

Comparison of the Effectiveness of Motivational Interviewing and Mindset Interventions on Academic Motivation among Female Secondary School Students

Nasrin Sadat, Seyed Maragheh¹, Khadijeh. Abolmaali Alhosseini^{2*}, Mohammad. Azad Abdollahpour³, Aboutaleb. Saadati Shamir⁴

¹ PhD Candidate, Department of Psychology, Ki.C., Islamic Azad University, Kish, Iran

² Professor, Department of Psychology, NT.C., Islamic Azad University, Tehran, Iran

³ Assistant Professor, Department of Educational Psychology, Mah.C., Islamic Azad University, Mahabad, Iran

⁴ Assistant Professor, Department of Educational Psychology and Personality, SR.C., Islamic Azad University, Tehran, Iran

* Corresponding author email address: Kh.abolmaali@iau.ac.ir

Article Info

Article type:

Original Research

Section:

Educational Counseling

How to cite this article:

Seyed Maragheh, N. S., Abolmaali Alhosseini, K., Azad Abdollahpour, M., & Saadati Shamir, A. (2027). Comparison of the Effectiveness of Motivational Interviewing and Mindset Interventions on Academic Motivation among Female Secondary School Students. *KMAN Counseling and Psychology Nexus*, 5, 1-16.

<http://doi.org/10.61838/kman.psynexus.6002>



© 2027 the authors. Published by KMAN Publication Inc. (KMANPUB), Ontario, Canada. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

ABSTRACT

The present study aimed to compare the effectiveness of motivational interviewing and mindset interventions on academic self-efficacy among female secondary school students. This study employed a quasi-experimental method with a pretest–posttest design, a two-month follow-up, and a control group. The statistical population consisted of female ninth-grade students attending lower secondary schools in District 5 of Tehran during the 2024–2025 academic year. In the present study, 58 female students were randomly assigned to three groups: motivational interviewing ($n = 19$), mindset intervention ($n = 19$), and control ($n = 20$). The results indicated that the difference between the effects of the motivational interviewing and mindset interventions on the intrinsic motivation factor was statistically significant ($p = .027$), such that the mindset intervention produced a greater increase in intrinsic academic motivation than motivational interviewing. Accordingly, it was concluded that there was a significant difference between the effectiveness of motivational interviewing and mindset interventions on academic motivation among female secondary school students, with the mindset intervention being more effective than motivational interviewing in enhancing their intrinsic academic motivation. Based on the findings, the mindset intervention can be employed as a more effective approach for enhancing intrinsic academic motivation among female secondary school students.

Keywords: *academic motivation, mindset, motivational interviewing*

1. Introduction

Academic motivation is one of the central psychological constructs underlying students' engagement with learning, persistence in educational activities, academic adjustment, and achievement. Students differ not only in the amount of effort they devote to learning but also in the reasons that energize and direct such effort. These motivational differences influence whether students approach academic challenges with persistence, regulate their learning effectively, seek assistance when needed, and continue working after experiencing difficulty or failure. Contemporary educational psychology therefore regards motivation as a dynamic process that interacts with cognition, self-regulation, perceived competence, contextual demands, and students' beliefs about learning. Academic motivation becomes particularly important during adolescence, when students encounter increasingly complex academic demands while simultaneously undergoing substantial cognitive, emotional, and social changes. Evidence has shown that students' motivation is closely connected with learning strategies, engagement, and academic performance, suggesting that interventions capable of improving the quality of students' motivation may have consequences extending beyond immediate classroom behavior (Athirathan, 2024; Juan et al., 2025).

A fundamental distinction in the study of motivation concerns intrinsic and extrinsic forms of motivation. From the perspective of self-determination theory, intrinsic motivation refers to engagement in an activity because the activity itself is experienced as interesting, satisfying, or personally meaningful, whereas extrinsic motivation refers to behavior driven by outcomes separable from the activity, such as grades, approval, rewards, avoidance of punishment, or other external contingencies. Importantly, extrinsic motivation is not a unitary construct, because externally initiated behaviors may differ considerably in the degree to which they become internalized and integrated into a person's values and sense of self. Self-determination theory proposes that the quality of motivation depends substantially on satisfaction of the basic psychological needs for autonomy, competence, and relatedness. When learning environments support these needs, students are more likely to develop autonomous, persistent, and internally regulated forms of motivation; conversely, controlling or discouraging

environments may undermine engagement and contribute to motivational decline (Ryan & Deci, 2017, 2020). Accordingly, increasing academic motivation cannot be reduced to simply encouraging students to work harder. Effective intervention requires attention to the psychological mechanisms through which students interpret academic tasks, perceive their own capabilities, regulate effort, and connect learning with personally meaningful goals.

Academic motivation is especially consequential during secondary education because this developmental period is characterized by growing expectations for independent learning and self-regulation. Students are increasingly required to organize study activities, manage competing demands, tolerate delayed rewards, cope with examinations, persist with difficult material, and make educational decisions that may affect subsequent academic trajectories. Inadequate academic motivation during this stage can manifest as disengagement, procrastination, avoidance of challenging tasks, low persistence, inconsistent study behavior, and declining achievement. Research on academic motivation has therefore emphasized the importance of identifying psychological variables that can explain why some students persist despite difficulty while others withdraw. Evidence from research on perseverance and self-regulated learning indicates that motivation interacts closely with students' capacity to sustain effort, monitor progress, use adaptive learning strategies, and maintain goal-directed behavior across different educational and cultural contexts (Xu, Koorn, et al., 2021). Similarly, Iranian research has documented the relevance of reduced academic motivation to a broader constellation of student-related variables, indicating that motivational difficulties represent an important educational and psychological concern rather than an isolated problem (Zahiri Nav & Rajabi, 2009).

The assessment of academic motivation also requires instruments capable of distinguishing meaningful motivational orientations. Harter's conceptualization of academic motivation has been widely used to differentiate intrinsic and extrinsic orientations toward learning. Within this framework, intrinsically motivated students are more likely to prefer challenge, curiosity, independent mastery, and internally guided academic activity, whereas externally motivated students may place greater emphasis on approval, grades, external evaluation, and teacher-directed criteria. The psychometric properties of Harter's Academic

Motivation Scale have also been examined in Iranian student populations, providing evidence supporting its reliability and validity for the assessment of academic motivation in this cultural context (Bahrani, 2009). This distinction is particularly relevant to intervention research because an intervention may increase students' observable academic effort without necessarily strengthening intrinsic motivation. Thus, understanding whether psychological interventions affect intrinsic motivation, extrinsic motivation, or both is important for clarifying the quality and durability of motivational change.

One approach that may be particularly relevant to improving students' academic motivation is motivational interviewing. Motivational interviewing is a collaborative, goal-oriented communication approach designed to strengthen an individual's own motivation and commitment to change by eliciting and exploring personal reasons for change within an atmosphere of acceptance and partnership. Rather than attempting to impose change through persuasion, confrontation, or direct instruction, motivational interviewing emphasizes empathy, autonomy support, reflective listening, evocation of change talk, exploration of ambivalence, and strengthening perceived discrepancy between current behavior and personally important goals. In its contemporary formulation, motivational interviewing is based on the assumption that sustainable change is more likely when individuals articulate their own arguments for change and experience themselves as active agents in the decision-making process (Miller & Rollnick, 2023). These principles make motivational interviewing potentially suitable for academic settings in which students may understand the importance of studying yet remain ambivalent, avoidant, discouraged, or insufficiently committed to changing ineffective educational behaviors.

