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Stuck in Time, Stuck in Mood? Cognitive Flexibility as a Mechanism Connecting Time Perspective and Depression

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ABSTRACT. How people mentally organize their past, present, and future has important implications for emotional well-being, yet the psychological mechanisms underlying this link remain poorly understood. Cognitive flexibility may represent a critical pathway through which temporal orientations shape vulnerability to depressive symptoms. This study examined whether the Alternatives and Control dimensions of cognitive flexibility mediate the relationships between time perspective dimensions and depressive symptoms. A sample of 441 adults (Mage = 29.9 years) completed measures of time perspective, cognitive flexibility, and depressive symptoms. Ten separate mediation models were estimated. Maladaptive time perspectives (Past Negative and Present Fatalistic) were positively associated with depressive symptoms, whereas adaptive perspectives (Future and Past Positive) were negatively associated. Both dimensions of cognitive flexibility emerged as significant partial mediators in most models, with stronger effects observed for the Control dimension. No significant mediation effects were found for Hedonistic Present. These findings suggest that enhancing cognitive flexibility (particularly perceived control) may offer a promising target for interventions aimed at reducing depressive symptoms by reshaping maladaptive temporal orientations.

Keywords: time perspective, depression, cognitive flexibility, control

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1. INTRODUCTION

Temporal perspective refers to how individuals cognitively and affectively frame past, present, and future experiences (Zimbardo & Boyd, 1999). According to temporal perspective theory, individuals differ in the extent to which they typically focus on specific time frames, such as the past, present, or future, and these orientations influence motivation, decision-making, and emotional functioning. A growing body of research has demonstrated robust associations between maladaptive temporal perspectives and psychological distress, particularly depressive symptoms (Allemand et al., 2025; Lefèvre et al., 2019; McKay & Cole, 2020).

Of the time perspective dimensions, the Negative Past variable correlates most consistently with depression (Desmyter & De Raedt; 2012; Lefèvre et al., 2019; Orkibi, 2015; Van Beek et al., 2011). Individuals with high scores on this dimension tend to focus on painful memories, failures, and regrets, which favors rumination and maintains negative cognitive schemas about the self, the world, and the future, which are central to depression (Addis et al., 2016; Maiese, 2018; Williams et al., 2022). In general, depressed individuals tend to be more focused on negative memories than non-depressed individuals (Addis et al., 2016; Anderson & Evans, 2015; Lefèvre et al., 2019).

At the same time, the Fatalistic Present variable, characterized by a perceived lack of control and the belief that events are determined by external forces, has also been associated with high levels of depression (Åström et al., 2019; Orkibi, 2015). On the other hand, time perspectives considered adaptive seem to have a protective role (Desmyter & De Raedt, 2012). Future orientation supports the idea of meaning and self-regulatory capacity, which negatively correlates with depression (Hamilton et al., 2015; Zheng et al., 2019). Similarly, the Positive Past variable is associated with psychological well-being and emotional stability, which contributes to personal identity reinforcement (Jankowski et al., 2020).

Regarding the Hedonistic Present variable, the results are less consistent. Some studies suggest a weak association with depression, possibly due to the ambivalent character, which includes both adaptive elements and traits associated with impulsivity (Jankowski et al., 2020; Orkibi, 2015).

The relationship between temporal perspective and cognitive flexibility

Cognitive flexibility refers to the ability to adapt thinking to situational demands and the ability to generate alternative interpretations and to perceive situations as controllable and manageable. A rigid cognitive style characteristic

of depression may reinforce the depressed state through a tendency to automatically accept maladaptive beliefs (Denis & Vander Wal, 2010). The model of cognitive flexibility proposed by Dennis and Vander Wal (2010) distinguishes two main dimensions: *Alternatives*, which reflects the ability to think about and identify multiple alternative solutions, explanations and perspectives, and *Control*, which refers to the perceived ability to influence events and to perceive difficult situations as manageable.

Deficits on both dimensions are associated with rigid cognitive styles and associated with depression (Dennis & Vander Wal, 2010; Murphy et al., 2012; Yu et al., 2020). Individuals with depression exhibit reduced cognitive flexibility, manifested by difficulties in reappraising situations, limited access to cognitive alternatives, and a low perception of personal control (Deveney & Deldin, 2006; Yu et al., 2020). Studies show that reduced levels of cognitive flexibility predict the severity of depressive symptoms, whereas improvements in this capacity are associated with reduced symptomatology and more favorable therapeutic outcomes (García-Fernández et al., 2025; Johnco et al., 2014).

