

Investigating the relationship between test anxiety and ambiguity tolerance on EFL learners' performance in written classroom assessment

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Abstract

This study examined the relationships between test anxiety, ambiguity tolerance and written classroom assessment performance among EFL university students. The data were gathered using Westside Test Anxiety Scale and Second Language Ambiguity Tolerance Scale along with a 15-mark written classroom assessment. Descriptive statistics were used to report the means and ranges of test anxiety and ambiguity tolerance; the results showed that most students reported high levels of test anxiety and that the levels of ambiguity tolerance varied. Correlational analyses indicated a small but statistically significant negative correlation ($r = -.25$, $p < .05$) between test anxiety and tolerance for ambiguity. Multiple regression analysis indicated that the combination of test anxiety and ambiguity tolerance explained 36% of the variance in written assessment performance ($R^2 = .36$). Finally, test anxiety was found to be a statistically significant negative predictor of students' written assessment scores, while ambiguity tolerance was a statistically significant positive predictor. Notably, students who achieved the highest scores exhibited the lowest levels of test anxiety and the highest levels of ambiguity tolerance. The results indicate that both emotional and cognitive factors are important predictors of written English as a Foreign Language (EFL) assessment performance.

1. Introduction

English proficiency is a fundamental factor in achieving academic success in higher education institutions worldwide, particularly for students learning it as a foreign language (Crystal, 2003). While linguistic knowledge and communicative competence directly contribute to academic performance (Bachman & Palmer, 1996), a growing body of research indicates that psychological factors—particularly affective variables such as anxiety and cognitive-affective traits such as ambiguity tolerance—play a significant role in students' test performance (Horwitz, 2016; Putwain et al., 2023; Dewaele & MacIntyre, 2014). Test anxiety and ambiguity tolerance—key factors influencing students' information processing, emotion regulation, and academic success—align with anxiety's definition as cognitive, emotional, and physiological responses during exams that impair performance (Zeidner, 1998). This anxiety typically includes feelings of tension, negative self-evaluation, and fear of failure as well as physical symptoms such as rapid heartbeat and muscle tension (Spielberger, 1980). While moderate anxiety may motivate students to prepare well for language tests, many studies have confirmed that high levels are associated with decreased concentration, impaired working memory, and reduced academic performance (Horwitz, 2016; Cassady and Johnson, 2002; Weng, 2024). In the context of EFL, where students are required to organize their thoughts and write accurately within a limited time (written tests) the effects of test anxiety are exacerbated on students, written tests by their nature require significant cognitive effort which may increase the negative impact of anxiety on performance.

The term “ambiguity tolerance” refers to the degree to which a person can cope with uncertainty in information, whether it is incomplete, vague, or unclear (Budner, 1962), without feeling

overwhelmed or threatened. Language learners frequently encounter ambiguity when faced with unfamiliar vocabulary, multiple possible meanings for a single word, open-ended hints, or specific expectations about what they should do in a task. Those with a high tolerance for ambiguity are typically flexible and able to experiment with different ways of communicating, while those with a lower tolerance for ambiguity are often confused, avoid using their new language, and/or feel anxious (Ely, 1995; Brown, 2000; Yu, 2022). While previous research has shown positive correlations between ambiguity tolerance and other areas of second language acquisition and performance, such as reading comprehension, vocabulary development, and overall integrated language competence (Sadeghi and Bakhshi, 2025; Chiang, 2016), few studies have examined these variables simultaneously within the context of written classroom assessments.

Most studies examining test anxiety and ambiguity tolerance have investigated each variable separately, while only a few have explored how these constructs jointly influence EFL students' performance on authentic classroom assessments, particularly those involving writing. There is an immediate need for further research on the interactional effects of test anxiety and ambiguity tolerance, considering the ambiguity inherent in many aspects of genuine classroom assessment, such as open-ended questions, answer interpretation, and limited guidelines. Therefore, this study examines test anxiety and ambiguity tolerance among EFL students at Iraqi universities to determine whether a relationship exists between these two variables and students' performance in written classroom tests. In addition, this study assesses both anxiety and ambiguity tolerance within the same group of English as a Foreign Language students in order to clarify the cognitive and emotional factors that affect students' performance in written assessments. Specifically, the current study seeks to determine the degree to which EFL students experience anxiety in written classroom assessments, the extent to which they exhibit ambiguity tolerance, whether there is a correlation between test anxiety and ambiguity tolerance, and whether both variables are associated with EFL learners' performance in written class examinations.

