balance model fit, parsimony, and the interpretability of factors.

After identifying the optimal number of factors, the proposed model–examining relations between political beliefs and social dominance–was tested. First, the measurement model of each latent variable (i.e., the four political belief factors) was assessed. Weighted least squares estimation was used due to the ordinal nature of each item. Model fit was evaluated using recommended guidelines (Hu & Bentler, 1999; Vandenberg & Lance, 2000), including the chi-square test of model fit (χ^2), comparative fit index (CFI), Tucker-Lewis Index (TLI), root mean squared error of approximation (RMSEA), and standardized root mean residual (SRMR). Namely, good model fit was indicated by a non-significant χ^2 statistic, CFI ≥ .95, TLI ≥ .95, RMSEA ≤ .06, and SRMR ≤ .06. Adequate model fit, on the other hand, is indicated by CFI ≥ .90, TLI ≥ .90, RMSEA ≤ .08, and SRMR ≤ .08. Second, the structural model was assessed through three iterative models: (1) testing direct relations between political beliefs and social dominance; (2) incorporating sociodemographic characteristics (i.e., age, gender, religion, race, education, and employment) as covariates; and (3) examining the indirect effects of sociodemographic characteristics through social dominance onto each political belief.

All analyses were conducted in R using the EFA. dimensions (O'Connor, 2023), lavaan (Rosseel, 2012), and semTools (Jorgensen et al., 2021) packages.

Results

Identification of Factor Structure

Both the KMO statistic (.96) and Bartlett's test of

sphericity ($\chi^2[465] = 16{,}111.72$, $p < .001$) supported the use of these data in factor analysis. Examination of eigenvalues, the scree plot, parallel analyses, and the MAP test indicated that 3 (MAP), 4 (scree plot), or 6 (eigenvalues, parallel analysis) factor solutions may be appropriate. Both the five- and six-factor solutions had factors with only two items, as well as poor interpretability of factors, suggesting possible overextractions. In contrast, the three- and four-factor solutions were interpretable. However, the three-factor solution had significantly poorer fit than the four-factor solution ($\Delta\chi^2[28] = 313.90$, $p < .001$), as well as numerous non-loading and cross-loading items; thus, the four-factor solution was retained for subsequent analyses. Factor loadings are presented in Table 2. Factor 1, reflecting general political issues, comprised 10 items. Factor 2, reflecting *women's/LGBTQ+ rights*, included 7 items. Factor 3, reflecting *fraud/higher-power control*, was composed of 4 items. Factor 4, reflecting *biases/appeal to emotions*, comprised 7 items. Three items did not load onto any factor and were removed from further consideration. There were significant correlations between each factor: general political issues, women's/LGBTQ+ rights, and beliefs about biases/appeal to emotions were all positively related to each other (*rs* = .39 to .74), whereas fraud/higher-power control was negatively associated with the other three factors (*rs* = -.79 to -.30).

Measurement Models

Good model fit was found for the general political issues ($\chi^2[35] = 65.72$, $p = .001$, CFI = 1.00, TLI = 1.00, RMSEA = .04, SRMR = .04), women's/LGBTQ+ rights ($\chi^2[14] = 37.22$, $p = .001$, CFI = 1.00, TLI = 1.00, RMSEA = .05, SRMR = .02), fraud/power ($\chi^2[2] = 7.57$, $p = .023$, CFI = 1.00, TLI = .99, RMSEA = .07, SRMR = .02), and bias/appeal to emotions ($\chi^2[13] = 62.39$, $p < .001$, CFI = .98, TLI = .97, RMSEA = .08, SRMR = .06) factors (with a residual covariance drawn between General Political 1 and General Political 2 in the bias/appeal to emotions model). This supported the use of these factors in the subsequent structural models.

Relations between Social Dominance and Political Beliefs

We first tested the direct relations between social dominance and each political factor. The overall model fit was adequate-to-good ($\chi^2[340] = 924.27$, $p < .001$, CFI = .94, TLI = .93, RMSEA = .06, SRMR = .05). Social dominance was significantly negatively related to general political issues ($\beta = -.62$, $p < .001$) and women's/LGBTQ+ rights ($\beta = -.61$, $p < .001$), but significantly positively related to fraud/power ($\beta = .59$, $p < .001$) and bias/appeal to emotions ($\beta = .50$, $p < .001$).

Next, sociodemographic characteristics were incorporated as covariates to examine whether these relationships remained statistically significant after accounting for individual characteristics. Model fit was adequate-to-good ($\chi^2[685] = 1373.26$, $p < .001$, CFI = .92, TLI = .91, RMSEA = .05, SRMR = .04). Social dominance remained significantly associated (in the same direction) with all four political factors, after accounting for all sociodemographic characteristics. Additionally, several significant sociodemographic findings emerged: Age was significantly negatively associated with general political issues and women's/LGBTQ+ rights, such that older adults were less likely to endorse these beliefs; age was unrelated to fraud/power and bias/appeal to emotions. Cisgender women and gender diverse individuals were more likely to endorse general political issues than cisgender men, and cisgender women were more likely to endorse women's/LGBTQ+ rights than cisgender men. No other gender differences emerged. Those identifying with a Christian religion were less likely to endorse general political issues and women's/LGBTQ+ rights, and more likely to endorse fraud/power beliefs than non-religious individuals. Those identifying with a world religion were more likely to endorse fraud/power beliefs than non-religious individuals. Finally, those with higher levels of education were less likely to endorse fraud/power beliefs than those with less education. Detailed statistics from this model can be found in Table 3.

Finally, we tested whether social dominance significantly accounted for the relationship between each sociodemographic characteristic and sociopolitical belief. Employment status was removed from this model for parsimony since it was not significantly related to social dominance or any political beliefs. Of the sociodemographic characteristics, only age, cisgender women (versus cisgender men), Christian religion, and education were significantly associated with social dominance. Indirect effects emerged for gender, Christian religion, and education; specifically, social dominance accounted for the relationship between (1) identifying as a cisgender woman and each political belief (*ps* = .013 to .015), (2) identifying with a Christian religion and each political belief (*ps* < .001), and (3) levels of education and each political belief (*p* = .004 to .006). There were no other significant indirect effects (*p* = .107 to .978).

Discussion

The purpose of the present study was to examine the relationship between social dominance orientation (SDO), sociopolitical beliefs, and attitudes about current sociopolitical issues. In addition to examining established associations between SDO and political ideology, this study contributes

to the literature by identifying distinct dimensions of contemporary sociopolitical beliefs and demonstrating how these belief dimensions relate to both SDO and sociodemographic characteristics. These dimensions reflect distinct patterns of attitudes toward contemporary sociopolitical issues, including beliefs about electoral legitimacy, social hierarchy, and attitudes toward marginalized groups. More specifically, this study was designed to (1) test the direct relations between sociopolitical beliefs and SDO; (2) incorporate sociodemographic characteristics into the analysis, including age, gender, religion, race, and other underrepresented variables such as education and employment; and (3) examine the indirect effects of the sociodemographic characteristics through SDO onto each sociopolitical belief.

Factor 1, which encompassed general political issues, revealed associations between Social Dominance Orientation (SDO) and a range of sociopolitical beliefs, including those related to economic policy, taxation, health care, and gerrymandering. These findings are consistent with prior research indicating that sociopolitical beliefs aligned with more liberal views tend to correlate with hierarchy-attenuating ideologies (Sidanius & Pratto, 1999).

