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Affective Filter Hypothesis and Second Language acquisition: A study on anxiety levels in the dictation part of TEM-4

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Abstract:

The Affective Filter Hypothesis is a cornerstone of second language acquisition (SLA) theory. This hypothesis explores the influence of emotional factors on language learning, particularly the role of emotional states such as anxiety, motivation, and self-confidence in the process of language input. This work investigates the applicability of the Affective Filter Hypothesis in the context of the Dictation section of the Test for English Majors, Band 4 (TEM-4). To explore the impact of emotional factors, especially anxiety levels, on performance in the Dictation section of the TEM-4, a mixed-methods approach was employed in this paper. Participants underwent an anxiety level test and a simulated dictation test to establish baseline data. The results indicated that the overall performance trend of the low-anxiety group was higher than that of the high-anxiety group. This outcome suggests that learners with low anxiety level performed better in TEM-4 dictation than learners with high anxiety level.

Keywords: Affective Filter, Anxiety, TEM-4, SLA

1. Introduction

Second language acquisition (SLA) is a multifaceted process influenced by a variety of cognitive and affective factors. Among the many theories that attempt to elucidate this complex phenomenon, the Affective Filter Hypothesis proposed by Stephen Krashen in the 1980s holds a prominent position (Krashen, 1981) [1]. Krashen's hypothesis posits that emotional factors such as anxiety, motivation, and self-confidence significantly impact the effectiveness of language learning. According to this theory, negative emotional states elevate the affective filter, a psychological barrier that hinders language input from being processed efficiently by the brain's language acquisition mechanism. Conversely, positive emotional states lower this filter, facilitating smoother and more effective language acquisition. "Anxiety is a feeling of apprehension accompanied by sympathetic nervous system arousal, which produces increases in sweating, heart rate, and breathing rate" (Sdorow, 1998) [2].

The Test for English Majors, Band 4 (TEM-4), is a crucial standardized exam administered to university students majoring in English in China. The exam assesses various aspects of English proficiency, including listening comprehension, reading, writing, and speaking. The Dictation section of the TEM-4, which requires students to accurately understand and transcribe spoken English, is particularly challenging. The broad listening ability requires high requirements, mainly emphasizing the dictation ability of speech and words (Chenjuan, 2022) [3]. This section not only tests the students' listening and writing skills but also demands a high level of cognitive and emotional resilience due to the high-stakes nature of the exam.

A significant problem faced by many students during the Dictation section of the TEM-4 is heightened anxiety, which can adversely affect their performance. High levels of anxiety can impair concentration, reduce working memory capacity, and lead to errors in transcription, thereby negatively impacting overall test scores. Despite the critical role of affective factors in language learning, there is a paucity of research specifically investigating the impact of anxiety on performance in the TEM-4 Dictation section. This gap in the literature highlights the need for a focused study that examines how anxiety and other emotional factors influence students' performance in these high stakes testing context.

The primary objective of this research is to explore the applicability of the Affective Filter Hypothesis in the Dictation section of the TEM-4 by investigating the impact of

anxiety levels on students' performance. Specifically, this study aims to:

1. To measure the anxiety levels of students during the Dictation section of the TEM-4 to establish a baseline understanding of their emotional state.
2. To examine the correlation between anxiety levels and performance in the Dictation section to determine how emotional states influence transcription accuracy and overall test scores.
3. To offer insights into how affective factors can be managed to improve performance in high-stakes language exams and propose practical recommendations for educators and policymakers to support students more effectively.

In this work, we are attempt to fill a critical gap in SLA research and provide valuable insights into the interplay between affective factors and language performance, especially how anxiety influences dictation performance in the TEM-4 can inform the development of more effective teaching practices, test preparation strategies, and assessment methods, ultimately enhancing language learning outcomes for English majors in China.

