

## The Power of Perception: Unpacking the Role of Negative Thinking in High School Students' Test Anxiety

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### Abstract

The main purpose of this study is to determine the factors that contribute to the formation and maintenance of negative cognitions in adolescents. The present study employs a qualitative methodology to examine test-related negative cognitions of senior high school students with test anxiety. The consensus qualitative research (CQR) method was employed in the study design. Subsequently, fifteen randomly selected students were administered an inventory prepared using semi-structured interview questions, test anxiety, cognitive and behavioral therapy literature, and expert opinions. It was revealed that students' negative cognitions were clustered in four domains: self-oriented, other-oriented, future-oriented, and test-oriented. The self-orientated domain had three themes: self-criticism, lack of confidence, and high self-expectations. Other-oriented domain contained two themes: blaming others and concern about the social consequences of failing. The future-orientated domain had two themes: reading the future and intolerance to uncertainty. Lastly, the test-oriented domain had three themes: distraction during test, inefficient test-taking strategies, and negative study skills assessment. The study's findings revealed that students have negative cognitions that have emerged as thoughts related to self, others, the future, and testing itself. These negative thoughts may affect students' test anxiety levels, confidence, academic performance, and well-being. These findings were generally consistent with the literature and were discussed considering the relevant literature. It is suggested that mental health professionals and educators can use the cognitions addressed within the scope of the research to support students to improve their well-being, academic performance and resilience.

**Keywords:** Test anxiety, negative cognitions, adolescent, dysfunctional thinking.

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## Introduction

When individuals face situations where their abilities are assessed, they often experience high levels of anxiety and worry about adverse outcomes based on their test performance (von der Embse, Jester, Roy, & Post, 2018). “Test anxiety” is a term used to describe the experience, which involves emotional and cognitive components (Liebert & Morris, 1967; Zeidner, 2014). Emotional aspects include negative physiological and emotional experiences like restlessness and arousal (e.g., heightened heart rate), such as increased heart rate during testing or assessment (King, Ollendick, & Prins, 2000; Liebert & Morris, 1967). On the other hand, cognitive aspects pertain to negative thoughts and uncontrollable cognitive processes associated with emotional discomfort, such as worrying about potential adverse outcomes. These aspects are conceptualized as cognitive concerns regarding an individual’s self-performance (Davey, 1994; Liebert & Morris, 1967). Test anxiety negatively affects cognitive functions required for test performance, such as attention, problem-solving, and memory (Eum & Rice, 2011). Researchers suggest that test anxiety affects approximately 15% to 22% of individuals (Putwain & Daly, 2014; Thomas, Cassady, & Finch, 2017; von der Embse et al., 2018).

Various explanations have been proposed for the causes of test anxiety. One explanation suggests that individuals perceive exams as threats, a perception that can be influenced by factors such as inadequate preparation or previous exam failures (Oludipe, 2009). Whitaker Sena et al. (2007) also argue that negative, task-irrelevant thoughts can play a significant role in the development of anxiety during adolescence. According to the Transactional Model of Stress (Lazarus & Folkman, 1984), individuals continuously assess the significance and impact of environmental cues on their well-being. These assessments vary between individuals with low and high levels of test anxiety, resulting in differences in emotional reactions and behaviors. Perceiving a situation as challenging encourages the search for resources to address it effectively, whereas viewing it as threatening leads to anxiety and emotional arousal characterized by anger (Zeidner, 1998).

Beck (1967, 1976) observed that individuals with depression and anxiety exhibit different dysfunctional cognitions about themselves, their world, and their future. These negative cognitions play a crucial role in the development and maintenance of psychological disorders (Beck & Emery, 1985). Wong (2008) highlighted the significance of the cognitive triad, dysfunctional attitudes, automatic thoughts, and irrational beliefs in relation to various problems, particularly anxiety and depression. Furthermore, it was found that distorted and irrational cognitions are closely associated with inhibitory test anxiety, with negative self-perceptions having a more significant impact on predicting such anxiety (Miloseva, 2012).

Cognitive Therapy, developed by Aaron T. Beck in the 1960s, is a structured, short-term form of psychotherapy designed to modify dysfunctional thoughts and behaviors by concentrating on the individual's present concerns (Beck, 2021). It is recognized as one of the foundational theories of Cognitive Behavioral Therapy (CBT) (Beck & Dozois, 2011). CBT is a widely utilized intervention method for reducing test anxiety, general anxiety, and rumination (Uysal et al., 2023). Various intervention methods, including family therapy, medication, and CBT, are employed to help students of different developmental age groups manage anxiety (Haugaard, 2008). Among these methods, CBT is particularly effective as it combines cognitive interventions, such as imagery and self-talk regarding the exam process, with behavioral interventions, such as deep breathing and progressive muscle relaxation, to enhance the ability to cope with exam-related anxiety (Buchler, 2013). CBT aims to develop a healthier and more functional structure by identifying the cycle of dysfunctional thought and behavior patterns. It uses methods such as cognitive restructuring, self-relaxation techniques, problem-solving skills, and modeling to help children and adolescents develop and implement new ways of thinking (İkiz & Sakarya-Çınk, 2020). Studies in the literature (Ergene, 2003; Sportel, de Hullu, de Jong, & Nauta, 2013; Karaburç & Tunç, 2017) reveal research findings that CBT interventions reduce test anxiety.

## Literature Review

### Negative Thoughts

Negative thoughts, which are associated with unpleasant feelings, are characterized by negative perceptions, expectations and attributions, and express negative cognitions about the self, others or the world (Hawkey, 2013). Sheets, Sandler, and West (1996) consider negative thoughts about life events as a six-dimensional concept. These dimensions are negative self-evaluation, negative evaluation by

others, rejection, criticism of others, harm to others and material loss. Negative thoughts are considered as cognitive components of negative psychosocial problems (i.e., depressive symptoms, anxiety and loneliness). In fact, research has shown that repetitive negative thinking is associated with psychological problems such as depression, anxiety, psychological distress, academic burnout and test anxiety (Garratt-Reed, Howell, Hayes, & Boyes, 2018; Jolly, Garratt-Read, & McEvoy, 2022; Macedo ve ark., 2015; Rood, Roelofs, Bögels, & Alloy, 2010).