Factor 2 focused on beliefs related to women's and LGBTQ+ rights, such as the protection of same-sex marriage and reproductive autonomy. These beliefs reflect liberal preferences and are similarly associated with hierarchy-attenuating ideologies (Jost et al., 2003; Sidanius & Pratto, 1999), reinforcing the connection between progressive social values and lower levels of SDO.

Factor 3, reflecting concerns about fraud and power, included beliefs about whether presidential elections have been rigged. These beliefs are difficult to associate consistently with SDO, as they have been expressed across party lines following elections such as Bush v. Gore in 2000 (Craig et al., 2006) and Trump v. Biden in 2020 (Pennycook & Rand, 2021). Concerns about election integrity also vary by political affiliation, with Democrats more focused on voter suppression and Republicans on fraudulent voting (Edelson et al., 2017). This suggests that beliefs about election fraud may be shaped more by immediate political contexts and partisan loyalties than by stable ideological orientations like SDO. Further research could explore how these contextual factors interact with SDO to inform beliefs about electoral integrity, guide the behavior of the electorate, and influence public policy design.

Factor 4, bias and emotional appeals, included beliefs such as media bias, political dishonesty, and the perception that educators hold partisan views. These beliefs are closely linked to Republican party affiliation and perceptions of cultural elitism, particularly the idea that professors promote ideological agendas (Jost et al., 2003; Pratto et al., 1994). These associations further underscore the role of ideological orientation in shaping how individuals interpret sociopolitical information, suggesting that future research should examine how perceptions of bias and emotionally charged rhetoric interact with SDO to influence institutional trust and political behavior.

Extensive research has demonstrated a significant link between SDO and sociopolitical beliefs, a finding that is well-supported by the research model (Bergh et al., 2014; Wedell & Bravo, 2021). For instance, studies (Barbeitos & Modesto, 2023; Jost et al., 2003) indicate that greater levels of SDO are associated with the endorsement of sexist attitudes and intolerance for women's issues. Results from our findings confirm this assertion, indicating that SDO is negatively associated with women's issues. Further, Prati et al. (2022) conducted research examining three political beliefs and associations with political engagement: (1) perceived fairness of the political system, (2) perceived corruption of the political system, and (3) perceived political self-efficacy. All three political beliefs were associated with greater levels of political engagement and individual levels of Social Dominance Orientation (SDO), underscoring the psychological underpinnings of civic behavior. These findings align with Prati et al.'s (2022) results, which similarly link concerns about electoral fraud and power dynamics to elevated SDO. Together, these patterns highlight the importance of examining sociopolitical beliefs, such as fairness, gerrymandering, and voter participation, not only as reflections of individual ideology but as influential factors for shaping public opinion and informing equitable policy design. Future research should continue to investigate how these beliefs interact with broader contextual factors to influence democratic engagement and institutional trust.

The next step was to evaluate how individual characteristics related to SDO. Age and gender, which are two enduring demographic features of social ordering, were examined to identify associations with SDO. In addition to the examination of age and gender, the study also considered underrepresented demographic variables ("arbitrary sets"), including race/ethnicity, education, and employment. Religiosity was also examined. The individual characteristics that are directly linked to SDO include identifying as male, Christian, and having lower levels of education.

Identifying as male was associated with higher levels of Social Dominance Orientation (SDO) compared to individuals identifying as female, a finding consistent with pri-

or research indicating that men are more likely to endorse hierarchy-enhancing ideologies (Reed, 2006; Sidanius & Pratto, 1993). This pattern held when comparing cisgender men and cisgender women, while no significant differences emerged between gender diverse participants and other gender groups. The sample also included a higher proportion of female respondents, which may limit the generalizability of these findings across gender groups. Although only 11 respondents identified as gender diverse, which refers to individuals who do not identify as cisgender men or women, their inclusion offers important insight. Prior research suggests that receptivity to social dominance orientation (SDO) predicts attitudes toward transgender and nonbinary individuals (Perez-Arche & Miller, 2021), highlighting the relevance of gender identity in shaping sociopolitical beliefs. Notably, cisgender women and gender diverse individuals were more likely to endorse general political issues than cisgender men, and cisgender women were more likely to support women's and LGBTQ+ rights. These findings suggest that gender identity may play a meaningful role in shaping public opinion on equity-related issues, and future research should further investigate how gender diversity intersects with ideological orientation to influence political engagement and attitudes toward social inclusion.

Religion was the sole arbitrary set designation under review for the present study. Religious designations consisted of Christian religion (including Catholic and Protestant traditions), world religions (referring to a range of religions including Buddhism, Islam, Judaism, Hinduism, and Sikhism), and none. Study findings indicate that identifying with a Christian tradition compared to no religion was associated with higher levels of SDO. Previous research has consistently linked Christianity to higher levels of SDO (Sidanius & Pratto, 1993; Sidanius et al., 2004), but examining it in relation to individuals who identify as Christian compared to those with no religious affiliation offers valuable insight and can inform the direction of future research initiatives. Identifying as gender diverse, compared to a man, and identifying with a world religion were unrelated to SDO. SDO did not account for the relation between a world religion and any of the four political factors, though it is notable that the total effect was only significant between world religion and fraud/power. No other arbitrary set associations were examined.

There were also indirect links between individual characteristics and beliefs about current political issues. Age was significantly negatively associated with Factor 1 (general political issues) and Factor 2 (women's and LGBTQ+ rights), indicating that older adults were less likely to endorse these beliefs. This finding aligns with previous research showing that older individuals tend to favor conservative beliefs and ideologies that support social hierarchies (Jost et al., 2003; Sidanius & Pratto, 1999; Zubielevitch et al., 2023). As shown in Table 3, higher levels of education were negatively correlated with SDO, consistent with prior studies (Sidanius & Pratto, 1993; Sidanius et al., 2004). Education was also significantly negatively related to fraud and power beliefs, but showed no association with the other three factors. This pattern is particularly relevant for future research and policy, as educational disparities—especially among members of low-status groups—may contribute to ideological divides and influence political engagement (Van Laar & Sidanius, 2001). Understanding how education shapes receptivity to dominance-oriented beliefs could inform interventions aimed at promoting civic awareness and reducing polarization. Employment was not associated with any of the four factors, though this may reflect limitations in study design rather than a definitive lack of relationship.

Limitations

In recognition that the present study has considerable strengths in identifying both direct and indirect associations between SDO, sociopolitical beliefs, and the multiple factors under review, there are also notable limitations which warrant further discussion. Firstly, the study questionnaire was distributed through advertisements on various social media channels, so the sample excludes those who do not use social media, which limits the generalizability of the findings. Furthermore, the mean age of study participants was 60 years old, which can prove limiting when contrasted against the life experiences and interests of both younger and older individuals. Future studies should aim for a more diverse age range to capture a broader spectrum of perspectives and to investigate how the relationship between SDO, demographics, and sociopolitical beliefs changes across the lifespan. In addition, the present study was cross-sectional, which can prove challenging when seeking to establish specific causal associations. Conducting longitudinal studies can enhance our understanding of causal relationships and temporal associations, thereby improving the generalizability of the findings.

It is also important to recognize that the sample consists primarily of older individuals, with an average age of 60.2 years and a majority identifying as White (83.6%). This demographic profile may limit the extent to which the findings can be applied to broader populations, especially in relation to issues concerning race and LGBTQ+ communities. The perspectives of younger individuals, as well as those from more racially and gender-diverse backgrounds,

may differ due to distinct social and political experiences.

