Original Article

The Mediating Role of Personal Intelligence in the Relationship between Mind Wandering and Emotional Flexibility with Language Anxiety in Students with Language Disorders

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Abstract

Children with speech and language difficulties are at risk for learning and behavioral problems. Therefore, the present study aimed to investigate the mediating role of personal intelligence in the relationship between mind wandering and emotional flexibility with language anxiety in students with language disorders. The research method was correlational, using the path analysis approach. The statistical population of the study included all secondary school students in East Azerbaijan province in 2024 who had speech disorders recorded in their academic records. Using purposive sampling, 200 students were selected as the sample. Data were collected using the Personal Intelligence, Emotional Flexibility, Mind Wandering Questionnaires and the short form of the Language Anxiety Questionnaire. Data analysis was conducted using Pearson correlation, Sobel and Bootstrap tests, along with Structural Equation Modeling (SEM). The results indicated that mind wandering and emotional flexibility, through the mediating role of personal intelligence, played a significant role in explaining language anxiety in students with speech disorders. In total, 28% of the variance in language anxiety was explained by the variables in the model. The direct effects of personal intelligence (-0.24), emotional flexibility (-0.40), and mind wandering (0.02) on the variance of language anxiety were observed. The indirect effects of emotional flexibility (t-value = -3.05) and mind wandering (t-value = 2.04) with the mediation of personal intelligence in explaining the variance of language anxiety were significant. These findings suggest that promoting personal intelligence and emotional flexibility could be effective in reducing language anxiety among students with speech disorders.

Introduction

Language, as an essential human trait, plays a vital role in shaping experiences and educational goals (Tang & Calafato, 2025). It is not only a means of communication but also central to forming personal identity and character. It allows individuals to express thoughts and values, presenting their identity to others. This process influences both social interactions and individual behavior (Shashkevich, 2019). Language can affect how people think, make decisions, and form values and beliefs. This view highlights language as an integral part of personality and cultural structure (Iskenderova, 2025). One psychological factor that negatively impacts language learning is anxiety, particularly in digital settings. It may stem from fear of interaction,

performance concerns, or difficulty understanding the language. This study notes that online environments can worsen anxiety due to technical problems or unfamiliar tools (Zhang & Zhang, 2022). Language anxiety is a negative emotional experience, often linked with fear of mistakes, insecurity, and concern about judgment. It affects performance, motivation, and class participation (Gkonou, 2021). It results from the interaction of personal factors (like self-confidence) and environmental pressures (like classroom demands), forming a cycle where anxiety leads to poor performance, which in turn increases anxiety (Lee & Oxford, 2023).
Various factors can correlate with language anxiety, one of which is personal intelligence. Mayer (2014) defines personal intelligence as an individual's ability to understand and interpret information about themselves

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and others, including recognizing personality patterns, predicting behaviors, and understanding motivations and emotions. He emphasizes it as a cognitive skill aiding interpersonal relationships and decision-making. Personal intelligence helps individuals process personality-related information (Peyghami et al., 2023). It involves identifying, organizing, and applying such information to guide behavior and predict social outcomes (Dimitrov, 2023). The ability to manage self- and other-related information is positively associated with social skills, self-awareness, and conflict resolution (Mayer et al., 2019). Personal and body intelligence training significantly reduced social anxiety in cosmetic surgery applicants (Ghaffari et al., 2017). A significant negative correlation was found between interpersonal intelligence and language teaching anxiety, though no such link was found with intrapersonal intelligence (Saidi & Arefian, 2023). Reporting data indicating an explained variance for the global trait of personal and emotional intelligence ranging from 29.7% to 32.9% for anxiety, 27.7% to 29.1% for depression, and 37.2% to 47.3% for stress, confirming the greater importance of well-being and self-control factors in the overall effect (Tolsa & Malas, 2022). Students with higher personal intelligence reported more positive social interactions (e.g., "Listened to a distressed friend"), while those with lower scores described more conflictual exchanges (Mayer et al., 2024).