2. Literature Review

The topic of anxiety levels in the dictation part of TEM-4 has gained significant attention in recent years due to the increasing pressure from schools and peers. Understanding students' anxiety levels in the dictation part of TEM-4 is crucial for improve students' mental health as well as learning efficiency.

In the field of anxiety levels, numerous studies have explored some factors that lead to anxiety levels in learning, the strategies in reducing anxiety and the effect of language anxiety. The Foreign Language Anxiety (FLA) which have close connections with many students (Whipple, S. 2020) [4]. Research on anxiety levels in TEM-4 has evolved over the years, with early studies focusing on some factors leading to anxiety and more recent work investigating strategies to cope with anxiety.

Studies can be categorized into three main areas: factors that influence anxiety, strategies to cope with it and levels of anxiety. For instance, Yvonne Jain and Gurnam Kaur Sidhu found that there is a negative but significant relationship in learning English as a second language between the three main variables of discipline, gender and language proficiency among students (Yvonne Jain, 2013) [5]. And according to Sulastri Sulastri and Ratnawati Ratnawati in 2018 that in some cases students can control their anxiety by motivating themselves to learn, and in other cases they can't control their anxiety (Sulastri Sulastri & Ratnawati Ratnawati, 2018) [6].

One of the strengths of the study by Sulastri Sulastri and Ratnawati Ratnawati is clearity. They classified students into three categories according to the level of anxiety, and surveyed and analyzed such students separately, which clearly illustrated the ways in which students could solve their anxiety in different situations again. However, the study has certain limitations, such as lacking data. Data has a strong supporting role in the investigation process, this study lacks relevant data and only specific descriptions would lack credibility.

Despite the extensive research on anxiety levels, gaps remain in our understanding of Anxiety levels of students in different situations in different states, that is, how the anxiety levels of their peers change as the environment changes. Previous studies have basically analyzed static and unchanged conditions without taking changes into account, so that the results are only partially credible and do not fully correspond to reality.

Further studies should focus on breakdown of stress levels, namely, changes in anxiety levels in different scenarios. The research identified an apparent knowledge gap in the prior research concerning some specific areas of anxiety levels as well as variables impact. In addition, the prior research did not address the subject of changes in stress levels under the influence of different variables. This encompasses several unexplored dismensions that lately have attracted research attention in other disciplines. Also, there is a methdological gap in the prior study. There is a lack of data-based and graph-based research designs in analyzing anxiety levels. In the study we seek to establish a new inquiry on research designs, and we collected the results of 41 questionnaires, compiled the data from the survey and made convincing charts such as linear regression charts and scatter plots based on the data. From the graphs, we can clearly see the theory we want to get, which is more convincing than just using words to describe it.

Understanding anxiety levels is essential for improving students' mental health as well as learning efficiency, as it appears more frequent than that in the past among students with increasing heavy stress. Continued investigation into anxiety levels in the dictation part of TEM-4 will be crucial for them to find a suitable way to improve performance and get a higher score in TEM-4.

3. Method and Materials

This study investigated the impact of anxiety levels on the dictation component of the Test for English Majors Band 4 (TEM-4) among Chinese undergraduates majoring in English. The participants comprised 41 students from a comprehensive university in China. To explore the relationship between anxiety and dictation performance, the

research was conducted in two main stages: administering a questionnaire to assess anxiety levels and conducting a practical dictation test.

Wenjuanxing is a popular Chinese online survey platform similar to SurveyMonkey, offering features for survey creation, distribution, and basic data analysis. It supports multiple question types, customizable templates, various distribution methods (including WeChat and QR codes), and real-time data collection. SPSS (Statistical Package for the Social Sciences) is a powerful software suite for data management and statistical analysis, widely used in social sciences, market research, and healthcare. It provides tools for data import/export, descriptive and inferential statistics, advanced modeling, and graphical representation. Data from Wenjuanxing can be exported to SPSS for in-depth analysis, creating a comprehensive solution for research projects requiring robust statistical examination.