Another notable limitation of the study concerns the categorization of religious affiliation. Participants were asked to select the option that most closely aligned with their religious identity, which may have oversimplified the complexity of religious belief systems. For example, Christianity encompasses a wide range of denominations with distinct traditions, practices, and theological interpretations despite sharing a common sacred text. Similarly, while Islam, Judaism, and Christianity are all Abrahamic religions, they differ significantly in doctrine, ritual, and worldview (Silverstein & Stroumsa, 2018; Stroumsa, 2015). These distinctions are further complicated by ideological variation within each tradition, ranging from moderate to more fundamentalist expressions. Such variation may meaningfully influence attitudes toward hierarchy and social dominance. Moderate religious orientations may align more closely with egalitarian values and lower SDO, whereas more dogmatic or fundamentalist beliefs may be associated with higher SDO due to their emphasis on tradition and social order. Future research should aim to incorporate more nuanced religious classification systems that account for denominational, philosophical, and ideological diversity, as these factors may significantly shape participants' sociopolitical attitudes and their relationship to SDO.

Lastly, the study employed a five-item modified version of the Social Dominance Orientation (SDO) scale rather than the full SDO-7. This decision was based on practical considerations during the study design phase, including the research team's prior experience with the abbreviated version and its use in related studies. Although the shortened scale has demonstrated acceptable reliability here and in previous research, it may not fully capture the conceptual breadth of the SDO construct. As a result, its use may limit content validity and affect internal consistency. Future research would benefit from employing the full SDO-7 to assess the robustness and generalizability of the present findings.

Conclusion

This study underscores the intricate relationship between social dominance orientation (SDO) and sociopolitical beliefs, revealing how deeply ingrained attitudes towards hierarchical social ordering and equality shape perspectives on critical political issues. By highlighting the significant associations between SDO and beliefs about reproductive rights, LGBTQ+ rights, election security, and other sociopolitical matters, this research provides valuable insights into the psychological underpinnings of political behavior. The findings indicated that lower levels of SDO are associated with more egalitarian attitudes and greater support for inclusive policies. Additionally, the role of sociodemographic factors such as age, gender, religion, and education in shaping these beliefs points to the need for targeted educational and policy initiatives that address the specific needs and perspectives of diverse population groups. Future research should explore the longitudinal effects of SDO on political engagement and policy support, as well as the potential for educational programs to mitigate hierarchical attitudes. Understanding the dynamic interplay between individual psychological orientations and broader sociopolitical contexts can inform the development of strategies to promote social equity and democratic participation.

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Competing Interests

The authors have declared that no competing interests exist.

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Table 1.

Political Belief Statements

Category - Item	Statement
Economic Issues - 1	The wealth inequality gap is widening
Economic Issues - 2	The wealthy should pay their fair share of taxes
Economic Issues - 3	Free health care is a right
Economic Issues - 4	Green energy will help the economy
Economic Issues - 5	Poor people should be given financial support from the government
Economic Issues - 6	The president is responsible for the economy
Election Security – 1	Voter fraud is an important issue
Election Security – 2	The most recent presidential election was rigged
Election Security – 3	A so-called "dark state" controls elections in the U.S.
Election Security – 4	Gerrymandering is not a problem
Election Security - 5	Both parties try to win elections at all costs
General Political - 1	All politicians are dishonest
General Political - 2	Politicians use fear to motivate people
General Political - 3	The media is biased
General Political - 4	I feel angry when I watch the news

Table 1 cont.

Political Belief Statements

General Political - 5	The U.S. is experiencing a constitutional crisis
LGBT Rights - 1	The right to same sex marriage should be protected
LGBT Rights - 2	States should decide same sex marriage laws
LGBT Rights - 3	Marriage is between one man and one woman
LGBT Rights - 4	The LGBTQ agenda is damaging society
LGBT Rights - 5	Transgender persons should have legal protections
Reproductive Rights - 1	Roe v. Wade is a constitutional right
Reproductive Rights - 2	States should decide abortion laws
Reproductive Rights - 3	People should have the right to make their own reproductive decisions
Reproductive Rights - 4	Abortion affects men and women equally
Reproductive Rights - 5	The loss of individual rights means the loss of freedom
School Issues - 1	CRT (critical race theory) should not be taught in schools
School Issues - 2	Local school boards need to be closely monitored
School Issues - 3	Many teachers and professors are politically biased
School Issues - 4	Transgender athletes should be able to compete with their gender of choice
School Issues - 5	The 2nd amendment makes schools less safe

Table 2.

Factor Loadings of the Four-Factor Solution

Item	Factor 1	Factor 2	Factor 3	Factor 4
Economic Issues - 1	**.78**	-.07	-.06	.08
Economic Issues - 2	**.69**	-.07	-.15	.07
Economic Issues - 3	**.85**	.12	.12	-.08
Economic Issues - 4	**.57**	.13	-.17	-.10
Economic Issues - 5	**.75**	.18	.18	-.11
Economic Issues - 6	.03	-.15	**.42**	.06
Election Security – 1	-.11	.03	**.64**	.13
Election Security – 2	.04	-.09	**.83**	.10
Election Security – 3	.02	-.03	**.79**	.13
Election Security – 4	**-.37**	.01	.06	-.03
Election Security - 5	-.21	.02	-.04	**.40**
General Political - 1	-.03	-.07	-.09	**.52**
General Political - 2	.05	-.08	-.24	**.49**
General Political - 3	-.28	.12	.17	**.61**
General Political - 4	.22	.08	.21	**.48**
General Political - 5	**.42**	-.10	.13	.33
LGBT Rights - 1	.02	**.93**	.06	.08

Table 2 cont.

Factor Loadings of the Four-Factor Solution

LGBT Rights - 2	-.30	**-.40**	.09	-.08
LGBT Rights - 3	-.01	**-.93**	-.03	-.07
LGBT Rights - 4	-.06	**-.83**	.01	.07
LGBT Rights - 5	.15	**.63**	-.01	-.04
Reproductive Rights - 1	.24	**.49**	-.14	-.04
Reproductive Rights - 2	-.32	-.31	.24	-.04
Reproductive Rights - 3	.03	**.62**	-.17	.08
Reproductive Rights - 4	-.01	-.14	.15	-.05
Reproductive Rights - 5	-.01	.33	-.05	.24
School Issues - 1	**-.43**	-.22	.07	.16
School Issues - 2	-.07	-.03	.23	**.36**
School Issues - 3	-.25	-.05	.14	**.46**
School Issues - 4	**.51**	.35	.22	-.23
School Issues - 5	**.53**	.07	-.14	-.16

Table 3.