Another psychological variable that can play a role in the language anxiety model is mind-wandering. According to neuroscientific and psychological theories, particularly the framework proposed by Jonathan Smallwood, mind-wandering refers to involuntary thoughts that emerge during low-demand cognitive tasks (Smallwood & Schooler, 2006). It is considered a cognitive error resulting from a failure in the executive control system, disrupting performance in tasks requiring continuous concentration (Irving et al., 2024). Mind-wandering involves dynamic, unfocused thoughts that shift from one topic to another, influenced by factors such as fatigue, stress, and motivation (Irving et al., 2020). It is a state in which an individual becomes unable to perceive their surrounding environment and is associated with learning and performance difficulties (Preiss, 2022). In individuals with anxiety, mind-wandering is linked to increased errors and decreased cognitive performance. Studies show it can lead to traffic accidents or mistakes in the workplace (Fell et al., 2023). Persistent mind-wandering processes are associated with negative emotions and anxiety, while mindful states exhibit an anti-correlation with mind-wandering patterns (Kandeğer et al., 2024). There is a positive correlation between mind-wandering and language learning anxiety (Figueiredo, 2020). Unbalanced levels of cognitive flexibility and mind-wandering can lead to negative psychological consequences and foreign language anxiety (Kaiko, 2024).

Another variable that may play a role in language learners' anxiety is emotional flexibility. Emotional flexibility refers to an individual's ability to experience and manage a wide range of emotions without judging or suppressing them (Brassey et al., 2020). It involves accepting emotions, identifying them, and using appropriate strategies to regulate emotions in various situations (Jafarzadeh Dashbolagh et al., 2021). Emotional flexibility allows an individual to remain adaptable in the face of negative or challenging emotions and align behaviors with long-term goals and values (Klein et al., 2023). Psychological flexibility is a key process in mental health, from both psychopathological and well-being perspectives (Malo et al., 2024). Results indicated that cognitive reappraisal mediates the relationship between cognitive flexibility and four sub-components of foreign language teaching anxiety: fear of negative evaluation, lack of student interest, teaching inexperience, and self-perception of language proficiency (Mutlu & Solhi, 2024). Trait anxiety was negatively associated with both enhancement and suppression abilities of expressive flexibility (Shangguan et al., 2024). Anxiety exerted a negative effect on affective flexibility in a high-anxiety subgroup of preschoolers (Mărcuș et al., 2022). A correlation between positive emotion regulation strategies and negative language learning anxiety was found, while a positive correlation was observed between negative emotion regulation strategies and language learning anxiety (Ng, 2023)

Another purpose of this study was to examine the mediating role of personal intelligence in the relationship between mind-wandering, emotional flexibility, and language anxiety in students with language disorders. The researchers aimed to investigate how personal intelligence mediates the correlation between mind-wandering, emotional flexibility, and language anxiety in students with speech disorders. To date, no research has specifically examined the mediating effect of personal intelligence in this relationship, or at least the researchers could not find any such studies. However, studies indicate that personal intelligence plays a role in moderating the effects of psychological and personality variables, either amplifying or reducing their impact (Mowlaie et al., 2017).

Based on the above information and the review of the literature, it can be argued that language learning anxiety in students with speech disorders is higher than in other students, reducing their ability to learn a new language. Since learning a new language has significant positive effects on the human brain, research shows it enhances learning ability, improves long-term memory, boosts creativity, and reduces the risk of diseases such as Alzheimer's. This process challenges the brain and promotes the formation of new synapses, leading to brain rejuvenation and improved cognitive performance. This perspective emphasizes that language is not only for communication, but also a tool for strengthening the mind and mental health (Dimbleby and Burton, 2020). This investigation can enhance our understanding of the underlying mechanisms of language learning anxiety in students with speech disorders and guide more effective educational interventions. Furthermore, the mediating role of personal intelligence in the language anxiety

model in students with speech disorders has not been explored. Therefore, this study aims to determine the mediating role of personal intelligence in the relationship between mind-wandering, emotional flexibility with language anxiety in these students.