In the first stage, we developed the TEM-4 Dictation Anxiety Scale, which included common anxiety-provoking questions relevant to the dictation section of TEM-4. The questionnaire comprised items that addressed various dimensions of anxiety, including cognitive, emotional, and physical reactions, as well as behavioral responses during dictation tasks (Huang, J, 2022) [7]. Participants were instructed to answer each item based on their personal experiences and feelings during previous dictation exercises. The responses were scored using a Likert scale, ranging from "strongly disagree" to "strongly agree," allowing us to quantify the anxiety levels of each student. The results from the questionnaire provided a baseline measure of the participants' anxiety related to dictation tasks.

In the second stage, we selected a representative essay and corresponding audio recording from the dictation section of the TEM-4 to conduct a practical dictation test. The dictation test was carried out in a controlled environment to ensure consistency in testing conditions across all participants. Each student was given a blank sheet to transcribe the dictated passage as accurately as possible. The audio was played at a standard pace, and students were given sufficient time to complete their transcription. After the dictation exercise, the written responses were collected and scored for accuracy and completeness, providing a measure of each student's dictation performance.

To ensure the reliability and validity of our findings, we conducted a thorough statistical analysis of the data collected from both the TEM-4 Dictation Anxiety Scale and the dictation test (Su, 2019) [8]. Correlation and regression analyses were performed to examine the relationship between anxiety levels and dictation performance. These analyses allowed us to determine the extent to which anxiety impacted students' ability to accurately transcribe the dictated passage.

The combination of quantitative data from the anxiety scale and qualitative data from the dictation test provided a comprehensive understanding of how anxiety influences second language acquisition in a high-stakes testing environment like the TEM-4 (Weng & Liu, 2024) [9]. By integrating these two methodological approaches, we were able to evaluate the Affective Filter Hypothesis within the context of second language learning, offering valuable insights into the role of anxiety in language acquisition. The findings from this study have implications for educators and policymakers aiming to create more effective language learning environments that account for the affective factors influencing student performance.

4. Results

Firstly, we carried out validity and reliability analysis on the questionnaire to prove the reliability of the data source and the desirability of the data. Then, according to the results of anxiety questionnaire and dictation test, we conducted statistical data sorting. We sorted 41 participants according to their anxiety levels, and then imported the data table into SPSS statistical analysis software for data analysis. The following results were obtained:

Table 1 KMO and Bartlett Test

KMO		0.645
Bartlett Sphericity test	Approximate chi-square	519.356
	df	190
	p	0.000

KMO and Bartlett tests were used to verify the validity. It can be seen from the table 1 that the KMO value is 0.645, between 0.6 and 0.7, and the research data is suitable for extracting information.

Table 2 reliability analysis

number of terms	sample size	Cronbach's Alpha coefficient
20	41	0.896

It can be seen from the table 2, the reliability coefficient value is 0.896, which is greater than 0.8, indicating that the reliability quality of the research data is high.

Table 3 Linear regression analysis results (*n*=41)

	Nonnormalized coefficient		Standardization coefficient	*t*	*p*	collinearity diagnostics	
	B	standard error	*Beta*			VIF	tolerability
constant	10.043	1.104	-	9.097	0.000**	-	-
degree of anxiety	-0.063	0.018	-0.491	-3.524	0.001**	1.000	1.000
R^2	0.242						
F	*F* (1,39)=12.422,*p*=0.001						
D-W value	2.021						

As can be seen from the table 3, degree of anxiety is taken as the independent variable and dictation score as the dependent variable for linear regression analysis. As can be seen from the above table, the formula of the model is as follows: dictation score=10.043-0.063*degree of anxiety, and the R square value of the model is 0.242, which means that the degree of anxiety can explain 24.2% of the variation of dictation score.

During the F-test of the model, it is found that the model passes the F-test (F=12.422, p=0.001<0.05), which means that the degree of anxiety will definitely affect the dictation score. The final concrete analysis shows that: The regression coefficient of degree of anxiety is -0.063(t=-3.524, p=0.001<0.01), which means that degree of anxiety will have a significant negative impact on dictation score.

