

Research on the Influence of Emotional Intelligence and Academic Emotions on Willingness to Communicate in a Second Language of Middle School Students

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Abstract: In the context of globalization, second language communication skills have become one of the essential core competencies for middle school students. However, there are significant differences in the willingness and enthusiasm exhibited by different middle school students in second language communication. Previous studies have shown that this difference is closely related to the emotional intelligence (EI) of middle school students, and the enjoyment and anxiety generated during foreign language learning may also play an important role in it. This research selected 120 middle school English learners as research subjects and conducted empirical research using quantitative research methods. SPSS 27.0 was used to test the normal distribution, descriptive statistics, correlation analysis, and multiple regression analysis of the data. PROCESS v4.1 was used to test the mediating effect of foreign language anxiety (FLA) and foreign language enjoyment (FLE), and to clarify the specific mechanism by which EI affects learners' willingness to communicate in a second language (L2 WTC). Not only does it touch on core issues in multiple disciplines such as psychology, education, and linguistics, but it also provides a new perspective and strategy for understanding and optimizing the second language learning process.

Keywords: Willingness to Communicate in Second Language; Emotional Intelligence; Academic Emotions (AEs).

1. Introduction

In the context of global interconnectivity and the integration of the times, mastering one or more foreign languages has become an important measure of an individual's overall quality and competitiveness. Especially for middle school students, second language communication skills are not only a bridge for cross-cultural communication, but also an essential skill for future academic advancement and career development. However, despite the increasing emphasis on the importance of language learning in education policies under the context of globalization, the willingness and enthusiasm demonstrated by different middle school students in second language communication practice vary greatly. This phenomenon has attracted widespread attention from educators, psychologists, and linguists, who attempt to explore the internal factors that affect L2 WTC of middle school students from multiple dimensions.

Emotional intelligence, as an individual's ability to identify, evaluate, and regulate emotions (Mayer&Salovey, 1990), is increasingly being valued in educational contexts. As a comprehensive concept that integrates cognitive, emotional, and behavioral regulation abilities, it has been confirmed by multiple studies in recent years as a key factor affecting individual learning outcomes, social interactions, and even mental health. Learners with high EI are often able to more effectively manage emotional fluctuations during the learning process, such as transforming anxiety into motivation to challenge themselves, or maintaining a enjoyable state to promote knowledge absorption and application. Therefore, exploring how EI specifically affects L2 WTC of middle school students has become a topic worthy of further research. It is worth noting that emotional experiences during foreign language learning, especially anxiety and enjoyment, which are two completely different emotional states, are widely

regarded as important variables that affect learning outcomes. FLA may lead learners to lack confidence and avoid communication opportunities in second language communication, while FLE can stimulate learning interest, promote active participation and exploration. These two emotional states are not only directly related to learners' immediate learning experience, but may also affect long-term language acquisition and the development of second language communication skills by influencing the choice of learning strategies, the maintenance of motivation, and the setting of learning goals.

Given the complex relationship between EI, AEs, and L2 WTC, this research selected 120 middle school English learners as research subjects. This group is currently in a critical period of language learning, and their learning experiences and emotional responses have certain representativeness and research value. A series of questionnaires and scales were designed using quantitative research methods to collect data on EI, FLA and FLE, as well as L2 WTC. This research not only helps deepen understanding of the psychological mechanisms of second language learning, but also provides useful insights for educational practice. By revealing the impact of EI and AEs on L2 WTC, we can provide educators with more targeted teaching strategies to help students better manage their emotions, enhance their second language communication skills, and lay a solid foundation for future cross-cultural communication.

2. Literature Review

Willingness to communicate in second language (L2 WTC), defined by MacIntyre et al. in 1998, refers to an individual's conscious intention to engage in dialogue with others in a second language at a specific moment, which is subject to situational variability. MacIntyre et al. also proposed a multi-

layer pyramid model, where the bottom layer consists of stable individual and social environmental factors, and the upper layer consists of variable and environmentally influenced factors. This model emphasizes the complex role of multiple factors in second language communication willingness. Emotional intelligence (EI), as pointed out by Bar On (2006), is a set of interrelated emotional and social skills that encompass the ability to recognize, understand, and manage emotions, handle interpersonal relationships, and cope with psychological needs, challenges, and stress. In the context of second language learning, the influence of EI on learners' language learning beliefs and behavioral engagement has attracted much attention. The concept of academic emotions (AEs) was first explicitly proposed by Pekrun et al. (2002), referring to various emotions directly related to students' academic learning, classroom teaching, and academic achievement. Chinese psychology researchers Yu Guoliang et al. (2005) further expanded this concept, proposing that academic emotions refer to various emotional experiences related to students' academic activities during the teaching or learning process, including classroom learning activities, homework completion, and exam periods.