Method

Participants

The research method used in this study was a correlational method of path analysis. The statistical population of the study consisted of all junior high school in the East Azerbaijan province in 2024, who had a speech disorder recorded in their academic files. Using a purposive sampling method, 200 students were selected as the sample. To collect the data, the following questionnaires were used.

Instrument

Short Form of the Personal Intelligence Questionnaire:

The short form of the personal intelligence guestionnaire, developed by Mayer et al. (2019), consists of 12 multiple-choice questions and includes two subscales: (A) model formation and (B) guide for choices. To assess validity, concurrent validity was examined, and a correlation of 0.87 with the long-form version of the questionnaire confirmed its satisfactory validity. Reliability was evaluated using both split-half and test-retest methods, with coefficients of 0.84 and 0.81, respectively, indicating good reliability. In Iran, Atadokht et al. (2018) standardized this questionnaire among Iranian university students, confirming its applicability to the Iranian population. Furthermore, a study by Narimani and Ghaffari (2016) reported a test-retest reliability of 0.88, further supporting its reliability.

Emotional Flexibility Questionnaire:

The emotional flexibility questionnaire was developed by Rashid and Bayat (2019) to assess emotional flexibility. It consists of 24 items and includes three components: positive emotional regulation, negative emotional regulation, and emotional connection. Factor analysis revealed that three factors with eigenvalues greater than one explained 75.716% of the variance in the items. The rotated factor matrix indicated that all items were effective in representing their respective components. Confirmatory factor analysis showed that the model fit indices were acceptable. Cronbach's alpha coefficient for the overall scale was 0.866, with values of 0.834, 0.761, and 0.641 for the subscales of positive emotional regulation, negative emotional regulation, and emotional connection, respectively (Rashid and Bayat, 2019).

Mind-Wandering Questionnaire:

The mind-wandering questionnaire, developed by Mrazek et al. (2013), is a five-item self-report scale designed to assess the trait of mind-wandering. It utilizes a six-point Likert scale, ranging from 1 (almost never) to 6 (almost always), with the total score varying between 5 and 30. Principal component factor analysis of responses to the five items revealed a single significant component that accounted for 63.16% of the total variance. Reliability analysis using a sample of college undergraduates yielded a Cronbach's alpha of 0.850. Evidence for convergent validity was demonstrated. In Iran, the Mind-Wandering Questionnaire was standardized among university students. The results of confirmatory factor analysis confirmed a factor of mind-wandering, consistent with the original form. Furthermore, the Cronbach's alpha for the overall scale was 0.89. The retest reliability coefficient, measured after a four-week interval, was 0.81 (Pourabdol, 2023).

Short-Form Foreign Language Anxiety Scale:

The short-form foreign language anxiety scale (S-FLCAS), originally developed by MacIntyre (1992), consists of eight items designed to assess general anxiety related to foreign language learning. Responses are rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). In the sample, the scale demonstrated excellent internal consistency, with a Cronbach's α of 0.892 and McDonald's omega of 0.89. The internal consistency for the scale was also confirmed as acceptable ($\alpha = 0.891$; $\omega = 0.893$). Convergent and divergent validity of the S-FLCAS was supported by a statistically significant positive correlation with the Penn state worry questionnaire (PSWQ-A) ($r = 0.322$, $p < 0.001$). Additionally, a significant negative correlation was found between the S-FLCAS and the short-form foreign language enjoyment scale ($r = -0.264$, $p < 0.001$), aligning with previous research that has shown a moderate negative correlation between anxiety and enjoyment in foreign language learning (Botes et al., 2022).

