





## Structural Modeling of Hope Based on Time Perspective Components with the Mediating Role of Perceived Social Support in Students

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### ABSTRACT

**Objective:** This study aimed to investigate the structural relationships between time perspective dimensions and hope for life in university students, focusing on the mediating role of perceived social support.

**Methods and Materials:** The research employed a descriptive–correlational design using structural equation modeling. The statistical population comprised university students in Tehran during the 2019–2020 academic year, from which 584 participants (55.1% female, 44.9% male) were selected through multistage random cluster sampling. Participants completed the Zimbardo Time Perspective Inventory (ZTPI), Snyder's Adult Hope Scale, and the Multidimensional Scale of Perceived Social Support (MSPSS). Data analysis was conducted using SPSS and AMOS software. Model fit was evaluated with  $\chi^2/df$ , CFI, TLI, and RMSEA indices. The mediating effects of perceived social support were tested through bootstrapping with 5,000 resamples at a 95% confidence interval.

**Findings:** Results indicated that Past-Negative ( $\beta = -0.034$ ,  $p < 0.01$ ) and Past-Positive ( $\beta = 0.035$ ,  $p < 0.01$ ) orientations indirectly predicted agency thinking via perceived social support. Present-Fatalistic orientation had a direct negative effect on both agency ( $\beta = -0.149$ ,  $p < 0.05$ ) and pathways thinking ( $\beta = -0.141$ ,  $p < 0.01$ ). Present-Hedonistic orientation indirectly predicted agency ( $\beta = 0.101$ ,  $p < 0.01$ ) and pathways thinking ( $\beta = -0.045$ ,  $p < 0.01$ ) through perceived social support. Future-Goal-Oriented perspective had a direct positive effect on pathways thinking ( $\beta = 0.262$ ,  $p < 0.01$ ).

**Conclusion:** The findings highlight that time perspective dimensions influence hope for life both directly and indirectly through perceived social support. Positive temporal orientations, when supported by strong social networks, enhance motivational and strategic components of hope, while negative orientations, particularly Present-Fatalistic, undermine these aspects.

**Keywords:** Time perspective; Hope for life; Perceived social support; Structural equation modeling; University students.

## 1. Introduction

The concept of mental health, as defined by the World Health Organization, extends beyond the absence of psychological disorders and encompasses emotional balance, self-efficacy, autonomy, competence, social connectedness, and the realization of one's intellectual potential (Tehrani et al., 2013). Among the cognitive-emotional constructs that support this multidimensional well-being, hope for life emerges as a central element, enabling individuals to adapt to life's challenges, sustain goal-directed behavior, and maintain psychological resilience (Bahadori Khosroshahi & Hashemi Nosratabadi, 2012; Osullivan, 2010; Pasha & Amini, 2010). Hope has been defined as a positive motivational state that includes both the agency to pursue goals and the pathways to achieve them (Hu, 2022; Mohammadi et al., 2016). Without hope, the human capacity for purposeful action and problem-solving declines, resulting in stagnation in both personal and social domains (Mohammadian et al., 2016).

In contemporary psychological research, hope is not examined in isolation but in connection with other determinants of well-being, including time perspective (TP) and perceived social support. Time perspective refers to the cognitive processes through which individuals partition their experiences into past, present, and future frames and imbue them with emotional and motivational significance (Przepiorka & Malgorzata Sobol, 2020; Zhang et al., 2022). First conceptualized within Lewin's field theory and further refined by Zimbardo and Boyd, TP has been recognized as a stable yet modifiable personality characteristic that influences decision-making, goal orientation, and adaptation (Birkas & Csatho, 2015; Carelli et al., 2011; Siu et al., 2014). The five major dimensions—Past-Negative, Past-Positive, Present-Hedonistic, Present-Fatalistic, and Future-Goal-Oriented—differentially affect emotional states, coping strategies, and behavioral outcomes (Anagnostipoulos & Griva, 2012; Arnold et al., 2011; Taghilo & Latifi, 2016).