The theoretical compatibility between motivational interviewing and academic motivation is also apparent when motivational interviewing is considered alongside self-determination theory. Both approaches emphasize autonomy rather than coercion, and both recognize that externally imposed pressure may produce compliance without necessarily generating personally endorsed motivation. In an educational context, motivational interviewing can help students clarify academic values, identify discrepancies between current behaviors and desired outcomes, examine the costs and benefits of change, recognize personal strengths, and develop self-generated strategies for overcoming barriers. Such processes may be particularly useful for adolescents who experience low confidence,

academic procrastination, school avoidance, or reduced achievement motivation. By eliciting students' own reasons for change and reinforcing their sense of personal choice, motivational interviewing may facilitate greater internalization of academic goals and enhance persistence in educational activities.

Empirical evidence provides support for the application of motivational interviewing in student populations. Research involving students with academic difficulties has indicated that motivational interviewing can contribute to improvements in academic self-efficacy and achievement-related outcomes (Kakaei et al., 2021). Other studies have suggested that motivational interviewing may reduce academic procrastination among adolescents, a finding that is especially relevant because procrastination is often associated with avoidance, low task value, diminished self-regulation, and motivational conflict (Hosseini et al., 2020). Motivational interviewing has also been proposed as a practical method for increasing motivation among students by helping them identify personal goals and strengthen readiness for behavioral change (Dinarvandpour & Ahmad Mahmoudi, 2021). Furthermore, an integrated intervention combining motivational interviewing with metacognitive skills has been reported to improve academic procrastination, academic resilience, and academic achievement motivation among students with a history of school avoidance (Bagheri Hosseinabadi & Yousefi, 2023). Collectively, these findings suggest that motivational interviewing may affect academic functioning through several interrelated pathways, including enhanced self-efficacy, greater readiness for change, reduced avoidance, improved resilience, and stronger achievement motivation.

A second theoretically important approach to academic motivation is the growth mindset framework. Mindset theory focuses on individuals' implicit beliefs about whether abilities and intelligence are fixed traits or capacities that can develop through learning, practice, strategy use, feedback, and sustained effort. Dweck distinguished between a fixed mindset, in which intellectual abilities are perceived as relatively stable and immutable, and a growth mindset, in which abilities are viewed as malleable and capable of development (Dweck, 2006). These beliefs can affect how students interpret difficulty and failure. A student with a fixed mindset may perceive poor performance as evidence of limited ability and may therefore avoid challenging tasks that threaten self-evaluation. By contrast, a student with a growth mindset may interpret difficulty as part of learning

and may respond by increasing effort, modifying strategies, seeking feedback, or persisting longer.

The educational significance of growth mindset lies not simply in encouraging effort but in altering the meaning attributed to effort, mistakes, and academic challenge. Effective growth mindset interventions communicate that learning changes competence over time and that difficulty does not necessarily indicate inability. Students are encouraged to replace categorical beliefs such as “I cannot do this” with a more developmental interpretation such as “I cannot do this yet,” thereby framing current performance as changeable rather than definitive (Ardeshiri & Mohseni, 2025). This shift may protect motivation when students encounter setbacks because unsuccessful performance is interpreted as information about the current state of learning rather than as a fixed judgment about personal capacity. Growth mindset interventions may therefore be especially relevant for students who disengage when learning becomes difficult or whose motivation depends strongly on immediate success.

Contemporary research has extended mindset theory by examining its relationship with self-regulated learning and cognitive processes. A recent review suggests that growth mindset is associated with several dimensions of self-regulated learning, including goal setting, strategy selection, persistence, monitoring, and adaptive responses to difficulty (Xu et al., 2025). These processes are closely linked to academic motivation because students who believe that improvement is possible may perceive greater value in investing effort and using regulatory strategies. Experimental research has also shown that a growth mindset can reduce perceived cognitive load and improve learning, suggesting that students’ motivational beliefs may influence not only persistence but also the subjective cognitive demands associated with challenging academic material (Xu, Cunha-Harvey, et al., 2021). When students interpret difficulty as an expected component of learning rather than as evidence of inability, they may experience complex tasks as more manageable and allocate cognitive resources more adaptively.

The relationship between mindset and learning can also be understood within broader motivational and evolutionary accounts. Contemporary models of motivation emphasize that many forms of formal academic learning involve biologically secondary knowledge that is not acquired as effortlessly as evolutionarily primary abilities and therefore often requires sustained attention, instruction, deliberate practice, and motivational support (Xu et al., 2024). From

this perspective, students cannot be expected to remain consistently motivated merely because educational content is objectively important. They need psychological beliefs and learning environments that make effort, persistence, and strategic engagement meaningful. Growth mindset may contribute to this process by providing an explanatory framework through which students understand why academic learning is difficult and why sustained practice can nevertheless produce improvement.

At the same time, the growth mindset literature has emphasized the need to avoid overly simplistic claims. Growth mindset is not a guarantee of academic success, and its effectiveness depends on how it is implemented, the educational context in which it is delivered, and whether students have access to effective learning strategies and supportive opportunities for improvement. Yeager and Dweck argued that debates surrounding growth mindset interventions should be interpreted in light of variation in populations, contexts, implementation quality, and outcome measures rather than as evidence that mindset is either universally effective or ineffective (Yeager & Dweck, 2020). This position is important for intervention research because it shifts attention from asking whether growth mindset “works” in general to examining for whom, under what circumstances, and for which psychological outcomes it is most beneficial. Direct comparisons with other established motivational interventions may therefore provide particularly informative evidence.

Motivational interviewing and growth mindset interventions share several features but operate through partially distinct psychological mechanisms. Both approaches attempt to reduce maladaptive reactions to academic difficulty and strengthen students’ active engagement in change. Both may support autonomy, persistence, and a sense of agency. However, motivational interviewing primarily focuses on resolving ambivalence, eliciting personally meaningful reasons for change, strengthening commitment, and supporting behavioral planning, whereas growth mindset intervention primarily targets beliefs about the malleability of ability and the interpretation of effort, mistakes, and challenge. Motivational interviewing may therefore be especially useful when students recognize academic difficulties but lack sufficient commitment or perceive barriers to change. Growth mindset intervention may be especially relevant when students’ motivation is undermined by beliefs that difficulty reflects low or fixed ability.

These differences may also have implications for intrinsic and extrinsic academic motivation. Because motivational interviewing helps students articulate personally endorsed reasons for academic change, it may facilitate internalization of educational goals and promote more autonomous forms of motivation. Growth mindset, however, may directly alter the meaning of academic challenge and competence development, thereby increasing students' willingness to engage with learning for mastery and improvement. This possibility is particularly relevant to intrinsic motivation, because intrinsic engagement is more likely when students perceive challenge as manageable, competence as developable, and effort as meaningful. Nevertheless, both interventions may also influence extrinsic motivation by improving students' willingness to pursue grades, educational advancement, social approval, or other externally valued academic outcomes. Comparing their effects on both intrinsic and extrinsic motivation can therefore provide a more differentiated understanding of how each intervention influences students' academic motivational structure.