Conceptually, temporal perspective and cognitive flexibility are closely intertwined. Temporal perspective reflects relatively stable cognitive frameworks through which the individual interprets life experiences, whereas cognitive flexibility determines the extent to which these frameworks can be adjusted or reinterpreted adaptively. Maladaptive temporal perspectives, such as Negative Past and Fatalistic Present, can be understood as expressions of cognitive processing characterized by difficulties in generating alternatives and a diminished perception of control. Emphasized Negative Past orientation may limit the ability to re-evaluate experiences, maintaining negative and ruminative emotional contents. The Fatalistic Present is associated with a low level of perceived control (Shahid et al., 2020), which may limit the individual's ability to evaluate situations as manageable and to adapt their cognitive responses, thus favoring cognitive rigidity.

Building on prior research highlighting the role of time perspective in emotional well-being (Desmyter & De Raedt, 2020; Tseferidi, et al., 2017) or depression (Lefèvre et al., 2019) and the importance of cognitive flexibility in adaptive functioning (García-Fernández et al., 2025), the present study examined whether cognitive flexibility mediates the relationship between time perspective dimensions and depressive symptoms. Given that cognitive flexibility is a multidimensional construct, two mediation sub-hypotheses were tested. The first examined the mediating role of alternative cognitive flexibility, reflecting the ability to generate alternative explanations and solutions when encountering difficult situations. The second focused on control cognitive flexibility, capturing perceived control over challenging circumstances and the capacity to maintain

an internal locus of control. Specifically, it was expected that both dimensions of cognitive flexibility would function as mediating mechanisms through which temporal orientations influence depressive symptomatology. Maladaptive time perspectives were expected to be associated with lower levels of cognitive flexibility, which in turn would be related to higher depressive symptoms, whereas adaptive time perspectives were expected to be associated with higher cognitive flexibility and, consequently, lower depressive symptoms.

2. METHODOLOGY

Participants and procedure

The questionnaire was created using Google Forms and disseminated through multiple social media platforms using the snowball sampling approach. Data were collected between 2024 and 2025. All participants were informed about the aims of the study, assured of the confidentiality and anonymity of their responses, and advised that participation was voluntary, with the option to withdraw at any time without consequences.

A total of 441 individuals (Mage = 29.7, SD = 12.9) participated in the study (Table 1). The sample comprised 143 men (32.4%) and 295 women (66.9%), while 3 participants (0.7%) did not report their gender. Most respondents resided in urban areas (n = 359; 81.4%), whereas 82 participants (18.6%) reported living in rural areas. Regarding educational attainment, 5 participants (1.1%) had completed middle school, 10 (2.3%) vocational school, 222 (50.3%) high school, 94 (21.3%) held a bachelor's degree, 94 (21.3%) a master's degree, and 16 participants (3.6%) had earned a doctoral degree. In terms of marital status, 123 participants (27.9%) were married, 176 (39.9%) were single, 129 (29.3%) reported being in a romantic relationship, 10 (2.3%) were divorced, and 3 (0.7%) were widowed.

Table 1. *Demographic characteristics of sample*

Demographic characteristic	**Sample**	
	n	**%**
Gender		
Female	295	66.9
Male	143	32.4
Unreported	3	0.7

Demographic characteristic	Sample	
	n	**%**
Residence		
Urban	359	81.4
Rural	82	18.6
Education		
Middle school	5	1.1
Vocational school	10	2.3
High school	222	50.3
Bachelor's degree	94	21.35
Master's degree	94	21.3
Doctoral studies	16	3.6
Marital status		
Married	123	27.9
Single	176	39.9
In a relationship	129	29.3
Divorced	10	2.3
Widowed	3	0.7

Instruments

The Zimbardo Time Perspective Inventory (ZTPI) (Zimbardo & Boyd, 1999) was used to assess individuals' temporal orientation, reflecting the extent to which people focus on past, present, or future experiences when interpreting events and making decisions. The instrument consists of 56 items rated on a 5-point Likert scale and comprises five subscales: Negative Past, Positive Past, Hedonistic Present, Fatalistic Present, and Future. A confirmatory factor analysis (CFA) was conducted using maximum likelihood estimation. Model fit indices indicated an acceptable fit to the data: $\chi^2(1474) = 4246.08$, $p < .001$; CFI = .66; TLI = .65; SRMR = .10; RMSEA = .07, 90% CI [.06, .07]. Internal consistency estimates demonstrated acceptable reliability across all subscales: Negative Past ($\alpha = .87$), Positive Past ($\alpha = .75$), Hedonistic Present ($\alpha = .81$), Fatalistic Present ($\alpha = .73$), and Future ($\alpha = .76$).