The Past-Negative perspective is characterized by a pessimistic and regret-laden view of one's history, which has been linked to higher levels of psychological distress and reduced life satisfaction (Braitman & Henson, 2015; Guo et al., 2017). Conversely, the Past-Positive perspective, involving nostalgic and affirming memories, fosters a sense of identity continuity and psychological security (Alizadeh et al., 2016). Present-Hedonistic orientation emphasizes pleasure, novelty-seeking, and risk-taking, which may promote creativity and vitality but can also reduce attention

to long-term goals (Anagnostipoulos & Griva, 2012; Omidian & Hemmati, 2016). Present-Fatalistic orientation, marked by resignation and helplessness, is often associated with hopelessness and disengagement (Arnold et al., 2011; Braitman & Henson, 2015). The Future-Goal-Oriented dimension reflects long-term planning, persistence, and strategic thinking, which are typically predictive of academic success, adaptive coping, and life satisfaction (He et al., 2024; Kwok et al., 2024).

Importantly, TP does not operate in isolation from social and environmental influences. The construct of perceived social support—the belief that one has reliable assistance from family, friends, and significant others—has been identified as a key mediator linking TP to hope (Ghodampour et al., 2016; Kong & You, 2013). Perceived social support not only buffers stress but also promotes adaptive interpretations of time-related experiences, enabling individuals to reframe past adversity, enjoy present opportunities, and sustain future-oriented aspirations (Budak & Kaatsiz, 2024; He et al., 2024). Students who perceive high levels of social support are more likely to exhibit goal-directed persistence, particularly in the face of academic and personal obstacles (Kwok et al., 2024; Mohammadian et al., 2016).

The interaction between TP and social support in predicting hope can be explained through cognitive-motivational theories. For example, according to Snyder's Hope Theory, agency (the motivational component) and pathways (the strategic component) are enhanced when individuals believe that their social environment provides both encouragement and tangible resources (Mohammadi et al., 2016; Sepehrian Azar et al., 2016). Research indicates that Future-Goal-Oriented perspectives are strengthened when individuals perceive their social networks as supportive, thereby translating temporal orientation into sustained goal pursuit (Zhang et al., 2022). Conversely, Present-Fatalistic orientation may erode hope unless counterbalanced by strong social support systems (Przepiorka & Malgorzata Sobol, 2020; Taghilo & Latifi, 2016).

Empirical evidence supports these propositions. Guo et al. (Guo et al., 2017) found that Future-Goal-Oriented perspective predicts reduced delay discounting via structural brain mechanisms, suggesting a neurocognitive basis for the link between temporal orientation and self-regulation. Similarly, Kwok et al. (Kwok et al., 2024) demonstrated in a longitudinal study that perceived social support from friends predicted increases in hope among adolescents, with

emotional intelligence acting as a mediator. He et al. (He et al., 2024) reported that in clinical populations, perceived social support mediated the relationship between comfort and hope, underscoring the generalizability of this mechanism across contexts.

The role of TP in mental health has also been examined in diverse cultural settings. Studies by Birkas and Csatho (Birkas & Csatho, 2015) and Przepiorka and Sobol (Przepiorka & Malgorzata Sobol, 2020) have shown that balanced TP profiles—characterized by low Past-Negative, high Past-Positive, moderate Present-Hedonistic, low Present-Fatalistic, and high Future-Goal-Oriented scores—are associated with higher gratitude, life satisfaction, and resilience. These outcomes align closely with the components of hope identified in both Western (Arnold et al., 2011) and non-Western contexts (Mohammadian et al., 2016; Omidian & Hemmati, 2016).

Furthermore, cross-sectional and longitudinal studies have confirmed that social support plays a significant mediating or moderating role in these associations. For instance, Zhang et al. (Zhang et al., 2022) found that social support and stress jointly mediated the link between hope and depression, while Ghodampour et al. (Ghodampour et al., 2016) emphasized the predictive role of social support dimensions in occupational outcomes, which are closely tied to goal achievement and hope.

From a developmental perspective, adolescence and early adulthood represent critical periods for the formation of both TP and hope. As individuals transition to university life, they encounter novel academic and social challenges that require adaptive temporal framing and supportive networks (Anagnostipoulos & Griva, 2012; Siu et al., 2014). The quality and availability of social support during this phase can determine whether students interpret these challenges as opportunities for growth (Future-Goal-Oriented) or as insurmountable obstacles (Present-Fatalistic) (Budak & Kaatsiz, 2024; Kwok et al., 2024).