Previous studies have explored the relationship between EI and L2 WTC from multiple perspectives. Some studies have shown that EI has a direct predictive effect on L2 WTC. As Birjandi and Tabataba'ian (2012) pointed out, a good level of EI can help stimulate students' willingness to communicate. Learners with higher EI are better able to manage their own emotions, feel more confident and composed in second language communication, reduce obstacles caused by negative emotions such as tension and anxiety, and are therefore more willing to actively participate in second language communication. Some studies have focused on the mediating variables between the two. Li Chengchen's research in 2020 found that EI positively predicts enjoyment, and enjoyment is positively correlated with L2 WTC. Dewaele (2018) and Khajavy et al. (2018), also showed a strong correlation between FLE and L2 WTC. Learners with high EI are better able to regulate their emotions and experience a greater sense of enjoyment during the learning process, which further stimulates their L2 WTC. Wang et al. (2021) found that language thinking patterns are significantly correlated with communication willingness. Some studies hypothesize that EI can predict L2 WTC, possibly because a good level of EI can stimulate learners' positive language thinking patterns.

This research focuses on middle school English learners and reveals the intrinsic relationship between EI, FLA, FLE, and L2 WTC. Following research hypotheses are made: 1) EI positively predicts L2 WTC; 2) EI negatively predicts FLA and positively predicts FLE; 3) FLA and FLE mediate the relationship between EI and L2 WTC.

3. Research Design

3.1. Research Subjects

This Research randomly selected 125 eighth grade students from a regular middle school in Zhangjiakou to conduct a questionnaire survey, and received 120 valid questionnaires. Among them, there were 52 male students, accounting for 43.3% of the total sample; 68 female students, accounting for 56.7% of the total sample. The participants are all between the ages of 14-15, with similar learning backgrounds, a history of more than five years of English learning, and no

overseas study experience.

3.2. Research Instruments

The survey of this research is divided into five parts, including gender and age information of the participants, EI level, FLA and FLE, and L2 WTC. All questionnaires are in the form of a Likert five point scale.

3.2.1. Emotional Intelligence Scale-Short Form

This research used the emotional intelligence scale (reduced version) developed by Petrides (2009) for measurement, which includes four dimensions: well-being, self-control, sociality, and emotionality, with a total of 30 questions. In this research, the Cronbach's alpha coefficient of the scale was 0.882, the KMO value was 0.850, and the Bartlett's sphericity test value was 0.000.

3.2.2. Short Form Foreign Language Classroom Anxiety Scale

Students' FLA was measured by the Simplified Foreign Language Classroom Anxiety Scale developed by Dewaele & MacIntyre (2014), which includes 8 items. The Cronbach's alpha coefficient of this scale is 0.877, the KMO value is 0.837, and the Bartlett's sphericity test value is 0.000.

3.2.3. Foreign Language Enjoyment Scale

The FLE of students is measured using the Foreign Language Enjoyment Scale developed by Dewaele (2021), which includes three dimensions: personal enjoyment, teacher understanding, and social enjoyment, with a total of nine items. The Cronbach's alpha coefficient of this scale is 0.860, the KMO value is 0.884, and the Bartlett's sphericity test value is 0.000.

3.2.4. Willingness to Communicate Scale

Willingness to Communicate scale in this research is based on MacIntyre et al. (2001), focusing on the willingness to communicate in the classroom, with a total of 8 items. The Cronbach's alpha coefficient of the scale is 0.838, the KMO value is 0.804, and the Bartlett's sphericity test value is 0.000. All scales have good internal consistency and construct validity within an acceptable range.

3.3. Data Collection and Analysis

After obtaining the consent of schools, teachers, and students, this research distributed paper questionnaires to 125 students who voluntarily and anonymously filled them out. A total of 120 questionnaires were collected, with an effective rate of 96.00%. After manually inputting questionnaire data, normal distribution test, descriptive statistics, and correlation analysis were performed using SPSS 27.0, and mediation effect test was performed using PROCESS v4.1.