Despite growing research on motivational interviewing and growth mindset, several gaps remain. Much of the available literature has examined these approaches separately, and outcomes have often centered on achievement, procrastination, resilience, self-efficacy, learning performance, or self-regulated learning rather than direct comparisons of intrinsic and extrinsic academic motivation. Furthermore, the effectiveness of motivational interventions may vary according to developmental stage, educational context, gender, and cultural environment. Research specifically focusing on female secondary school students is therefore warranted because motivational processes during adolescence are shaped by developmental transitions as well as by academic and social expectations. A direct comparison also has practical value for school psychologists, counselors, and educators who must select interventions under constraints of time and resources. If two brief interventions both improve motivation but one demonstrates greater effectiveness for a specific dimension such as intrinsic motivation, such information can support more targeted school-based intervention planning.

The need for comparative research is further reinforced by the close relationship among motivation, learning strategies, persistence, and achievement. Students who become more motivated may be more likely to adopt effective learning strategies and participate actively in instruction, while successful strategic engagement may in

turn strengthen motivation and academic confidence (Juan et al., 2025). Similarly, research on perseverance demonstrates that motivational beliefs and self-regulatory processes function together rather than independently (Xu, Koorn, et al., 2021). Thus, interventions that strengthen academic motivation during secondary education may contribute to a broader adaptive cycle involving persistence, strategic learning, perceived competence, and continued engagement. However, determining which intervention produces stronger and more durable motivational changes requires longitudinal assessment extending beyond an immediate posttest.

The inclusion of a follow-up assessment is particularly important because improvements observed immediately after an intervention do not necessarily indicate stable psychological change. Motivational effects may diminish once structured sessions end, particularly if students return to educational environments containing the same difficulties and pressures that contributed to low motivation. Conversely, interventions that change how students interpret academic challenges or help them internalize personally meaningful reasons for educational engagement may demonstrate more sustained effects. Examining whether intervention-related improvements are maintained over time therefore provides stronger evidence regarding their practical significance. This is consistent with contemporary views of academic motivation as a dynamic construct that develops through ongoing interactions among beliefs, goals, strategies, contextual supports, and learning experiences (Ryan & Deci, 2020; Xu et al., 2025).

Taken together, existing theory and evidence indicate that both motivational interviewing and growth mindset interventions have plausible mechanisms for improving students' academic motivation, but they emphasize different pathways to motivational change. Motivational interviewing focuses on autonomy, ambivalence resolution, personal values, readiness, and commitment, whereas growth mindset training emphasizes malleability of ability, adaptive interpretations of errors, persistence, and the developmental potential of learning. Previous findings support the educational utility of motivational interviewing (Bagheri Hosseinabadi & Yousefi, 2023; Dinarvandpour & Ahmad Mahmoudi, 2021; Hosseini et al., 2020; Kakaei et al., 2021) and the motivational and learning-related benefits associated with growth mindset (Ardeshiri & Mohseni, 2025; Dweck, 2006; Xu, Cunha-Harvey, et al., 2021; Yeager & Dweck, 2020), while broader research confirms the importance of academic motivation for learning, engagement, perseverance, and performance (Athirathan, 2024; Xu et al.,

2024). However, there remains a need for controlled research directly comparing these interventions in adolescent students and distinguishing their effects on intrinsic and extrinsic academic motivation.

Therefore, the present study aimed to compare the effectiveness of motivational interviewing and growth mindset interventions on academic motivation among female secondary school students.

2. Methods and Materials

2.1. Study Design and Participants

The present study was applied in purpose and employed a quasi-experimental design with pretest, posttest, three-month follow-up, and a control group. The statistical population consisted of female ninth-grade students enrolled in lower secondary schools in District 5 of Tehran during the 2024–2025 academic year. Initially, three schools were selected using random cluster sampling. Subsequently, the Academic Self-Efficacy Scale developed by Jing and Morgan (1999) was administered to 300 students, representing the total number of students in the selected schools, for initial screening. Following the screening process and application of the eligibility criteria, 58 students were selected and randomly assigned to three groups: the motivational interviewing group ($n = 19$), the mindset intervention group ($n = 19$), and the control group ($n = 20$). The inclusion criteria were informed consent from both students and their parents, no simultaneous participation in another psychological or educational intervention, and obtaining a score at least one standard deviation below the population mean on the variables examined in the study. The exclusion criteria included absence from more than one intervention session and unwillingness to continue participation in the study. Participants in the two experimental groups received their respective interventions, whereas the control group did not receive any psychological or educational intervention during the study period. Measurements were conducted at the pretest, posttest, and three-month follow-up stages. Ethical principles were observed throughout the study, including obtaining informed consent, maintaining the confidentiality of participants' personal information and research data, ensuring voluntary participation, and informing participants of their right to withdraw from the study at any time without adverse consequences. The study was approved under the research ethics code IR.IAU.TNB.REC.1403.240.

2.2. Measures

Academic Motivation Questionnaire. Academic motivation was assessed using Harter's Academic Motivation Questionnaire, originally developed on the basis of Harter's work on intrinsic and extrinsic motivational orientations (Harter, 1980, 1981). The modified version used in the present study consists of 33 items designed to assess academic motivation among students across two dimensions: intrinsic academic motivation and extrinsic academic motivation. The intrinsic motivation subscale comprises Items 1, 2, 6, 7, 8, 12, 13, 14, 18, 19, 20, 24, 25, 26, 29, 30, and 33, whereas the extrinsic motivation subscale comprises Items 3, 4, 5, 9, 10, 11, 15, 16, 17, 21, 22, 23, 27, 28, 31, and 32. Responses are scored on a five-point Likert scale ranging from 1 (never) to 5 (almost always). Items 3, 4, 5, 9, 10, 15, 16, 19, 21, 27, and 31 are reverse-scored, such that responses are scored from 5 for "never" to 1 for "almost always." Higher scores indicate higher levels of the corresponding dimension of academic motivation. Previous psychometric evaluations have provided evidence for the reliability and validity of the instrument. Zohiri and Rajabi (2009) reported a Cronbach's alpha coefficient of .92 for the questionnaire, while Bahrani (2009) reported a validity coefficient of .84. In the original psychometric evaluation, Harter (1981) reported Kuder–Richardson Formula 20 reliability coefficients ranging from .54 to .84 across the subscales. Test–retest reliability coefficients ranged from .48 to .63 over a nine-month interval in one sample and from .58 to .76 over a five-month interval in another sample. Harter (1981) also provided evidence of validity by demonstrating meaningful differentiation across school social-class contexts and significant associations between questionnaire scores and teachers' ratings of students. Construct validity was further examined through associations between perceived competence and dimensions such as preference for challenge, independent mastery, and independent judgment, with generally positive correlations reported, although correlations with the internal criterion were comparatively low.