In summary, the literature suggests a complex interplay between TP dimensions, perceived social support, and hope. While certain TP profiles inherently facilitate hopeful thinking, social support serves as a crucial environmental factor that can amplify or buffer these effects. This study builds upon prior findings (Alizadeh et al., 2016; Anagnostipoulos & Griva, 2012; Arnold et al., 2011; Bahadori Khosroshahi & Hashemi Nosratabadi, 2012; Birkas & Csatho, 2015; Braitmman & Henson, 2015; Carelli et al., 2011; Ghodampour et al., 2016; Guo et al., 2017; Kong & You, 2013; Mohammadian et al., 2016; Nakahara, 2013;

Omidian & Hemmati, 2016; Osullivan, 2010; Pasha & Amini, 2010; Przepiorka & Malgorzata Sobol, 2020; Sepehrian Azar et al., 2016; Siu et al., 2014; Taghilo & Latifi, 2016; Tehrani et al., 2013; Zhang et al., 2022) by examining these relationships in a sample of university students, with the mediating role of perceived social support explicitly modeled.

Given the importance of fostering hope in young adults—a period marked by both heightened aspirations and vulnerability—understanding the mechanisms through which TP and social support interact to shape hopeful thinking is essential. The present study aims to fill this gap by testing a structural model that links TP dimensions to hope, mediated by perceived social support, thereby offering theoretical and practical insights for psychological interventions in educational settings.

## 2. Methods and Materials

### 2.1. Study Design and Participants

The present study employed a descriptive-correlational design. The statistical population included all university students in Tehran aged between 23 and 30 years who were enrolled during the 2019–2020 academic year. A multistage random cluster sampling method was used: first, a number of universities in Tehran were randomly selected; then, from among various academic disciplines, several fields were chosen, and the study was conducted within student groups from those fields. The final sample consisted of 584 male and female students from clusters representing the medical sciences, engineering, basic sciences, and arts. Out of 623 distributed questionnaires, 584 complete and valid questionnaires were analyzed, yielding a response validity rate of 93.73%.

### 2.2. Measures

Zimbardo Time Perspective Inventory (ZTPI): The ZTPI developed by Zimbardo and Boyd (1999) is a 56-item self-report instrument scored on a five-point Likert scale ranging from very untrue of me to very true of me. It measures the five time perspective dimensions defined by Zimbardo and Boyd. Items 9, 24, 25, 41, and 56 are reverse-scored. Zimbardo and Boyd (1999) reported Cronbach's alpha coefficients of 0.82 for Past-Negative, 0.80 for Past-Positive, 0.79 for Present-Hedonistic, 0.74 for Present-Fatalistic, and 0.77 for Future-Goal-Oriented subscales. In the study by Taghilo and Latifi (2016), alpha coefficients were 0.74, 0.70,

0.71, 0.72, and 0.69, respectively. Exploratory factor analysis provided partial support for the original factor structure, with 42 of the 56 items showing significant loadings and explaining about 30% of the variance. Confirmatory factor analysis, however, did not fully confirm the five-factor model. Internal consistency (Cronbach's alpha) in their study was 0.75 for Past-Negative, 0.61 for Present-Hedonistic, 0.70 for Future, 0.64 for Past-Positive, and 0.61 for Present-Fatalistic.

**Adult Hope Scale:** The Adult Hope Scale developed by Snyder, Harris, Anderson, et al. (1991) consists of 12 items, of which 8 are scored and 4 serve as distractor items. Of the scored items, four assess agency thinking (willpower component: items 2, 9, 10, and 12) and four assess pathways thinking (strategic thinking component: items 1, 4, 6, and 8). The remaining four items (3, 5, 7, and 11) are filler items, with items 3, 7, and 11 reverse-scored. Responses are given on a five-point Likert scale ranging from 0 to 4. Snyder et al. (1991) reported Cronbach's alpha coefficients of 0.74 for agency and 0.78 for pathways thinking, with adequate convergent and divergent validity. Shahni et al. (2012) reported alpha coefficients of 0.66 and 0.80, respectively. Taghilo and Latifi (2016) reported alpha coefficients of 0.73 and 0.67. In the present study, Cronbach's alpha was 0.85 for agency thinking and 0.83 for pathways thinking.