Test anxiety has been shown by many researchers to be a very prevalent issue affecting students' overall ability to perform well on assessments (Zeidner, 1998). Research indicate that when students are overly anxious about tests, it hinders them from demonstrating their full capabilities due to intrusive thought processes and physical responses (Cassady & Johnson, 2002). Cassady and Johnson (2002) discovered that test anxiety negatively impacts comprehension and memory skills, which further inhibits students' ability to show what they know during evaluations. Academic anxiety is extremely common among English as a Foreign Language (EFL) learners, Güvendir and Uzun (2023) found that high levels of anxiety consume the cognitive resources needed for effective reading comprehension, thereby transferring focus away from language-based processing skills. Furthermore, Putwain (2023) supported this finding by showing that test anxiety is associated with not only poor performance in all subjects but also higher levels of emotional issues including social anxiety and depression. Therefore, academic performance may indicate a student's level of anxiety as accurately as their level of knowledge or competence. Anxiety is an integral part of human nature, and moderate levels of anxiety can promote alertness and foster a sense of responsibility in educational settings (Yerkes & Dodson, 1908; Pekrun, 2006). Nonetheless, high levels of anxiety can cause problems across multiple aspects of a person's life. A person who experiences high levels of anxiety may experience serious negative consequences for their mental health and physical health and can also negatively affect academic performance, social interactions, and professional success (Sidik et al., 2021; Vinueza, I et al., 2025). Test anxiety is one of the most common forms of anxiety experienced by individuals, especially those experiencing high stakes testing (e.g. SATs, ACTs, etc.) as the individual will be judged by authority figures. This type of anxiety may destroy one's belief in his/her own abilities and develop behavioral problems and even create an aversion to school itself (Putwain et al., 2020).

Excessive test anxiety is detrimental to learning and can have serious long-term consequences for student achievement. Numerous recent studies highlight the prevalence of this problem, a consequence of the increasing number of high-stakes tests in our current educational systems. For example, Test anxiety is a common issue among students, particularly in high-stakes assessment contexts. Recent studies evidence shows that a substantial number of university students experience moderate to high levels of test anxiety which negatively affects their academic performance and psychological well-being (Ahmed et al., 2023). Research also indicates consistent gender differences, with females reporting higher levels of test anxiety than males (Huntley, 2023). In addition, meta-

analytic findings confirm a significant negative relationship between test anxiety and academic achievement due to its interference with attention and working memory processes during exams (Robson et al., 2023). Overall, test anxiety is strongly linked to both reduced academic performance and increased emotional distress.

However, research suggests that the relationship between test anxiety and academic performance is complex and may be explained by competing theoretical models including the deficit hypothesis, which argues that lower academic ability may contribute to higher levels of test anxiety rather than a direct causal effect from anxiety to poor performance (Cassady & Johnson, 2002; Von der Embse et al., 2018). Among EFL learners, test anxiety is a major obstacle that interferes with the learner's ability to call upon previously acquired knowledge, and reach the intended goals (Dusek, 1980; Zeidner, 1998). The same anxiety that affects speaking tests, also affects writing tests, and writing tests present additional challenges for learners. Research shows that learners' self-assessment of their proficiency in English is a much stronger predictor of their writing confidence, than their actual test scores. This illustrates the influence of personal belief on performance. Test anxiety is a complex problem, and may provide benefits for motivation at low to moderate levels of test anxiety, but will result in severe and negative results at excessive levels of test anxiety, including but limited to: poor academic performance, loss of confidence, poor mental health, and barriers to future educational success especially for EFL learners (Cassady & Johnson, 2002). Test anxiety should be conceptually distinguished from related concepts such as generalized anxiety, academic anxiety, and writing anxiety. Generalized anxiety refers to a general predisposition to feeling stressed in various contexts, while academic anxiety is related to a specific field and particular learning environments. Test anxiety represents a more focused form of evaluative anxiety related to performance in test situations, encompassing cognitive, emotional, and physiological responses. In contrast, writing anxiety is task-specific and relates to feelings of fear during writing activities, particularly when learning a second language. Although specific scales for writing anxiety exist, this study uses the West Side Test Anxiety Scale (WTAS) to measure evaluative anxiety in time-bound assessment contexts. This is theoretically justified, as the writing task under study was conducted under examination conditions, where performance pressure and evaluative stress are key components, making a generalized test anxiety scale appropriate for capturing the broader emotional experience affecting writing performance.

Ambiguity tolerance is becoming a central concern of classroom assessment, particularly in English as a Foreign Language (EFL) settings, in which learners often experience incomplete, vague or complex data requiring them to think critically and be adaptable (Ely, 1995; Brown, 2000).

Ellis (1994) defined ambiguity tolerance as the capacity to deal with unknown or unclear stimuli without feeling frustrated or seeking authority figures to answer questions about the stimuli. Brown (2000), referred to it as an individual's level of mental readiness to consider ideas, or even proposals, that will either challenge or contradict the belief systems, or prior knowledge an individual may have developed. He also indicated that this was one of the main factors of a learner's success in achieving adaptive learning.

Ely (1995) suggested that those students who have a high level of ambiguity tolerance will be able to successfully handle ambiguous or unclear instructions and therefore will perform better on assignments that require interpretative skills than students with lower levels of ambiguity tolerance. Evidence supporting this notion is provided by Chiang (2016), who found a moderate positive correlation between ambiguity tolerance and overall language proficiency. In addition, Sadeghi and Bakhshi (2025) found a significant positive relationship between ambiguity tolerance and performance in integrated language skills in which more tolerant students significantly outperform less tolerant students.

These results suggest that ambiguity tolerance acts as a barrier against the negative effects of test anxiety although very few studies have examined the relationships between test anxiety, general anxiety, and ambiguity tolerance simultaneously. The complexity of ambiguity tolerance to as a psychological concept has led researchers to develop different definitions that represent its various aspects. Kazamia (1999) emphasized that ambiguity is composed of interconnected and multifaceted components that cannot be oversimplified. In one of his studies (2012), Kamran suggested that more research should be conducted regarding the developmental roots of ambiguity tolerance in order to

understand its importance in the development of second language learners. Brown (2000) stated that it is a significant element in the determination of whether an individual has successfully learned a second language. Ely (1995) added additional weight to its value by indicating that ambiguity is typically present in English as a Foreign Language (EFL) environments and that it hinders a student's ability to apply new techniques or methods.