2.3. Interventions

The two experimental conditions consisted of motivational interviewing and growth mindset interventions, each implemented across six structured sessions. The motivational interviewing program consisted of six weekly 90-minute sessions and was organized around motivational enhancement principles and stages of behavioral change,

including precontemplation, contemplation, preparation, action, planning, and maintenance of change. Barriers to change were identified and addressed throughout the intervention. The first session focused on establishing rapport, conducting structured introductions, identifying each student's target behavior, determining the participant's stage of change according to the transtheoretical model, introducing concepts related to self-efficacy, motivation, and determination, and teaching self-monitoring skills. Students were asked to monitor their target behavior for three days and describe how successful behavioral change could affect their academic lives. The second session focused on strengthening intrinsic motivation and identifying emotional and behavioral barriers to studying, including fear, anxiety, boredom, and avoidance. Guided imagery of a successful future self was used, and students identified one major obstacle and a possible solution. The third session addressed goal setting and functional analysis. Students learned to formulate specific and achievable goals, practiced SMART goal setting, and were introduced to the antecedent-behavior-consequence model to analyze behaviors such as academic procrastination. The fourth session emphasized alignment between behavior and personal values and strengthening confidence in the capacity for change. Participants identified and prioritized important values such as achievement, family, health, and independence and examined whether their current academic behaviors moved them toward or away from these values. They were also encouraged to recall previous successful experiences as evidence of personal capabilities. The fifth session focused explicitly on motivational interviewing techniques for strengthening intrinsic motivation and commitment to change. Students learned the distinction between judgmental and exploratory questions, observed a modeled motivational interview, practiced exploratory questioning through role-play, and developed alternative strategies for problematic academic behaviors. The sixth session was devoted to consolidating acquired skills, reviewing learning experiences, answering remaining questions, evaluating intervention outcomes, administering the posttest, and developing an individualized plan for maintaining behavioral and motivational changes.

The growth mindset intervention was adapted from the educational growth mindset materials developed by Khan Academy in collaboration with Stanford University and informed by Dweck's theoretical framework and the Project for Education Research That Scales initiative (Khan Academy, 2018; Yeager et al., 2019). Although the original

package for lower secondary school students comprised five sessions, it was adapted into six sessions for the present study, with each session lasting approximately 60 to 90 minutes. The content validity of the adapted sessions was evaluated by 10 psychologists, including six educational psychologists, two clinical psychologists, and two general psychologists. Using the content validity ratio procedure proposed by Lawshe (1975), a value of .80 was obtained for all sessions, indicating satisfactory content validity. The first session focused on establishing rapport, introducing basic growth mindset concepts, discussing self-efficacy and determination, and familiarizing students with brain plasticity and the possibility that abilities can develop through practice and effort. Students identified a challenging academic subject and proposed strategies for improving their performance. The second session focused on reframing mistakes from threats or indicators of inability into opportunities for learning. Students completed deliberately challenging tasks, discussed their emotional responses to mistakes, and maintained a "mistake journal" in which they documented errors and the lessons learned from them. The third session was designed to strengthen perseverance and persistence in the face of academic difficulties. Students examined factors that contribute to disengagement or giving up and generated strategies for continuing effort when tasks become difficult. They were asked to complete an academic task that they had previously postponed or abandoned and report the outcome. The fourth session addressed the mechanisms through which practice and repetition facilitate learning and strengthen neural pathways. Students discussed previously difficult skills that became easier through practice, learned a brief new skill during the session, and reviewed previously learned academic material to experience the effect of reactivating and strengthening learning. The fifth session emphasized the practical integration of growth mindset principles, including viewing errors as informative, persisting in the face of difficulty, and understanding intellectual abilities as malleable. Participants individually and collaboratively worked on challenging logical or mathematical problems, examined common errors, discussed unsuccessful problem-solving pathways, and analyzed how their thinking could be modified when confronting difficult academic tasks. The sixth session focused on consolidation, final evaluation, and termination. Students discussed the most important concepts they had learned, identified activities that had influenced them most strongly, completed the posttest, and formulated a personal academic learning goal to pursue after termination of the

sessions. Participants were encouraged to continue applying the acquired growth mindset strategies in their everyday academic activities. The control group received no intervention during the study period.

2.4. Data Analysis

Data were collected at three assessment points, including pretest, posttest, and three-month follow-up, and were analyzed using descriptive and inferential statistical procedures. Descriptive statistics, including means and standard deviations, were calculated for academic motivation and its intrinsic and extrinsic dimensions across the three measurement occasions and study groups. To examine changes in academic motivation over time and compare the effectiveness of motivational interviewing and growth mindset interventions with the control condition, repeated-measures analysis of variance was employed. The analysis examined the main effects of time and group as well as the time-by-group interaction, which represented differential changes in academic motivation across the three groups over the assessment periods. Where statistically significant effects were identified, appropriate pairwise comparisons were used to determine the location and direction of differences between assessment stages and intervention conditions. Prior to conducting the main analysis, relevant statistical assumptions for repeated-measures analysis, including the distribution of scores, homogeneity of variances, and the sphericity assumption, were evaluated. When the assumption of sphericity was violated, an appropriate correction such as the Greenhouse–

Geisser adjustment was applied. Statistical significance was evaluated at an alpha level of .05.

3. Findings and Results

A total of 58 female students participated in the study and were assigned to the motivational interviewing group ($n = 19$), growth mindset group ($n = 19$), or control group ($n = 20$). The mean age of participants was 15.21 years ($SD = 0.69$) in the motivational interviewing group, 14.96 years ($SD = 0.87$) in the growth mindset group, and 15.10 years ($SD = 0.85$) in the control group. Regarding paternal education in the motivational interviewing group, 4 fathers had less than a high school diploma, 6 had a high school diploma, 6 held a bachelor's degree, and 3 had postgraduate education. In the growth mindset group, 6 fathers had a high school diploma, 2 held an associate degree, 5 held a bachelor's degree, and 6 had postgraduate education. In the control group, 6 fathers had a high school diploma, 3 held an associate degree, 6 held a bachelor's degree, and 5 had postgraduate education. Regarding maternal education, in the motivational interviewing group, 2 mothers had less than a high school diploma, 9 had a high school diploma, 6 held a bachelor's degree, and 2 had postgraduate education. In the growth mindset group, 1 mother had less than a high school diploma, 8 had a high school diploma, 2 held an associate degree, 4 held a bachelor's degree, and 4 had postgraduate education. In the control group, 1 mother had less than a high school diploma, 9 had a high school diploma, 2 held an associate degree, 6 held a bachelor's degree, and 2 had postgraduate education.

Table 1

Descriptive Statistics for Intrinsic and Extrinsic Academic Motivation Across the Three Measurement Stages

Variable	Group	Pretest M (SD)	Posttest M (SD)	Follow-Up M (SD)
Intrinsic Academic Motivation	Motivational Interviewing	44.42 (8.43)	58.39 (7.55)	55.84 (7.34)
	Growth Mindset	45.84 (7.14)	63.16 (6.33)	60.79 (7.84)
	Control	42.90 (7.37)	40.75 (5.79)	41.35 (5.77)
Extrinsic Academic Motivation	Motivational Interviewing	47.26 (8.34)	56.52 (6.55)	55.11 (5.91)
	Growth Mindset	43.94 (8.10)	53.84 (7.25)	53.68 (6.49)
	Control	45.40 (8.76)	43.90 (6.39)	44.05 (6.16)

As shown in Table 1, the mean scores of both intrinsic and extrinsic academic motivation increased from pretest to posttest in both experimental groups, and these improvements were largely maintained at the three-month follow-up. For intrinsic academic motivation, the motivational interviewing group increased from $M = 44.42$

($SD = 8.43$) at pretest to $M = 58.39$ ($SD = 7.55$) at posttest and remained elevated at follow-up, $M = 55.84$ ($SD = 7.34$). The growth mindset group demonstrated an even greater increase, from $M = 45.84$ ($SD = 7.14$) at pretest to $M = 63.16$ ($SD = 6.33$) at posttest, with the effect remaining evident at follow-up, $M = 60.79$ ($SD = 7.84$). In contrast, the control

group showed no comparable improvement. A similar pattern was observed for extrinsic academic motivation. Scores increased from $M = 47.26$ ($SD = 8.34$) to $M = 56.52$ ($SD = 6.55$) in the motivational interviewing group and from $M = 43.94$ ($SD = 8.10$) to $M = 53.84$ ($SD = 7.25$) in the growth mindset group, whereas scores in the control group remained relatively stable across the three measurement occasions. Overall, the descriptive findings indicate that both interventions were associated with improvements in intrinsic and extrinsic academic motivation, with the most pronounced increase in intrinsic motivation observed in the growth mindset group.