Relationships between Sociodemographic Characteristics, Social Dominance, and Political Beliefs

	Social Dominance		General Political Issues		Women's/LGBTQ+ Rights		Fraud/Power		Bias/Appeal to Emotions	
	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*
Age	-.12	.111	-.21	.001	-.16	.010	.04	.607	.10	.213
Cisgender Woman	-.10	.027	.10	.006	.12	.001	-.01	.894	-.01	.824
Gender Diverse	-.00	.995	.10	.005	.06	.100	-.04	.307	-.05	.240
Christian Religion	.32	< .001	-.24	< .001	-.29	< .001	.24	< .001	.06	.239
World Religion	.06	.172	-.04	.307	-.02	.581	.10	.014	.05	.328
Race (White)	-.05	.277	.03	.427	.01	.792	-.06	.138	-.10	.047
Education	-.15	.001	.05	.235	.07	.076	-.09	.038	-.08	.083
Employment Type										
Full-Time	.05	.675	.06	.548	.11	.251	-.09	.353	.08	.470
Part-Time	-.06	.479	.05	.429	.06	.351	-.06	.426	.05	.543
Retired	.00	.980	.15	.191	.22	.053	-.19	.133	-.04	.791
Student	-.09	.215	.08	.174	.12	.050	-.05	.439	.13	.097
Home Caregiver	.00	.978	.05	.209	.02	.620	.01	.810	.02	.719
Multiple Jobs	-.02	.582	.02	.493	.05	.149	-.03	.463	-.04	.377
Disabled/ Unemployed	.03	.662	.05	.469	.06	.353	-.06	.435	.11	.196
Other	.02	.763	.02	.670	.03	.537	-.02	.754	-.01	.890
Social Dominance			-.54	< .001	-.51	< .001	.50	< .001	.47	< .001

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Effectiveness of Cognitive Hypnotherapy in Mental Diorders: A Systematic Review (2018–2023)

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Hypnotherapy is a growing field within psychology. However, its effectiveness in treating mental health disorders was last reviewed by the Australian Psychological Society (APS) in 2018. This systematic review aimed to evaluate the evidence from 2018 to 2023 and determine the effectiveness of cognitive hypnotherapy. The methodology followed the PRISMA guidelines and the relevant Joanna Briggs Institute critical appraisal tools. A total of six papers were identified as meeting the criteria. Significant symptom reduction was observed in five studies, and cognitive hypnotherapy was reported to be as effective as Cognitive Behavioral Therapy in treating depression. The review suggests that hypnotherapy is a viable treatment option. Despite contrasting results from Rousseaux et al. (2022), the review highlights that tailored, interactive approaches may enhance the benefits of cognitive hypnotherapy. Future research should examine the effectiveness of different hypnotherapy techniques to determine whether certain hypnotherapeutic techniques are associated with different therapeutic outcomes.

Keywords: hypnotherapy; mental health disorders; depression; systematic review, PRISMA

Cognitive hypnotherapy (hereafter referred to as hypnotherapy), an evidence-based technique that uses the state of hypnosis for therapeutic purposes, has gained prominence as an adjunct treatment within psychotherapeutic options for mental health disorders (Alladin & Alibhai, 2010; Schlarb et al., 2017). Hypnosis is a naturally occurring state of concentration accompanied by physical and mental relaxation, similar to a daydream that can be induced by a trained professional when necessary (Vagnoli et al., 2019). Within this definition, and for the purpose of this review, *hypnotherapy* refers to a structured therapeutic intervention that integrates hypnotic techniques. This review does not treat the phenomenological experience of hypnosis as direct evidence of clinical efficacy; rather, hypnosis is conceptualized as a potential mechanism mediating treatment response. In 2018, the Australian Psychological Society (APS) published a systematic review examining the effectiveness of evidence-based psychological interventions for mental health disorders in Australia. Prior to this review, few studies had investigated the effectiveness of hypnotherapy for mental health disorders, and the available evidence demonstrated mixed findings. Some studies also focused on the psychological aspects of specific physical illnesses, such as bowel syndromes and sleep disorders (Gonsalkorale et al., 2004; Schlarb et al., 2017).

Australian Psychological Society (2018) Review

In 2018, a systematic review was released by the APS synthesizing evidence regarding the use of hypnotherapy across different mental health disorders (Australian Psychological Society, 2018). Hypnotherapy was mentioned twice with Level II evidence but with limited and insufficient evidence including findings for Posttraumatic Stress Disorder (PTSD), while stronger evidence was identified for functional abdominal pain and Irritable Bowel Syndrome (IBS) in children (Australian Psychological Society, 2018). Level II evidence refers to "a study of test accuracy with an independent, blinded comparison with a valid reference standard, among consecutive persons with a defined clinical presentation" (Australian Psychological Society, 2018, p. 11). However, the review also highlighted a limitation in its scope, stating that since only evidence subjected to "rigorous" investigation was included, the absence of evidence did not necessarily indicate that an intervention was ineffective (Australian Psychological Society, 2018).

Prior to 2018, evidence supporting hypnotherapy in mental health disorders remained limited. Although the APS (2018) review concluded that evidence was insufficient to establish the effectiveness of hypnotherapy for most mental disorders, this conclusion may reflect both the scarcity of experimental studies and the exclusion of several relevant domains where hypnotherapeutic interventions demonstrated promise. For example, controlled and systematic evidence published prior to 2018 reported beneficial effects of hypnotherapy for functional gastrointestinal disorders and sleep-related conditions, accompanied by improvements in associated psychological symptoms such as anxiety and depressive features. Collectively, these findings suggest that gaps identified in the APS review were driven by evidentiary limitations rather than consistent null effects, thereby providing a rationale for reexamining post-2018 experimental research focused specifically on mental health outcomes.

Given the heterogeneity of study designs, pop-

ulations, and hypnotherapeutic approaches, this review did not test a single confirmatory hypothesis but instead sought to synthesize and evaluate the current empirical evidence regarding clinical effectiveness. As such, the aim of this systematic review is to collate the evidence from 2018 to 2023 and determine the effectiveness of hypnotherapy in mental disorders as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5 (American Psychiatric Association, 2013).

Method

This systematic review was conducted in accordance with the PRISMA 2020 guidelines, the gold standard for systematic reviews within the field of psychology (Page et al., 2021). The review protocol was registered with the Open Science Framework (https://doi.org/10.17605/OSF.IO/CKBP8). Ethical approval was obtained in February 2024 through the University of Technology Sydney (UTS).

Research Design

Figure 1 serves to illustrate the breakdown of the review process and subsequent screening (Page et al., 2020). This systematic review is an extension of the previous APS (2018) paper, which also utilised the PRISMA framework (Page et al., 2021). The APS (2018) paper focused on studies between the years 2010-2017, while this review focused on the years 2018-2023. Another difference was that this review focused on hypnotherapy specifically rather than on all psychological therapies. This is because hypnotherapy demonstrated insufficient evidence for its effectiveness in treating mental disorders in the APS (2018) review. To address this, the present review included new search parameters and excluded systematic reviews and meta-analyses as sources of evidence (Australian Psychological Society, 2018) to enable direct comparison between each study.

Study quality was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools. Two independent reviewers conducted the appraisal, and discrepancies were resolved through discussion (Table 2).

Systematic Review Duration

The systematic review was undertaken from 20/11/2023 to 07/06/2024.

Databases

Databases were selected for their relevance to psychological research and coverage of peer-reviewed literature. Databases searched included PsycINFO, *Frontiers in Psychology*, ProQuest, Taylor & Francis, Springer, SAGE Journals, PubMed Central, and ScienceDirect. The continued relevance of these databases was affirmed through consultations with researchers experienced in systematic review methodology and psychological research, both from within and outside the UTS system. The selection of these databases was deliberate, based on their recognised status as primary sources for psychological publications. The APS (2018) review also utilised comprehensive electronic databases: Cochrane Library, PsycINFO, MEDLINE, Psychology and Behavioural Sciences Collection, SocINDEX and the National Library of Medicine (US). Differences between the databases used in this review and those employed in the APS (2018) review reflect the present review's specific focus on hypnotherapy rather than on evidence-based psychological interventions broadly. Collectively, the inclusion of these databases ensured a comprehensive exploration of the academic field, optimising access to a broad spectrum of academic resources and reinforcing the academic groundwork upon which the research findings are based.