Jawad Abdulridha et al. (2025) indicated that fear of being negatively evaluated by their instructor was a primary source of apprehensive thinking for many Iraqi students. Further, the researchers found there were no statistical differences relating writing anxiety with an individual's tolerance for ambiguity. Therefore, it seems that this relationship will depend on the context in which the student writes rather than being a global phenomenon. Langer (2014) defines the ability to operate in environments characterized by uncertainty, where one does not know what to expect because the environment lacks some level of structured predictability, as an aspect of emotional regulation and how well an individual uses adaptive coping strategies.

Budner (1962) categorized uncertainty into three basic forms: new situations where the information appears unfamiliar, complex situations where the amount of available information is overwhelming and confusing situations where the information provided is contradictory and/or conflicting. Ehrman (2003) proposed a comprehensive developmental model explaining the way individuals develop through three stages: understanding, where individuals initially take in and learn new information; acceptance, which is the point at which an individual comes to realize that some information is incomplete or contradictory; and adjustment, which is the stage at which an individual takes new information and incorporates it into their pre-existing thought patterns to create new thought patterns. Recent studies of the second language learning process support the notion that individuals need to be able to cope with uncertainty during the process of acquiring a second language. Specifically, the authors defined it as the ability to remain calm in ambiguous situations when the environment is unclear, confusing or contradictory (Huang, S. 2022; Hillen et al., 2017). Budner (1962) explained uncertainty broadly as anything new, unclear or structurally complex. Students of English as a foreign language typically experience these kinds of problems when dealing with ambiguous vocabulary, multiple meanings of sentences or irregularities in the flow of information. Individuals who are comfortable with uncertainty tend to perform well in these situations and demonstrate comfortability with the unknown, require little explanation for the tasks assigned to them and are enthusiastic participants in novel tasks (Grace, 1998). On the other hand, individuals who are uncomfortable with uncertainty typically feel a greater degree of anxiety, are hesitant to attempt new and challenging tasks and are often slow to develop their English language skills (Ehrman, 1996).

Written examinations embody a unique type of test anxiety—one that is characterized by an intense sense of fear, accompanied by physiological responses such as rapid heart rate and sweating, and associated with negative patterns of thinking focused on failure (Spielberger, 1980; Zeidner, 1998). These elements can negatively affect an individual's ability to think clearly and perform tasks effectively. This negative impact will likely influence a student's academic success (Cassady & Johnson, 2002). The anxiety of taking a written test is different from the anxiety experienced when taking an oral test. Oral test anxiety is typically related to an individual's fear of social evaluation and the possibility of being evaluated or judged by someone else (Horwitz, 2016). There are standardized measures available, such as the Test Anxiety Inventory (TAI), that educators can use to identify students that have the potential to experience test anxiety so that they may create interventions for those individuals. Some research has found many possible ways in which educators can intervene in the event that students exhibit high levels of test anxiety. Those include providing students with opportunities to write expressively about their test-related fears before administering a test (Ramirez & Beilock, 2011) and teaching students how to utilize study skills that emphasize effective time management techniques and learning strategies (Putwain, 2014).

As indicated earlier, the multifaceted nature of test anxiety includes three components: affective worry, physical manifestations of anxiety, and maladaptive behaviors, such as procrastination or avoiding the task altogether. While some level of anxiety may enhance motivation, excessive levels of anxiety can severely disrupt basic cognitive processes, including working memory, attention, the ability to analyze problems, and critical thinking, thus resulting in suboptimal performance on written exams.

2. Method

This study employed a descriptive correlational research methodology that examined the relationship between the level of test anxiety and ambiguity tolerance in English as a Foreign Language (EFL) learners and their performance on written classroom assessments. The correlational research method permitted the researcher to establish participant's levels of written test anxiety and ambiguity tolerance; and it permitted the researcher to evaluate the degree of association between those two variables, written test anxiety and ambiguity tolerance, and written assessment performance. In addition, this study is contributing to the body of literature by assessing the combined effects of both test anxiety and ambiguity tolerance for Iraqi University Students enrolled in an English as a Foreign Language program to identify the relationship between each variable independently (test anxiety and ambiguity tolerance), and their individual impact on written assessment performance.

2.1. Participants

Purposive sampling was employed to ensure that participants shared similar educational backgrounds and intermediate English proficiency levels. The participants were 75 undergraduate EFL students enrolled in the Department of English. Their ages ranged from 20 to 22 years ($M = 21.1$, $SD = 0.7$). None of the participants had studied in English-speaking countries or experienced substantial exposure to native English speakers outside the classroom. This criterion helped ensure a relatively homogeneous sample whose language-learning experiences were primarily shaped by formal EFL instruction.

2.2. Ethical Considerations

This study was approved by an appropriate academic ethics committee. Prior to participation in this study all participants were fully appraised as to the nature and processes involved within the study. All participants provided their own written consent to participate, and it was made clear that all data collected for the purposes of this study would be treated as confidential and anonymous. The researcher adhered to all ethical standards which are associated with the research process. Included in these standards is the participant's right to withdraw from the study at any stage without detriment or penalty.