4. Results

4.1. Descriptive Statistics

The data analysis results (see Table 1) show that the absolute values of skewness and kurtosis coefficients of the data are less than 2, and the variables are normally distributed, which is suitable for subsequent parameter testing. EI, as the core ability for individual emotional perception and regulation, has a mean of 3.28 (SD=0.67), which is close to the theoretical median of the scale (3.0), but slightly higher than the neutral level, indicating that the sample students generally possess basic emotional management skills. The data distribution shows a slight left bias, indicating a high degree of segmented clustering, and most students are able to

effectively identify their own and other emotions.

In the dimension of AEs, FLA ($M=2.60$, $SD=1.02$) exhibits contradictory characteristics. Its mean is significantly lower than that of EI and FLE, but the standard deviation is the highest among the four variables, and the kurtosis deviates negatively, indicating a polarized trend in anxiety experience. In contrast, the average level of FLE is 3.46 ($SD=0.85$), and its distribution pattern shows a moderate degree of left leaning and flattening, indicating that students experience positive emotions overall in foreign language interaction, but the proportion of high enjoyment groups is limited.

As the dependent variable, the mean of L2 WTC is the highest ($M=3.53$, $SD=0.80$), indicating that the overall middle school student population tends to actively participate in foreign language interactions. However, the range of this variable is 3.38 with a standard deviation of 0.80, indicating that although the group has a high level of L2 WTC, there is significant differentiation among individuals. From the distribution pattern, L2 WTC shows a left skewed trend, with the peak of the distribution curve shifting to the right and the tail extending to the left, indicating that the majority of students have a high willingness to communicate, but the presence of a few low scoring individuals requires attention from educational intervention.

Table 1. Middle school students' status of EI, FLA, FLE, and L2 WTC

Variables	Mean	Min	Max	SD	S	K
EI	3.28	1.53	4.43	0.67	-0.82	0.37
FLA	2.60	1.25	4.63	1.02	0.80	-0.91
FLE	3.46	1.55	4.67	0.85	-0.60	-0.61
L2 WTC	3.53	1.12	4.50	0.80	-1.11	0.32

4.2. Correlation Analysis

The Pearson correlation analysis results (see Table 2) indicate a significant bidirectional correlation between EI and academic emotional variables. EI is significantly negatively correlated with FLA ($r=-0.537$, $p<0.01$), and students with higher EI have lower levels of FLA. This result supports the emotion regulation theory, which suggests that individuals with high EI can effectively identify and manage anxiety triggers (such as classroom correction and peer evaluation), thereby reducing negative emotional intensity. EI is highly positively correlated with FLE ($r=0.757$, $p<0.01$), indicating that EI not only suppresses anxiety, but also positively predicts FLE experience by enhancing learning immersion and self-efficacy. The predictive power of EI on FLE ($r^2=0.573$) is significantly higher than its explanatory power on FLA ($r^2=0.288$), suggesting that EI may mainly affect AEs through the pathway of "promoting positive emotions" rather than "suppressing negative emotions".

EI is significantly positively correlated with L2 WTC ($r=0.653$, $p<0.01$), and the effect size is at a moderate to strong level. This finding is consistent with MacIntyre's (2012) dynamic system model of communicative intention: EI directly enhances students' communicative motivation by improving situational adaptability (such as interpreting teacher feedback intentions) and risk tolerance (such as tolerating language errors in communication). It is worth noting that the explanatory power of EI on communicative intention ($r^2=0.426$) is lower than that of FLE ($r^2=0.504$), suggesting that EI may have an indirect pathway of action, which needs to be further tested through mediating effects.

The impact of FLA and FLE on L2 WTC shows a mirror

relationship. There is a significant negative correlation between FLA and L2 WTC ($r=-0.614$, $p<0.01$), which is consistent with the "anxiety suppression hypothesis". High anxiety students avoid interaction due to fear of negative evaluation (such as being ridiculed for pronunciation errors), leading to a decrease in their willingness to communicate. There is a strong positive correlation between FLE and L2 WTC ($r=0.710$, $p<0.01$), which validates the core viewpoint of the control value theory (Pekrun, 2006) that enjoyment promotes active communication behavior by enhancing task value perception (such as "communication contributes to progress") and activating cognitive resources (such as attentional concentration).