Table 4 Results of normality test

Description	sample size	average value	standard deviation	Skewness	Kurtosis	Shapiro-Wilk test	
						The statistic W value	*p*
degree of anxiety	41	61.024	11.071	-0.453	-0.368	0.950	0.070
dictation score	41	6.213	1.414	-0.210	-0.466	0.975	0.491
* *p*<0.05 ** *p*<0.01							

Normality test is carried out on the data of degree of anxiety and dictation score. Assuming that the two data present normal distribution, it can be seen from the table 4 that the sample size of the research data is all less than or equal to 50, so the S-W test is used. Specifically, both degree of anxiety and dictation score show no significance (p>0.05), which means that the original hypothesis is accepted, and both degree of anxiety and dictation score have normal characteristics.

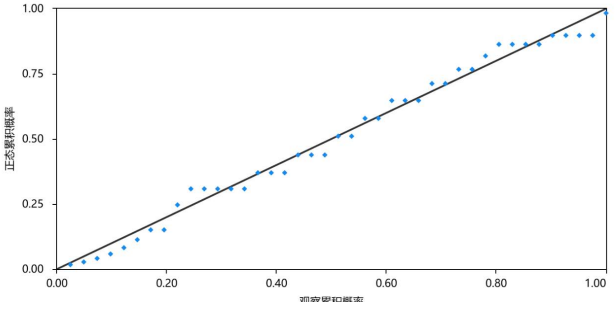

Figure 1 Dictation Score Normal P-P Diagram

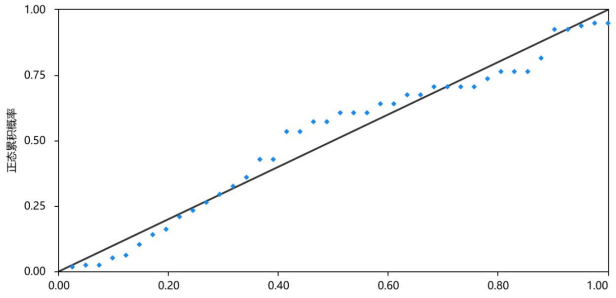

Figure 2 Degree of Anxiety P-P Diagram

The Figure 1 and Figure 2 show that the data of dictation score and degree of anxiety are basically in line with the normal distribution, but there is a certain degree of deviation. The numbers for degree of anxiety deviate more sharply in the middle range (0.20 to 0.60), while the numbers for the dictation score are slightly better. In general, both sets of data can be considered to be close to normal distribution. Which means learners with low anxiety level performed better in TEM-4 dictation than learners with high anxiety level.

5. Discussion

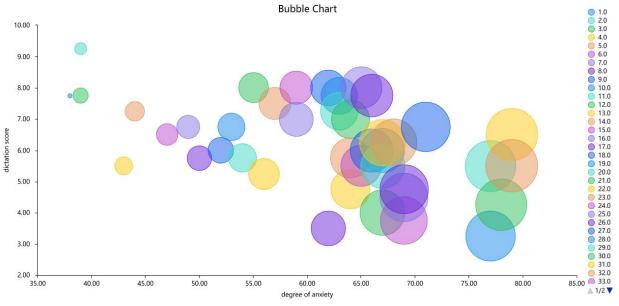

Figure 3 Bubble Chart

Anxiety may produce some covariates to the experiment (e.g., learning efficiency, knowledge absorption capacity, etc.), which will lead to positive feedback. It can be seen from the figure 3 that some students with low anxiety level have low dictation scores, while those with high anxiety level have high dictation scores. This may indicate that anxiety promotes longer review times and greater concentration, resulting in a positive feedback phenomenon.