According to the cognitive model, the way people perceive events affects their emotions, behavior, and physiology, and negative thoughts lead to the emergence of negative emotions (Beck, 2021). Accordingly, negative cognitions mediate students' behavioral, emotional and physiological responses to stressful assessment situations such as exams (Beck, 2021; Zeidner, 2014). As a student perceives an exam as threatening, their negative cognitions are strengthened. These negative cognitions trigger maladaptive coping behaviors, leading to increased test anxiety (von der Embse et al., 2013). Students with test anxiety tend to have more negative thoughts than others (Jolly, et. al., 2021; Maloney, et al., 2014). As a result of having more negative and task-irrelevant thoughts, they have difficulty focusing on the test and their performance decreases (Pekrun, Goetz, Titz, & Perry, 2002; Lowe, 2018; Wine, 1971). Examples of negative thoughts about the tests include feeling unprepared for the test, preoccupation with self-deprecating thoughts, self-doubt about performance abilities, and lack of confidence (Cassady, & Johnson, 2002; Zeidner, 1998).

### **Test Anxiety**

Negative cognitions have long been seen as a major factor in test anxiety. For instance, Wine (1971) found that individuals with high test anxiety tend to focus on self-deprecatory thoughts, leading to divided attention and impaired performance. Sarason (1984) argued that anxious test-takers experience intrusive thoughts and self-doubt during evaluations, resulting in poor performance. Zeidner (1998) indicated that rumination and excessive self-preoccupation impair mental capacities, leading to negative affect and lower performance. Putwain et al. (2010) showed that negative cognitions, particularly related to academic content, such as catastrophizing and overgeneralizing, are linked to test anxiety. Guraya et al. (2018) revealed that irrational thoughts about the exam and fear of failure were the most significant factors among students. Intervention studies targeting irrational beliefs through cognitive restructuring and mindful practices with cognitive reappraisal showed a decrease in students' test anxiety levels, further supporting the findings of previous studies (Akinsola & Nwajei, 2013; Cho, Ryu, Noh, Lee, 2016). Also, Wong (2008) emphasized that self-related distorted thoughts were the strongest predictors of test anxiety. Research has shown that adolescents with test anxiety tend to have low academic self-efficacy (Krispenz, Gort, Schültke, & Dickhäuser, 2019), and individual differences in test behavior may be influenced by internal dialogues, adaptive or maladaptive testing strategies, and the content of underlying belief systems about the test (Bruch, Juster, & Kaflowitz, 1983).

### **The Present Study**

Although the literature supports the relationship between negative cognitions and test anxiety, specific cognitive components can be influenced and shaped by cultural factors (Sahin & Sahin, 1992). Studies on exam perception in Turkey reveal diverse perceptions students develop towards exams. In a study conducted by Karaşahinoğlu (2015) to examine the exam perceptions of fifth-grade secondary school students, it was found that students most frequently associated exams with the concept of "anxiety" and least with the concept of "fun." Similarly, research by Baş and Kılılcım (2019) on students' perceptions of central system exams in Turkey revealed that students generally generated negative metaphors for these exams, describing them as "a concept that worries/tortures/causes discomfort."

Ulusoy (2020) examined the perceptions of 8th-grade students about the High School Transition Examination (LGS) through metaphors and concluded that the metaphors produced by the students were mostly gathered in the category of 'LGS as a situation that causes discomfort/difficulty'. In the study conducted by Çakmak and Ceyhan (2022) on the perceptions of senior high school students about the university entrance exam, it was determined that 68.9% of senior high school students produced metaphors containing negative emotions such as anger-sadness, stress, and fear, while 27.9% produced metaphors containing a sense of hope.

Research conducted in Turkey has yielded various findings, such as a strong positive relationship between test anxiety, intolerance of uncertainty, and general anxiety (Kilit, Dönmezler, Erensoy, & Berkol, 2020). Additionally, test anxiety has been identified as a significant predictor of depression (Yıldırım, 2004), and there is a notable negative correlation between test anxiety and self-esteem (Çakmak, Şahin, & Demirbaş, 2017). Other studies have highlighted factors like uncertainty about the future, which exacerbates exam anxiety in the context of students' "future anxiety" (Uyar & Canbolat, 2023), and irrational beliefs, which are significant predictors of test anxiety (Güler & Çakır, 2013). In the Turkish education system, university entrance exams are administered annually using a centralized, large-scale, multiple-choice format rather than relying on portfolios or other assessment methods. As a result of this examination system, students face numerous test-taking experiences both during their preparation for university exams and during the actual exams. Thus, the present study aims to explore further the negative cognitions related to test-taking among adolescents in Türkiye by employing a qualitative approach. Additionally, we aim to identify the factors contributing to forming and maintaining these negative cognitions, including the adolescents' backgrounds, relationships, and post-COVID-19 pandemic experiences. Through this study, we seek to gain valuable insights into the challenges faced by adolescents in Türkiye regarding test-taking, and to lay the groundwork for future research that can develop Cognitive Behavioral Therapy-based interventions to address these negative cognitions effectively.

## Method

### Study Design

Consensus Qualitative Research (CQR) was deemed the most appropriate method for an in-depth exploration of the negative cognitions of students experiencing test anxiety. CQR aims to achieve a common understanding among researchers regarding a complex phenomenon and is often employed when a group of experts seeks to grasp the essence of the issue at hand (Hill, Thompson, & Williams, 1997). This approach aligns well with the objectives of our study, as it allows for the exploration of broad topics through open-ended questions while incorporating multiple perspectives, thereby reducing the potential for researcher bias (Hill et al., 1997).