Table 2. The correlation matrix between EI, FLA, FLE, and L2 WTC

Variables	1	2	3	4
EI	—			
FLA	-0.537**	—		
FLE	0.757**	-0.648**	—	
L2 WTC	0.653**	-0.614**	0.710**	—

** $p < 0.01$

4.3. Multiple Regression Analysis

When using EI as a single independent variable for regression analysis of L2 WTC, the correlation coefficient R is 0.653 and the determination coefficient R^2 is 0.427, indicating that EI can explain 42.7% of the variation in L2 WTC. This strongly confirms the strong linear relationship between EI and L2 WTC, highlighting the significant role of EI in improving communication willingness. In the significance test, $F=87.918$ ($p<0.001$), which fully indicates that the regression equation is significant overall. This means that EI has statistical validity for linear prediction of L2 WTC, meeting the strict criteria for data significance. In terms of regression coefficients, the standardized regression coefficient $\beta=0.653$, the non standardized regression coefficient $B=0.764$, and $t=3.105$ ($p<0.001$). For every unit increase in EI, the average L2 WTC increases by 0.764 units, demonstrating the positive promotion effect of EI on L2 WTC from a quantitative perspective.

In the regression analysis of EI on FLA in AEs, in terms of goodness of fit, $R=0.537$, $R^2=0.288$, this indicates that EI can explain 28.8% of the variation in FLA, and EI plays a certain role in regulating anxiety during foreign language learning. In the significance test, $F=47.699$, $p<0.001$, the regression equation is significant. The regression coefficient $\beta=-0.537$, $B=-0.799$, $t=-6.906$ ($p<0.001$) reveals a significant negative correlation between EI and FLA, meaning that the higher the EI, the lower the FLA. When exploring the relationship between EI and FLE, the goodness of fit showed $R=0.757$ and $R^2=0.573$, indicating that EI can explain 57.3% of the variation in FLE. The significance test result is $F=158.053$ ($p<0.001$), and the regression equation is significant. Regression coefficient $\beta=0.757$, $B=0.932$, $t=12.572$ ($p<0.001$). This indicates a significant positive correlation between EI and FLE, highlighting the importance of EI in shaping positive emotional experiences in foreign language learning.

When conducting multiple regression analysis on L2 WTC with EI, FLA, and FLE as independent variables, the goodness of fit results showed $R=0.755$ and $R^2=0.570$,

indicating that these three variables together can explain 57.0% of the variation in L2 WTC. Compared with the prediction of EI alone, the explanatory power has been further improved. In terms of significance testing, $F=51.339$ ($p<0.001$), it fully demonstrates that the entire regression model is significant, that is, the combination of EI, FLA, and FLE has a significant linear impact on L2 WTC. From the perspective of regression coefficients, the standardized regression coefficient β of EI is 0.245, the non standardized regression coefficient B is 0.287, $t=2.623$ ($p<0.001$), indicating that after controlling for FLA and FLE, EI still has a positive impact on L2 WTC. For FLA, $\beta=-0.246$, $B=-0.193$, $t=-3.065$ ($p<0.001$), This indicates that

FLA has a significant negative impact on L2 WTC, meaning that the higher the FLA, the lower the L2 WTC. The standardized regression coefficient β of FLE is 0.365, the non standardized regression coefficient B is 0.346, and $t=3.527$ ($p<0.001$), indicating that FLE has a significant positive impact on L2 WTC.

Overall, EI has a direct positive impact on L2 WTC, meaning that the higher the EI, the stronger the L2 WTC. Meanwhile, EI indirectly affects L2 WTC by influencing AEs (FLA and FLE). Specifically, FLA has a negative impact on L2 WTC, while FLE has a positive impact on L2 WTC.

Table 3. Multiple regression analysis results

Regression Equation		Fit Index			Coefficient		
Independent Variable	Dependent Variable	R	R ²	F	β	B	t
EI	L2 WTC	0.653	0.427	87.918***	0.653	0.764	3.105***
EI	FLA	0.537	0.288	47.699***	-0.537	-0.799	-6.906***
	FLE	0.757	0.573	158.053***	0.757	0.932	12.572***
EI FLA FLE	L2 WTC	0.755	0.570	51.339***	0.245	0.287	2.623***
					-0.246	-0.193	-3.065*
					0.365	0.346	3.527***

Note: β is the standardized coefficient, B is the non standardized coefficient; *** $p < 0.001$; * $p < 0.05$.