Prior to conducting the repeated-measures analysis of variance, the relevant statistical assumptions were examined. The normality of the distributions was assessed using the Shapiro–Wilk test. The Shapiro–Wilk statistics were nonsignificant for almost all combinations of group, measurement occasion, and dependent variable, indicating approximate normality. The only exception was intrinsic academic motivation in the growth mindset group at posttest, for which the Shapiro–Wilk test was statistically significant,

$W = .897$, $p = .042$. Given the relatively minor deviation from normality and the robustness of analysis of variance to moderate violations of normality, this deviation was not considered sufficient to invalidate the subsequent analyses. Homogeneity of error variances was assessed using Levene's test, and the results were nonsignificant across the dependent variables and measurement occasions, supporting the assumption of homogeneity of variance. Homogeneity of the variance–covariance matrices across groups was examined using Box's M test. The test was nonsignificant for intrinsic academic motivation, Box's $M = 20.22$, $F = 1.70$, $p = .059$, and for extrinsic academic motivation, Box's $M = 16.77$, $F = 1.29$, $p = .219$, indicating that the assumption of homogeneity of covariance matrices was satisfied. The assumption of sphericity was evaluated using Mauchly's test. The findings were nonsignificant for both intrinsic academic motivation, $W = .984$, $\chi^2 = 0.88$, $p = .646$, and extrinsic academic motivation, $W = .979$, $\chi^2 = 1.12$, $p = .571$. Thus, the sphericity assumption was met for both dependent variables, and no correction to the degrees of freedom was required.

Table 2

Results of Repeated-Measures Analysis of Variance for Intrinsic and Extrinsic Academic Motivation

Variable	Effect	Sum of Squares	Error Sum of Squares	F	p	Partial η^2
Intrinsic Academic Motivation	Group	7114.92	2913.75	67.15	< .001	.709
	Time	1983.58	2673.26	40.81	< .001	.426
	Group $\times$ Time	2448.96	5414.35	12.44	< .001	.311
Extrinsic Academic Motivation	Group	2256.68	5448.36	11.39	< .001	.293
	Time	848.17	1731.38	26.94	< .001	.329
	Group $\times$ Time	1006.71	3054.98	9.06	< .001	.248

The repeated-measures analysis of variance presented in Table 2 demonstrated significant group, time, and group-by-time interaction effects for both dimensions of academic motivation. For intrinsic academic motivation, the main effect of group was statistically significant, $F = 67.15$, $p < .001$, partial $\eta^2 = .709$, indicating substantial overall differences among the three study groups. The main effect of time was also significant, $F = 40.81$, $p < .001$, partial $\eta^2 = .426$, demonstrating significant changes in intrinsic academic motivation across the pretest, posttest, and follow-up assessments. More importantly, the group-by-time interaction was statistically significant, $F = 12.44$, $p < .001$, partial $\eta^2 = .311$, indicating that changes in intrinsic academic motivation over time differed significantly across

the three groups. For extrinsic academic motivation, a significant main effect of group was similarly observed, $F = 11.39$, $p < .001$, partial $\eta^2 = .293$, together with a significant main effect of time, $F = 26.94$, $p < .001$, partial $\eta^2 = .329$. The group-by-time interaction was also significant, $F = 9.06$, $p < .001$, partial $\eta^2 = .248$. These findings indicate that changes in extrinsic academic motivation across the three measurement occasions also varied significantly as a function of group membership. Collectively, the significant interaction effects support the effectiveness of both motivational interviewing and growth mindset interventions in producing changes in academic motivation relative to the control condition.

Table 3

Bonferroni Post-Hoc Comparisons for Intrinsic and Extrinsic Academic Motivation

Variable	Comparison	Mean Difference	SE	p
Intrinsic Academic Motivation	Pretest vs. Posttest	-9.72	1.23	< .001
	Pretest vs. Follow-Up	-8.27	1.30	< .001
	Posttest vs. Follow-Up	1.45	1.38	.891
Extrinsic Academic Motivation	Pretest vs. Posttest	-5.89	0.97	< .001
	Pretest vs. Follow-Up	-5.41	1.04	< .001
	Posttest vs. Follow-Up	0.48	0.92	1.000
Intrinsic Academic Motivation	Motivational Interviewing vs. Growth Mindset	-3.70	1.36	.027
	Motivational Interviewing vs. Control	11.23	1.35	< .001
	Growth Mindset vs. Control	14.93	1.35	< .001
Extrinsic Academic Motivation	Motivational Interviewing vs. Growth Mindset	2.47	1.86	.570
	Motivational Interviewing vs. Control	8.52	1.84	< .001
	Growth Mindset vs. Control	6.04	1.84	.005

The Bonferroni post-hoc comparisons presented in Table 3 further clarified the significant effects observed in the repeated-measures analysis. Regarding changes over time, intrinsic academic motivation significantly increased from pretest to posttest, mean difference = -9.72, SE = 1.23, $p < .001$, and from pretest to the three-month follow-up, mean difference = -8.27, SE = 1.30, $p < .001$. However, the difference between posttest and follow-up was not statistically significant, mean difference = 1.45, SE = 1.38, $p = .891$. A similar pattern emerged for extrinsic academic motivation: significant differences were observed between pretest and posttest, mean difference = -5.89, SE = 0.97, $p < .001$, and between pretest and follow-up, mean difference = -5.41, SE = 1.04, $p < .001$, whereas the difference between posttest and follow-up was not significant, mean difference = 0.48, SE = 0.92, $p = 1.000$. These findings demonstrate that the improvements achieved following the interventions were maintained through the three-month follow-up period. Between-group comparisons showed that both experimental groups obtained significantly higher intrinsic academic motivation scores than the control group. The motivational interviewing group differed significantly from the control group, mean difference = 11.23, SE = 1.35, $p < .001$, and the growth mindset group also differed significantly from the control group, mean difference = 14.93, SE = 1.35, $p < .001$. Importantly, the difference between the motivational interviewing and growth mindset groups was also statistically significant for intrinsic academic motivation, mean difference = -3.70, SE = 1.36, $p = .027$, indicating that the growth mindset intervention produced a greater improvement in intrinsic academic motivation than motivational interviewing. For extrinsic academic motivation, both the motivational interviewing group, mean

difference = 8.52, SE = 1.84, $p < .001$, and the growth mindset group, mean difference = 6.04, SE = 1.84, $p = .005$, differed significantly from the control group. However, the difference between motivational interviewing and growth mindset was not statistically significant, mean difference = 2.47, SE = 1.86, $p = .570$. Therefore, although both interventions were effective in increasing intrinsic and extrinsic academic motivation and their effects were maintained at follow-up, the growth mindset intervention was significantly more effective than motivational interviewing specifically in enhancing intrinsic academic motivation.