### Participants

Purposive sampling was employed to ensure the reliability of the data and results, in line with the study's objectives (Campbell et al., 2020). The school's guidance service encouraged students struggling with test anxiety to participate in the study through an announcement. To select participants, the Test Anxiety Inventory (TAI), developed by Spielberger (1980) and adapted by Öner (1990), was administered to the students who expressed interest. Those who scored above the average test anxiety score ( $M = 46$ ) were then randomly invited to participate in the study.

As shown in Table 1, fifteen students, 66.7% ( $n = 10$ ) female and 33.3% ( $n = 5$ ) male, participated in the study. All participants ( $n = 15$ ) attended public schools. In addition, 86.7% ( $n = 13$ ) of the students reported medium and 13.3% ( $n = 2$ ) reported high socioeconomic status. No student reported low socioeconomic status. The mean age of the participants was 18.00 years ( $SD = .38$ , range = 17-19 years).

Table 1.  
Sociodemographic Information of Participants

Variables	Group	N	Percent
Gender	Female	10	%66.7
	Male	5	%33.3
Socioeconomic Status	Low	0	-
	Average	13	%86.7
	High	2	%13.3
School Type	Public School	15	%100
	Private School	0	-
Total		15	%100

### **Data Collection Tools**

Two measurement tools were utilized in this study. These were the Test Anxiety Inventory (TAI) and Semi-Structured Interview Survey.

**Test Anxiety Inventory (TAI).** The TAI, developed by Spielberger (1980), was used in this study to identify students with above average test anxiety and invite them to participate in qualitative research. The TAI consists of 20 items, with eight questions in the worry dimension and 12 questions in the emotionality dimension. Worry refers to negative self-evaluations and cognitions about incompetence and failure, while emotionality relates to physical symptoms such as sweating, shaking, nausea, and trembling. Higher scores on the TAI indicate higher levels of test anxiety. The scale has been validated in by Oner (1990), demonstrating internal consistency coefficients of .73 - .89 and test-retest reliability coefficients of .70 - .90. Validity was established by examining its correlation with the state-trait anxiety inventory, resulting in coefficients between .39 and .70. The TAI consists of statements such as “I freeze up on my important exams.” and “I feel safe and comfortable during the examination”.

**Semi-Structured Interview Survey.** This survey comprises semi-structured interview questions prepared by the researchers, drawing from the test anxiety, cognitive and behavioral therapy literature, and expert insights. The survey focuses on the thoughts that disturb students on various subjects, such as interactions with others, self-reflection, study methods, physical reactions, and concerns about the future, which are frequently encountered in test anxiety literature. The questions are designed to cover the period before, during, and after the exam. Two sample questions from the survey are: “What thoughts come to mind about your studying method before, during, or after the exam that disturbs you?” and “What thoughts come to mind before, during, or after the exam that disturbs you? (e.g., if I do badly on the exam, my life will be ruined.” Furthermore, students were prompted with appropriate questions to elicit clear and comprehensive responses.

### **Procedure**

Prior to data collection, Hacettepe University Non-interventional Clinical Researches Ethics Board’s approval and the legal permission of the İstanbul Provincial Directorate of National Education were obtained (ethical approval received from Non-interventional Clinical Researches Ethics Board, Hacettepe University (13/01/2022; Application No: 16969557-64) and Ethics Board of Ministry of National Education in İstanbul (08/03/2022; Application No: E-59090411). Announcements were made to reach various high schools in Istanbul to recruit participants. Senior students who applied were invited to complete the TAI online. Written informed consent forms were obtained from the participants and their parents before administering the TAI. Upon checking the data of the 86 students who voluntarily applied the TAI scale, it was found that one student had completed the questionnaire twice with the same answers.

Additionally, one student marked that she was not a senior, and her data were excluded from the study. The remaining 84 students’ data were examined, and the average test anxiety score was calculated to be 46. Fifteen students with scores above the average level were randomly invited to participate in the study. After they were briefed about the research and the interview questions, the research team conducted individual online interviews with ten female and five male volunteer students, ages 17 to 19, in June 2022. During the interviews, which lasted an average of 29 minutes, students were encouraged to explain their cognitions about their test anxiety. Information about their age, gender, grade point average, type of school attended, and family’s socioeconomic status was also collected during the interviews.

### **Trustworthiness**

To establish the validity of findings, following the trustworthiness steps is essential for qualitative studies (Hill, 2012; Williams & Morrow, 2009). In the present study, three steps defined by Williams and Morrow (2009) were followed for trustworthiness. The first step, data integrity, is related to clearly stating and referencing an analytic strategy. Direct quotations from students’ thoughts were included as examples to ensure integrity. The categories created for the findings were handled by cross-analyzing the transcripts. The second step, the balance between participant meaning and researcher interpretation, requires acknowledging subjectivity, remaining open to inquiry, and controlling prejudices. In this study, analyses were conducted by a research team consisting of the article's authors. Support was

received from an external supervisor to ensure unbiased interpretation of findings and enhance reliability. The last step is clear communication and application of findings, emphasizing presenting them clearly and relating them to the study's social validity context.

### Data Analysis

This study used the CQR method for data analysis to understand better and describe the negative content of students' cognitions (Hill et al., 1997). At least three primary authors analyzed the data to minimize biases, while two auditor members ensured data control and consensus within the team (Hill, 2012). After data collection, the last three authors independently determined the negative content of the students' cognitions and coded them based on the Cognitive Behavioral Therapy (CBT) literature. After achieving consensus among these three authors, the three lead authors of this study individually reviewed and verified the coded data by referring back to the interview transcripts. The researchers conducted cross-analyzing and repeated verifications until a consensus was ensured. For increased reliability, the analyses were further reviewed by an external supervisor.

