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Research paper

Perceived control and long-term depression and anxiety: An 18-year longitudinal mediation study of coping

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ABSTRACT

Background: Perceived control over daily stressors is a key aspect of adaptive functioning and is closely linked to the development and maintenance of major depressive disorder (MDD) and generalized anxiety disorder (GAD). Different coping patterns may serve as proxy mechanisms underlying this relationship. The present study examined the longitudinal mediating role of coping strategies in the association between perceived control and MDD and GAD severity 18 years later.

Method: We analyzed three-wave data from 3294 participants in the Midlife Development in the United States (MIDUS) study, with waves spaced approximately nine years apart. Longitudinal structural equation modeling examined whether T2 coping strategies–approach coping and avoidance coping–mediated the relationship between T1 perceived control (mastery and constraints) and T3 MDD and GAD symptoms. Each model controlled for baseline symptoms of the disorder severity outcome.

Results: Avoidance coping, but not approach coping, significantly mediated the association between constraint and MDD severity ($d = 0.042$; mediated effect = 29.88%). Neither approach nor avoidance coping mediated the mastery → MDD severity pathway. For GAD symptoms, both approach and avoidance coping mediated the constraint → GAD severity pathway ($d = 0.014$–0.057; mediated effect = 10.75–42.29%). Approach coping fully mediated the mastery → GAD severity pathway ($d = -0.019$), whereas avoidance coping did not.

Conclusion: Perceived constraints contribute to MDD and GAD symptoms primarily via avoidance coping, whereas approach coping specifically links both constraints and mastery to GAD symptoms. These disorder-specific patterns highlight the importance of tailoring prevention strategies for MDD and GAD.

1. Introduction

Accounting for 9% of all diseases and 63% of mental illness, depressive disorders, and anxiety disorders are the major mental health challenges globally and impose heavy public health burden (Zhang et al., 2026). The global lifetime prevalence is estimated at 10.8% for major depressive disorder (MDD; Lim et al., 2018) and 3.7% for generalized anxiety disorder (GAD; Ruscio et al., 2017). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013), MDD is primarily characterized by persistent depressed mood, loss of interest in most activities, hopelessness, and suicidal thoughts. Core symptoms of GAD include excessive and uncontrollable worry with somatic symptoms, such as muscle tension. MDD and GAD have demonstrated high comorbidity with four symptoms shared in their diagnostic criteria, including sleep disturbances, fatigue, difficulty concentrating, and psychomotor disturbances (Saha et al., 2021). They also have shared genetic and environmental risk factors (Morneau-Vaillancourt et al., 2025; Patterson et al., 2018) and could increase each other's risk (Barber et al., 2023; Jacobson and Newman, 2017). Both MDD and GAD symptoms are associated with poor physical health, impaired daily functioning, and lower quality of life (Zhou et al., 2017). Given how MDD and GAD symptoms correlate with biopsychosocial impairments, identifying their risk and protective factors could support targeted prevention strategies.

As a general psychological vulnerability (Barlow, 2000), lower perceived control has been established as a distal risk factor of MDD and GAD symptoms (Shin and Park, 2024). Perceived control is defined as the belief in one's ability to obtain desired outcomes (Skinner, 1996; Thompson, 2020). Lachman and Weaver (1998) further conceptualized it as comprising *mastery*, defined as one's sense of effectiveness in managing challenges and achieving goals. Perceived control could also

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involve *constraints*, reflecting perceptions of external obstacles that block goal pursuit. According to self-determination theory, autonomy, competence, and relatedness constitute basic psychological needs to promote resilience and well-being (Deci and Ryan, 2013). Within this framework, greater mastery reflects more competence and autonomy, i.e., the feeling of being capable when interacting with the environment. Simultaneously, constraints thwart both competence and autonomy by limiting effective action and undermining volitional acts (Ryan and Deci, 2017). Sustained constraints and lower mastery undermine internal motivational and self-regulatory systems, promote maladaptive habits, and increase physiological stress reactivity (Vansteenkiste and Ryan, 2013; Wen and Sin, 2022). Together, these cumulative biobehavioral dysregulations might consolidate into enduring patterns of worry and helplessness, constituting a transdiagnostic risk factor for symptoms of MDD and GAD.

Consistent with these theories, there has been consistent evidence that lower mastery and higher constraints were associated with lower life satisfaction and greater internalizing problems across diverse populations (Biggs et al., 2017; Gallagher et al., 2014; Jose and Weir, 2013). Conversely, greater perceived control might prevent the translation from stress to emotional disorders (Gallagher et al., 2014), especially in GAD (Brown and Naragon-Gainey, 2013). The protective role of perceived control could stem from its ability to motivate individuals to act in stressful situations, facilitating active coping and solution-seeking. For example, people with higher perceived control are more likely to identify the cause of a problem and take action to solve it, whereas those with low control tend to cope by avoiding the problem (Ross and Mirowsky, 1989). Additionally, perceived control might enable individuals to prepare for upcoming stressors, thus helping to prevent the situation from becoming overwhelming (Miller, 1979). Overall, it has been well established that lower perceived control precedes and predicts MDD and GAD symptoms, but the mechanism by which mastery and constraints transmit this effect remains open to inquiry.