4. Discussion

The present study aimed to compare the effectiveness of motivational interviewing and growth mindset interventions on academic motivation among female secondary school students. The findings showed that both interventions were effective in increasing intrinsic and extrinsic academic motivation compared with the control group. The significant group-by-time interaction for both intrinsic and extrinsic academic motivation indicated that the pattern of change across the pretest, posttest, and follow-up assessments differed significantly among the three groups. In both experimental groups, academic motivation increased from pretest to posttest, and these improvements were largely maintained at the three-month follow-up. However, an important distinction emerged between the two interventions: the growth mindset intervention was significantly more effective than motivational interviewing in increasing intrinsic academic motivation, whereas no significant difference was found between the two interventions in their effects on extrinsic academic

motivation. These findings suggest that although both approaches can be useful for improving students' academic motivation, growth mindset training may have a particular advantage in strengthening motivation that originates from interest, mastery, personal growth, and engagement with learning itself.

The effectiveness of motivational interviewing in improving academic motivation is consistent with the theoretical foundations of motivational interviewing and with previous empirical studies conducted in educational contexts. Motivational interviewing is designed to increase readiness for change by exploring ambivalence, eliciting personally meaningful reasons for change, strengthening commitment, and supporting autonomous decision-making (Miller & Rollnick, 2023). In the present study, students in the motivational interviewing group were encouraged to identify their academic goals, clarify personal values, recognize discrepancies between their current behaviors and desired academic outcomes, examine barriers to studying, and develop practical plans for change. Such processes can increase students' awareness of the consequences of their academic behaviors and help them transform vague intentions into more concrete commitments. When students articulate their own reasons for studying and identify personally meaningful academic goals, their engagement is less likely to be experienced as purely externally imposed and more likely to be interpreted as personally relevant.

The present findings are aligned with the results of Dinarvandpour and Ahmad Mahmoudi, who emphasized the usefulness of motivational interviewing for increasing motivation among students (Dinarvandpour & Ahmad Mahmoudi, 2021). They are also consistent with findings indicating that motivational interviewing can improve academic self-efficacy and academic achievement among low-achieving students (Kakaei et al., 2021). These relationships are theoretically plausible because motivational interviewing can strengthen perceived personal agency and encourage students to view change as achievable rather than externally demanded. Greater perceived competence may, in turn, facilitate persistence and willingness to engage in academic activities. Similarly, previous research has shown that motivational interviewing can reduce academic procrastination in adolescents (Hosseini et al., 2020). Because procrastination frequently reflects avoidance, low commitment, competing motivations, and difficulty initiating goal-directed behavior, reductions in procrastination may represent one mechanism

through which motivational interviewing improves academic motivation.

The findings are also consistent with the study by Bagheri Hosseinabadi and Yousefi, who reported that an intervention integrating motivational interviewing and metacognitive skills improved academic procrastination, academic resilience, and achievement motivation in students with a history of school avoidance (Bagheri Hosseinabadi & Yousefi, 2023). Although the present intervention did not combine motivational interviewing with formal metacognitive training, several components, including self-monitoring, functional analysis, SMART goal setting, identification of barriers, and development of alternative strategies, may have enhanced students' awareness of their own academic behavior. Such activities can increase self-regulation and reduce automatic patterns of avoidance. Consequently, the motivational interviewing intervention may have influenced academic motivation not only by increasing desire for change but also by helping students organize behavioral steps required to translate motivation into action.

The effectiveness of motivational interviewing can additionally be explained through self-determination theory. According to self-determination theory, higher-quality motivation develops when individuals experience autonomy, competence, and relatedness and when their behavior becomes increasingly internalized and personally endorsed (Ryan & Deci, 2017, 2020). Motivational interviewing closely corresponds with these principles because it avoids coercive persuasion and instead emphasizes choice, collaboration, and the individual's own reasons for behavioral change. In the context of academic behavior, adolescents may resist direct instructions to study more, particularly when those demands are perceived as controlling. Motivational interviewing reduces this resistance by allowing students to examine their own goals and decide how they wish to change. This autonomy-supportive process may explain why students receiving motivational interviewing showed increases in both intrinsic and extrinsic academic motivation.

The finding that growth mindset training significantly improved academic motivation is likewise consistent with the theoretical framework proposed by Dweck. Growth mindset theory suggests that individuals differ in their implicit beliefs regarding whether intellectual abilities are fixed or can be developed through effort, practice, strategy use, and learning (Dweck, 2006). Students who believe that academic ability is fixed may interpret difficulty as evidence

that they lack sufficient ability, which can lead to avoidance, helplessness, reduced effort, and disengagement. In contrast, students with a growth mindset are more likely to interpret difficulty as part of the learning process and to view mistakes as opportunities for improvement. The growth mindset sessions in the present study directly addressed these interpretations by teaching students about brain plasticity, reframing mistakes as opportunities for learning, emphasizing persistence, and providing structured experiences in which difficult tasks became more manageable through effort and strategy use.

The present results are compatible with the educational perspective emphasized by Ardeshiri and Mohseni, who described growth mindset as a process of changing students' beliefs from "I cannot" to "I have not yet" (Ardeshiri & Mohseni, 2025). This apparently simple cognitive shift has important motivational consequences because it changes the meaning of temporary failure. When students regard unsuccessful performance as a permanent indicator of inability, investing further effort may appear irrational or emotionally threatening. However, when failure is interpreted as temporary and modifiable, continued effort has greater subjective value. In this sense, growth mindset intervention may enhance academic motivation by increasing students' expectations that their effort can produce meaningful improvement.

The finding is also consistent with research showing that growth mindset is related to self-regulated learning. A review by Xu and colleagues indicated that students' growth mindset is associated with several self-regulatory processes, including goal setting, monitoring, strategic learning, persistence, and adaptive responses to academic difficulties (Xu et al., 2025). These processes can reinforce academic motivation because students are more likely to remain engaged when they have strategies for dealing with difficulty and believe that their actions can improve performance. Similarly, cross-cultural evidence has demonstrated meaningful relationships among perseverance, self-regulated learning, motivation, and achievement (Xu, Koorn, et al., 2021). Accordingly, the improvements observed in the growth mindset group may reflect an interaction between motivational beliefs and regulatory behavior. Students may have become more motivated because they developed a stronger belief in the possibility of improvement while simultaneously learning more adaptive ways of responding to difficulty.

Another explanation is provided by findings showing that growth mindset can reduce perceived cognitive load and

improve learning (Xu, Cunha-Harvey, et al., 2021). When students interpret demanding academic tasks as evidence of personal inability, the psychological burden associated with those tasks may increase. Worry about failure, self-evaluative thoughts, and avoidance tendencies can consume cognitive resources that could otherwise be allocated to learning. Growth mindset may reduce this burden by normalizing difficulty and presenting effort as a necessary part of competence development. Consequently, students may perceive difficult academic activities as less threatening and more manageable. This change in cognitive appraisal may contribute to greater engagement and stronger academic motivation.