### Findings

The students' cognitions related to the test were categorized into four distinct domains. The first domain, labeled **self-oriented**, encompassed the students' disturbing thoughts about themselves before, during, and after the exam. The second domain, named **other-oriented**, focused on the students' cognitions about others feeling uncomfortable. The third domain, termed **future-oriented**, reflected the content of students' cognitions concerning the future, their status, and uncertainties. Finally, the **test-oriented** domain captured the students' disturbing cognitions about the test itself, including their thoughts on attention, test strategies, and study methods.

#### Self-Oriented Negative Cognitions

The cluster analysis revealed three main themes in line with the content of cognitions: *self-criticism*, *low self-confidence*, and *high self-expectations*. In addition, two sub-themes of each theme were found to be related to their meanings (see Figure 1).

##### Self-criticism

This theme was formed from students' cognitions that they sometimes judge and/or doubt themselves but basically criticize themselves. This theme consisted of three sub-themes: *self-judgment*, *self-labeling*, and *self-doubt*. Accordingly, the first sub-theme, **self-judgment**, consists of statements that students get angry with or blame themselves with or without negative self-labels. Participant male number 8 (PM8) indicated, "*How could I not solve that? It's a very simple thing (question), actually, I say to myself.*" PF13 remarked on **self-labeling**: "*I say to myself that you're too slow, you need to speed up, but you still haven't accelerated (regarding test timing). Actually, I use bad language myself a lot, I mean, I use nonsense bad language myself.*"

The other sub-theme, **self-doubt**, described students' doubts about their academic and/or mental capacities or whether they reflect their learnings on tests. For instance, PF6 stated their cognitions as "*I wonder if I can do this in the mockup exam?*" or "*Do not I comprehend?*"

##### Lack of confidence

This theme focused on students' expressions of low confidence in themselves. The analysis revealed two reference frames: **internal and external**. The internal frame involved self-cognitions tied to inadequate study performance. PF9 expressed her discomfort before exams, stating, "*I am not very qualified or sufficient.*" This reflects an external frame of reference, where students compare themselves to others whom they perceive as more academically competent or hardworking. For example, PF13 shared a similar sentiment: "*Oh, it was very easy, but I cannot do it; everyone else must have solved it.*"

##### High self-expectations

This theme highlighted students' discomfort with high self-expectation and consisted of two sub-themes: **high academic goals from himself/herself and perfectionism**. The first sub-theme, high academic goals from himself/herself, involved academic goals set by students for themselves. PF3 stated

these expectations as the source of her disturbing cognitions: “*Actually, I think I'm stressed out mostly to achieve my goal. I don't think other considerations are that important. I create stress within myself. For myself, for myself.*” The second sub-theme, perfectionism, reflected students' troubling cognitions related to aiming to be the best rather than setting high academic goals for themselves. For example, PF9 referred to this bothersome issue for herself at different times and said, “*It's always about me being the best. It's about perfectionism. There is nothing other than that [...] It's like I must have the best.*”