According to the transactional model of stress and coping, perceived control, conceptualized as a component of cognitive appraisal, precedes and guides the selection of coping strategies, which, in turn, influences stress experiences and psychological outcomes (Lazarus and Folkman, 1984). This temporal sequence posits coping as the key mechanism through which situational control affects emotional health. Specifically, individuals who appraise a situation as controllable and changeable are more likely to engage in problem-focused coping (PFC), addressing the problem directly through active actions. In contrast, appraising a situation as threatening and uncontrollable tends to involve emotion-focused coping (EFC), which focuses on managing emotional responses (Biggs et al., 2017; Carver et al., 1989). PFC was generally associated with lower mental distress and greater well-being (Cho and Choi, 2024; Leslie-Miller et al., 2025; Person and Frazier, 2024). However, this umbrella definition of EFC conflated functionally incompatible adaptive and maladaptive strategies, thereby complicating the interpretation of its relationship with mental health outcomes (Guadalupe and DeShong, 2025; Skinner et al., 2003; Stanisławski, 2019). EFC is also complex, encompassing both approach and avoidance dimensions (Ben-Zur, 2009). For example, adaptive EFC strategies (e.g., emotional approach coping, seeking support) were generally linked to better emotional adjustment (Hoyt et al., 2024; Ragan et al., 2016), whereas maladaptive strategies (e.g., venting, avoidance) were associated with greater emotional distress (Marr et al., 2022; Mayordomo et al., 2016). Such heterogeneity in EFC operationalization likely contributed to the inconsistent empirical findings in the literature (Folkman and Lazarus, 1988b; Guadalupe and DeShong, 2025). Instead, an alternative framework that distinguishes between approach and avoidance coping (also termed engagement vs. disengagement coping; see Sun et al., 2023, for a discussion of this distinction) better captures functional effectiveness across coping styles and helps resolve conceptual and measurement heterogeneity (Roth and Cohen, 1986). Approach coping involves actively addressing stressors and emotions, including both problem-focused efforts and adaptive emotion regulation strategies, such as planning, positive reinterpretation, and growth (Stanisławski, 2019). Although positive reinterpretation and growth have been typically classified as emotion-focused (Carver et al., 1989; Folkman and Lazarus, 1988a), we conceptualized them as approach coping because they involve actively and effortfully confronting the stressor by finding positive meaning (Pickens et al., 2019; Stanisławski, 2019). In contrast, avoidance coping consists of avoiding the stressor and its associated emotions, such as denial, behavioral disengagement, and venting (Baumstarck et al., 2017; Kasi et al., 2012). Approach coping was correlated with greater perceived control, whereas avoidance coping was associated with lower perceived control (Crowe and Sarma, 2022; Dijkstra and Homan, 2016).

However, evidence for the coping framework and mental outcomes has been mixed. Although most studies acknowledged the effectiveness of approach coping in managing stress and its link with lower levels of emotional distress (Austenfeld and Stanton, 2004; Chaaya et al., 2025; Taylor and Stanton, 2007), some studies reported its limited effects in samples involving individuals with specific physical illnesses and their caregivers (Fang et al., 2006; Hinch and Sirois, 2024; Muñoz-Cruz et al., 2024). Regarding avoidance coping, it largely overlaps with dysfunctional coping strategies in the COPE framework (Carver et al., 1989) and has been consistently reported to be associated with poorer psychological outcomes (Kit, 2025; Orgeta and Orrell, 2014; Woodhead et al., 2014). Despite this, self-distraction, a form of avoidance coping, has been associated with short-term reductions in stress for patients and caregivers (Waugh et al., 2021). Even avoidance and venting can temporarily regulate anxious emotions and reduce internalizing symptoms when perceived low support is present (Trần et al., 2023). The strategy-situation fit hypothesis (Cheng et al., 2014) offers a valuable integrative perspective, proposing that the effectiveness of a coping approach is contingent on the degree to which it aligns well with the controllability of a stressor. Specifically, approach coping and taking direct action can be more adaptive in controllable situations, whereas some types of avoidance can exert short-term emotional relief in comparatively uncontrollable contexts (Roth and Cohen, 1986). However, as the current study focused on long-term outcomes, the design precluded direct tests of short-term strategy-situation fit consequences. Instead, we evaluated how perceived control was longitudinally linked to future MDD and GAD symptoms via the choice of unique coping approaches. Relatedly, the inconsistency in the literature on avoidance and approach coping may reflect a lack of integrated examination of these relationships. Previous studies have typically tested only the direct association between coping and emotional outcomes, or between coping and control beliefs, without explicitly considering how perceived control shapes mental health through the mediating role of coping, as proposed by the transactional model and the strategy–situation fit hypothesis. Drawing on these theories, a mediation framework could help extend the studies by examining whether control beliefs influence MDD and GAD symptoms through the selection of specific coping strategies and whether these coping patterns are longitudinally associated with maladaptive outcomes. Together, although central to the theories, approach and avoidance coping as mediators (proxy mechanisms) of the pathway from perceived control to later MDD and GAD symptoms remain underexplored.

Despite increasing research on investigating the links among perceived control, coping, and psychopathological outcomes, several gaps remain that the present study seeks to address. First, no existing studies have directly examined whether approach and avoidance coping strategies mediate the prospective links between perceived control and MDD and GAD severity, leaving the underlying mechanisms open to inquiry, despite longstanding theories supporting such pathways. Second, most relevant research relied on cross-sectional designs, which cannot establish temporal precedence, and cross-sectional mediation analyses have been shown to produce biased estimates (Maxwell and Cole, 2007; Maxwell et al., 2011). The present three-wave study

alleviated this concern. Third, although research showed different effects of mastery and constraints on psychological outcomes (Hamm et al., 2025; Infurna and Mayer, 2015; Toyama and Hektner, 2023), past research continues to conceptualize perceived control as a unidimensional construct. This lack of differentiation could obscure distinct pathways through which each facet impacts psychopathology and limits the development of targeted treatments. Finally, most evidence on this topic has been collected from adolescents (Compas et al., 2010; Hampel and Petermann, 2006; Oğul and Gençöz, 2003) and older adults (Infurna and Mayer, 2015; Robinson and Lachman, 2017; Toyama and Hektner, 2023), creating a critical gap in understanding how these mechanisms operate during midlife. Evidence showed that midlife could be marked by greater stress, with occupational and caregiving burdens particularly pronounced (Gomez-Bernal et al., 2019). Daily stressors and chronic stress during this period predicted later-life physical and mental health problems (Sabik et al., 2025; Wickrama et al., 2021). Research also showed that perceived control remains relatively stable in midlife, in contrast to the declines observed in younger and older adults (Cerino et al., 2024). Longitudinal evidence indicated age-specific patterns in coping strategies, with reduced use of emotional focus and venting during midlife compared with younger adulthood. In addition, positive reappraisal declined more steeply during midlife, whereas other strategies (e.g., denial, disengagement, and venting) showed more pronounced declines in older adulthood (Kurth et al., 2025). Findings highlighted the value of examining how these processes operate specifically in midlife, a period in which control is relatively stable but specific coping strategies change.