2.3. Data Collection Instruments

Two instruments were used to assess two different areas of students' concerns about writing: test anxiety and ambiguity tolerance. The first instrument was the Westside Test Anxiety Scale (WTAS), a short and well-designed tool developed by Driscoll (2007) to measure test-related performance impairment and worry. The WTAS consists of ten items rated on a five-point Likert-type scale ranging from 1, "Not at All True of Me," to 5, "Extremely True of Me." Respondents' total scores are determined by calculating the average score across all items. A higher mean score indicates greater test anxiety, whereas a lower mean score reflects lower test anxiety. One example item is, "The closer I am to a big exam, the harder it is for me to think about the material." In Driscoll's (2007) initial study, the WTAS was found to be highly reliable for assessing test-related anxiety, with a Cronbach's alpha of .89, indicating that the instrument was reliable and valid for educational purposes. In addition, a pilot administration with students from the target population indicated acceptable internal consistency, with a Cronbach's alpha of .86.

The second instrument was the Second Language Ambiguity Tolerance Scale (SLATS), which was first created by Ely (1995) and later modified by Erten and Topkaya (2009) to allow respondents to answer "Uncertain" in addition to the options of Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. The SLATS is a 12-item survey specifically designed to assess participants' ambiguity tolerance in second language learning. Previous studies have reported acceptable reliability coefficients for the SLATS, with values of around $\alpha = .74$ (Erten & Topkaya, 2009). In the present study, internal consistency was examined using Cronbach's alpha and demonstrated good reliability, with $\alpha = .80$.

2.4. Data Collection Procedures

In order to provide high-quality, reliable and ethically collected data, several strict measures were taken throughout the data collection process. Formal permission was acquired to begin

conducting the study as well as distributing the questionnaire with the Department of English Language at Al-Zahraa University for Women. In order to create an environment that would be as comfortable and familiar as possible for the participants, the researcher distributed the questionnaires during the regularly scheduled class time in the participants' normal classrooms. After acquiring voluntary informed consent from each of the participants, the researcher assured the participants of the confidential and anonymous nature of their responses and explained the purpose, procedures and voluntary nature of the study. To minimize participant anxiety, both the WTAS and SLATS were administered in paper format during regular class time in the participants' familiar classroom environment. Instructing participants how to respond to the Likert scale questions and encouraging the participants to respond based upon their actual experience, created an opportunity for honest responses from the participants.

Brief explanations of the tools were made in English for clarity; however, some additional explanation in Arabic was provided as needed to help participants with understanding the tools. Throughout the administration time, the researcher was available to answer procedure-related questions and provide clarification as needed. It took approximately 20-25 minutes to administer the tools to each participant. The dependent measure was students' completion of a 15 mark written classroom test that required an argumentative essay (approximately 250 words) on "the impact of technology on education" in which students would have 45 minutes to complete the task. Essays were evaluated using an analytic scoring rubric adapted from Jacobs et al. (1981), assessing content (5 points), organization (3 points), vocabulary (3 points), language use (3 points), and mechanics (1 point). Two trained EFL instructors with M.A. degrees independently scored all essays. The scores assigned by the two raters were strongly correlated ($r = .89$, $p < .001$), indicating substantial consistency in scoring. The researcher gathered these scores and organized them for comparison with questionnaire data. Upon completion, all questionnaires were collected immediately to minimize the possibility of data loss or missing responses. All of the responses were reviewed for completeness, and only those questionnaires that were completely filled out ($n = 75$, 100%) were included in the data analyses.

2.5. Data Analysis

Quantitative data obtained from the WTAS, SLATS, and written assessment scores were analyzed using SPSS software. Descriptive statistics were first used to determine participants' levels of test anxiety and ambiguity tolerance. Pearson correlation coefficient analysis was then conducted to examine the relationship between test anxiety and ambiguity tolerance, as well as the relationship between each variable and students' written classroom assessment performance. In addition, multiple regression analysis was employed to determine the extent to which test anxiety and ambiguity tolerance, both individually and jointly, predicted participants' written assessment performance. A moderation analysis using Hayes's (2013) PROCESS macro, Model 1, with 5,000 bootstrap samples, was also conducted to examine whether ambiguity tolerance moderated the relationship between test anxiety and written performance. Prior to the moderation analysis, both predictors were mean-centered.

Before conducting inferential analyses, the assumptions of normality, linearity, homoscedasticity, and absence of multicollinearity were examined using residual plots, normal probability plots, tolerance statistics, and variance inflation factor (VIF) values. The results indicated that all assumptions were adequately satisfied. Standardized beta coefficients were used to evaluate the relative contribution of each predictor variable in the regression model (Field, 2018).

3. Results and Discussion

This section presents the quantitative results of the study. Descriptive statistics are reported first to show the levels of written test anxiety and ambiguity tolerance among the participants, followed by correlation analyses examining the relationships between these variables and students' performance in written classroom assessments." The answers to the first research question that will address how much EFL students experience written test anxiety was found by analyzing the scores from the participants' use of the Westside Test Anxiety Scale (WTAS). Table 1 illustrates how many of the students fell into one of three categories regarding their level of test anxiety, as well as provided descriptive statistics for each of these categories. Scores from WTAS were also translated into percentiles in accordance with Driscoll (2007); therefore, a score of $\leq 45\%$ is classified as low

anxiety; a score of 46 – 64% is classified as moderate anxiety; and a score $\geq 65\%$ is classified as high anxiety.