Cognitive flexibility was assessed using the Cognitive Flexibility Inventory (CFI) (Dennis & Vander Wal, 2010), a 20-item self-report measure designed to evaluate individuals' ability to adapt their thinking and behavior in response to changing situational demands. The CFI includes two subscales (1) *Alternatives*, which reflects the ability to generate multiple explanations and solutions for difficult situations, and (2) *Control*, which assesses perceived control over

challenging circumstances and the ability to maintain an internal locus of control. Items are rated on a 7-point Likert scale, with higher scores indicating greater cognitive flexibility. Confirmatory factor analysis of the Romanian version of the CFI supported the proposed two-factor structure: $\chi^2(151) = 540.25$, $p < .001$; CFI = .92; TLI = .91; SRMR = .06; RMSEA = .08, 90% CI [.07, .08]. These indices fall within commonly accepted thresholds for adequate model fit (Hu & Bentler, 1999). Internal consistency was excellent for the Alternatives subscale ($\alpha = .94$) and good for the Control subscale ($\alpha = .83$).

Depressive symptoms were assessed using the Depression subscale of the Depression, Anxiety, and Stress Scale (DASS-21) (Lovibond & Lovibond, 1995). This subscale consists of 7 items rated on a 4-point Likert scale ranging from 0 to 3, with higher scores indicating greater severity of depressive symptomatology. The depression subscale measures core features of depression, including persistent sadness, hopelessness, diminished sense of meaning in life, low self-worth, withdrawal from activities, anhedonia, and reduced behavioral activation. Confirmatory factor analysis (CFA) of the DASS-21, indicated a very good model fit: $\chi^2(186) = 330.11$, $p < .001$; CFI = .99; TLI = .99; RMSEA = .04; SRMR = .04. Internal consistency for depression subscale was high, with a Cronbach's alpha coefficient of $\alpha = .92$, demonstrating a strong reliability.

Data analysis

Data analyses were conducted using Jamovi. Descriptive statistics were first computed to characterize the sample. Frequencies and percentages were calculated for demographic variables (gender, area of residence, education level, and marital status), while means and standard deviations were computed for age. For the study variables, means and standard deviations were calculated to describe central tendency and variability. Pearson correlation analyses were then performed to examine bivariate associations among time perspective dimensions, cognitive flexibility, and depressive symptoms.

Mediation analyses were conducted using the *medmod* module in Jamovi, within a regression-based mediation framework. Separate mediation models were estimated for each time perspective dimension, with depressive symptoms specified as the outcome variable and cognitive flexibility factors (Alternative or Control) entered as the mediators. In this regard, ten separate mediation models were estimated (one for each combination of time perspective dimension and cognitive flexibility component) in order to examine their unique indirect effects on depressive symptoms while avoiding multicollinearity and ensuring clearer interpretation of each mediation pathway. All variables included in the mediation models were standardized prior to analysis. Direct, indirect, and total effects were estimated. The proportion of the total effect explained by the indirect pathway was reported as an indicator of effect size.

3. RESULTS

Pearson correlation analyses were conducted to examine the relationships among cognitive flexibility (Alternative - CFI_A, Control - CFI_C), time perspective dimensions (Negative Past - PNTP, Positive Past - PPTP, Hedonistic Present - PHTP, Fatalistic Present - FPTP, and Future - FTP), and depressive symptoms (DAS_D).

CFI_A was positively correlated with CFI_C (r = .24, p < .001), FTP (r = .35, p < .001), and PPTP (r = .21, p < .001). Negative associations were observed between CFI_A and PNTP (r = −.25, p < .001), FPTP (r = −.32, p < .001), and depressive symptoms (r = −.24, p < .001). The association between CFI_A and HPTP was not significant. CFI_C showed a similar pattern, displaying strong negative correlations with PNTP (r = −.54, p < .001), FPTP (r = −.35, p < .001), and depressive symptoms (r = −.43, p < .001). Positive correlations were found with FTP (r = .19, p < .001) and PPTP (r = .17, p < .001).