The present results are also compatible with the broader view that formal academic learning often requires sustained motivational support. Xu and colleagues argued that many forms of school-based knowledge are biologically secondary and therefore require explicit instruction, effort, practice, and sustained motivation to acquire (Xu et al., 2024). From this perspective, motivational interventions are especially important because students cannot be expected to engage consistently with complex academic material simply because it is educationally valuable. They need beliefs and regulatory processes that help them tolerate difficulty and maintain effort over time. Growth mindset training may serve this function by providing students with a psychologically adaptive explanation of why learning is difficult and why continued effort remains worthwhile.

A particularly important finding of the present study was that growth mindset training was significantly more effective than motivational interviewing in increasing intrinsic academic motivation. This difference can be understood in terms of the mechanisms targeted by each intervention. Motivational interviewing primarily focuses on resolving ambivalence, strengthening commitment, and clarifying reasons for behavioral change. Although these processes can promote internalization, they may still be directed toward outcomes that are partly external to the learning activity itself, such as improved grades, academic success, or meeting educational expectations. Growth mindset training, in contrast, directly changes students' beliefs about learning, competence, effort, and challenge. It encourages students to experience learning as a developmental process in which difficulty, persistence, and mastery have personal meaning. These mechanisms may be more closely related to intrinsic academic motivation because intrinsic motivation involves interest, mastery, curiosity, and engagement with the learning process itself.

This interpretation is supported by self-determination theory, which proposes that intrinsic motivation is facilitated when individuals experience competence and autonomy in an activity (Ryan & Deci, 2017, 2020). Growth mindset may strengthen perceived competence by teaching students that competence is not fixed and can be developed. When students believe that they can become more capable through practice, difficult tasks may no longer threaten their sense of competence to the same extent. Instead, challenge can become an opportunity for mastery. This mechanism may explain why intrinsic motivation increased more strongly in the growth mindset group than in the motivational interviewing group. The result is also conceptually consistent with research showing that growth mindset can improve learning by modifying students' responses to cognitive difficulty (Xu, Cunha-Harvey, et al., 2021).

The distinction between the two interventions should nevertheless be interpreted carefully. Yeager and Dweck emphasized that growth mindset effects depend on context, implementation, participant characteristics, and the availability of genuine opportunities for improvement (Yeager & Dweck, 2020). A growth mindset is unlikely to produce meaningful academic change if students are merely told to try harder without being provided with effective strategies or supportive learning environments. In the present study, the intervention did not simply promote positive thinking. It included structured tasks, discussion of mistakes, perseverance strategies, practical exercises, and explicit application of growth mindset principles to academic challenges. The active and applied character of the intervention may therefore have contributed to its effectiveness.

The absence of a significant difference between motivational interviewing and growth mindset interventions in extrinsic academic motivation is also informative. Both interventions significantly improved extrinsic motivation relative to the control group, but neither was superior to the other. Extrinsic academic motivation can involve engagement in learning for grades, recognition, educational advancement, or other outcomes external to the activity itself. Both interventions may have strengthened such motivation through different mechanisms. Motivational interviewing may have increased the salience of personally relevant educational outcomes, while growth mindset training may have increased students' belief that those outcomes were attainable through effort. Thus, although the interventions differed in their direct psychological targets,

both may have increased students' willingness to pursue externally valued academic goals.

The observed improvements are also consistent with evidence that academic motivation is associated with learning engagement and performance. Athirathan reported a relationship between academic motivation and academic performance among secondary school students (Athirathan, 2024). Similarly, Juan and colleagues demonstrated that learning strategies, learning motivation, engagement, and academic performance are interconnected (Juan et al., 2025). These findings support the view that improvements in academic motivation may have broader educational implications. Although academic performance was not the primary outcome of the present study, increasing students' intrinsic and extrinsic motivation could potentially facilitate greater engagement, persistence, and use of adaptive learning strategies.

The maintenance of intervention effects at the three-month follow-up represents another important finding. For both intrinsic and extrinsic academic motivation, significant differences were observed between pretest and follow-up, whereas differences between posttest and follow-up were nonsignificant. This pattern indicates that the gains achieved by the experimental groups were largely maintained after completion of the interventions. Such stability may be explained by the fact that both interventions attempted to modify processes that students could continue applying independently. Motivational interviewing encouraged students to develop individualized goals, identify personal values, monitor their behavior, and create plans for maintaining change. Growth mindset training provided students with cognitive frameworks for interpreting academic difficulty, mistakes, and effort. Once internalized, these strategies could remain applicable to subsequent academic situations even without continued intervention.

The maintenance of effects is particularly meaningful because academic motivation is a dynamic construct influenced by ongoing experiences of success, failure, feedback, and environmental demands. From a self-determination theory perspective, autonomous and internalized motivation is more likely to persist than motivation based entirely on external pressure (Ryan & Deci, 2020). Likewise, growth mindset theory suggests that adaptive beliefs about ability can influence how students interpret future academic challenges, potentially allowing intervention effects to extend beyond the immediate training period (Dweck, 2006; Yeager & Dweck, 2020). The follow-up findings therefore provide preliminary evidence that both

interventions may produce changes that endure beyond the immediate post-intervention period.

The use of Harter's Academic Motivation Questionnaire also allowed the present study to distinguish between intrinsic and extrinsic motivational changes. This distinction is important because increases in total academic motivation could conceal differences in the quality of motivation. Previous Iranian psychometric research has supported the validity and reliability of Harter's measure for assessing academic motivation (Bahrani, 2009), and earlier research has demonstrated the relevance of diminished academic motivation among student populations (Zahiri Nav & Rajabi, 2009). By examining intrinsic and extrinsic motivation separately, the present findings provide a more precise understanding of how motivational interviewing and growth mindset training may influence students' academic functioning.

5. Conclusion

Overall, the findings support the conclusion that both motivational interviewing and growth mindset interventions can improve academic motivation among female secondary school students, although growth mindset training appears to have a stronger effect on intrinsic motivation. This result extends previous research on motivational interviewing in educational settings (Bagheri Hosseinabadi & Yousefi, 2023; Dinarvandpour & Ahmad Mahmoudi, 2021; Hosseini et al., 2020; Kakaei et al., 2021) and is consistent with theoretical and empirical work emphasizing the role of growth mindset in persistence, self-regulated learning, cognitive processing, and adaptive responses to difficulty (Dweck, 2006; Xu, Cunha-Harvey, et al., 2021; Xu, Koorn, et al., 2021; Xu et al., 2025; Yeager & Dweck, 2020). The results also reinforce the broader educational importance of fostering forms of motivation that enable students to engage actively with learning, persist despite difficulty, and interpret academic challenges as manageable opportunities for development.