Table 1. Levels of Test Anxiety based on Westside Test Anxiety Scale (WTAS)

Anxiety level	Number of students	Percentage of students	Minimum score (%)	Maximum score (%)	Mean within category (%)
Low anxiety	2	2.66	45	45	45.00
Moderate anxiety	5	6.6	63	64	64.00
High anxiety	68	90.66	66	100	90.66
Total	75	100	45	100	

Note: Mean values represent percentage scores within each category.

The majority of the 75 students who took part in the Westside Test Anxiety Scale (WTAS) study experienced a high level of written test anxiety. A total of 68 students (or 90.66%) fell into the high-anxiety category and had WTAS mean scores of between 66% and 100%. These findings indicate that most participants reported high levels of test anxiety during written examinations. Only five students (or 6.66%) were classified as moderate test anxiety, and their mean WTAS scores ranged from about 63-65, indicating that some students may experience worry or apprehension at times but they are able to cope with the demands of an examination. Two students (or 2.66%) scored within the low anxiety category (mean WTAS = 45%), and as such, they appear to be generally relaxed and self-assured during written examinations. These findings indicate that high levels of test anxiety were reported by the majority of participants in the present sample.

The second research question was designed to investigate how many EFL learners exhibit tolerance of ambiguity in learning English. SLATS scores were converted to percentages following Ely (1995): scores of 0-33% indicate low ambiguity tolerance, 34-66% indicate moderate tolerance, and 67-100% indicate high tolerance (Table 2).

Table 2. Distribution of Ambiguity Tolerance Levels (SLATS)

Category	N	Minimum score	Maximum score	Percentage (%)
High ambiguity	38	67	100	50.67
Moderate ambiguity	14	34	66	18.67
Low ambiguity	23	0	33	30.67
Total	75	0	100	100.00

To determine the degree of ambiguity tolerance of the participants, an analysis was conducted of the student's Second Language Ambiguity Tolerance Scale (SLATS) scores. The results from Table (2) show that nearly half (approximately 50%) of the students had high levels of ambiguity tolerance, which is defined as scoring 67 – 100 points and indicates that these students reported relatively high levels of tolerance toward ambiguous or unfamiliar language input. Approximately one-fifth (19%) of the students have moderate levels of ambiguity tolerance, which suggests that while they can usually deal with some types of ambiguity, they will occasionally experience difficulties when dealing with ambiguity at a higher degree or complexity than usual. On the other hand, approximately one-third (30.67%) of the participants exhibited low levels of ambiguity tolerance, which indicates that they often become confused, uncomfortable or stressed when they come across unclear meanings or insufficient information. Overall, the findings indicate considerable variation in participants' levels of ambiguity tolerance.

To answer the third research question, which is “What is the relationship between test anxiety and ambiguity tolerance?”. The relationship between students' scores on the Westside Test Anxiety Scale (WTAS) and the Second Language Ambiguity Tolerance Scale (SLATS) was examined using Pearson correlation as it presented in table 3. The goal was to determine whether higher levels of test anxiety are associated with lower tolerance of ambiguity among EFL learners scores in written tests.

Table 3. Correlation between Test Anxiety and Ambiguity Tolerance

Variables	Test anxiety (WTAS)	Ambiguity tolerance (SLATS)
Test anxiety (WTAS)	1.00	-0.25*
Ambiguity tolerance (SLATS)	-0.25*	1.00

Note: * $p < .05$

The correlation coefficient ($r = -0.25$) indicates a statistically significant, but a small negative relationship between test anxiety and ambiguity tolerance. This means that as students' test anxiety levels rise, their ambiguity tolerance decreases, and vice versa, but with a limited effect size. This suggests that students with a higher ambiguity tolerance tend to experience less anxiety during tests.

To provide a clearer picture of how these affective variables relate to written exam outcomes, the students' scores on the 15-mark written test were grouped into three performance bands as it presented in Table 4.

Table 4. Distribution of Students Across Written Performance Bands

Performance band (written test)	Score range (out of 15)	Number of students	Percentage of students
High performance	11-15	10	13.33%
Medium performance	7-10	40	53.33%
Low performance	0-6	25	33.33%
Total	3-15	75	100%

Note: No participants obtained scores of 11–13, resulting in a gap in the score distribution.

To provide a fuller picture of written assessment performance, Table 4 presents descriptive statistics for written scores disaggregated by anxiety category. Students in the high-anxiety group ($n = 68$) recorded a mean score of 6.84 ($SD = 2.31$), while those in the moderate-anxiety group ($n = 5$) averaged 9.40 ($SD = 1.52$), and the two low-anxiety students averaged 13.50 ($SD = 0.71$). The overall written assessment results were distributed around a mean of 7.21 ($S.D. = 2.89$; Range = 3 – 15) showing that all assessments of student performance were clearly biased towards the lower end of this band. All descriptive statistics provided here show agreement with the previous regression analysis and provide clear replication results for further research on these topics. A statistically significant inverse correlation demonstrates that students who reported higher levels of test anxiety reported lower levels of ambiguity tolerance whereas those who reported lower levels of test anxiety reported higher levels of ambiguity tolerance. While the size of the correlation is relatively small, it demonstrates that there is a statistically significant association between test anxiety and ambiguity tolerance and they appear to be separate but related concepts.