Inclusion Criteria (IC)

The inclusion criteria were partially informed by those used in the APS (2018) systematic review. For example, IC1 and IC3 stemmed from the APS (2018) study. This was to ensure consistency in the quality and types of publications included in this literature review and to facilitate direct comparison of the literature in the APS (2018) review and the current literature. Criteria included within the APS (2018) study but excluded in this review included the use of systematic reviews and meta-analyses as evidence. This literature review excluded these criteria to allow for a direct comparison of the evidence specific to mental health disorders. Before conducting the literature search, the following inclusion criteria were formulated:

IC1. Each paper was required to be peer-reviewed. This was to ensure that the work was rigorous and coherent. Similarly, the APS (2018) review also included peer-reviewed publications.

IC2. The time frame of the literature search was limited to papers published between and \2018-2023, inclusive. This criterion was included because the APS (2018) review included papers that appeared in the literature prior to 2018, and this review serves as an update of modern evidence regarding the effectiveness of hypnotherapy.

IC3. The papers were required to be published in scientific journals, which are publications that contain original articles written by research professionals and evaluated by experts within the same field of study. This is consistent with the APS (2018) review, which only included studies that were published in scientific journals.

Exclusion Criteria (EC)

There were three criteria for exclusion identified, as listed below:

EC1. Publications that were not written in the English language were excluded.

EC2. Publications were excluded if the methodology did not follow an experimental design. Excluded formats included systematic reviews, case studies, meta-analyses, newspaper articles, literature reviews, blog posts, magazine articles, dissertations, committee reports, and narrative reviews. These experimental designs were included in the APS (2018) review methodology.

EC3. Publications that were not relevant to the subject matter of the systematic review were excluded. This means that the papers were required to examine the effectiveness of hypnotherapy in relation to mental health disorders as described in the DSM–5 (American Psychiatric Association, 2013). This was to ensure that the included publications did not expand to every area of hypnotherapy and instead focused specifically on mental health. This excluded articles broadly relating to mental disorders such as pain, IBS, insomnia, fatigue, addictions, positive thinking, and stress.

The IC and EC were applied during the initial screening phase. If there was uncertainty or ambiguity regarding whether an article met the criteria, it was included for further assessment during the full-text screening stage. In cases where an abstract was unavailable, the introduction section was reviewed instead.

Search Words (SW)

The following search words (SWs) were systematically applied across the selected databases:

- SW1: hypnotherapy
- SW2: cognitive hypnotherapy
- SW3: hypnotherapy AND mental disorders
- SW4: hypnosis AND mental disorders
- SW5: cognitive hypnotherapy AND (depression AND/OR anxiety AND/OR PTSD AND/OR phobia)
    - SW5.1: cognitive hypnotherapy AND depression
    - SW5.2: cognitive hypnotherapy AND anxiety
    - SW5.3: cognitive hypnotherapy AND PTSD
    - SW5.4: cognitive hypnotherapy AND phobia

SW1. hypnotherapy

The keyword "hypnotherapy" was utilised, along with filters adhering to the inclusion criteria specifying that selected papers must be peer-reviewed and published between 2018 and 2023. This approach aimed to establish a foundational framework for identifying the relevant literature. This approach resulted in a substantial volume of studies that were not related to the core focus of the review and did not capture key studies specific to mental health.

SW2. cognitive hypnotherapy

This search included the keyword "cognitive hypnotherapy", which in the literature is sometimes used to refer to hypnotherapy from a cognitive perspective (Alladin & Alibhai, 2010). This search did reduce the search to hypnotherapy that was associated with clinical settings.

SW3. hypnotherapy AND mental disorders

The AND in this search referred to the subject headings and titles of the articles containing both the words "hypnotherapy" and "mental disorders."

SW4. hypnosis AND mental disorders

Another commonly used terminology for hypnotherapy is "hypnosis", which is a common technique utilised uniquely in hypnotherapy (Rousseaux et al., 2022).

SW5. cognitive hypnotherapy AND (depression AND/OR Anxiety AND/OR PTSD AND/OR Phobia)

The utilised SWs identified the principal disorders commonly linked with hypnotherapy. Although all studies featuring one or more of these disorders were included, each association is addressed separately below (SW5.1-5.4).

SW5.1. cognitive hypnotherapy AND depression

Previous searches were based on broad mental health disorders and hypnotherapy. These searches displayed various types of mental disorders, of which depression was a prominent one (Ersan, 2020). Hence, this keyword combination identified articles that were relevant to only depression to filter the results.

SW5.2. cognitive hypnotherapy AND anxiety

Like the depression search, this search produced a

limited number of articles that were relevant to anxiety and hypnotherapy. Anxiety treated by hypnotherapy was also common in the literature (Golden, 2012).

SW5.3. cognitive hypnotherapy AND PTSD

PTSD was also prevalent within the hypnotherapy databases (Abramowitz et al., 2008). For example, Abramowitz et al. (2008) found decreases in intrusion and avoidance reactions, as well as improvement in all assessed sleep variables, in the hypnotherapy group. This SW was used to identify specific articles relating to PTSD and hypnotherapy. The acronym PTSD was searched instead of the full term as the disorder was commonly referred to by its acronym in the literature.

SW5.4. cognitive hypnotherapy AND phobia

Phobias were another mental disorder that were included due to their prevalence in the literature, such as the study by Lupu et al. (2019), which conducted a case study on treating flight phobia with virtual reality and hypnotherapy techniques. Hence, this SW was utilised to identify publications relating to phobia and hypnotherapy.

Search String Used

To identify relevant studies, the following search string was constructed from the above SW and applied across multiple academic databases:

("hypnotherapy" OR "cognitive hypnotherapy" OR "hypnosis") AND ("mental disorders" OR "depression" OR "anxiety" OR "PTSD" OR "phobia")

Identification and Selection of Relevant Research (Exclusion Criteria)

After reviewing the full text of the 17 articles, 11 were removed based on the exclusion criteria. A summary of the exclusion justifications is illustrated in Table 1. Only the primary reason for exclusion was specified in the following summaries; however, it is important to highlight that some articles could have been excluded based on multiple criteria.

Considering that hypnotherapy is still a growing field, it is understandable that there are only six articles that fit the inclusion and exclusion criteria. This was an increase from the three articles in the APS (2018) review. However, due to the small number and the diverse outcomes, a meta-analysis of the results was not appropriate, instead a narrative review of the methodology and findings of each paper, alongside a thematic analysis was conducted. This followed the procedure utilised by Rutten et al. (2013) in their literature review where the studies were not statistically combined due to diverse outcome measures.

Results

Six studies met the criteria established for this review. Their findings are summarised below and within Table 3. Due to heterogeneity in study designs, outcome measures, and interventions, findings were synthesised narratively and thematically.

Fuhr et al. (2023): Hypnotherapy for Agoraphobia

Fuhr et al. (2023) compared hypnotherapy (HT) with control waitlist (WL) conditions within a 2 x 2 mixed design study. Assessments were conducted using the Panic and Agoraphobia Scale (PAS) at baseline and post-treatment (Fuhr et al., 2023). Thirty-six patients (mean age = 42 yrs; majority female) were randomly assigned to receive 8-12 HT sessions or WL allocation. Both groups demonstrated symptom reduction, with greater reductions observed in the hypnotherapy group (Fuhr et al., 2023). The non-significant outcome was identified in the pre-protocol analysis, where WL did not differ from HT (Fuhr et al., 2023). Secondary analyses confirmed significant symptom decreases in the HT group compared to WL (Fuhr et al., 2023).