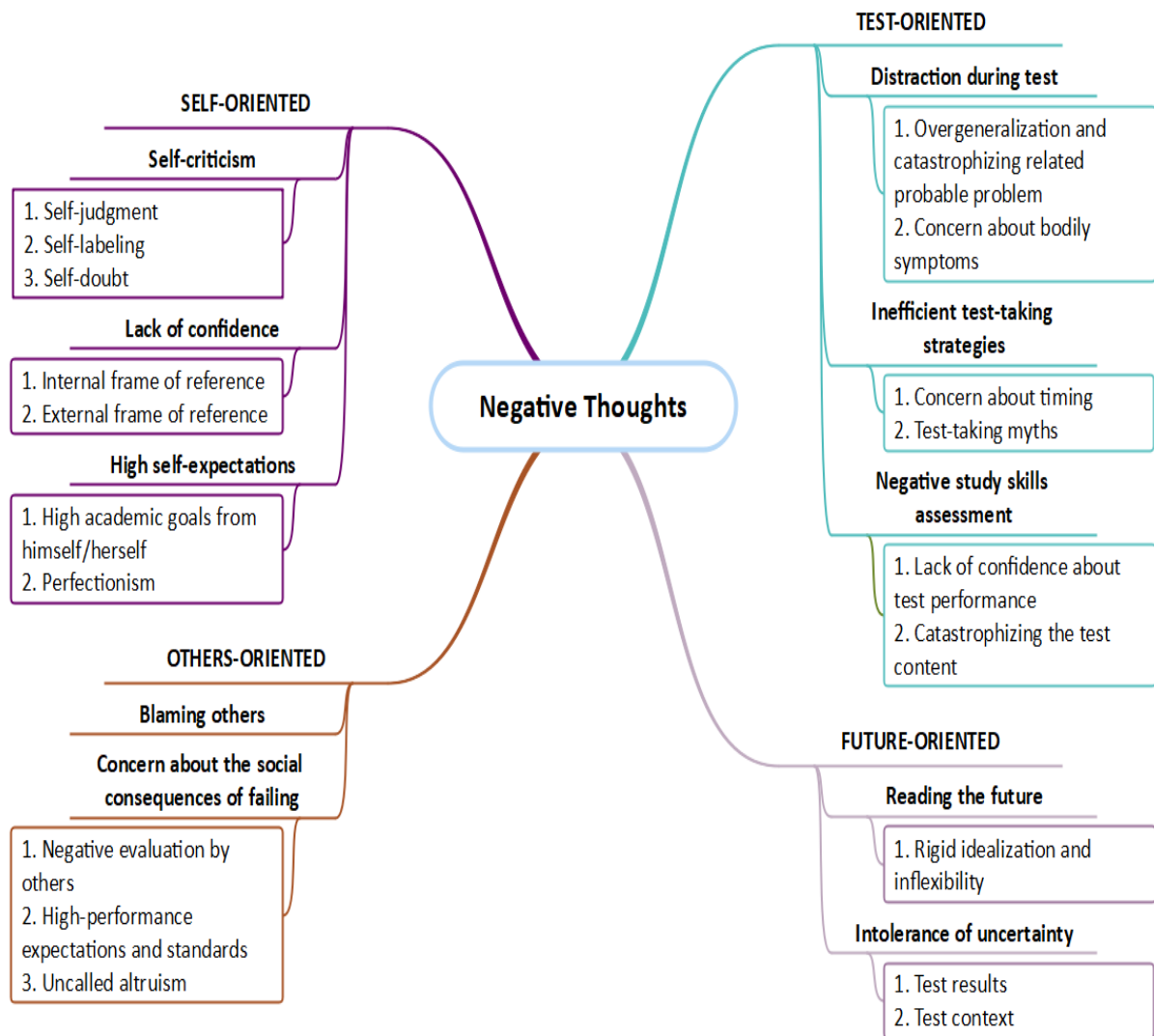


Figure 1. Domain and Theme Structure for Negative Thoughts

### Other-Oriented Negative Cognitions

Other-oriented cognitions frequently emerged during the interviews, highlighting the students' discomfort with certain situations. Upon analysis, these statements were categorized into two main themes related to others: *blaming others* and *concerns about the social consequences of failing* (see Figure 1).

#### Blaming others

This theme consists of expressions where students resent and blame others for their circumstances. For instance, PF9 expressed her discomfort with teachers by saying “*Why did the teachers push it so hard? Why must they push it so hard? They will lower the (general academic) average*”.

On the other hand, PM5 explained his disturbing cognitions about tests by attributing blame to school climate. He provided further details, stating, *“I personally do not blame myself for this. You know, they (the teachers) did not tell us what the university entrance exam was, you know, we did not learn much about it. We worked only to finish high school.”*

### Concern about the social consequences of failing

This theme includes **three sub-themes** representing students' discomfort with the social consequences of failing the exam. The first sub-theme, ***negative evaluation by others***, includes the students' cognitions about how others perceive them and their values. Almost every student mentioned their cognitions on this sub-theme. Some students explained this situation in relation to their families. PF3 stated, *“I don't think my mother will kick me out of the house... but frankly, (If I will not pass the exam) I feel like I will be worthless.”*

Others evaluated this issue in relation to their **acquaintances, friends**. PF6 stated that: *“I think that every ... young one is going through this after the exam. Relatives always suddenly appear and want to ask about you, even if they usually don't. Or your mother's friends [...] That's how I thought I'd have to give them an account if I failed this general exam. Why? Because they will ask, I will say I failed, and it seems like it will hurt my honor.”*

The second sub-theme, ***high-performance expectations, and standards***, reveals that students internalized **the high academic expectations of those around them**, leading to pressure and discomfort in not being able to meet these expectations. Students emphasized feeling obligated not to disappoint their families or teachers.

The last sub-theme of the theme, ***uncalled altruism***, reflects the students' altruistic approach toward their families concerning the negative outcomes of not passing the exam, even though they were not asked for it. Students associated the potential negative results with being an economic and/or psychological burden on their families. For instance, PM3 indicated: *“My family does not, I mean, pressure me. That's why I never thought about my family (as uncomfortable). However, only my father, he puts so much effort into, you know, earning money, I feel responsible to him.”*

### Future-Oriented Negative Cognitions

When the statements were examined, the cluster was divided into two main themes related to future-oriented cognitions as *reading the future* and *intolerance of uncertainty* (see Figure 1).

#### Reading the future

This theme comprises negative cognitions where students make predictions about their future. It consists of a single subtheme: ***rigid idealization and inflexibility***. During the interviews, students mentioned negative evaluations of their future, firmly believing that they would not pass the test. For instance, PM13 claimed, *“I already believe that I won't be able to pass it.”*

On the other hand, some students focused on their professional status or future goals, believing that low test results would negatively impact their prospects. This generated a separate sub-theme of ***rigid idealization and inflexibility***. PF11 exemplified this sub-theme as: *“There is a chain for me, it will affect my life in ten days. I have something like this. There is a chain, so the university entrance exam is like that for me anyway. If I do not pass, the university I attend will be low quality, my professional life will be unqualified, then there will be a chain reaction as if my life will go wrong as an average ordinary businesswoman.”*

#### Intolerance of uncertainty

During the interviews, students expressed their cognitions about the future, highlighting the challenges and discomfort caused by uncertainty. This theme emerged with two sub-themes. The first sub-theme, ***test results***, includes students' cognitions about uncertainty regarding their test results and their potential future impacts. For example, PF7 expressed a concern by stating, *“I am wondering if I am not able to get into a good university, what would happen if I transferred laterally?”*

The second sub-theme, ***test context***, consists of students' cognitions about uncertainty regarding the test topics or the difficulty level of test material. Especially before a test, students explained their discomfort



with statements like *"I am inquisitive about what will happen. I still don't know what kind of questions or what kind of test will come out. They are making me very uncomfortable."* (PM4).

### **Test-Oriented Negative Cognitions**

When students' statements regarding uncomfortable expressions during the test were analyzed, the test-oriented negative cognitions cluster was formed with three main themes in line with the content of their cognitions: *distraction during the test*, *inefficient test-taking strategies*, and *negative study skills assessment* (see Figure 1).