Procedure

After identifying the sample, the researcher coordinated with school authorities to obtain access to the students. In accordance with health and safety protocols, the researcher visited the classrooms and provided a clear explanation of the study's purpose and significance. Students were informed that participation was entirely voluntary, and that non-participation would not affect their academic status or school-related activities in any way. Informed consent was then obtained from all participants. Following this, the data collection instruments were distributed, and students were instructed on how to complete them independently and accurately. The collected data were analyzed using Pearson's correlation coefficient to examine the simple correlation matrix among the study variables. Path analysis was conducted to assess the significance of the mediating relationships within the model, utilizing SPSS and AMOS software (version 26). A p-value of less than 0.05 ($p < 0.05$) was considered indicative of statistical significance.

Results

The sample of the study consisted of 200 students with language disorders from East Azerbaijan Province, of whom 80 students were in the first grade, 75 in the second grade, and 45 in the third grade of the second cycle of secondary school. The mean, standard deviation, minimum, and maximum scores for the variables are presented in Table 1.

Table 1. Descriptive statistics of variables

Variable	Mean	Std. Deviation	Minimum	Maximum
1. Language anxiety	19.42	2.89	10	24
2. Personal intelligence	6.43	2.63	1	10
3. Mind-wandering	21.58	2.72	16	28
4. Emotional flexibility	79.52	7.72	50	100

In structural equation modeling, multivariate normality is an important assumption that must be considered. One of the common criteria for assessing the assumption of normality is the calculation of skewness and kurtosis statistics. Based on the data in Table 2, since all the research variables have absolute skewness coefficients smaller than 3 and absolute kurtosis coefficients smaller than 10, there is no observable deviation from normality in the data. Additionally, to assess the simple correlation between predictor variables and language anxiety, Pearson's correlation matrix was used. The results presented in Table 2 show that there is a significant negative correlation between personal intelligence (r = -0.373) and emotional flexibility (r = -0.483) with language anxiety in students with speech disorders. However, the correlation coefficient for mind-wandering (r = 0.164) with language anxiety was found to be positive and significant, indicating that as mind-wandering increases in students, their language anxiety decreases.

Table 2. Correlation matrix of variables

Variable	Kurtosis	Skewness	1
1. Language anxiety	0.153	-0.611	-
2. Personal intelligence	-0.261	-0.677	-0.373[**]
3. Mind-wandering	-0.340	-0.115	0.164[*]
4. Emotional flexibility	4.11	-0.877	-0.483[**]

[**]Correlation significant at the 0.01 level (2-tailed)

To determine the significance of the indirect relationships in the model, the bootstrap test and Sobel test were used. The results indicate that mind-wandering and emotional flexibility interact with the mediating role of personal intelligence in explaining language anxiety in students with speech disorders. In total, 28% of the variance in language anxiety is explained through the model's variables. The direct effects of personal intelligence (-0.24), emotional flexibility (-0.40), and mind-wandering (0.02) were observed in the estimation of the variance in language anxiety. The indirect effects of emotional flexibility (t-value = -3.05) and mind-wandering (t-value = 2.04) through the mediation of personal intelligence in explaining the variance in language anxiety were found to be significant, as shown in Figure 1.
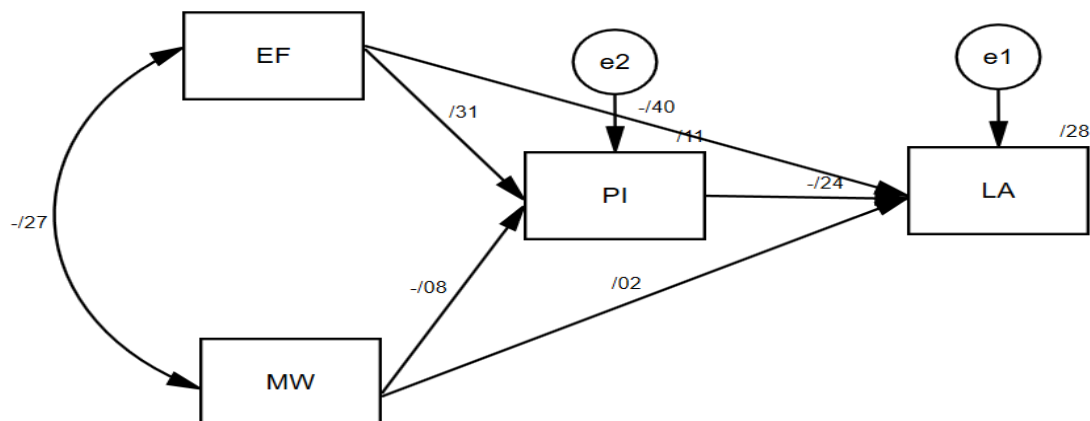
Figure 1. The standard coefficients of the final research model