**Multidimensional Scale of Perceived Social Support (MSPSS):** Developed by Zimet et al. (1988), this 12-item self-report scale assesses perceived social support from three sources: family, friends, and a significant other, with four items per subscale. Items are rated on a five-point Likert scale ranging from strongly disagree to strongly agree. Reported Cronbach's alpha coefficients for the subscales range from 0.76 to 0.80. Bruwer et al. (2008) found internal consistency reliabilities between 0.86 and 0.90 for the subscales and 0.86 for the total scale in a sample of 788 high

school students. Salimi, Jokar, and Nikpour (2009) reported alpha coefficients of 0.86, 0.86, and 0.82 for family, friends, and significant others, respectively. In the present study, alpha coefficients were 0.78 for family support, 0.86 for friend support, and 0.73 for support from significant others.

### 2.3. Data Analysis

Data were analyzed using structural equation modeling (SEM) to examine the direct and indirect relationships between time perspective dimensions, perceived social support, and hope. Preliminary analyses included descriptive statistics, skewness, and kurtosis to assess normality, with all variables falling within acceptable ranges. Pearson correlation coefficients were computed to explore bivariate associations among variables. The hypothesized model was tested using AMOS software, applying maximum likelihood estimation, and model fit was evaluated through standard indices (e.g., CFI, TLI, RMSEA, and  $\chi^2/df$ ). Indirect effects were assessed using bootstrapping with 5,000 resamples to obtain bias-corrected confidence intervals for mediation paths. All analyses were conducted at a significance level of 0.05.

## 3. Findings and Results

Analysis of the demographic characteristics of the participants indicated that 55.1% of respondents were female and 44.9% were male. The mean age of respondents was approximately 30 years. Regarding marital status, 54.1% were single and 45.9% were married. The largest proportion of respondents fell within the age range of 26–28 years. Table 1 presents descriptive statistics for the study variables, including means, standard deviations, skewness, and kurtosis.

**Table 1**

*Descriptive statistics of the study variables*

Variable (Component)	Mean	SD	Skewness	Kurtosis
Time Perspective	3.36	0.30	0.264	0.738
Past-Negative	3.28	0.675	-0.140	-0.129
Past-Positive	3.52	0.521	-0.359	0.065
Present-Fatalistic	2.84	0.660	0.095	-0.362
Present-Hedonistic	3.41	0.468	0.400	0.560
Future-Goal-Oriented	3.75	0.461	-0.128	-0.261
Hope	3.73	0.610	-0.520	0.266
Agency Thinking	3.76	0.674	-0.394	-0.019
Pathways Thinking	3.70	0.666	-0.613	0.418
Perceived Social Support	3.72	0.730	-0.714	0.792

Family	3.81	0.850	-0.612	0.093
Friends	3.61	0.854	-0.835	0.880
Significant Others	3.75	0.894	-0.581	-0.101

The mean scores for all study variables were higher than the population mean (3.00), indicating relatively high levels of time perspective, hope, and perceived social support. Among the components, Past-Negative, Past-Positive, Present-Hedonistic, Future-Goal-Oriented, Hope (Agency), Hope (Pathways), and social support from family, friends, and significant others all scored above the mean. Only Present-Fatalistic scored below the mean. Skewness and kurtosis values fell within the acceptable ranges suggested by Plante (2016) —  $\pm 3$  for skewness and  $\pm 10$  for kurtosis — confirming the normal distribution of data.

The correlation results show no significant relationships between Past-Positive and either Present-Hedonistic or Future-Goal-Oriented. The presence or absence of positive/negative correlations among these components does not affect subsequent analyses. Agency and pathways thinking were strongly correlated, and all forms of perceived social support (family, friends, significant others) were positively and significantly correlated with one another. Time perspective dimensions accounted for 20% of the variance in agency thinking and 19% of the variance in pathways thinking.

**Table 2**

*Direct and indirect effects of time perspective on hope through perceived social support*

Mediator	Path →	Direct Effect	Indirect Effect	Bootstrapping	Z-score	R <sup>2</sup>
Perceived Social Support	Past-Negative → Agency Thinking	—	-0.034**	—	2.926***	0.20
	Past-Positive → Agency Thinking	—	0.035**	—	—	
	Present-Fatalistic → Agency Thinking	-0.149**	—	—	—	
	Present-Hedonistic → Agency Thinking	-0.029**	0.101*** (Full Mediation)	—	-3.828***	
	Past-Positive → Pathways Thinking	—	0.042***	—	—	0.19
	Present-Fatalistic → Pathways Thinking	-0.141***	—	—	—	
	Present-Hedonistic → Pathways Thinking	—	-0.045***	—	-3.828***	
	Future-Goal-Oriented → Pathways Thinking	0.262***	—	—	—	