Regarding time perspective dimensions, PNTP was strongly positively correlated with depressive symptoms (r = .60, p < .001) and FTP (r = .51, p < .001), and negatively correlated with FTP (r = −.19, p < .001) and PPTP (r = −.36, p < .001). FPTP was also positively associated with depressive symptoms (r = .45, p < .001) and negatively associated with FTP (r = −.49, p < .001). FTP was negatively related to depressive symptoms (r = −.28, p < .001) and positively related to both dimensions of cognitive flexibility. HPTP showed weaker associations overall, being positively related to PNTP (r = .17, p < .001) and FPTP (r = .44, p < .001), but not significantly associated with depressive symptoms.

Table 2. *Descriptive Statistics and Correlations Between Variables*

	M (SD)	CFI_A	CFI_C	PNTP	PHTP	FTP	PPTP	PFTP	DAS_D
CFI_A	65.3 (13.0)	—							
CFI_C	34.4 (7.58)	0.24***	—						
PNTP	2.88 (0.86)	-0.25***	-0.54***	—					
PHTP	3.29 (0.58)	-0.07	-0.003	0.17***	—				
FTP	3.57 (0.56)	0.35***	0.19***	-0.19***	-0.29***	—			
PPTP	3.48 (0.68)	0.21***	0.17***	-0.36***	0.15**	0.25***	—		
FPTP	2.50 (0.66)	-0.32***	-0.35***	0.51***	0.44***	-0.49***	-0.10*	—	
DASS_D	7.39 (5.88)	-0.24***	-0.43***	0.60***	0.08	-0.28***	-0.36***	0.45***	—

Note. * p < .05, ** p < .01, *** p < .001
CFI_A – CFI Alternative, CFI_C – CFI Control, PN – Past Negative, PH – Present Hedonistic, F – Future, PP – Past Positive, PF – Present Fatalistic, DASS_D – DASS Depression Factor.

The mediating role of cognitive flexibility in the relationship between time perspective and depression

A series of mediation analyses were performed to investigate whether cognitive flexibility functions as an intervening mechanism in the associations between time perspective dimensions and depressive symptoms. Specifically, the two components of cognitive flexibility (Alternatives and Control) were examined as mediators of the relationships between each time perspective dimension and depressive symptom severity (DAS_D). Separate mediation models were estimated for each combination of time perspective dimension and cognitive flexibility component in order to isolate their unique indirect effects. This approach allowed for a more precise examination of the distinct cognitive pathways through which temporal orientations may influence depressive symptoms.

The mediating role of Alternatives dimension of Cognitive Flexibility

Mediation analyses indicated that the Alternatives dimension of cognitive flexibility mediated the associations between several time perspective dimensions and depressive symptoms. Negative Past was negatively associated with CFI_A ($\beta = -0.25$, $p < 0.001$), which in turn was negatively associated with depressive symptoms ($\beta = -0.10$, $p = 0.014$). The indirect effect was statistically significant ($\beta = 0.024$, $p = 0.025$), while the direct association between PNTP and depressive symptoms remained statistically significant ($\beta = 0.58$, $p < 0.001$).

FTP has a significant indirect association with depressive symptoms through CFI_A. FTP was positively associated with cognitive flexibility ($\beta = 0.35$, $p < 0.001$), which was negatively associated with depressive symptoms ($\beta = -0.16$, $p < 0.001$). The indirect effect was significant ($\beta = -0.056$, $p = 0.002$) and accounted for 20.2% of the total effect, while the direct effect remained significant ($\beta = -0.22$, $p < 0.001$).

Similarly, PPTP exhibited a significant indirect effect via CFI_A. PPTP was positively related to cognitive flexibility ($\beta = 0.21$, $p < 0.001$), and cognitive flexibility was negatively related to depressive symptoms ($\beta = -0.17$, $p < 0.001$). The indirect effect was significant ($\beta = -0.036$, $p = 0.004$), accounting for 10.2% of the total effect, alongside a robust direct association ($\beta = -0.32$, $p < 0.001$).

FPTP was negatively associated with CFI_A ($\beta = -0.32$, $p < 0.001$), which in turn was negatively associated with depressive symptoms ($\beta = -0.11$, $p = 0.017$). The resulting indirect effect was significant ($\beta = 0.034$, $p = 0.024$), accounting for 7.5% of the total effect, while the direct effect remained strong ($\beta = 0.41$, $p < 0.001$).

No evidence for mediation was observed for HPTP. HPTP did not significantly influenced CFI_A ($p = 0.155$), and neither the indirect ($\beta = 0.016$, $p = 0.171$) nor the total effect on depressive symptoms reached statistical significance.