Based on the theories, research, and logic outlined, we aimed to test how approach and avoidance coping strategies mediated the effects of trait-level mastery and constraints on MDD and GAD severity after 18 years among middle-aged adults. Specifically, we hypothesized that higher mastery and lower constraints promote greater use of approach coping and less reliance on avoidance coping, which, in turn, are associated with lower MDD and GAD severity. Conversely, lower mastery and higher constraints are expected to facilitate less approach coping and more avoidance coping, contributing to higher MDD and GAD severity 18 years later. By clarifying the distinct effects of these variables and their underlying mechanisms, the present study could support the development of more targeted prevention and intervention strategies for MDD and GAD symptoms.

2. Method

2.1. Participants

The present study used data from the Midlife in the United States (MIDUS; Brim et al., 2020; Ryff et al., 2015; Ryff et al., 2019), a national study across three waves: 1995–1996 (Time 1; T1), 2004–2006 (Time 2; T2), and 2013–2014 (Time 3; T3). As the dataset is publicly available and retrieved from an online repository (http://tinyurl.com/icpsrmidus), the present study was exempt from Institutional Review Board (IRB) approval. The initial MIDUS sample comprised 7108 U.S. adults, of whom 4963 were successfully followed at T2. The final analytic sample included 3294 adults who participated in all three waves and gave relevant data. At baseline (T1), participants had a mean age of 45.62 years (SD = 11.41, range = 20–74), with 54.95% female, and 46.84% holding a college degree or higher. Most participants (89.01%) identified as White, and the remaining participants were African Americans, Asians, Native Americans, Pacific Islanders, or individuals of other races.

2.2. Procedures

In the MIDUS study, data were collected at T1–T3 via telephone interviews and self-administered questionnaires (SAQs). The present study analyzed data from participants who completed SAQs measuring perceived control at T1 and coping strategies (approach and avoidance) at T2. Participants' MDD and GAD symptom severity were assessed via telephone at T1 and T3 using the World Health Organization's (WHO) Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler et al., 1998).

2.3. Measures

2.3.1. T1 trait-level perceived control

Perceived control was measured using a 12-item scale (Lachman and Weaver, 1998; Pearlin and Schooler, 1978) with two domains: 4-item personal mastery and 8-item perceived constraints. To reiterate, mastery (Cronbach's α = .91 in the present study) reflects individuals' beliefs about their efficacy in pursuing goals (e.g., "I can do just about anything I really set my mind to"). In contrast, constraints (α = .85 herein) capture the degree to which individuals perceive external obstacles that interfere with goal pursuit (e.g., "What happens in my life is often beyond my control"). Each item was scored on a 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). The scale has shown good reliability and strong construct validity (Lachman and Weaver, 1998).

2.3.2. T2 trait-level coping strategies

Six subscales from the COPE Inventory (Carver et al., 1989) were used to examine two types of coping strategies. Approach coping (α = .91 herein) comprised three subscales: *positive reinterpretation and growth* (e.g., "I look for something good in what is happening"), *active coping* (e.g., "I take direct action to get around the problem"), and *planning* (e.g., "I make a plan of action"). Avoidance coping (α = .84 herein) includes *focus on and venting of emotion* (e.g., "I get upset and let my emotions out"), *denial* (e.g., "I pretend that it hasn't really happened"), and *behavioral disengagement* (e.g., "I admit to myself that I can't deal with it, and quit trying"). Each subscale consisted of four items, rated on a four-point Likert scale from 1 (*Not at all*) to 4 (*A lot*). The scale has demonstrated strong test-retest reliability and convergent and discriminant validity across diverse populations (Carver et al., 1989; Rodrigues et al., 2022).

2.3.3. T1 and T3 MDD and GAD Symptom Severity in the Past 12 Months

CIDI-SF measured the severity of MDD and GAD (Kessler et al., 1998), based on the diagnostic criteria in the third edition-revised of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987). To measure MDD severity (α = .93 herein), participants reported whether they had experienced seven specific depressive symptoms linked to anhedonia or low mood for at least two weeks within the past year (e.g., depressed mood, loss of interest or pleasure, fatigue, feelings of worthlessness, suicidal thoughts). Each item was answered on a "*yes*" or "*no*" binary scale. Participants who did not meet the initial criteria were assigned an MDD severity score of 0, resulting in a zero-inflated distribution in which most scores were 0. For those meeting the requirements, the total score ranged from 0 to 7, with higher scores indicating greater levels of MDD severity.

For GAD severity (α = .98 herein), participants were asked how frequently they experienced 10 worry-related symptoms over the past 12 months, rated on a 4-point Likert scale from 1 (*never*) to 4 (*on most days*). Examples of items include excessive worry, restlessness, irritability, and muscle tension. Higher total scores reflected greater GAD severity. As with the MDD measure, this screening approach produced a zero-inflated distribution, with most participants scoring 0 and only the subset meeting screening criteria exhibiting variance in symptom scores. The CIDI-SF symptom scales have consistently shown high reliability and strong construct validity for MDD and GAD symptoms (Gigantesco and Morosini, 2008; Kessler et al., 2013; Pez et al., 2010).