Note: LA= Language anxiety; PI= Personal intelligence; EF= Emotional flexibility; MW= Mind-wandering.

To assess the goodness of fit of the proposed model, Amos software version 26 was used. The output showed that the variables of mind-wandering, emotional flexibility, and personal intelligence are capable of explaining the variance in language anxiety, as the goodness-of-fit indices—such as GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index), IFI (Incremental Fit Index), and CFI (Comparative Fit

Index)—all exceed 0.90. Additionally, in suitable models, the chi-square to degrees of freedom ratio (X²/df) should fall within the range of 1 to 3, and in this model, the chi-square to degrees of freedom ratio (X²/df) is within the range of 1 to 3. Furthermore, the

RMSEA (Root Mean Square Error of Approximation) should be less than 0.09, which in this model was found to be 0.07, indicating that the model's validity is acceptable. Therefore, the proposed model is fully saturated, and the results can be seen in Table 3.

Table 3. Fit the proposed pattern with data based on fit Indexes

Index	X²	df	X²/df	GFI	AGFI	IFI	CFI	RMSEA
Pattern	16.5	6	2.75	1	0.913	0.967	0.946	0.07

Note: X² = chi square; df = degrees of freedom; X²/df = chi square ratio to degree of freedom; GFI = goodness of fit; AGFI = adjusted goodness of fit index; IFI = incremental fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Discussion

The main hypothesis of the study was that the mediating role of personal intelligence in the relationship between emotional flexibility and mind-wandering with language anxiety in students with speech disorders is significant. Results from the Sobel test showed that the indirect effects of emotional flexibility (t-value = -3.05) and mind-wandering (t-value = 2.04) with the mediation of personal intelligence in explaining variance in language anxiety were significant. This result aligns with the study of Mowlaie et al. (2017), which demonstrated that the mediating role of personal intelligence in the relationship between psychological and educational variables is significant. It can be concluded that personal intelligence not only directly helps reduce language learning anxiety but also acts as a mediator, as children with high personal intelligence are capable of identifying, understanding, and regulating their emotions. This ability enhances their emotional flexibility, reducing language anxiety during learning and communication. Furthermore, children with high personal intelligence better identify and manage negative thoughts. By employing emotion regulation techniques such as focusing on breathing or changing perspectives, they can lessen mind-wandering intensity, enabling more effective coping with anxiety and ultimately reducing language learning anxiety.

The second finding of the study indicated that the direct effect of personal intelligence on the language anxiety of students with speech disorders was negative and significant. This finding aligns with studies by Ghaffari et al. (2017), Saidi and Arefian (2023), Tolsa and Malas (2022), and Mayer et al. (2024), who found that enhancing personal intelligence in students with speech disorders reduces their language anxiety. Personal intelligence plays an important role in reducing language anxiety in students with stuttering by helping individuals better identify and manage their emotions. For students who stutter, awareness of feelings can help control the anxiety associated with speaking. Additionally, personal intelligence teaches emotional control in various situations, such as public speaking, reducing stress during word and sentence pronunciation, and lessening stuttering. It also includes social skills like empathy and building positive relationships. When students feel secure and supported, their anxiety decreases, and they can speak more comfortably. Boosting self-confidence, another component of personal intelligence, helps students feel more at ease and better cope with stuttering

in stressful situations. Furthermore, personal intelligence enables stress management through relaxation techniques, allowing students to feel more comfortable when speaking.