The descriptive findings on performance further clarify this relationship. When the written exam scores were grouped into three bands, 10 students (13.33%) formed a high-performance group with a perfect score of 11-15 out of 15, 40 students (53.33%) fell into a medium-performance band with scores between 7 and 10, and 25 students (33.33%) were in a low-performance band with scores between 0 and 6. Notably, no students scored 11 resulting in a gap in the upper-middle range of the distribution. This pattern may indicate limited discrimination among higher-performing students on the 15-point assessment scale. The bimodal clustering at the upper end of the scale (11–15) may reflect the nature of the classroom assessment, where students either achieved very high scores or obtained considerably lower scores on the assessment. Residual analysis confirmed that regression assumptions of linearity and homoscedasticity were adequately met. In this sample, descriptively, students in the highest performance band tended to report lower levels of test anxiety and higher levels of ambiguity tolerance than students in the lower performance bands, illustrating a particularly advantageous affective profile. In contrast, most of the students in the medium and low performance bands reported high levels of test anxiety and only moderate or low tolerance of ambiguity. This distribution suggests that while not every student with high anxiety necessarily performs poorly, the combination of high anxiety and weak ambiguity tolerance is much more common among students who do not reach top scores.

To answer the fourth research question, multiple regression analysis was used to examine the combined and individual effects of test anxiety and ambiguity tolerance on students' scores in the 15-mark written classroom exam. Test anxiety (WTAS scores) and ambiguity tolerance (SLATS

scores) were entered as predictors, and written exam score was entered as the dependent variable, as it presented in table 5. Pearson correlations were inspected first to ensure that both predictors were meaningfully related to exam performance and that multicollinearity was not a problem. Preliminary analyses confirmed that the assumptions of linearity, normality, homoscedasticity, and absence of multicollinearity were met. Tolerance values (.94) and VIF values (1.06) indicated no multicollinearity concerns. As it presented in Table 5.

Table 5. Multiple Regression Analysis Predicting Written Exam Performance

Predictor	B	SE B	β	t	p	Tolerance	VIF
Constant	6.42	1.1	–	5.73	< .001	–	–
Test Anxiety (WTAS)	–0.08	0.02	–0.42	–4.10	< .001	0.94	1.06
Ambiguity Tolerance (SLATS)	0.05	0.02	0.29	2.78	.007	0.94	1.06

The results of the entire regression model were statistically significant, $F(2, 72) = 20.25$, $p < .001$. The regression model explained 36% of the variance in written assessment performance ($R^2 = .36$) and an adjusted R^2 of .34. Thus, affective variables accounted for a meaningful proportion of the variance in written assessment scores. Test anxiety was a significant negative predictor of written exam performance ($\beta = -0.42$, $p < .001$). On the other hand, ambiguity tolerance was a significant positive predictor, $B = 0.05$, $SE = 0.02$, $\beta = 0.29$, $t = 2.78$, $p = .007$, so students who have a greater tolerance for ambiguity tend to score better on exams, after controlling for anxiety. The findings indicate that both test anxiety and ambiguity tolerance were significant predictors of written assessment performance, with test anxiety showing the stronger standardized effect. To examine whether ambiguity tolerance moderated the relationship between test anxiety and written performance, a moderation analysis was conducted using Hayes's (2013) PROCESS macro (Model 1) with 5,000 bootstrap samples. Written exam score was entered as the outcome variable, test anxiety (WTAS) as the predictor, ambiguity tolerance (SLATS) as the moderator, and both variables were mean-centered prior to analysis. The interaction term (test anxiety $\times$ ambiguity tolerance) was statistically significant ($\beta = -0.18$, $SE = 0.07$, $t = -2.54$, $p = .013$, 95% CI $[-0.32, -0.04]$), indicating that ambiguity tolerance moderated the relationship between test anxiety and written performance. Specifically, the negative association between test anxiety and performance was stronger among students with low ambiguity tolerance (conditional effect at -1 SD: $\beta = -0.61$, $p < .001$) than among students with high ambiguity tolerance (conditional effect at $+1$ SD: $\beta = -0.23$, $p = .041$). In this case, it appears that a higher level of ambiguity tolerance seemed to mitigate the relationship between test anxiety and writing performance. Adding the interaction term improved the model's fit ($\Delta R^2 = .04$, $p = .013$) and brought the total amount of variance in the data that was being explained by the model to just over 40 percent. Thus, these results suggest that interventions aimed at increasing ambiguity tolerance could be particularly useful to help those with high levels of test anxiety.

The current study investigated the relationship between test anxiety, ambiguity tolerance, and the performance of Iraqi EFL students during their written classroom assessment. The results provide empirical evidence supporting the central assumption of previous research that affective and cognitive-affective variables are critical determinants of language assessment results, above and beyond proficiency level in English. More specifically, the descriptive data of the study found that test anxiety was extremely common among all participants, with over 90% of them falling into the "high" category. Test anxiety showed a small but significant negative correlation with written performance, while regression analysis indicated a moderate predictive effect with the results of the students' written exams. The regression analyses further supported the association between test anxiety and poor performance by showing that test anxiety was a significant negative predictor of the students' written performance. Furthermore, test anxiety demonstrated a moderate to large effect on written performance ($\beta = -0.42$, $p < .001$), even when ambiguity tolerance was included in the model.