6. Conclusion

This study aims to explore the applicability of the affective filtering hypothesis in the TEM-4 dictation section, filling a critical gap in second language acquisition (SLA) research by investigating the impact of anxiety levels on student performance. Anxiety, as a kind of emotion, has a certain influence on the dictation performance of English majors. Anxiety blocks learners' language input, making it difficult for it to filter through to the brain's language acquisition mechanisms. The focus of this study is: First, the anxiety level of students in the TEM-4 dictation section was measured to establish a baseline of their emotional state. Second, the correlation between anxiety levels and dictation performance was analyzed to determine how emotional states affected transcription accuracy and overall test scores. In the process of data analysis, it is found that learners with low anxiety level perform better in TEM-4 dictation than learners with high anxiety level, although the performance is not very obvious in the data.

In view of the long experimental period, future experiments can be improved to screen out participants in the high-anxiety group by a certain proportion, and give them teaching intervention or relaxation training to reduce their dictation anxiety. They were then given dictation tests to see if they could reduce their anxiety and improve their dictation performance. This study not only aims to reveal the interaction between emotional factors and language performance, but also provides valuable insights for improving teaching practices, test preparation strategies, and assessment methods to ultimately improve language learning outcomes for Chinese English majors.

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Yuxuan Jiang, Yueyue Wu and Yi Liang contributed equally to this work and should be considered co-first authors.

Appendix

TEM-4 Dictation Anxiety Scale

The purpose of this questionnaire is to investigate the anxiety of English majors in TEM-4 Dictation, and to understand the students' learning situation and psychological feelings in Dictation. This questionnaire is purely for study and research purposes, so your answers will be an important source of research data and will be of great significance to us!

In order to make this study go smoothly and get objective results, please answer according to the real situation. Here, we would like to express our heartfelt thanks for your participation and cooperation!

Is the following statement consistent with your usual learning experience? Please select from the following five options which are consistent with your practice.

Your name is:

_____

Your grade is:

○ freshman
○ sophomore
○ junior
○ senior

1, How do you feel about English?
○ Be interested in it.
○ A bit hard.
○ It's difficult.
○ Have no desire to learn.
2, Your current listening level is:
○ Can understand foreign news and original movies.
○ There is no difficulty of hearing when communicating with foreigners.
○ I can basically understand daily work communication.
○ In English, you can only understand some words or simple sentences.
○ I barely understand it.
3, Do you think English listening is difficult?
○ Easy
○ General
○ Difficult to understand

4, When listening to the Dictation section, I usually get stuck with one or two words I don't know.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ Strongly agree

5, I get nervous when I only read the text once during the Dictation test.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

6, I find it difficult to understand the recording of the exam when the way of pronunciation is different from mine.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

7, When the audio is fast, I worry that I won't be able to understand it all.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

8, When practicing or taking an exam, if the Dictation is something I've never heard before, I feel uneasy and anxious.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

9, When doing the Dictation section, I have a hard time guessing what I missed.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

10, If my mind wanders a little while listening to the Dictation, I worry that I may be missing important information.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

11, When listening to Dictation, I get anxious if I don't understand every word.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

12, When I listen to the Dictation section, I often forget what I heard in the last sentence in order to hear the next one.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

13, When I can't think about what I'm hearing within a limited time frame, I get worried and anxious.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

14, When listening to the Dictation section, I get anxious if the speed of the audio is not what I am used to.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

15, When I am in a test or practice, I always think that everyone else can understand the listening content, only I can't.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

16, When I listen to the Dictation section, I get upset if I'm not sure I've understood it.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

17, When listening to the Dictation section, I get annoyed if I come across words I don't understand.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

18, I think I have a good recognition of Dictation stress and word pronunciation.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

19, When listening to the Dictation audio, I can often understand the words, but still not quite understand what the speaker means.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

20, When I listen to the audio, if I don't hear a word in the content, I feel worried and anxious.

○ bitter against	○ disagree	○ indeterminacy	○ agree	○ strongly agree

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