Notably, the CIDI-SF employs a stem-branch design. That is, only respondents who screened positive on the initial stem questions receive a full assessment of MDD or GAD symptom severity. Consequently, many

participants had zero symptom severity scores, resulting in zero-inflated distributions (Percentage of 0 s: W1 MDD severity = 81.37%; W3 MDD severity = 91.10%; W1 GAD severity = 94.19%; W3 GAD severity = 96.21%).

2.4. Data preprocessing

All data preprocessing and analyses were conducted using the *R* software (R Core Team, 2026). At the preprocessing stage, data from three waves were merged according to participants' unique identifiers using the *dplyr* package. Following this, random forest imputation was performed to address missing data (observed 13.88% in the current study) with the *missRanger* package (Mayer, 2024).

2.5. Data analysis

Longitudinal structural equation modeling (SEM) was conducted using the *lavaan* package (Rosseel, 2012). The fit of SEM models was assessed using multiple indices, including Chi-square (χ^2) statistic (Hu and Bentler, 1999), degrees of freedom (*df*) and the corresponding probability value (*p*-value; Kline, 2023), the confirmatory fit index (CFI; Bentler, 1990), the root mean square error of approximation (RMSEA; Steiger, 1990), and the standardized root mean square residual (SRMR; Byrne, 2001; Hu and Bentler, 1999). Generally, CFI values above .90 were considered indicative of adequate model fit (Bentler, 1990), whereas RMSEA values below .10 suggest acceptable fit (Steiger, 1990). To achieve model identification for the model testing the perceived control → coping strategies (approach and avoidance coping) → MDD or GAD symptom pathways, we had to estimate four item-level covariances based on the modification indices analysis.

Mediation analyses were performed using the product-of-coefficients method to estimate indirect effects ($a \times b$) (Huang et al., 2016). Specifically, regression coefficients were examined for pathways in which T1 mastery or constraints predicted T2 approach or avoidance coping ("*a* path"). In turn, T2 approach or avoidance coping predicted T3 symptom severity for MDD or GAD ("*b* path"). We reported unstandardized regression coefficients (*b*), *p*-values, and effect size (Cohen's *d*), with estimates bootstrapped with 2000 resampling iterations and robust maximum likelihood (MLR) estimators (Cheung and Lau, 2008; Preacher and Hayes, 2008). Before the main analyses, assumptions of normality, univariate and multivariate outliers, linearity, and multicollinearity were examined. For both MDD and GAD models, multivariate normality was violated for several items. Mahalanobis distance indicated potential multivariate outliers (MDD model: $n = 602$, GAD model: $n = 811$), and high correlations (> 0.9) were observed among a few items in each model, suggesting minor multicollinearity. These minor assumption violations were accommodated using MLR, which provides standard errors and model fit statistics that are robust to violations of multivariate normality, and is well-suited for the skewed and zero-inflated MDD and GAD severity data in our dataset (Finney and DiStefano, 2006). Despite these minor violations, the models converged successfully, indicating the robustness of the parameter estimates. Modeling constructs such as MDD and GAD severity as latent variables, marked by multiple items, aggregates information across indicators, reducing the influence of measurement error and item-level noise. This is a fundamental advantage of latent-variable approaches in SEM, as it enhances estimation accuracy (Bollen et al., 2022).

Mediation effect sizes were calculated as the proportion of the indirect effect ($a \times b$) relative to the total effect ($c = a \times b + c'$), indicating the percentage of variance in T3 disorder severity explained by the mediators (Cole and Maxwell, 2003; Preacher and Kelley, 2011). All models controlled for baseline outcome variables (e.g., T1 MDD severity when predicting T3 MDD severity). Baseline levels of the mediators (e.g., T1 approach or avoidance coping) were not adjusted, as they were not measured. Moreover, such an adjustment could block part of the indirect pathway and bias estimates of total effects (D'Onofrio et al., 2020; Rosenbaum, 1984). Fig. 1 illustrates an example SEM model used for one of the mediation analyses, specifically showing the pathway in which T1 mastery and constraints predict T2 approach and avoidance coping, which in turn predict T3 MDD symptom severity, controlling for baseline MDD severity. A structurally equivalent model was conducted for T3 GAD severity, with T1 GAD symptoms included as the covariate. Other potential demographic covariates (e.g., age, gender) were not included because they may plausibly operate upstream of perceived control or influence the coping process. Controlling for such variables could block indirect pathways or introduce bias, thereby complicating causal interpretation. Moreover, fitting complex latent-variable mediation models with too many covariates increases model complexity, which can lead to convergence difficulties, overfitting, and reduced statistical power (VanderWeele, 2016, 2019).