Several limitations should be considered when interpreting the findings. First, the study was conducted exclusively with female ninth-grade students from schools in District 5 of Tehran; therefore, the generalizability of the results to male students, other age groups, other educational levels, and students from different geographical, socioeconomic, and cultural contexts is limited. Second, the sample size was relatively modest, which may restrict the precision of effect estimates and the ability to identify

smaller differences between the interventions. Third, academic motivation was assessed primarily through a self-report questionnaire, and participants' responses may therefore have been influenced by social desirability, response tendencies, or awareness of their intervention condition. Fourth, although a three-month follow-up was conducted, this period remains relatively short for determining whether motivational changes persist across longer academic periods. Fifth, the study did not include objective educational outcomes such as grade point average, examination scores, attendance, homework completion, or teacher-rated engagement. Consequently, it cannot be concluded directly that improvements in academic motivation translated into corresponding improvements in academic achievement or classroom behavior. Finally, because each intervention contained several components, the design does not permit determination of which specific components were primarily responsible for the observed changes.

Future studies should replicate the present research with larger and more heterogeneous samples, including male and female students from different educational levels, school types, socioeconomic backgrounds, and geographical regions. Comparative studies could also examine whether age, baseline motivation, academic achievement, socioeconomic status, parental education, or initial mindset moderates the effectiveness of motivational interviewing and growth mindset interventions. Longer follow-up periods, such as six months or one academic year, would provide stronger evidence regarding the durability of intervention effects. Future investigations should combine self-report measures with behavioral and objective academic indicators, including grades, attendance, assignment completion, classroom participation, and teacher evaluations. It would also be useful to investigate potential mediating mechanisms such as academic self-efficacy, self-regulated learning, perseverance, perceived competence, academic resilience, procrastination, and perceived cognitive load. Component-based or dismantling studies could identify which elements of each intervention contribute most strongly to motivational improvement. In addition, future studies may compare individual, group-based, school-wide, and technology-assisted delivery formats and examine whether combining motivational interviewing with growth mindset training produces additive or synergistic effects.

The findings suggest that school counselors, educational psychologists, teachers, and administrators can consider

incorporating brief motivational interviewing and growth mindset programs into school-based psychological and educational services for students with low academic motivation. Growth mindset activities may be particularly useful when the primary objective is to strengthen students' intrinsic interest, persistence, mastery orientation, and willingness to engage with challenging academic material. Teachers can reinforce these effects by presenting mistakes as informative, emphasizing progress and effective strategy use rather than fixed ability, and helping students recognize that competence develops through practice. Motivational interviewing techniques can be especially useful for students who demonstrate ambivalence, procrastination, avoidance, or weak commitment to academic goals. School counselors can employ open-ended questions, reflective listening, values clarification, individualized goal setting, and change planning to help students identify personally meaningful reasons for academic engagement. Rather than treating the two interventions as mutually exclusive, educational settings may also use them complementarily, with motivational interviewing supporting commitment and readiness for change and growth mindset training strengthening adaptive beliefs about learning and ability.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

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

References

- Ardeshtiri, A., & Mohseni, R. (2025). *Growth Mindset: Changing a Student's Belief from "I Can't" to "I Haven't Yet"*. Second International Conference of Outstanding Teachers, Masjed Soleyman. <https://civilica.com/doc/2503470>
- Athirathan, S. (2024). The Influence of Academic Motivation on the Academic Performance of Senior Secondary Grade Students (A Study Based on Tamil Medium Schools in the Colombo South Education Zone, in Sri Lanka). *International Journal of Research and Innovation in Social Science*, 8(12), 3748-3752.
- Bagheri Hosseinabadi, F., & Yousefi, N. (2023). Effectiveness of an Integrated Intervention Based on Motivational Interviewing and Metacognitive Skills on Academic Procrastination, Academic Resilience, and Academic Achievement Motivation in Students with a History of School Avoidance. *Psychological Achievements*, 30(2), 281-302.
- Bahrani, M. (2009). Examining the Validity and Reliability of Harter's Academic Motivation Scale. *Psychological studies*, 5(1), 51-72.
- Dinarvandpour, A., & Ahmad Mahmoudi, R. (2021). *Using Motivational Interviewing to Increase Motivation in Students*. Ninth National Conference on Sustainable Development in Educational Sciences and Psychology, Social and Cultural Studies, Tehran. <https://civilica.com/doc/1239714>
- Dweck, C. S. (2006). *Mindset: The New Psychology of Success*. Random House.
- Hosseini, S., Rezaei, A., Kazemi, S., & Samani, S. (2020). The Effectiveness of Motivational Interviewing on Academic Procrastination in Adolescents. *Psychological Models and Methods*, 11(39), 81-94.
- Juan, W., Lei, W., Huanhuan, Y., & Dongfang, Y. (2025). The Influence of Learning Strategies on Students' Learning Motivation, Engagement, and Academic Performance in the Context of Online Flipped Teaching. *Sage Open*, 15(2). <https://doi.org/10.1177/21582440251336575>
- Kakaei, H., Keshavarz Shirazi Mosalman, Z., Rastegar, L., Mashhadi Farahani, Z., & Tavakoli, E. (2021). Examining the Effect of Motivational Interviewing on Self-Efficacy and Academic Achievement of Low-Achieving Male Students in Tehran Schools. *Scientific Journal of New Research Approaches in Management and Accounting*, 5(16), 49-63.
- Miller, W. R., & Rollnick, S. (2023). *Motivational Interviewing: Helping People Change* (4th ed.). Guilford Press.
- Ryan, R. M., & Deci, E. L. (2017). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. The Guilford Press. <https://doi.org/10.1521/978.14625/28806>
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and Extrinsic Motivation from a Self-Determination Theory Perspective: Definitions, Theory, Practices, and Future Directions. *Contemporary Educational Psychology*, 61, 101860. <https://doi.org/10.1016/j.cedpsych.2020.101860>
- Xu, K. M., Coertjens, S., Lespiau, F., Ouwehand, K., Korpershoek, H., & Paas, F. (2024). An Evolutionary Approach to Motivation and Learning: Differentiating Biologically

- Primary and Secondary Knowledge. *Educational psychology review*, 36, 45. <https://doi.org/10.1007/s10648-024-09880-3>
- Xu, K. M., Cunha-Harvey, A. R., King, R. B., de Koning, B. B., Paas, F., & Baars, M. (2021). A Cross-Cultural Investigation on Perseverance, Self-Regulated Learning, Motivation, and Achievement. *Compare: A Journal of Comparative and International Education*, 53, 361-379. <https://doi.org/10.1080/03057925.2021.1922270>
- Xu, K. M., Koorn, P., de Koning, B., Skuballa, I. T., Lin, L., & Henderikx, M. (2021). A Growth Mindset Lowers Perceived Cognitive Load and Improves Learning: Integrating Motivation to Cognitive Load. *Journal of Educational Psychology*, 113, 1177-1191. <https://doi.org/10.1037/edu0000631>
- Xu, K. M., Leferink, J., & Wijnia, L. (2025). A Review of the Relationship between Student Growth Mindset and Self-Regulated Learning. *Frontiers in Education*, 10, 1539639. <https://doi.org/10.3389/feduc.2025.1539639>
- Yeager, D. S., & Dweck, C. S. (2020). What Can Be Learned from Growth Mindset Controversies? *American psychologist*, 75, 1269-1284. <https://doi.org/10.1037/amp0000794>
- Zahiri Nav, B., & Rajabi, S. (2009). Examining the Relationship of a Group of Variables with Reduced Academic Motivation among Students of Persian Language and Literature. *Daneshvar Behavior*, 16.36(12), 69-80.