Khazraee et al. (2023): Effectiveness of Hypnotherapy on Depression in Women

Khazraee et al. (2023) implemented a single-blind, randomised controlled trial, comprising of 31 participants (16 in the hypnotherapy intervention group, 15 in control group) to examine mindful hypnotherapy for treating major depressive disorder in female adults in Iran (Khazraee et al., 2023). The intervention consisted of eight weekly sessions of mindful hypnotherapy, focusing on components such as present-moment awareness, self-compassion, and mindfulness (Khazraee et al., 2023). Both groups demonstrated symptom reduction, with greater reductions observed in the hypnotherapy group (Khazraee et al., 2023).

Results demonstrated a significant reduction in depression in the intervention group post-intervention and at the two-month follow-up (Khazraee et al., 2023). Self-compassion scores, including positive subscales (self-kindness, common humanity, and mindfulness), improved significantly in the intervention group post-intervention and at follow-up (Khazraee et al., 2023). Negative subscales (self-judgment, isolation, and overidentification) decreased significantly post-in-

tervention and at follow-up (Khazraee et al., 2023). Psychological inflexibility also significantly decreased in the intervention group post-intervention and at the two-month follow-up (Khazraee et al., 2023).

Haipt et al. (2022): Hypnotherapy vs Cognitive Behaviour Therapy in Depression

Haipt et al. (2022) compared CBT and HT to treat mild to moderate depressive episodes (Haipt et al., 2022). Seventy-five participants (56 females and 19 males, aged 18–69 years) completed pre- and post-therapy Near-Infrared Spectroscopy (NIRS) measurements and an emotional gait paradigm. Participants judged the emotion portrayed by walking avatars while NIRS data, reaction time, and errors were recorded (Haipt et al., 2022). Functional Connectivity between the Superior Temporal Sulcus and Extrastriate Body Area regions was calculated (Haipt et al., 2022). Changes in functional connectivity and behavioural outcomes were analysed using regression models (Haipt et al., 2022). Results showed significant changes in brain activation and emotional processing in both groups, with HT demonstrating comparable efficacy to CBT. Rumination and treatment group were associated with changes in functional connectivity.

Brooker (2018): Music Performance Anxiety in Cognitive Hypnotherapy vs. EMDR

Brooker (2018) compared the efficacy of Cognitive Hypnotherapy and Eye Movement Desensitisation and Reprocessing (EMDR) in treating 46 pianists exhibiting music performance anxiety (Brooker, 2018). The research utilised a multi-modal repeated-measure design, combining quantitative data from standardised assessments with qualitative information on subjective cognitive anxiety (Brooker, 2018). Cognitive anxiety was assessed using the State-Trait Anxiety Inventory, while performance quality was measured pre- and post-intervention (Brooker, 2018). Additionally, a self-report questionnaire allowed for the assessment of anxiety through idiographic reports of each performance experience (Brooker, 2018). Cognitive hypnotherapy and EMDR significantly reduced anxiety, compared to the control group, with EMDR showing greater effectiveness in reducing self-perceived anxiety. Performance quality also improved across both treatment groups.

Rousseaux et al. (2022): Hypnosis and Virtual Reality for Anxiety

Rousseaux et al. (2022) examined the impact of hypnosis, virtual reality, and Virtual Reality Hypnosis (VRH) on self-assessed anxiety, pain, fatigue, and relaxation states in cardiac surgery patients (Rousseaux et al., 2022). Forty-eight participants were allocated to either intervention groups or standard care. Interventions included standard care plus a 20-minute prerecorded hypnosis session, a virtual reality session using a head-mounted display with goggles, or a combination of both (Rousseaux et al., 2022). Assessments were conducted before and after each session (Rousseaux et al., 2022). No significant differences were observed between groups (Rousseaux et al., 2022). Anxiety levels decreased over time in all groups, with patients in the hypnosis group reporting more anxiety than those in the VRH group (Rousseaux et al., 2022).

Fuhr et al. (2021): Hypnotherapy vs CBT in Major Depression

Fuhr et al. (2021) employed a rater-blind randomised controlled trial (RCT) to compare hypnotherapy and cognitive behavioural therapy (CBT) for mild to moderate depression in 153 patients. Montgomery–Åsberg Depression Rating Scale (MADRS) outcomes were measured pre-treatment, post-treatment, and at six- and twelve-months post-treatment (Fuhr et al., 2021).

Hypnotherapy was found to be non-inferior to CBT in reducing depressive symptoms at post-treatment and follow-up (Fuhr et al., 2021). In the secondary outcomes, both treatments showed comparable efficacy in terms of symptom reduction, response rate, and remission rate (Fuhr et al., 2021). A slightly higher proportion of patients achieved a 50% reduction in MADRS scores in the hypnotherapy group compared to the CBT group (Fuhr et al., 2021). Remission rates were slightly higher in the hypnotherapy group, although the differences were not significant (Fuhr et al., 2021).

Discussion

The findings of this systematic review largely support the effectiveness of hypnotherapy for mental health disorders, with five of the six included studies reporting significant improvements in clinical outcomes. Rousseaux et al. (2022) presented contrasting results, with no significant differences observed among the four groups (recorded hypnosis, VR, VRH, and control) for any measured variables, including anxiety, pain, fatigue, and relaxation.

Most studies employ randomised controlled trial designs to ensure the validity and reliability of their findings. A variety of psychological assessment tools were used across the studies to measure outcomes. Commonly used tools include the Panic and Agoraphobia Scale (PAS), Beck Depression Inventory-II, Montgomery–Åsberg Depression Rating Scale (MADRS), and State-Trait Anxiety Inventory. Follow-up assessments were a common feature, with evaluations conducted several months post-treatment to determine the longevity of therapeutic effects. For instance, Fuhr et al. (2023) and Khazraee et al. (2023) included follow-up assessments to track symptom changes over time. The studies often involved diverse participant demographics, but there was a notable emphasis on adult populations with specific conditions. Khazraee et al. (2023) focused on women with major depressive disorder, and Brooker (2018) included advanced pianists with performance anxiety. Many studies compared HT with other therapeutic approaches or control conditions. Fuhr et al. (2021) and Haipt et al. (2022) compared hypnotherapy with CBT, while Brooker (2018) compared hypnotherapy with EMDR.

The contrasting findings of Rousseaux et al. (2022) can be interpreted through several key considerations. The study noted that anxiety and pain levels were initially low to moderate, suggesting that the standard medical treatment provided to all patients might have been sufficient to manage these symptoms. In contrast, other studies reviewed often involved patients with higher baseline levels of distress or pain, where the additional intervention of hypnotherapy may have had a more pronounced effect. The methodological differences between the studies might account for the varied outcomes. Rousseaux et al. (2022) employed a design that did not allow for clinician interactions with the patients, which may have limited the degree of therapeutic engagement compared with clinician-guided hypnotherapeutic interventions. Other studies, such as those by Fuhr et al. (2023) and Khazraee et al. (2023), utilised interactive and engaging therapeutic protocols, which might have contributed to their positive findings. Haipt et al. (2022) included active therapist involvement in the intervention, creating hypnotherapy sessions which were more personalised and interactive. Furthermore, the timing and context of the intervention in Rousseaux et al. (2022) study involved a high-stress, immediate postoperative ICU setting, where factors such as extreme fatigue and deep sedation may have limited the patient's ability to engage with or benefit from hypnotherapy and VR interventions. In contrast, other studies were conducted in less acute settings, allowing patients to be more responsive to the interventions.

Previous studies have highlighted hypnotherapy's role in enhancing cognitive-behavioural interventions, managing pain, and reducing symptoms of anxiety and depression. Most studies in this review supported these claims, demonstrating hypnotherapy's potential across different populations and settings. The integration of hypnotherapy with other therapeutic techniques underscores the prospective flexibility and potential broad applicability of hypnotherapy in clinical practice.