3. Results

3.1. T1 mastery and constraints predicting T3 MDD severity via T2 approach and avoidance coping

This mediation model showed good fit ($\chi^2(1361) = 7141.832$, $p < .001$, CFI = .910, RMSEA = .045, SRMR = .050). All individual items had high factor loadings on their latent constructs in this model (T1 mastery: $\lambda = 0.470$–0.702; T1 constraint: $\lambda = 0.555$–0.711; T2 approach coping: $\lambda = 0.520$–0.789; T2 avoidance coping: $\lambda = 0.313$–0.614; T3 MDD: $\lambda = 0.413$–0.965; all *p* values $< .001$). Table 1 showed that higher levels of mastery were significantly associated with greater use of approach coping ($d = 0.281$, $p < .001$) but not with avoidance coping ($d = -0.057$, $p = .078$). In contrast, higher levels of constraint significantly predicted less approach coping ($d = -0.213$, $p < .001$) and more avoidance coping ($d = 0.488$, $p < .001$). Approach coping did not predict higher MDD severity ($d = 0.006$, $p = .806$), whereas avoidance coping showed a positive predictive effect ($d = 0.086$, $p = .003$). Among all indirect pathways tested, only the effect of constraint on MDD severity via avoidance coping was significant ($d = 0.042$, $p = .003$). The combined indirect effect of approach and avoidance coping, mediating the path from mastery to MDD severity, was not significant ($d = -0.003$, $p = .686$), accounting for 9.2% of this pathway. Specifically, avoidance accounted for 29.9% of the total effect of perceived constraints on MDD severity. However, approach and avoidance coping together demonstrated a significant mediating effect ($d = 0.041$, $p = .017$), accounting for 27.0% of the variance in the pathway from constraints to MDD severity. Tables S1 and S2 in the online supplementary materials (OSM) report the measurement model and complete SEM results for the MDD analysis, respectively.

3.2. T1 mastery and constraints predicting T3 GAD severity via T2 approach and avoidance coping

This mediation model showed good fit ($\chi^2(1472) = 10{,}261.685$, $p < .001$, CFI = .918, RMSEA = .048, SRMR = .052). All individual items showed high factor loadings on their respective constructs (T1 mastery: $\lambda = 0.469$–0.703; T1 constraint: $\lambda = 0.559$–0.710; T2 approach coping: $\lambda = 0.547$–0.784; T2 avoidance coping: $\lambda = 0.401$–0.602; T3 GAD: $\lambda = 0.889$–0.919; all *p* values $< .001$). As shown in Table 2, mastery was positively associated with approach coping ($d = 0.284$, $p < .001$) but was not associated with avoidance coping ($d = -0.050$, $p = .119$). Higher constraint significantly predicted lower approach coping ($d = -0.211$, $p < .001$) and greater avoidance coping ($d = 0.483$, $p < .001$). In turn, approach coping ($d = -0.069$, $p = .002$) was negatively associated with GAD severity, whereas greater avoidance coping ($d = 0.118$, $p < .001$) significantly predicted higher GAD severity. The combined indirect effect of approach and avoidance coping significantly mediated the paths from mastery ($d = -0.025$, $p = .003$) and constraints ($d = 0.071$, $p < .001$) to GAD severity. Specifically, approach and avoidance coping accounted for 10.7 and 42.3% of the total effect of perceived constraints