#### **Distraction during test**

During the interviews, students frequently mentioned distraction problems in two areas they might experience while taking the test, expressing their discomfort with the related cognitions. Accordingly, the first sub-theme, ***overgeneralization and catastrophizing related probable problems***, refers to the cognitions about external or inner distracting factors that students may experience during the test. For instance, PF7 reported her catastrophizing cognitions as follows: *"... What if someone coughs in the test, or someone starts crying, or the window is open, and my test booklet is flying?"*

The second sub-theme, ***concern about bodily symptoms***, refers to the cognitions about the students' concerns regarding bodily reactions they may experience during the test, such as *headache, stomachache, nausea, sweater, dizziness, and shaking*. Similarly, PF11 stated, *"I am terrified of what will happen if I have to go to the toilet during the test."*

#### **Inefficient test-taking strategies**

Throughout the interviews, students reflected on their test-taking strategies with negative cognitions, expressing regrets and concerns about their approach to solving tests. This led to the emergence of the theme of inefficient test-taking strategies, which was further divided into two sub-themes. Accordingly, the first sub-theme, ***concern about timing***, refers to students' cognitions about their test-solving skills about the time given. In this context, they expressed worries that the time might not be enough to solve all questions and/or that they could not use the given time efficiently. For example, PF7 emphasized, *"The questions I've left blank are circling in my mind like this again. I wonder if I'll ever look back to solve them. I'm in a dilemma."* The second sub-theme, ***test-taking myths***, includes students' beliefs and myths about test-taking strategies that disturbed them. PM5 explained his myths as follows: *"Should I say the first four questions, the first two or three? They are related to your psychology. You know, with that psychology, when you look at the first question with excitement, you wonder if the exam is difficult, you do the second question, the third question, and after four, you say, okay, I'm in command now. [... ] If I couldn't mark the questions consecutively, for example, one after the other, of course, this makes me think that I won't be able to do it."*

#### **Negative study skills assessment**

The final theme emerged from statements about students' evaluation of their own study performance during the interviews. Students were often skeptical or regretful about their study skills and evaluated them negatively. Two sub-themes emerged under this theme: ***lack of confidence about test performance*** and ***catastrophizing test content***. ***Lack of confidence about test performance*** refers to students' self-doubts and regrets about not studying enough or stressing during the test. For instance, PF8 expressed, *"I wish I had studied more, or I wish I could do the elementary things, or I wish I hadn't stressed during the test."*

The second sub-theme, ***catastrophizing the test content***, involves students' negative cognitions about the topics and questions in the test. During the interviews, students expressed worries about being unable to solve questions or encountering unfamiliar topics. PF9 explicitly stated her trouble *"I'm going to take the exam, I will not know the questions, leaving them blank, I will pass the answer and the fact that the questions will come out where I don't know..."*

Table 2.  
Sub-Themes and the Meanings of These Sub-Themes

Domains	Themes	Sub-themes	Definition
Self-oriented	Self-criticism	Self-judgment	Statements that students get angry with or blame themselves with or without negative self-labels.
		Self-labeling	Students' accusatory and judgmental exact sentences that they directed to themselves.
		Self-doubt	Students' doubts about their academic and/or mental capacities or whether they reflect their learnings on tests.
	Lack of confidence	Internal frame of reference	Cognitions with an internal frame of reference and is often associated with inadequate study performance.
		External frame of reference	Consists of cognitions on a comparative perspective.
	High self-expectations	High academic goals from himself/herself	Includes high academic goals that reflect students' own rather than others.
Other-oriented	Blaming others	-	This theme has no subthemes and consists of expressions that make students resent and blame others based on their situation.
		Negative evaluation by others	Includes the students' cognitions about their image and values in the eyes of others.
	Concern about the social consequences of failing	High-performance expectations and standards	Students' internalization of the expectations of the people around them.
		Uncalled altruism	Students' associations of the possible negative results of the exam with being an economic and/or psychological burden on their families.
Test-oriented	Distraction during test	Overgeneralization and catastrophizing related probable problems	Refers to the cognitions regarding external or inner distracting factors the students may experience at the moment of the test.
		Concern about bodily symptoms	Refers to the cognitions regarding the students' concerns about the bodily reactions they may experience during the test.
	Inefficient test-taking strategies	Concern about timing	Refers to students' cognitions of their test-solving skills in relation to the test time given to them.
		Test-taking myths	Myths developed by students about test-taking strategies that disturbed them.
	Negative study skills assessment	Lack of confidence about test performance	Students' lack of confidence in their learning that they could reflect on the test.
		Catastrophizing the test content	Negative cognitions about the topics and questions in the test students would take and that this made them very uncomfortable.
Future-oriented	Reading the future	Rigid idealization and inflexibility	Negative exact judgments on the future
	Intolerance of uncertainty	Test results	Students' cognitions about uncertainty about test results and their future impacts.
		Test context	Students' cognitions about uncertainty about the topics or about the difficulty level of the test material

### Discussion, Conclusion, and Suggestions

The present study aimed to explore the test-related negative cognitions of adolescents in Türkiye by employing a qualitative methodology. The study identified four main domains of students' negative cognitions, namely "self-oriented", "other-oriented", "future-oriented", and "test-oriented". The first domain, self-oriented, consists of the themes of "self-criticism", "lack of confidence" and "high self-expectations", which include the negative cognitions of students about themselves before, during, and after the test. The second domain, other-oriented, consists of the themes of "blaming others" and "concern about the social consequences of failing", including students' negative cognitions, such as holding others responsible and worrying about being negatively evaluated by others. The third domain, future-oriented, consists of the themes of "reading the future" and "intolerance of uncertainty", including students' negative cognitions about the future, situation, and uncertainty before, during, and after the test. The last domain, test-oriented, consists of the themes of "distraction during test", "inefficient test-taking strategies" and "negative study skills assessment", which include disturbing cognitions about attention, test strategies, and study methods.