However, in contrast to other previous studies, the APS review found insufficient evidence to support the efficacy of hypnotherapy for PTSD, a conclusion supported by the Australian Centre for Posttraumatic Mental Health (2013), which reported inadequate evidence of hypnotherapy's effectiveness over waitlist control for treating PTSD in adults. Conversely, Rotaru and Rusu (2016) presented a meta-analysis indicating a positive impact of hypnotherapy on reducing PTSD symptoms, especially with specific hypnotherapeutic approaches such as ego state therapy. This mixed evidence highlights the complexity of hypnotherapy's role in treating PTSD, requiring further research to substantiate its effectiveness. Fuhr et al. (2023), Khazraee et al. (2023), and Haipt et al. (2022) provided evidence supporting hypnotherapy's efficacy for agoraphobia, depression, and functional connectivity improvements in depressive patients. Fuhr et al. (2021) found hypnotherapy to be non-inferior to CBT for major depression, with both treatments showing comparable efficacy in symptom reduction and remission rates. These findings suggest that hypnotherapy can be a viable treatment alternative for depression-related disorders, contrasting with the limited evidence for PTSD.

The APS review supported hypnotherapy for functional abdominal pain and IBS in children, with Rutten et al. (2013) reporting significant reductions in pain and treatment success rates post-treatment and at follow-up. These studies collectively highlight hypnotherapy's potential in treating both psychological and somatic symptoms, demonstrating its versatility across various conditions. The studies by Fuhr et al. (2023), Khazraee et al. (2023), and Haipt et al.

(2022) provide more recent evidence supporting hypnotherapy's efficacy for mental health disorders, indicating a progression in research outcomes over time.

Methodological Limitations and Improvements

While the five reviewed studies provide evidence that hypnotherapy is effective for treating mental health disorders, several methodological limitations must be acknowledged. Many studies had small sample sizes, limiting the generalisability of the findings. Including larger and more diverse populations could enhance external validity. The duration of follow-up varied across studies, with some only assessing short-term outcomes. Longitudinal studies are needed to assess the sustained effects of hypnotherapy. The control conditions also varied, with some studies using waitlists or alternative therapies such as CBT and EMDR. Standardising comparison groups would facilitate more consistent assessments of hypnotherapy efficacy. Furthermore, due to the heterogeneity of study designs and control conditions, the review could not weight studies by methodological rigour. As such, the convergence observed across findings reflects qualitative consistency rather than quantitative equivalence. In addition, because the studies varied widely in methodology and theoretical grounding, a unified mechanistic mapping was not feasible within the scope of this review. Future reviews should include greater emphasis on the mapping of findings onto underlying psychological and cognitive mechanisms to clarify how and for whom hypnotherapy is most effective.

In Rousseaux et al.'s (2022) study, high dropout rates due to the inability to participate post-surgery because of fatigue and sedation limited the study's power and generalisability. The study's standardised approach did not allow adaptation to individual patient needs, which is an important aspect of effective therapy (Rousseaux et al., 2022). The use of passive VR without user interaction might have reduced the potential benefits of VR, as active engagement is known to enhance immersion and therapeutic outcomes (Rousseaux et al., 2022). As noted by the authors, this study could be improved by incorporating more interactive VR environments with a therapist and considering individual patient needs (Rousseaux et al., 2022).

Future Directions and Clinical Significance

Previous studies, such as Rotaru & Rusu (2016), found differences in the level of effectiveness of different types of hypnotherapies. Differences in outcomes across studies may partly reflect variation in hypnotherapeutic techniques, including the use of clinician-guided cognitive hypnotherapy, mindful hypnotherapy, and prerecorded or technology-mediated hypnosis. This could explain the varied results regarding effectiveness identified in the original APS (2018) study. Future research could examine comparative effectiveness within hypnotherapy to identify whether significant variation exists and why such variation occurs. Furthermore, previous studies focused on hypnotherapy combined with EMDR or CBT. Examining the combined effects of hypnotherapy with other therapeutic modalities might reveal other benefits, thereby enhancing overall treatment outcomes. For instance, combining hypnotherapy with dialectical behaviour therapy or psychodynamic therapy could provide comprehensive treatment approaches.

The applied significance of this research lies in its potential to diversify treatment options for mental health practitioners (Lupu et al., 2019). Integrating hypnotherapy into standard practice could offer patients additional pathways to recovery, particularly for those who do not respond well to conventional treatments.

Conclusions

The evidence collected from these studies suggests that hypnotherapy may be a viable treatment option for certain mental health disorders, including anxiety, depression, PTSD, and phobias. Hypnotherapy showed comparable efficacy to established treatments such as CBT and EMDR, particularly in reducing symptoms of anxiety and depression. These findings underscore the potential of hypnotherapy to be integrated into therapeutic practices for mental health care. However, its efficacy may be influenced by factors such as the patients' baseline symptom levels, the type of hypnotherapy technique, and the therapeutic context. The contrasting findings of Rousseaux et al. (2022) highlight the need for tailored, interactive approaches and consideration of patient-specific factors to optimise the benefits of hypnotherapy. It should be noted, however, that the findings remain limited by methodological variability and inconsistency of treatment protocols. Greater standardisation of hypnotherapeutic procedures is essential for establishing replicable and clinically applicable outcomes. This review supports the continued exploration and utilisation of hypnotherapy in mental health care, advocating for its

inclusion as a complementary therapeutic approach.

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Table 1.

Summary of Excluded Studies

Exclusion Criteria (EC)	No. of Excluded Articles	Reason for Exclusion
Non-English Language	2	One paper was in German and one paper was in Turkish.
Non-Experimental Design	4	Two meta-analyses, one review article, and one case study.
Irrelevant Subject Matter	5	Focused on topics not relevant to hypnotherapy and mental health disorders, including pain, irritable bowel syndrome, insomnia and sleep disorders, fatigue, addictions, positive thinking, and stress.

Table 2.

Summary of JBI Quality Analyses

Study Author and Consensus	Internal Validity	Assessment Bias	Bias Related to Participant Retention	Statistical Validity	Statistical Analyses Used	Trial Design
Rousseaux et al. (2022)	Randomisation in blocks of five patients, but details were not specified.	Assessors were aware of treatment assignments.	Follow-up details were not adequately described. 30 participants had dropped out.	Participants were analysed in groups as randomised.	Repeated measures ANOVA.	Single-blind, randomised controlled trial.
Consensus	Yes	No	No	Yes	Yes	Yes
Brooker (2018)	Participants were randomised into three groups.	Participants were likely aware of the assignment due to self-reports.	Follow-up was not detailed; dropout rates were unclear	Groups were analysed as randomised.	ANCOVA, paired sample *t*-tests, and pairwise comparisons.	Multimodal repeated measure design and randomised sample.
Consensus	Yes	No	No	Yes	Yes	Yes
Fuhr et al. (2021)	Randomisation to hypnotherapy or CBT using nQuery 7.0.	Participants were blind until therapy started.	Follow-up was incomplete, and differences in retention were not analysed.	Analysed as randomised.	Linear regression.	Single-factor design with repeated measures and randomised participants.
Consensus	Yes	Yes	No	Yes	Yes	Yes

Table 2 cont.