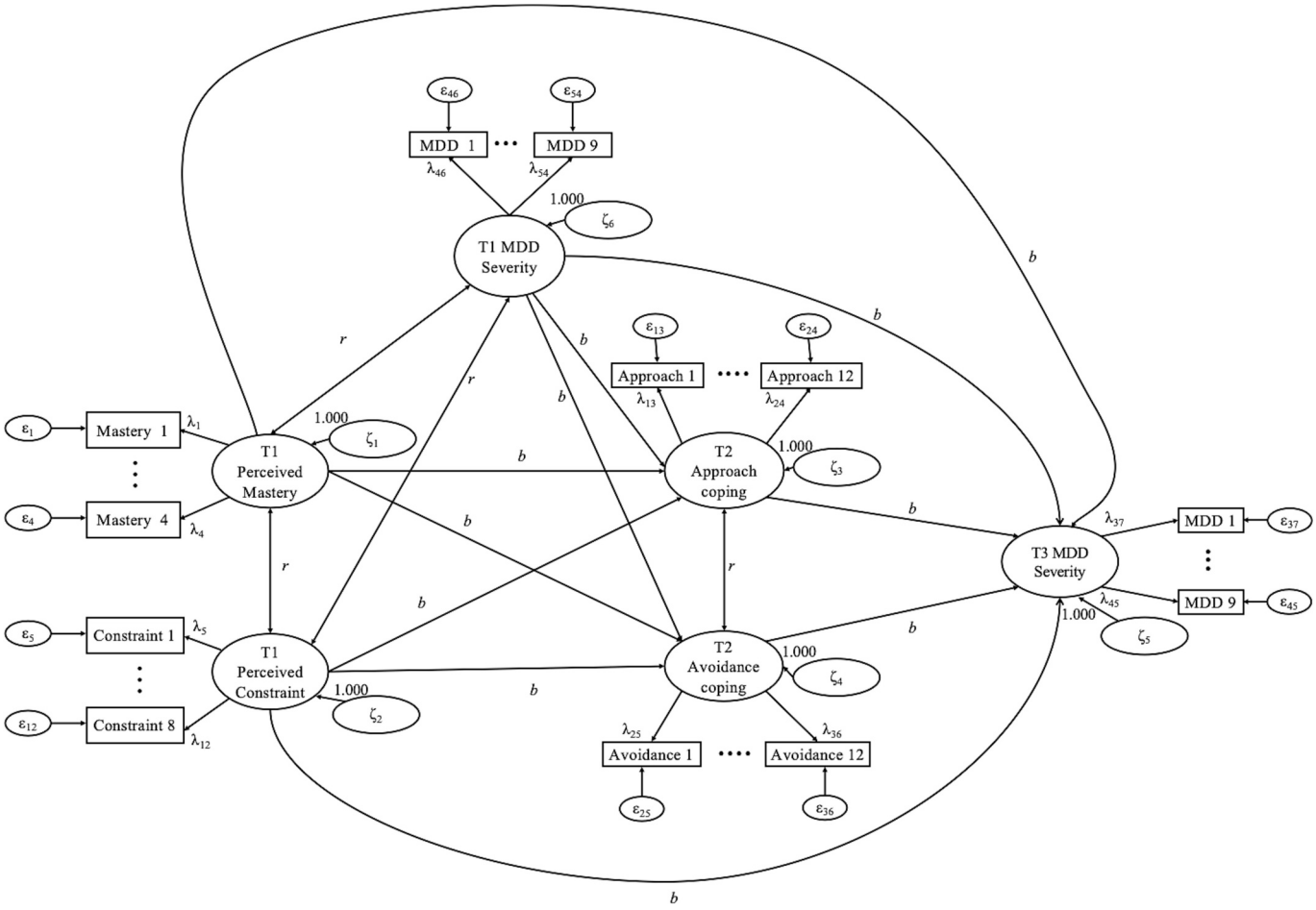

Fig. 1. Longitudinal SEM Mediation of T1 Perceived Control Predicting T3 MDD Severity via T2 Coping, controlling for T1 MDD
Note. T1, time 1; T2, time 2; T3, time 3; Approach, approach coping; Avoidance, avoidance coping; MDD, major depressive disorder; β = unstandardized beta regression weight with standard error in parentheses; ε = item residual variances; ζ = factor residual variances.

on GAD severity, respectively. Moreover, two coping strategies together accounted for 100.0% of mastery and 53.0% of constraints on GAD severity. OSM Tables S3 and S4 report the measurement model and complete SEM results for the GAD analysis, respectively.

4. Discussion

The present study examined the longitudinal mediating effect of coping strategies (approach and avoidance coping) on the relationship between baseline perceived control (mastery and constraints) and 18-year MDD and GAD severity. Our findings indicated that avoidance coping (denial, behavioral disengagement, and venting) rather than approach coping (active coping, planning, and positive reinterpretation and growth) significantly mediated the pathway from constraint to subsequent MDD severity, accounting for 29.9% of the total effect. In contrast, neither approach nor avoidance coping demonstrated a significant mediating role in the mastery → MDD severity pathway. For GAD outcomes, both approach and avoidance coping significantly mediated the association between constraints and GAD severity, accounting for approximately 10.7–42.3% of the total effect. However, only approach coping mediated the pathway from mastery to GAD severity, explaining the full proportion of the mediated effect.

Our findings indicated that avoidance coping, but not approach coping, might function as a change mechanism of the pathway from constraints to future MDD severity, which aligned with and built on previous cross-sectional (Clarke and Goosen, 2009; Sadaghiani, 2013) and longitudinal evidence (Holahan et al., 2005; Pelekanakis et al., 2022; Toyama and Hektner, 2023; Woo et al., 2024). Consistent with the transactional model of stress and coping (Biggs et al., 2017; Lazarus and Folkman, 1984), avoidance coping tends to be used adaptively in uncontrollable situations to temporarily regulate distress. However, chronic reliance on avoidance coping is maladaptive as it does not involve constructive emotional processing and regulation, finally weakens individuals' capacity to recover from stress, and increases their vulnerability to future stressors and internalizing problems (Ben-Zur, 2009; MacNamara, 2025). Moreover, repeated experiences of uncontrollability could lead to learned helplessness (Peterson and Seligman, 1984; Seligman, 1972), reducing individuals' motivation to act or cope with stressors. Plausibly, these experiences might persistently activate the serotonergic system in the dorsal raphe nucleus (Maier and Seligman, 2016; Tafet and Ortiz Alonso, 2025). Avoidance coping could further disrupt amygdala-prefrontal connectivity, thereby preventing effective emotion regulation and perpetuating MDD symptoms (Ebneabbasi et al., 2021; Feurer et al., 2021; Meyer-Arndt et al., 2022; Tafet and Ortiz Alonso, 2025; Yang et al., 2021). Meta-analyses indicated that greater avoidance coping tactics are associated with the occurrence and relapse of depressive episodes and prolonged recovery (Christensen and Kessing, 2005). Overall, future research should continue to test these conjectures about how biopsychosocial processes mediate the indirect effect of avoidance coping on the pathway from baseline constraint to long-term MDD symptoms.

Conversely, approach coping appeared to be a relatively weaker mediator of the pathway from perceived control facets to future MDD symptoms. The mediating effect of approach coping may vary across

Table 1
T1 Perceived Control Predicting T3 MDD Severity via T2 Coping, controlling for T1 MDD Severity.

	b (95% CI)	*d*
Regression estimates		
T1 PM → T2 approach	0.129*** (0.099, 0.159)	0.281
T1 PC → T2 approach	−0.092*** (−0.117, −0.066)	−0.213
T1 PM → T2 avoidance	−0.025 (−0.054, 0.003)	−0.057
T1 PC → T2 avoidance	0.206*** (0.175, 0.237)	0.488
T2 approach → T3 MDD severity	0.003 (−0.022, 0.028)	0.006
T2 avoidance → T3 MDD severity	0.047** (0.016, 0.078)	0.086
T1 PM → T3 MDD severity	0.010 (−0.005, 0.024)	0.039
T1 PC → T3 MDD severity	0.025** (0.010, 0.041)	0.111
Indirect effects		
T1 PM → T2 approach → T3 MDD severity	0.000 (−0.003, 0.004)	0.002
T1 PC → T2 approach → T3 MDD severity	−0.000 (−0.003, 0.002)	−0.001
T1 PM → T2 avoidance → T3 MDD severity	−0.001 (−0.003, 0.000)	−0.005
T1 PC → T2 avoidance → T3 MDD severity	0.010** (0.003, 0.016)	0.042
T1 PM → T2 approach + avoidance → T3 MDD severity	−0.001 (−0.005, 0.003)	−0.003
T1 PC → T2 approach + avoidance → T3 MDD severity	0.009* (0.002, 0.017)	0.041
Total effects		
T1 PM → T3 MDD severity	0.009 (−0.005, 0.023)	0.036
T1 PC → T3 MDD severity	0.035*** (0.021, 0.048)	0.152

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.
T1, time 1; T2, time 2; T3, time 3; PM, perceived mastery; PC, perceived constraint; Approach, approach coping; Avoidance, avoidance coping; MDD, major depressive disorder; *b*, unstandardized regression estimate; CI, confidence interval; *p*, *p*–value; *d*, Cohen's *d* effect size.