The first domain, self-oriented, focuses on students' academic self-perceptions on their impact on test anxiety. The themes of "self-criticism", "lack of confidence" and "high-self expectations" emerged, including negative cognitions of self-doubt, self-judgment, feelings of inadequacy compared to peers, and expressing high self-expectations. These cognitions have been discussed in the literature as concepts closely related to test anxiety, such as self-doubt (Barrows, Dunn, & Lloyd, 2013), self-judgment (Roick & Ringeisen, 2017), lack of confidence (Lawal, Idemudia, & Adewale, 2017; Meijer & Oostdam, 2007), high academic self-expectations (Çelik & Yıldırım, 2019), and perfectionism (Eum & Rice, 2013; Stoeber & Rambow, 2007). These negative cognitions may be related to students' self-efficacy perceptions, as studies have shown significant relationships between self-efficacy, academic self-confidence, and test anxiety (Barrows et al., 2013; Lawal et al., 2017; Roick & Ringeisen, 2017). According to Bandura (1997), negative beliefs about an individual's self-efficacy significantly affect their cognitive processes. High self-efficacy makes individuals feel more comfortable when attempting complex tasks, whereas low self-efficacy leads to perceiving tasks as more difficult, fostering negative affect and avoidance. This belief in the inability to accomplish tasks contributes to failure, creating a self-fulfilling prophecy. Failures due to low self-efficacy or giving up before a task also diminish confidence (Pajares, 2005). Meijer and Oostdam (2007) consider "lack of confidence" as a component of test anxiety. Besides, Putwain (2008) argues that this structure bridges test anxiety and academic self-concept. The present study revealed that most students had thought content related to a lack of confidence. It is seen that the contents of students' cognitions on lack of confidence are affected by internal and external frames of reference, which can be especially important in relatively collectivist societies such as Türkiye. From a cultural perspective, in societies where the opinions of others are valued, it is expected that "others" would strongly influence self-oriented inferences (Hofstede, 2011). These findings align with Hofstede's (2011) model, considering Türkiye is a masculine and collectivist country. In masculine countries, success and glory are emphasized, and success often means being the best, leading to high expectations and ambition. On the other hand, in collectivist societies, there is a strong emphasis on "we"; people act as part of large groups, and the group's opinion is more important than the individual's opinion (Hofstede, 2011). In this context, it can be said that while students are forming their self-perceptions, they are also significantly influenced by the "others" in the environment, and others' opinions play a role in displaying negative cognitions about the individual's self. Ultimately, these negative self-cognitions can increase anxiety, test anxiety, and psychological distress, and decrease academic performance (Balkıs & Duru, 2019; Beck, 1967, 1976; Beck & Emery, 1985; Barrows et al., 2013; Chan & Sun, 2021; Flett, Hewitt, & Cheng, 2008; Roick & Ringeisen, 2017).

Following the findings from the first domain, "others" are included as the second domain of this study, and this new domain was named "other-oriented." This domain focuses on students' negative cognitions regarding blaming others and the social consequences of failing. In this domain, it is observed that students have dysfunctional cognitions about others, like Beck's (1967) view about people with anxiety. Upon close examination, it becomes evident that the test not only determines the universities or programs they will enroll in but also carries social meanings beyond that. Specifically, students indicated that failing the exam would mean not meeting the high standards expected by their social environment, negatively affecting their social self-image and leading to negative evaluations from their close circles.

These results are consistent with the study conducted by Zwettler et al. (2018) and correspond to the worry aspect of test anxiety, which refers to cognitive concerns described by Liebert and Morris (1967).

Furthermore, students made hypothetical comments about the negative evaluations they might receive from their social environment and even made statements supporting the opposite, such as “My family does not say anything, but that is what I think”. Studies have shown low social support increases test anxiety (Sarason, 1981; Hyseni Duraku & Hoxha, 2018; Yıldırım, 2008). However, some students' hypothetical inferences about their social environment can be explained by their culture's masculinity and collectivism dimensions (Hofstede, 2011). Other findings support the idea that students perceive exam success and the high standards expected by others as a source of pressure and anxiety rather than pride for themselves. Moreover, this study is unique in that students drew attention to the potential negative consequences of the exam on "others" and the aspects of the exam that concern themselves. They expressed altruistic but disturbing cognitions about their families, even though they were not expected to do so. These results can be interpreted culturally, as Hofstede (2011) suggests that altruistic behaviors are expected in collectivist societies. Thus, children with a high level of altruism may be at risk for test anxiety. However, due to the model of this study, causal or comparative studies are needed to understand the underlying mechanisms fully.

According to the study's findings, the third domain, future-oriented, highlights students' cognitive concerns about the future. This aligns with Beck's (1967) perspective, revealing a negative perception of the future alongside their self-image. The students seem to attribute their life and career outcomes solely to exam results. Considering that test anxiety is not just a factor but a cause of academic failure (Putwain, 2008) and the fact that worry and poor performance expectations are highly positively correlated (Liebert & Morris, 1967), it is commonly believed that these dysfunctional cognitions (catastrophizing the future) will lead students to anxiety and, in the end, academic failure. Therefore, it can be said that students create a "self-fulfilling prophecy" cycle. There are explanations about the relationship between test anxiety and self-fulfilling prophecy in the literature. For instance, Rahmat et al. (2019) found that anxiety towards specific academic tasks could increase due to the effects of the learning environment, resulting in further avoidance and self-fulfilling prophecy. On the other hand, students in this study exhibited uncertainty regarding test results and content, finding it challenging to tolerate. They expressed that this uncertainty was uncomfortable and led them to anxiety. These findings support the high correlation between test anxiety and intolerance for uncertainty, as observed by Huntley and colleagues in their study in 2022. Several other studies have also found a strong and positive relationship between test anxiety and intolerance of uncertainty (Osmanağaoğlu, Creswell, & Dodd, 2018; Kilit et al., 2020). Considering that cognitive and behavioral therapy has successful results in developing tolerance to uncertainty (Hui & Zhihui, 2016), it can be said that this study also supports cognitive behavioral theory explanations for intolerance to uncertainty.