These findings are consistent with the vast body of research demonstrating that excessive test anxiety is associated with interference in working memory processes, concentration, and retrieval of learned information (Putwain et al., 2023; Cassady & Johnson, 2002; Zeidner, 1998). Given the dual requirements of the writing task in the EFL context (simultaneously managing the production of language, the need to produce grammatically accurate language, and producing content within the confines of the time limit), the cognitive interference associated with test anxiety was linked to reduced effectiveness in written output. Güvendir and Uzun (2023) argue that L2 writing anxiety is

associated with reduced allocation of cognitive resources to language processing, a pattern consistent with the lower written performance observed in more anxious students in this study. Additionally, the fact that the standardized beta coefficient for test anxiety was substantial provides additional evidence that test anxiety appears to be one of the primary predictors of written exam performance. Therefore, the view that high scores on examinations may be associated with the emotional regulation strategies employed by the learners as well as their proficiency levels in language is supported, especially in high stakes academic settings. These findings can be further understood through cognitive load theory, which posits that working memory has limited capacity, and anxiety-related worry consumes cognitive resources that would otherwise be allocated to task performance. The results also align with the affective filter hypothesis (Krashen, 1982), suggesting that elevated anxiety is associated with a psychological barrier that may limit learners' access to their acquired linguistic knowledge.

Ambiguity tolerance also emerged as a positive predictor of the performance of the students on their written exams ($\beta = 0.29, p < .05$). Thus, students who were more tolerant of ambiguity in their learning environment performed better in written assessments. These findings are consistent with previous studies that examined the relationship between ambiguity tolerance and language learning/assessment and highlighted the beneficial effects of ambiguity tolerance (Brown, 2000; Chiang, 2016; Ely, 1995).

As previously mentioned, written classroom assessments often include ambiguous components including open-ended questions/prompt, unfamiliar vocabulary, different possible ways to interpret the prompt, etc. Students who exhibit greater levels of ambiguity tolerance seem to be able to interact more effectively with this type of uncertainty without becoming frustrated or avoiding the unknown. According to Ehrman (2003), individuals who possess high levels of ambiguity tolerance can continue to learn and engage in the learning process even if they are unable to understand the material completely. This characteristic is critical to the completion of complex language-based tasks such as writing. These findings can be interpreted through cognitive flexibility theory (Spiro et al., 1988), which suggests that individuals with higher ambiguity tolerance possess greater adaptive capacity when facing novel or uncertain situations. Furthermore, ambiguity tolerance may facilitate the use of compensatory strategies when precise linguistic knowledge is unavailable, enabling learners to employ inferencing and strategic risk-taking to maintain task progress.

Moreover, ambiguity tolerance retained its significance as a predictor of performance in written exams after controlling for the effect of test anxiety, suggesting that it represents a distinct cognitive-affective ability (and not simply the inverse of test anxiety). This distinction supports the theoretical frameworks that conceptualize ambiguity tolerance as a cognitive-affective ability to be flexible, take risks, and employ adaptive strategy in the learning process, and not as a solely emotional response.

Anxiety about tests has been found to have a small negative relationship to tolerance of ambiguity ($r \approx -.25$). Test anxious students were less able to accept ambiguous information than non-test anxious students. A statistically and theoretically significant relationship exists even though the size of the relationship was not large. Both factors exist separately enough so they can be used simultaneously in predictive models. This result parallels Ely's (1995) assertion that learners who perceive ambiguity as dangerous will experience greater amounts of anxiety in evaluative situations. However, the relatively small r value also supports the idea that some learners can be very good at accepting ambiguity while being very test anxious, or vice versa. This nuanced relationship could explain the differences among studies where these two variables were studied separately.

A major finding from this study is that every student who received a perfect score on the tests (i.e., achieved 11-15 of 15 possible points) had relatively little test anxiety; these same students were also tolerant of ambiguity. The fact that all students with such a successful performance demonstrated both low test anxiety and high ambiguity tolerance makes it clear that there may be an ideal "affective" context in which students can perform optimally when completing written assessments. It seems likely that those students who are able to cope well with evaluative pressure and yet maintain their ability to think flexibly will have the best opportunity to utilize their language abilities during time-consuming writing tasks. These results suggest avenues by which researchers could investigate potential causal relationships in future studies. Does this optimal profile reflect stable individual differences, or can these affective states be modified through intervention?

Longitudinal and experimental designs could examine whether reducing test anxiety and enhancing ambiguity tolerance leads to improved writing performance, or whether successful performance experiences reciprocally shape these affective variables. Additionally, the absence of students scoring in the 11 range warrants attention as a potential validity concern. Three plausible explanations merit consideration. First, the rubric's weighting structure — particularly the single point allocated to mechanics — may have compressed the upper range of achievable scores, making intermediate outcomes structurally unlikely. Second, rater calibration tendencies could have produced a band-avoidance effect, where scorers gravitated toward either clearly strong or clearly weak essays. Third, the 45-minute time constraint on a 250-word argumentative task may have produced a bimodal outcome, with students who managed cognitive load effectively producing high-quality work and those who did not producing notably weaker essays. Future studies should consider piloting the rubric separately and conducting item-level inter-rater analyses to determine whether the gap reflects a scoring artifact or a genuine polarization in performance.