The third outcome of the study showed that the direct effect of emotional flexibility on explaining the variance in language anxiety in students with speech disorders was negative and significant. This finding supports the results of studies by Malo et al. (2024), Mutlu & Solhi (2024), Shangguan et al. (2024), Mărcuș et al. (2022), and Ng (2023), which indicated that students with emotional flexibility in language learning can better control their anxiety and worry. Students who stutter often face anxiety and fear of being judged or mispronouncing words. In such situations, emotional flexibility helps them recognize their emotions and, instead of surrendering to anxiety, employ strategies such as shifting attention or deep breathing to reduce stress. This ability to adapt emotions allows them to cope with challenges with less pressure. Emotional flexibility is particularly effective in social contexts where students might fear judgment; by adjusting their emotions, they focus more on speaking and positive thinking, reducing anxiety and strengthening self-confidence. It also enables students to learn from stressful experiences and develop coping skills for managing anxiety. Over time, they can better regulate emotions and experience less language-related anxiety. Ultimately, emotional flexibility acts as a key factor in reducing language anxiety, helping students boost self-confidence and face social and classroom situations with greater assurance.

Another result of the study showed a positive and significant correlation between mind-wandering and language anxiety in students with speech disorders. Research studies that align with this result indicate that mind-wandering plays a role in increasing language anxiety in these students (Irving et al., 2020; Preiss, 2022; Fell et al, 2023; Kandeğer et al., 2024; Kaiko, 2024). Mind-wandering refers to a state in which an individual oscillates between different thoughts and worries and is unable to focus on a specific topic. When a student faces a stuttering situation, they may worry about mistakes or others' reactions. These worries lead to mind-wandering, engaging the person in thoughts about speaking, external judgments, or negative self-assessments. As a result, the student's focus on verbal content or communication decreases, exacerbating anxiety. Mind-wandering creates a negative feedback loop of thoughts and worries, repeated in social or classroom situations, increasing

anxiety. Scattered thoughts impair information processing and reduce self-confidence, heightening stress and worsening stuttering. Thus, mind-wandering acts as a key factor in language anxiety among students with stuttering. Psychological interventions, such as mindfulness training and reducing negative thoughts, can help alleviate this anxiety.

Given the significant role of personal intelligence in moderating the relationship between emotional flexibility and mind-wandering with language anxiety in students with speech disorders, it is recommended that psychologists and linguists design and implement programs to help reduce language learning anxiety in children with speech disorders by enhancing personal intelligence, emotional flexibility, and reducing mind-wandering. These programs could include techniques for emotion regulation, teaching mindfulness, strengthening social skills, and boosting self-confidence, ultimately improving children's ability to manage language-related anxieties and enhancing their effectiveness in the learning process.

One of the limitations that researchers tried to control was the insufficient number of samples of children with speech disorders. This could limit the impact of the results and reduce the generalizability of the findings. Additionally, the accurate measurement and assessment of emotional flexibility, mind-wandering, and personal intelligence were other limitations, as these constructs are complex and multidimensional, requiring specific tools appropriate for the age and individual characteristics of children, which may not always be available.

Conclusion

The results of the study indicated that personal intelligence plays an important mediating role in moderating the relationship between emotional flexibility and mind-wandering with language learning anxiety in children with speech disorders. Enhancing personal intelligence helps children better manage their emotions and reduce anxiety related to language learning. These findings can provide effective strategies for designing educational and psychological interventions for these children.

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No potential conflict of interest was reported by the authors.

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