The mediating role of Control - Cognitive Flexibility

Regarding the role of the Control dimension of cognitive flexibility, the mediation analyses indicated that it mediated the associations between multiple time perspective dimensions and depressive symptoms. PNTP was strongly and negatively associated with CFI_C ($\beta = -0.54$, $p < 0.001$), which in turn was negatively associated with depressive symptoms ($\beta = -0.15$, $p < 0.001$). The indirect effect was statistically significant ($\beta = 0.082$, $p = 0.001$), accounting for 13.6% of the total effect, while the direct association between PNTP and depressive symptoms remained substantial ($\beta = 0.52$, $p < 0.001$).

A significant indirect association was observed for FTP. FTP was positively associated with CFI_C ($\beta = 0.19$, $p < 0.001$), which was strongly and negatively associated with depressive symptoms ($\beta = -0.39$, $p < 0.001$). The indirect effect was significant ($\beta = -0.074$, $p < 0.001$) and accounted for 26.6% of the total effect, while the direct effect of FTP on depressive symptoms remained significant ($\beta = -0.20$, $p < 0.001$).

Similarly, FPTP demonstrated a significant indirect effect via CFI_C. FPTP was negatively associated with perceived control ($\beta = -0.35$, $p < 0.001$), and CFI_C was negatively associated with depressive symptoms ($\beta = -0.31$, $p < 0.001$). The indirect effect was significant ($\beta = 0.109$, $p < 0.001$), accounting for 24.3% of the total effect, alongside a robust direct association ($\beta = 0.34$, $p < 0.001$).

PPTP showed a significant indirect association with depressive symptoms through CFI_C. PPTP positively influenced perceived control ($\beta = 0.17$, $p < 0.001$), which in turn was negatively associated with depressive symptoms ($\beta = -0.38$, $p < 0.001$). The indirect effect was significant ($\beta = -0.065$, $p < 0.001$), accounting for 18.1% of the total effect, while the direct effect remained strong ($\beta = -0.29$, $p < 0.001$).

No evidence for mediation was observed for HPTP. HPTP did not significantly influenced CFI_C ($p = 0.951$), and neither the indirect ($\beta = 0.001$, $p = 0.951$) nor the total effect on depressive symptoms reached statistical significance.

Table 2. *Estimated indirect effects*

TP	Mediator	Estimate	*SE*	*Lower*	*Upper*	*Z*	*p*	% Mediation
TPNP	CFI_A	0.024*	0.011	0.003	0.044	2.24	.025	3.9
	CFI_C	0.082**	0.025	0.033	0.131	3.28	.001	13.6
HPTP	CFI_A	0.016	0.012	−0.007	0.038	1.37	.171	—
	CFI_C	0.001	0.021	−0.039	0.042	0.06	.951	—
FTP	CFI_A	−0.06**	0.019	−0.093	−0.020	−3.04	.002	20.2
	CFI_C	−0.074***	0.020	−0.114	−0.035	−3.70	< .001	26.6
PPTP	CFI_A	−0.036**	0.012	−0.061	−0.012	−2.92	.004	10.2
	CFI_C	−0.065***	0.019	−0.102	−0.027	−3.35	< .001	18.1
FPTP	CFI_A	0.034*	0.015	0.005	0.063	2.26	.024	7.52
	CFI_C	0.109***	0.020	0.069	0.149	5.33	< .001	24.3

Note. * p < .05, ** p < .01, *** p < .001
CFI_A – CFI Alternative, CFI_C – CFI Control, PN – Past Negative, PH – Present Hedonistic, F – Future, PP – Past Positive, PF – Present Fatalistic, DASS_D – DASS Depression Factor.

The present study shows that cognitive flexibility plays an important role in linking time perspective to depressive symptoms. Both the Alternatives and Control dimensions mediated the associations between maladaptive time perspectives (PNTP and FPTP) and higher depression, as well as between adaptive perspectives (FTP and PPTP) and lower depression. The Control dimension emerged as a stronger mediator, suggesting that perceived control is particularly important in understanding how temporal orientations influence depressive symptoms. These findings highlight cognitive flexibility as a relevant target for psychological interventions aimed at reducing depression.

4. DISCUSSIONS

This study examined whether cognitive flexibility (CFI - Alternatives and Control) helps explain how time perspective relates to depressive symptoms. The correlation pattern was consistent with prior evidence showing that maladaptive temporal orientations (particularly Negative Past and Fatalistic Present) are positively associated with depression, while more adaptive orientations (especially Future and Positive Past) are negatively associated with depressive symptoms. Similar associations have been reported in both community and clinical samples, including cross-cultural work and comparisons between depressed and non-depressed groups (Kaya Lefèvre et al., 2019).