Table 2
T1 Perceived Control Predicting T3 GAD Severity via T2 Coping, controlling for T1 GAD Severity.

	b (95% CI)	*d*
Regression estimates		
T1 PM → T2 approach	0.131*** (0.101, 0.162)	0.284
T1 PC → T2 approach	−0.092*** (−0.119, −0.066)	−0.211
T1 PM → T2 avoidance	−0.025 (−0.057, 0.006)	−0.050
T1 PC → T2 avoidance	0.231*** (0.198, 0.265)	0.483
T2 approach → T3 GAD severity	−0.125** (−0.203, −0.046)	−0.069
T2 avoidance → T3 GAD severity	0.196*** (0.118, 0.274)	0.118
T1 PM → T3 GAD severity	0.012 (−0.036, 0.059)	0.014
T1 PC → T3 GAD severity	0.050* (0.001, 0.100)	0.063
Indirect effects		
T1 PM → T2 approach → T3 GAD severity	−0.016** (−0.027, −0.005)	−0.019
T1 PC → T2 approach → T3 GAD severity	0.012** (0.004, 0.019)	0.014
T1 PM → T2 avoidance → T3 GAD severity	−0.005 (−0.012, 0.002)	−0.006
T1 PC → T2 avoidance → T3 GAD severity	0.045*** (0.026, 0.064)	0.057
T1 PM → T2 approach + avoidance → T3 GAD severity	−0.021** (−0.035, −0.007)	−0.025
T1 PC → T2 approach + avoidance → T3 GAD severity	0.057*** (0.034, 0.080)	0.071
Total effects		
T1 PM → T3 GAD severity	−0.009 (−0.056, 0.037)	−0.011
T1 PC → T3 GAD severity	0.107*** (0.062, 0.152)	0.135

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.
T1, time 1; T2, time 2; T3, time 3; PM, perceived mastery; PC, perceived constraint; Approach, approach coping; Avoidance, avoidance coping; GAD, generalized anxiety disorder; *b*, unstandardized regression estimate; CI, confidence interval;
p, *p*–value; *d*, Cohen's *d* effect size.

different demographic subgroups (e.g., age, gender, and socioeconomic status). In addition to the age-specific pattern mentioned in the introduction, gender differences in coping effectiveness have been documented, with women typically using a broader range of coping strategies and showing greater benefits from these strategies than men in some contexts (Cholankeril et al., 2023; Nicholls et al., 2007; O'Rourke et al., 2022; Tamres et al., 2002). We deliberately did not include these demographic covariates in our primary models to retain fidelity to the mediation models; adjusting for upstream confounders might obstruct indirect effects, bias estimates, and increase the risk of non-convergence. Future studies could clarify whether demographic heterogeneity explains the observed null effects by examining the mediating role of approach coping across demographic subgroups. Beyond demographic factors, the mediating effect of approach coping could have been masked by personal attributes, the nature of stressors, and stress reactivity tendencies (Carver and Connor-Smith, 2010; Forsythe and Compas, 1987; Park et al., 2004). Alternatively, the non-significant result could suggest that reliance on approach coping was not a central mechanism linking perceived constraints to long-term MDD severity (Clarke and Goosen, 2009). Drawing on the strategy-situation fit hypothesis (Cheng et al., 2014), reductions in approach coping may be an adaptive response to external uncontrollability rather than a marker of cognitive vulnerability for MDD symptoms. Prior evidence indicated that individuals with depression did not substantially differ from non-clinical populations in their use of approach coping (Sadaghiani, 2013). Future research is needed to more comprehensively account for potential covariates, identify additional boundary conditions, and validate these conclusions.

The absence of mediation by either approach or avoidance coping in the pathway from mastery to MDD severity suggested that perceived external constraints have a stronger overall impact on resilience and well-being than internal mastery beliefs. This interpretation aligned with prior reviews (Msetfi et al., 2024) and longitudinal evidence (Infurna and Mayer, 2015; Magin et al., 2024; Toyama and Hektner, 2023). One possible explanation was that perceived mastery tended to represent a more abstract belief, which might be influenced by optimism or self-enhancement biases (John and Robins, 1994; Ragan et al., 2016). Prior work indicated that individuals with a stronger mastery showed greater confidence, managed stress more effectively, and were more emotionally stable, with fewer anxiety and depression symptoms (Bian et al., 2024; Kim et al., 2025). In contrast, constraints were often reinforced by external barriers, which could override the effects of mastery (Infurna and Mayer, 2015). Although mastery could predict changes in coping strategies and subsequent reductions in depressive symptoms, these pathways might operate independently (Hish et al., 2019; Shin and Park, 2024; Toyama and Hektner, 2023). Accordingly, neither approach nor avoidance coping appeared to be a necessary or sufficient mechanism via which mastery exerted its protective effect on MDD severity. Future studies can investigate how mastery influences MDD severity via depression-specific pathways. Possible examples include cognitive dyscontrol and cognitive bias (Villalobos et al., 2021), broader psychosocial resources (Du et al., 2025), and potential biological pathways such as neural activity patterns (Sinha et al., 2016), neuroimmune indicators (Cizza et al., 2008; Hladek et al., 2020), and brain-derived neurotrophic factor (BDNF; aan het Rot et al., 2009; Bedard et al., 2017).