Summary of JBI Quality Analyses

Haipt et al. (2022)	Participants were randomly assigned to CBT or hypnotherapy groups. Method was not specified.	Self-assessment-based, creating potential bias.	Dropout details were not fully described.	Participants were analysed in their assigned groups.	Linear regression and two-tailed *t*-tests.	Randomised controlled trial.
Fuhr et al. (2023)	Up to 50 patients were block-randomised using nQuery 7.0.	Outcome assessors were not blinded.	No dropout analysis.	Groups were analysed according to randomisation.	Non-parametric Mann–Whitney *U* tests, repeated measures ANOVA.	2 × 2 mixed-design study with the factor time and treatment condition.
Consensus	Yes	No	No	Yes	Yes	Yes
Khazraee et al. (2023)	Randomisation was conducted via an SPSS number generator and sealed envelopes.	Self-assessment-based; assessors were aware of treatment.	Follow-up details were vague, and there was no dropout analysis.	Analysed as randomised groups.	ANCOVA and repeated measures ANOVA.	Single-blind, randomised controlled trial.
Consensus	Yes	No	No	Yes	Yes	Yes

Note. JBI = Joanna Briggs Institute; CBT = Cognitive Behavioral Therapy; HT = Hypnotherapy.

Table 3.

Summary Table of Articles on Hypnotherapy

Study	Methodology	Sample	Intervention	Outcome Measures	Key Findings
Fuhr et al. (2023)	2 × 2 mixed-designs with time (pre- and post-) and treatment condition (HT vs. WL); assessments conducted 3 months post-treatment	36 patients (mean age = 42.03 years; mostly female)	HT: 8-12 sessions over 3 months; WL: control waitlist	Panic and Agoraphobia Scale (PAS), symptom reduction percentage	Significant symptom reduction in HT compared to WL; non-significant pre-protocol analysis; substantial improvements for both groups
Khazraee et al. (2023)	Single-blind, randomised controlled trial with assessments at baseline, post-intervention, and 2-month follow-up	31 participants (16 HT, 15 control)	8 weekly sessions of mindful hypnotherapy	Beck Depression Inventory-II, Self-Compassion Scale-Short Form, Acceptance and Commitment Questionnaire–II	Significant reduction in depression post-intervention and follow-up in HT group; significant changes in self-compassion and psychological flexibility
Haipt et al. (2022)	Randomised trial with pre- and post-therapy NIRS measurements and emotional gait paradigm assessment	75 participants (56 female, 19 male)	Randomised to CBT or HT	Functional Connectivity (FC) between STS and EBA regions, reaction time, errors	Significant changes in FC and behavioural data; significant predictors of change in FC included pre-FC, rumination, and therapy group
Brooker (2018)	Multimodal repeated-measures design with quantitative and qualitative data collection	46 advanced pianists	CH and EMDR	State-Trait Anxiety Inventory, self-report questionnaire, performance assessment criteria	Significant decrease in anxiety for both CH and EMDR groups compared to the control; EMDR was more effective in reducing self-perceived anxiety
Rousseaux et al. (2022)	Randomised trial with standard care plus interventions (hypnosis, VR, or	48 cardiac surgery patients	20-minute prerecorded hypnosis session, VR	Self-assessed anxiety, pain, fatigue, relaxation states,	No significant differences between groups; anxiety levels decreased over

Table 3 cont.

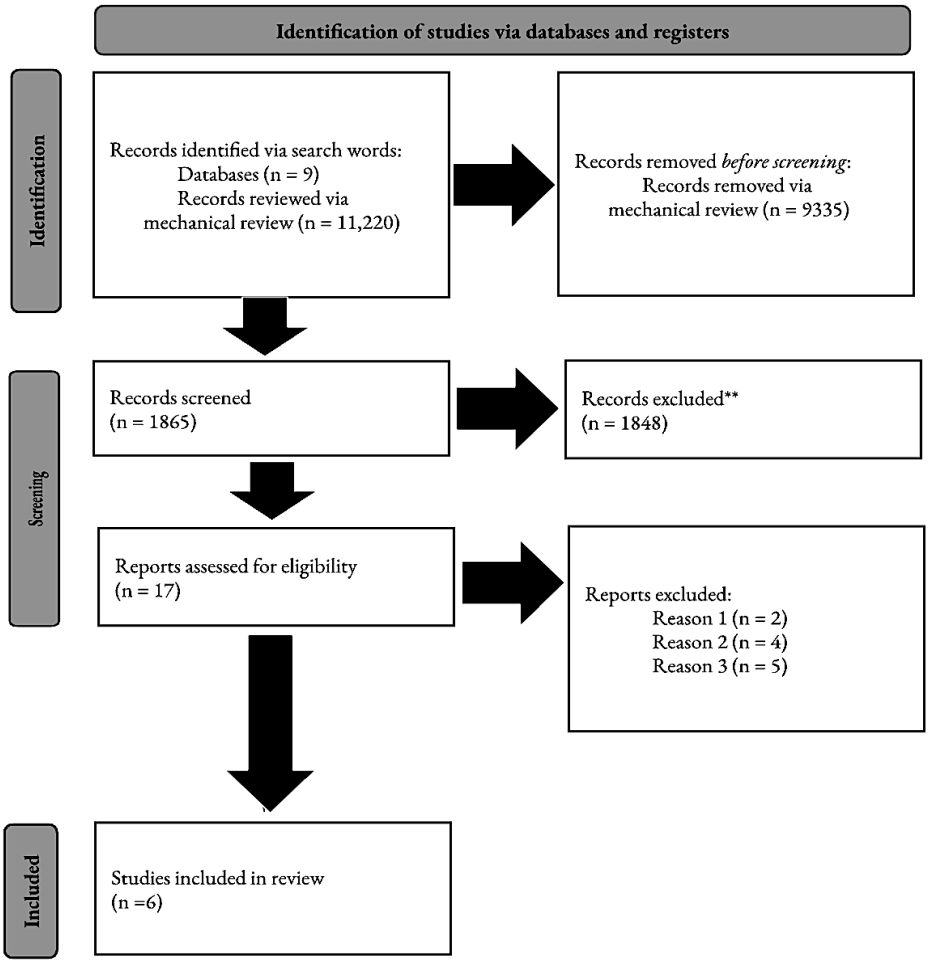
Summary Table of Articles on Hypnotherapy

Category - Item	Statement
Economic Issues - 1	The wealth inequality gap is widening
Economic Issues - 2	The wealthy should pay their fair share of taxes
Economic Issues - 3	Free health care is a right
Economic Issues - 4	Green energy will help the economy
Economic Issues - 5	Poor people should be given financial support from the government
Economic Issues - 6	The president is responsible for the economy
Election Security – 1	Voter fraud is an important issue
Election Security – 2	The most recent presidential election was rigged
Election Security – 3	A so-called "dark state" controls elections in the U.S.
Election Security – 4	Gerrymandering is not a problem
Election Security - 5	Both parties try to win elections at all costs
General Political - 1	All politicians are dishonest
General Political - 2	Politicians use fear to motivate people
General Political - 3	The media is biased
General Political - 4	I feel angry when I watch the news

Note. HT = Hypnotherapy; WL = Waitlist; CBT = Cognitive Behavioral Therapy; MDD = Major Depressive Disorder; CH = Cognitive Hypnotherapy; EMDR = Eye Movement Desensitisation and Reprocessing; VR = Virtual Reality; VRH = Virtual Reality Hypnosis; NIRS = Near-Infrared Spectroscopy; STS = Superior Temporal Sulcus; EBA = Extrastriate Body Area; FC = Functional Connectivity; MADRS = Montgomery–Åsberg Depression Rating Scale.

Figure 1.

Modified PRISMA Model Flow Diagram (Page et al. 2020)



Note. Adapted from Page et al. (2020).

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