4.4. The Mediating Role of AEs between EI and L2 WTC

According to Table 3, EI significantly affects L2 WTC and AEs (FLA and FLE). AEs (FLA and FLE) significantly affect L2 WTC and the direct effect of EI is weakened.

The PROCESS plugin (Model 4) developed by Hayes (2018) was used to test the mediating effect of FLA and FLE. Bootstrap sampling was conducted 5000 times, and the results showed that the confidence intervals did not include 0, indicating a significant effect. Among them, the direct effect is reflected in the direct influence path of EI on L2 WTC. From the analysis results (see Table 4), the direct effect value of EI on L2 WTC is 0.287, reflecting the positive traits inherent in EI itself, such as effective management and utilization of one's own emotions, which can encourage individuals to actively seek communication opportunities in second language learning contexts, thereby directly promoting the enhancement of L2 WTC. This highlights the fundamental role of EI in the formation of L2 WTC, which cannot be ignored and is an important factor in building a positive psychological environment for second language learning.

According to indirect effect analysis, EI indirectly enhances L2 WTC by reducing FLA, with an effect value of $\beta=0.154$. Specifically, individuals with higher EI are often better able to cope with stress and challenges in the learning process, thereby reducing anxiety in foreign language learning. A lower level of FLA helps learners to more easily engage in second language learning and communication activities, enhancing their willingness to participate in second

language communication. For example, when students are able to use EI to regulate their own emotions and reduce anxiety caused by fear of making mistakes or concerns about language learning difficulty, they are more willing to speak a foreign language for communication. This process reflects the mediating effect of FLA between EI and L2 WTC. Secondly, the influence of EI on L2 WTC is partially achieved by enhancing FLE. Students with high EI are better at discovering joy in foreign language learning, and are able to view the learning process positively, enjoying the sense of achievement brought by language learning. This pleasant emotional experience further stimulates the willingness to communicate in a second language. For example, in classroom activities, students with higher EI are more likely to derive enjoyment from interacting with peers in a foreign language, thereby encouraging them to actively participate in second language communication scenarios. Therefore, FLE plays a crucial role as a mediating variable in the process of EI promoting the improvement of L2 WTC. Finally, the indirect effect value of the FLE pathway is significantly higher than that of the FLA pathway, which means that in the process of EI affecting L2 WTC, the impact generated through the mediating variable of FLE is more prominent.

Through in-depth analysis of mediation effect data, it can be concluded that FLA and FLE both play a mediating role in the relationship between EI and L2 WTC, but there are significant differences in their impact significance. Although the effect estimation of FLA pathway is relatively more accurate, in terms of overall impact, the role played by FLE is more critical.

Table 4. Intermediary Path Analysis

Effect Type	Path	Effect Value	SD	95% CI
Direct Effect	EI→L2 WTC	0.287	0.1093	[0.0728-0.5012]
Indirect Effect	EI→FLA→L2 WTC	0.154	0.0582	[0.0540-0.2835]
	EI→FLE→L2 WTC	0.323	0.1025	[0.1519-0.5411]

5. Conclusion and Implications

This research uses a series of statistical analysis methods to reveal the complex relationship between EI, AEs, and L2 WTC among middle school students. The results indicate that EI has a significant positive impact on L2 WTC. At the same time, EI is negatively associated with FLA and positively associated with FLE, and FLA and FLE play a mediating role between EI and L2 WTC. This means that EI not only directly affects L2 WTC, but also exerts influence through the mediating variable of AEs.

Based on the above conclusion, in teaching practice, teachers should attach great importance to the cultivation of students' EI. Through specialized courses or activities, students' emotional management and empathy abilities can be enhanced, and their confidence and initiative in second language learning can be strengthened. At the same time, efforts should be made to alleviate students' FLA, such as by arranging the difficulty of teaching content reasonably and creating a relaxed classroom atmosphere; And actively enhance the enjoyment of foreign language learning, using diverse teaching methods and task designs that are close to life, so that students can gain fun and a sense of achievement in second language learning, ultimately improving their willingness to communicate in a comprehensive way.

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