This result supports interactionist theories (e.g., MacIntyre & Gregersen, 2012; Dewaele & MacIntyre, 2014) which argue that successful performance in EFL contexts is dependent not on the lack of anxiety, but on the optimal balance between emotional regulation and cognitive flexibility. Students who are able to remain calm while taking exams, and accept ambiguity are better equipped to call upon their linguistic resources in order to complete writing exams. The results of this study provide important information regarding how to instruct and assess students in EFL settings. First, the fact that test anxiety occurred in nearly all of the students in this study, and it is notable negative association with student performance demonstrate the importance of developing ways to reduce student test anxiety. Examples of ways to do this include using low stakes formative assessments, providing students with explicit exam preparation techniques, and giving students supportive feedback. Second, the positive impact of ambiguity tolerance demonstrates the importance of teaching students how to deal with uncertain situations, and encouraging them to take risks and use strategic thinking in dealing with ambiguity rather than simply relying on correct answers. When assessing students, test designers should avoid creating unnecessary ambiguity in test instructions by making them as clear as possible, while still maintaining a genuine language task. Helping students to develop skills to deal with unavoidable ambiguity may also improve both student performance and long term language development.

The present study has several limitations. This study's sample consists entirely of female students from one Iraqi university; therefore, the study cannot be generalized to other populations, different institutions or male students. The study's correlational design prevents drawing causal inferences about the direction of relationships among the variables. Future studies could conduct longitudinal or experimental studies to investigate if interventions designed to reduce anxiety and/or enhance ambiguity tolerance would result in better written performance. Additional studies may investigate other potential moderating variables (e.g., language proficiency, self-efficacy, type of instruction) to develop a more complete model of how affective variables influence assessment outcomes in EFL. These findings have significant implications for teaching English as a foreign language writing. The inverse relationship between test anxiety and performance suggests that teachers should alleviate assessment-related stress through simple tasks, pre-writing support, and gradual exposure to timed assessments. Simultaneously, the positive role of accepting ambiguity highlights the importance of using open-ended, unrestricted writing tasks to build resilience. Combining these two factors may help students perform more effectively in examination situations.

This study investigated how test anxiety and ambiguity tolerance impact Iraqi EFL learners' performance in written classroom assessments. Results indicated that test anxiety is an extremely common problem experienced by the participants of this study and was significantly and negatively related to written test scores. Ambiguity tolerance was positively related to achievement and together test anxiety and ambiguity tolerance explained a moderate portion of the variance in the written scores of the students in this study; therefore, it appears that success in EFL written assessments is influenced not just by linguistic ability, but by students' emotional regulation and cognitive-affective flexibility. There was a moderate to negative relationship between test anxiety and ambiguity tolerance, indicating that students who experience more test anxiety are generally less tolerant of linguistic ambiguity than those experiencing less test anxiety. It was found that the most successful students had very low-test anxiety and very high ambiguity tolerance; therefore, it can be inferred that having both low test anxiety and high ambiguity tolerance constitutes an

especially desirable affective profile for success in written assessments. Overall, the study supports the need to consider psychological factors when developing EFL instruction and assessments. By reducing excessive test anxiety and increasing students' tolerance for ambiguity, educators may create more equitable assessments and improve written performance. Future studies will expand upon this line of research by investigating a larger range of diverse populations and through employing longitudinal or intervention-based studies to further clarify the causal mechanisms underlying the relationships described in this study.

4. Conclusion

This study concludes that test anxiety and ambiguity tolerance are important psychological factors associated with Iraqi EFL learners' performance in written classroom assessments. The findings showed that most participants experienced high levels of test anxiety, while their ambiguity tolerance varied considerably. Test anxiety was negatively related to written performance, whereas ambiguity tolerance was positively associated with students' achievement. Together, both variables explained a meaningful proportion of the variance in written assessment scores, indicating that students' success in EFL writing tasks is influenced not only by linguistic competence but also by emotional regulation and cognitive-affective flexibility. The results further suggest that learners with lower test anxiety and higher ambiguity tolerance tend to perform better in written assessments, as they are more capable of managing evaluative pressure and coping with uncertainty in language tasks. Therefore, EFL instructors are encouraged to create supportive assessment environments, reduce unnecessary test-related stress, provide clear instructions, and design learning activities that gradually develop students' ability to tolerate ambiguity. Future research may extend these findings by involving larger and more diverse samples and by using longitudinal or intervention-based designs to clarify the causal relationships among test anxiety, ambiguity tolerance, and written performance.

Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Author Contributions

All authors contributed equally to the conceptualization, data collection, data analysis, manuscript preparation, and revision of this article. All authors have read and approved the final version of the manuscript and agreed to be accountable for its content.

Conflicts of Interest

All authors in this publication declare no conflict of interest regarding the title, data, location, and results of the research.

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Supplementary Materials

This study does not include any supplementary materials.

Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript. AI were used only to improve readability and language under strict human oversight; no content, ideas, analyses, or conclusions were generated by AI.

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