Across mediation models, both cognitive flexibility dimensions emerged as statistically significant mediators for Negative Past, Fatalistic Present, Future, and Positive Past. Conceptually, these findings align with cognitive-behavioral accounts in which flexible appraisal and perceived controllability support adaptive re-interpretation and problem-solving, reducing vulnerability to depressive symptoms. This interpretation is consistent with the original conceptualization of the CFI, which was designed to capture flexibility relevant to challenging and replacing maladaptive thoughts, and has shown concurrent links with depression measures (Dennis & Vander Wal, 2010). Furthermore, independent research has documented negative associations between cognitive flexibility and depressive symptoms, supporting the plausibility of flexibility as a mechanism in depression-related pathways (Fukuzaki & Takeda, 2022).

A key contribution of the present findings is the comparative pattern across the two CFI dimensions: Control tended to show larger and more consistent indirect effects than Alternatives. This suggests that perceived controllability and an internal locus of control may be particularly important in linking temporal appraisals to depressive symptoms. This pattern is theoretically coherent with the CFI framework, where “control” captures perceived manageability of difficult situations, an element closely tied to helplessness-related processes central to depression (Dennis & Vander Wal, 2010).

Notably, Hedonistic Present did not show significant mediation effects in either model. This null pattern is not necessarily contradictory to prior literature, as findings regarding the present-hedonistic dimension have been mixed across outcomes and populations. For example, prior work has linked present-hedonistic tendencies more strongly to life satisfaction and well-being rather than depressive symptoms per se, and other studies report heterogeneity depending on context and sample characteristics (Tseferidi et al., 2017). Taken together, the present findings suggest that not all temporal orientations operate through cognitive flexibility in the same way, and that the

depression-relevant pathways may be most pronounced for negative past-focused and fatalistic present-focused appraisals, as well as future/positive-past protective orientations.

From an applied perspective, the results are consistent with emerging therapeutic approaches targeting temporal biases (e.g., Time Perspective Therapy) and support the idea that interventions may benefit from combining time-perspective work with strategies that increase cognitive flexibility, particularly perceived control (Mirzania et al., 2022). However, given the cross-sectional design, causal interpretations should be made cautiously.

5. CONCLUSIONS

The present study provides evidence that cognitive flexibility is a meaningful pathway linking time perspective to depressive symptoms. Negative Past and Fatalistic Present orientations were associated with higher depressive symptoms, whereas Future and Positive Past orientations were associated with lower depressive symptoms; these associations were partly accounted for by individual differences in cognitive flexibility. Across models, CFI_Control emerged as the more robust mediator, underscoring the potential importance of perceived control in understanding how temporal orientations become emotionally consequential (Lefèvre et al., 2019).

Future directions

Several directions follow from these findings. First, longitudinal and experimental designs are needed to clarify temporal ordering and test whether changes in time perspective predict subsequent changes in cognitive flexibility and depressive symptoms (or vice versa), particularly given evidence that time perspective profiles differ in clinically depressed versus non-depressed groups (Lefèvre et al., 2019).

Second, future studies could examine whether these mediation pathways generalize across clinical samples, age groups, and cultural contexts, extending large-scale cross-cultural work showing that time perspective dimensions can predict depression levels (Micillo et al., 2022).

Third, research should test expanded mechanistic models that include additional processes commonly implicated in depression, such as rumination, cognitive fusion, or emotion regulation, alongside cognitive flexibility. Recent work has already begun to link deviations from balanced time perspective to depression-related constructs (e.g., cognitive fusion), suggesting multi-process pathways may be especially informative (Pyszkowska et al., 2023).

Fourth, intervention research could evaluate whether boosting cognitive flexibility (especially perceived control) amplifies the benefits of time-perspective–focused approaches, consistent with clinical applications of time perspective therapy that report reductions in maladaptive temporal orientations (Mirzania et al., 2022)

Finally, measurement considerations deserve attention. While the ZTPI is widely used and foundational to the field, model fit issues are common in some samples and language adaptations; future work could consider alternative scoring approaches, shorter validated forms, or testing measurement invariance across groups before comparing pathways (Zimbardo & Boyd, 1999).

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Conflicts of interest

The authors have no conflict of interest to declare.

Availability of data and material

Data available on request.

Author contribution

All authors contributed equally.

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