The finding that both approach and avoidance coping mediated the pathway from constraints to GAD severity highlighted plausible coping mechanisms specific to the etiology of GAD symptoms and distinct from those underlying MDD symptoms. The helplessness and limited personal agency arising from perceived constraint aligned closely with key correlates of GAD, including intolerance of uncertainty and threat-oriented cognitive processing (Lee et al., 2010). Perceived high constraints might trigger a negative problem orientation (NPO), a dysfunctional cognitive-emotional schema characterized by viewing problems as threatening, doubting one's problem-solving ability, and expecting pessimistic outcomes (Robichaud and Dugas, 2005). This NPO could be closely linked to reduced approach coping activity, creating a self-reinforcing cycle

that intensifies perceptions of helplessness and the inefficacy of one's actions, thereby exacerbating GAD symptoms (Belzer et al., 2002; Clarke et al., 2017). Based on the contrast avoidance model (Newman and Llera, 2011), decreased approach coping activity might co-occur with worry-driven pseudo-problem-solving tendencies that maintain GAD symptoms, thereby leading to avoidance of shifts from positive or neutral moods to negative ones. Chronic avoidance of these negative emotional contrasts and greater maladaptive avoidance coping have been linked to problem-solving difficulties, suggesting that constraints can both weaken approach coping and promote avoidance coping, thereby maintaining GAD symptoms (Dijkstra and Homan, 2016; Llera and Newman, 2023). These processes could hinder optimal decision-making and emotional processing (Boi and Llera, 2023). Thus, greater constraints might drive more avoidance of negative emotional contrasts and poorer problem-solving, which fuel vicious cycles that perpetuate GAD symptoms. Future research should test whether constructs, such as NPO and negative emotional contrasts, might mediate the role of approach and avoidance coping in the pathway from baseline constraints to future GAD symptoms.

In contrast, in the pathway predicting future GAD severity from baseline mastery, approach coping, but not avoidance coping, was a key mediator. Theoretical and empirical work suggested that individuals with high mastery were more likely to engage in approach coping because they perceive stressors as manageable and are motivated to undertake goal-directed efforts (Subaşı, 2020). This link was particularly salient in the context of GAD rather than MDD, which might be attributed to disorder-specific anticipatory worry. Relatedly, both approach and avoidance coping patterns have been entwined with repetitive negative thinking. Therefore, approach coping could serve as a more pivotal mediator linking mastery to subsequent GAD severity. This rationale is also consistent with the efficacy of cognitive-behavioral therapy (CBT) and other interventions that encourage active coping and goal-directed action in alleviating GAD severity (Newman et al., 2013; Borkovec and Ruscio, 2001). In contrast, avoidance coping showed weaker associations with mastery, likely because of its more passive nature (Compas et al., 1988; Person and Frazier, 2024).

Several limitations should be acknowledged. First, although the longitudinal design provides temporal information, the possibility of mutual or bidirectional relationships among perceived control, coping, and MDD and GAD symptoms cannot be ruled out entirely. Future research should consider using approaches such as random-intercept cross-lagged panel models (Mulder, 2022) to address this concern. Second, although our operationalization of avoidance coping overlaps with emotion-focused coping as conceptualized by Lazarus and Folkman (1984), because the MIDUS dataset did not measure adaptive emotion-focused strategies such as instrumental social support and acceptance, our findings cannot be generalized to emotion-focused coping. Future work could expand on this work by examining a broader range of coping and using recent advances, such as longitudinal network analysis (e.g., Zainal and Newman, 2023), to examine component-to-component relations in more nuanced ways and to provide a more complete picture of coping mechanisms. Third, all measures relied on self-reports, which may be subject to recall or social desirability bias. Finally, as the data were drawn from a U.S. sample of primarily middle-aged White adults, these findings might not generalize to populations with different cultural or socio-demographic attributes.

Despite these limitations, the present study had several strengths. First, the longitudinal design enabled a more nuanced comprehension of the temporal relationships among perceived control, coping strategies, and MDD and GAD symptom outcomes. Second, the present study focused on a middle-aged population. This group has been understudied in the coping and perceived control literature, as previous research has predominantly examined adolescents or older adults. Third, the large sample size enhanced the robustness of the findings by increasing confidence in the parameter estimates. Finally, as recommended by Infurna and Mayer (2015), we examined perceived control through its two dimensions (mastery and constraints), thereby enabling us to better comprehend how these dimensions were differently related to coping and common mental health problems.

To conclude, the present study offered nuanced insights into how different coping strategies mediate the impact of perceived constraints and mastery on MDD and GAD symptom severity. Specifically, avoidance coping mediated the effect of constraints on MDD symptoms, whereas approach coping mediated the effect of mastery on GAD symptoms, and both coping styles influenced GAD symptoms under greater perceived constraints. These findings indicated that, when considering risk or resilience, the translation of environmental conditions and personal resources into symptom severity is disorder-specific and depends on distinct coping pathways. If replicated, these patterns suggest that prevention efforts should be tailored to the specific stress context and psychological outcome by enhancing perceived control and shaping adaptive coping. For instance, reducing maladaptive avoidance coping might help prevent both MDD and GAD symptoms under high constraints, while enhancing approach coping could promote resilience against GAD symptoms. Therefore, by targeting the interplay between coping strategies and cognitive process antecedents, prevention and intervention efforts could mitigate vulnerability and prevent long-term common mental disorder outcomes.

CRediT authorship contribution statement

Yongshi Liu: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Nur Hani Zainal:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Ethical approval

The study was approved by the institutional review boards (IRBs) of Harvard University, Georgetown University, the University of California, Los Angeles, and the University of Wisconsin-Madison. The use of publicly available data exempted it from additional IRB approval.

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Declaration of Generative AI and AI-assisted technologies in the writing process

None. The authors did not use generative AI tools in the writing process. The authors are solely responsible for the scientific content and integrity of this work.

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Declaration of competing interest

The authors have no financial or personal relationships with organizations or individuals that could bias the work reported in this study.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2026.121543.

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