Finally, students' negative cognitions about taking the exam came to the fore in the test-oriented domain. Considering the students' opinions about the distracting factors during the exam were categorized under the sub-themes of overgeneralization and catastrophizing-related probable problems and concerns related to bodily symptoms. A meta-analysis indicated a link between perceived test difficulty and high test anxiety (von der Embse et al., 2018). In this study, adolescents expressed irrational thoughts about the difficulty of the exam. Similarly, consistent with the literature, it was found that focusing on physical symptoms during the exam contributes to test anxiety (Zeidner & Matthews, 2005). Additionally, focusing on physical sensations during exams, commonly called selective attention, may lead to test anxiety. Moreover, the study revealed a sub-category of ineffective test-solving strategies related to timing, where negative cognitions about timing can induce test anxiety. In addition, inadequate preparation or ineffective strategies during exam preparation can result in negative cognitive states and outcomes (e.g., Heiman & Precel, 2003; Kirkland & Hollandsworth, 1980). Another sub-category observed during test-taking was the presence of test-taking rituals. Individuals with anxiety disorders use various rituals unique to them to cope with their anxiety (Abramowitz, Deacon, & Whiteside, 2019). For instance, a person with obsessive-compulsive disorder experiences anxiety when she/he thinks of odd numbers and ritually counts even numbers again. Similarly, we also saw students during test-taking (e.g., PM5). Many studies showed that such rituals are associated with anxiety (e.g., Başoğlu, Lax, Kasvikis, & Marks, 1988; Foa, Yadin, & Lichner, 2012; Muris, Steerneman, Merckelbach, Holdrinet,

& Meesters, 1998). Lastly, the negative study skills assessment was another category related to the test. In our study, many students felt a lack of confidence in the performance of the exam preparation. It remains uncertain whether this assessment of study skills is due to a lack of self-confidence and biased evaluation or if it genuinely reflects inadequate studying. However, when the literature is examined, it is known that students with test anxiety are less inclined to benefit from effective test-taking strategies (Peng, Hong, & Mason, 2014).

The findings of this study demonstrate that high school students experience negative cognitions related to testing, which can impact their confidence, academic performance, and well-being. These findings underscore the importance of implementing interventions and educational strategies to help students overcome negative cognitions and beliefs related to testing. Addressing these issues is crucial, considering their potential adverse effects on students' academic performance and mental health. For instance, self-oriented cognitions, such as self-criticism and lack of confidence, may lead to decreased motivation and self-esteem. In contrast, other-oriented cognitions, such as blaming others and concern about social consequences, may contribute to stress and anxiety. This study also sheds light on the role of altruism in adolescents' test anxiety, and future research could explore how altruism interacts with other variables such as low self-esteem or socioeconomic status. Furthermore, this study highlights the influence of masculine culture on test anxiety, which is compatible with the ecological system approach. Understanding this cultural aspect can be essential in addressing and managing test anxiety effectively. Another implication of this study is the necessity for further research to understand the risk and protective factors associated with negative cognitions related to testing. For instance, investigating the role of students' prior experiences with testing and the effect of external factors, such as parental expectations and school-level policies, on their' cognitions and beliefs about testing provide valuable insights. This deeper understanding can inform the development of effective interventions and strategies to tackle negative cognitions effectively. One potential intervention that could address these negative cognitions is CBT, which targets negative thought patterns and assists individuals in developing strategies to change these cognitions. Furthermore, therapists and school counselors can play a critical role in supporting students by recognizing the types of negative cognitions they may experience and implementing techniques like CBT and mindfulness training interventions.

Despite the strengths of this study, a few limitations need to be considered. Firstly, the limited number of students who participated in the study and the data being collected solely in ..., the findings do not reflect the views of all students in this age group in .... Additionally, the findings only reflect the cognitions of students attending public high schools, and students in private schools may have different perspectives. The second limitation is that students' cognitions were captured during the interview rather than when they occurred. This may have led to difficulties in recalling their cognitions, potentially resulting in a smaller number of cognitions being identified. Thirdly, the dynamics of the interview setting, with the presence of an interviewer, could have affected the students' ability to express their views more comfortably and clearly. Fourth, the study was conducted after the COVID-19 pandemic, and the impact of online education during the pandemic on students' irrational thoughts is another factor that might have influenced the results. Finally, despite efforts to increase trustworthiness in this qualitative study, it is essential to acknowledge the potential for bias in the analyses due to the nature of the study.

The current qualitative study contributes to the test anxiety literature among adolescents by examining the nature of negative cognitions underlying test anxiety. The study's findings shed light on the negative cognitions of high school students (i.e., before, during, and after exam), which are related to test anxiety. The results are found to be consistent with CBT, the ecological system approach (Bronfenbrenner, 1994), and Hofstede's (2011) cultural dimensions model. The use of qualitative methodology allowed for a deeper understanding of the dynamics of test anxiety and its connection to negative cognitions in adolescents. It provided insights into how theoretical frameworks and negative cognitions are associated with test anxiety. Finally, this study's implications are valuable for policymakers and professionals in developing effective educational strategies. Cognitive-behavioral approaches, for instance, have been shown to be effective in reducing negative cognitions related to test anxiety in previous studies (Yıldırım & Ergene, 2003; Reiss et al., 2017; von Der Embse, Barterian, & Segool, 2013; von Der Embse et al., 2018). Overall, the present study emphasizes the essential role of educational strategies aimed at helping

high school students overcome negative cognitions and beliefs about testing. By addressing these negative cognitions, educators and mental health professionals can support students in improving their academic performance, mental health, and well-being.

### **Acknowledgment**

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**Ethic statement:** In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, that all authors contribute to the study and that all the responsibility belongs to the article authors in case of all ethical violations.

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**Data Availability:** The corresponding author can provide interview transcripts and the dataset analyzed for this study upon request.

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