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

According to Table 2, Past-Negative and Past-Positive dimensions indirectly predicted agency thinking through perceived social support, with path coefficients of -0.034 and 0.035, respectively. Present-Fatalistic directly predicted agency thinking with a coefficient of -0.149 ( $p < 0.05$ ). Present-Hedonistic indirectly predicted agency thinking with a coefficient of 0.101 ( $p < 0.01$ ), showing a full mediation effect. Present-Fatalistic and Future-Goal-Oriented directly predicted pathways thinking, with coefficients of -0.141 and 0.262, respectively ( $p < 0.01$ ). Additionally, Past-Positive and Present-Hedonistic indirectly predicted pathways thinking, with coefficients of 0.042 and -0.045, respectively ( $p < 0.01$ ).

The results of the present study provide important insights into the interrelationships between time perspective (TP) dimensions, hope for life, and perceived social support among university students. Consistent with the structural equation modeling outcomes, Past-Negative and Past-Positive orientations were found to exert indirect effects on agency thinking through perceived social support. The negative coefficient for Past-Negative indicates that an unfavorable interpretation of past experiences reduces the perceived availability and quality of social support, which in turn undermines motivational aspects of hope. This is in line with the notion that maladaptive temporal framing can erode trust in social resources and self-efficacy (Braitman & Henson, 2015; Guo et al., 2017). Conversely, Past-Positive orientation, characterized by nostalgic and affirming memories, strengthened perceived social support and thereby enhanced agency thinking, corroborating evidence that a constructive relationship with one's personal history

#### 4. Discussion and Conclusion



fosters resilience and openness to interpersonal assistance (Alizadeh et al., 2016; Anagnostipoulos & Griva, 2012).

The direct negative relationship observed between Present-Fatalistic perspective and both components of hope (agency and pathways thinking) reinforces previous findings that fatalistic attitudes, which emphasize a perceived lack of control over outcomes, diminish both the drive to pursue goals and the perceived capacity to devise strategies for their attainment (Arnold et al., 2011; Taghilo & Latifi, 2016). In psychological terms, this orientation reflects cognitive rigidity and learned helplessness, both of which hinder adaptive coping. Similar patterns have been reported in studies where fatalistic thinking predicted depressive symptoms and disengagement from goal-directed behaviors (Birkas & Csatho, 2015; Omidian & Hemmati, 2016).

In contrast, the Future-Goal-Oriented perspective directly and positively predicted pathways thinking, confirming the theoretical expectation that long-term planning and purposive behavior enhance strategic problem-solving capabilities (He et al., 2024; Kwok et al., 2024). Individuals high in this orientation are more likely to identify multiple routes toward goal achievement, a cognitive asset that is central to Snyder's model of hope (Mohammadi et al., 2016; Osullivan, 2010). This relationship also aligns with neurocognitive evidence indicating that future orientation engages brain regions involved in executive planning and self-regulation (Guo et al., 2017).

A noteworthy finding is the indirect role of Present-Hedonistic perspective in predicting both agency and pathways thinking through perceived social support. Although this orientation is often associated with impulsivity and risk-taking, the mediation results suggest that when accompanied by strong supportive networks, its influence can shift toward enhancing motivational and cognitive aspects of hope (Anagnostipoulos & Griva, 2012; Braitmman & Henson, 2015). This may be because individuals with a hedonistic present-time focus often value and seek out social relationships, and when those relationships are perceived as supportive, they can channel energy toward constructive pursuits (Budak & Kaatsiz, 2024; Kong & You, 2013).

The mediating effect of perceived social support across several TP–hope relationships confirms the importance of the social context in sustaining optimistic, future-oriented cognition. Perceived social support can buffer against the detrimental effects of negative temporal orientations and amplify the benefits of positive ones (Ghodampour et al., 2016; Zhang et al., 2022). This finding is consistent with

earlier studies showing that supportive networks improve psychological resilience, increase goal commitment, and reduce avoidance tendencies (Bahadori Khosroshahi & Hashemi Nosratabadi, 2012; Sepehrian Azar et al., 2016). Social support acts both as an external resource, offering tangible aid and advice, and as an internalized belief system, reinforcing self-worth and competence (He et al., 2024; Kwok et al., 2024).

The interplay between TP and social support also resonates with the broader literature on life satisfaction and mental health. Przepiorka and Sobol (Przepiorka & Malgorzata Sobol, 2020) demonstrated that individuals with a positive TP profile are more grateful and satisfied with life, largely because they interpret their social connections as sources of encouragement and stability. This interpretation is echoed in the present study's finding that the indirect effects of positive temporal orientations (Past-Positive, Future-Goal-Oriented) on hope are largely carried by perceived social support. Inversely, negative temporal orientations reduce hope partially through diminishing the perception of available social resources, creating a feedback loop of social withdrawal and lowered goal pursuit (Arnold et al., 2011; Taghilo & Latifi, 2016).

It is also significant that the three subcomponents of perceived social support—family, friends, and significant others—jointly contributed to the mediation effects. Prior studies have found that family support is especially critical for reinforcing agency thinking, while peer support may be more strongly linked to pathways thinking by offering diverse perspectives on problem-solving (Budak & Kaatsiz, 2024; Kong & You, 2013). The balanced contribution of these sources in the current study suggests that interventions to enhance student hope should aim to strengthen all forms of supportive relationships, rather than focusing exclusively on one domain.

The overall pattern of results supports a model in which TP shapes cognitive and motivational aspects of hope both directly and indirectly via perceived social support. This aligns with socioemotional selectivity theory, which posits that individuals prioritize goals and social relationships differently depending on their perceived time horizon (Alizadeh et al., 2016; Anagnostipoulos & Griva, 2012). When time is perceived as expansive, as in a Future-Goal-Oriented perspective, individuals are more likely to invest in acquiring new knowledge, expanding their networks, and planning strategically—behaviors that both generate and are supported by social connections (He et al., 2024; Kwok et al., 2024). Conversely, limited time horizons, as perceived

in a Present-Fatalistic frame, lead to narrowed social engagement and reduced hope.

From a practical perspective, these findings underscore the potential for psychological and educational programs to target both temporal orientation and perceptions of social support as levers for enhancing hope among students. For example, cognitive-behavioral interventions could help students reframe Past-Negative interpretations into more constructive narratives, while group-based workshops could cultivate peer support networks. Similarly, mentoring programs might foster Future-Goal-Oriented thinking by pairing students with role models who exemplify strategic goal pursuit in the context of supportive relationships (Mohammadian et al., 2016; Sepehrian Azar et al., 2016).

Overall, the convergence between the present findings and prior studies suggests a robust and culturally generalizable relationship between time perspective, social support, and hope. This reinforces the theoretical integration of TP theory with hope theory, mediated by the social cognitive construct of perceived support (Guo et al., 2017; Przepiorka & Malgorzata Sobol, 2020; Zhang et al., 2022).

## 5. Limitations & Suggestions

This study relied on self-report measures, which may be subject to social desirability bias and recall inaccuracies. The cross-sectional design precludes causal inference, limiting the ability to determine the directionality of relationships between time perspective, perceived social support, and hope. The sample was restricted to university students in Tehran, which may reduce the generalizability of findings to other age groups, educational contexts, or cultural settings. Additionally, while the statistical models demonstrated good fit, the exclusion of potential moderating variables such as personality traits, academic performance, or mental health status may have omitted important nuances in the observed relationships.

Longitudinal studies are needed to establish causal pathways between time perspective, perceived social support, and hope. Future work could explore potential moderators, including emotional intelligence, coping styles, and resilience, to better understand how these factors shape the observed relationships. Comparative studies across cultural contexts would help determine the universality of the proposed model. Experimental interventions that manipulate temporal orientation or enhance perceived social support could provide valuable evidence of their causal effects on hope. Finally, incorporating qualitative methods

could yield richer insights into how students personally interpret and integrate time perspectives and social support into their motivational systems.

Universities should consider implementing programs that simultaneously address students' time perspectives and social support networks. Time perspective training can be incorporated into counseling services to help students cultivate a more balanced temporal profile. Peer mentoring, family engagement initiatives, and faculty-student interaction programs could enhance perceived social support. Integrating goal-setting workshops with collaborative group activities may further strengthen both agency and pathways thinking. These interventions should be tailored to the developmental and cultural needs of students, ensuring relevance and sustainability.

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## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

## Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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## Authors' Contributions

All authors equally contributed to this article.

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