CHAPTER 1

The Nature of Test Anxiety

Educational tests have existed for centuries, and so has test anxiety. Research interest in test anxiety has waxed and waned across the years, but concern about test anxiety among the general public appears to have increased in the past 20 years. This trend may be due partly to more openness about mental health issues, particularly in educational settings. For instance, columns about test anxiety are now common in college newspapers (e.g., Boutouis, 2021). The rise in high-stakes tests for K–12 school accountability has also likely played a role. For instance, a large-scale survey of school psychologists found that increased anxiety in students was associated with the introduction of high-stakes tests, and that such tests induced more anxiety than local teacher-made tests did (New York Association of School Psychologists and New York State School Boards Association, 2015). In fact, test anxiety (in children as well as parents) has driven some parents to "opt out" of their children's participation in state exams (Paladino, 2020).

The COVID-19 pandemic initially paused the use of some tests, as schools moved much of their instruction online, and teachers and professors often chose alternative ways of assessing student skills. Likewise, many higher education institutions became "test optional," reviewing applications whether or not students chose to submit admissions test scores (Elias, 2021). However, soon enough, online versions of many tests were developed, and new sources of test anxiety had formed: anxiety over the novelty of taking tests in new ways, anxiety over intrusive approaches to remote test proctoring, and eventually, anxiety over returning to test in person after months of being able to test in the comfort of one's own home (e.g., Caplan-Bricker, 2021; Stevens, 2021). Moreover, adolescents and young adults experienced an increase in generalized anxiety during the pandemic, leading to more extreme reactions to any kind of stressor (Hawes et al., 2021). At this point, most tests have returned, and the test-optional admissions policies that remain seem to have *raised* anxiety among high-achieving students, who still feel pressure to take the tests but are now less sure of how their scores will be used (Selingo, 2022). In short, the pandemic did not decrease test anxiety in any sustained fashion, and the problem continues to be as important as ever.

In this chapter, we introduce the science of test anxiety, including its symptoms, how common it is, and its causes and effects. Myths about test anxiety abound, and the first step in learning how to treat the condition is understanding it thoroughly.

THE COMPONENTS OF TEST ANXIETY

Like most clinical constructs, test anxiety is multidimensional (Zeidner, 1998). It consists of many symptoms that have been grouped into two clusters. We refer to these clusters as the *components* of test anxiety, and almost all test takers will immediately recognize these components. Clinicians should pay special attention to their differentiation, since a comprehensive assessment should cover both components plus problem behaviors associated with test anxiety (see Chapter 3), and distinct therapeutic strategies (detailed in Part II of the present volume) can be used to address each. The descriptions of each test anxiety component (provided below), as well as dysfunctional behaviors associated with test anxiety, derive from empirical studies, scales measuring test anxiety, and our own clinical experiences.

The Physiological Component

The physiological symptoms of test anxiety are similar to those seen in other types of anxiety, panic, and stress-related conditions. Many of these symptoms are consistent with activation of the sympathetic branch of the autonomic nervous system, associated with the stress response. Students with high levels of test anxiety typically report an increase in heart rate and more vigorous heart contractions, felt as palpitations. In addition, various types of gastrointestinal distress are often reported, such as a general unsettled feeling ("butterflies in the stomach"), nausea, vomiting, intestinal cramps, and even a sudden urge to defecate. Muscular tension and rigidity, restlessness, and a jittery feeling are also common. Because physiological arousal makes sleep difficult, students may report poor sleep the night before an exam, or even for several nights leading up to an especially important exam. Less commonly, a student will sleep poorly *after* a test, usually when they are certain that they have not done well. Other physiological symptoms include sweating, a dry mouth or throat, and an urge to urinate. Students report physiological symptoms not only immediately prior to a test but also sometimes in reaction to thinking about an upcoming test or while studying for a test. Physiological symptoms typically continue during a test but subside, at least temporarily, after a test is over.

Laboratory research finds that self-reported symptoms of test anxiety have a basis in objectively measurable physiological arousal. A recent meta-analysis (Roos et al., 2021) reviewed over 30 studies on the topic and concluded that self-reported test anxiety was consistently and significantly related to heart rate, skin conductance (a measure of sweating), blood pressure, and levels of cortisol (an adrenal hormone released in response to stress). It is easy to see how such arousal can be distressing in the context of an exam. However, as we will discuss in greater detail later, autonomic arousal also occurs in the context of positive excitement, not just perceived threat, and students can be taught to reinterpret their symptoms through a different lens. Moreover, arousal symptoms can often be tamed somewhat

through relaxation strategies that have long been part of behavior therapy procedures (see Chapter 7).

The Cognitive Component

For many students, the more irksome aspect of test anxiety is cognitive. The most prominent cognitive symptoms of test anxiety involve *worries*—specific propositional thoughts about anticipated negative events. In a classic study, Galassi et al. (1981) recorded the thoughts of students in a large college history course during an actual class exam. The students had earlier all completed a self-report test anxiety scale. Students with high levels of test anxiety reported more negative than positive thoughts while taking their exam, and many experienced the same specific negative thoughts about how they were going to do poorly, their peers were performing better than they were, and their test scores would not show the effort that they put into studying.

Of course, worries often long precede the exam situation itself. Before an exam, many students already expect that the exam will be difficult, that they will do poorly, and that there will be negative and severe consequences of poor performance. Those thoughts continue during the exam, and for some students, the end of the exam fails to bring relief. Instead, after the exam, the students continue to worry about their likely test score and its consequences for their academic progress and for others' opinions of them. The worries may be highly individualized to the student's personal and academic goals. For instance, a high school student may specifically worry about how a low score on a college admissions test will prevent them from gaining admission to a particular desired university. At times, the cognitive symptoms are actually *about* physiological symptoms; as in panic disorders, the student may worry that their rapidly beating heart will lead to fainting or even a heart attack.

To be clear, worries have the potential to be adaptive responses to threats, but as in other clinical anxiety conditions, test anxiety leads to worry responses that are unhelpful in three ways. First, the worries are often irrational, grossly overestimating the chances of negative events. For instance, it is common for test-anxious students with a consistent history of high test performance to nonetheless genuinely believe that each new exam will finally be the one that generates a poor score. Second, the student assumes that their thought is an accurate and informative reflection of reality, rather than merely a cognition that occurred to them. Finally, even when the worries are accurate and rational (e.g., a student might be correct that they got a particular item wrong on a test), the worries have a ruminative quality. Rather than generating a solution that terminates the worry, the student will continue to have a worry thought repeatedly without any resolution.

The cognitive component of test anxiety goes beyond worries. In addition, students report various types of cognitive failures, including memory retrieval problems (being unable to recall information needed for the test), distractibility (extraneous thoughts other than worries), and confusion (e.g., failing to understand test instructions or questions). Students typically describe these experiences as their mind "going blank" during a test, being unable to focus on the test, and not trusting their comprehension of the task directions and items. After the exam, rather than being certain of having performed poorly, some students

report having no sense of how they did and find that uncertainty itself to be extremely distressing.

As we discuss in Chapter 2, students typically overstate the direct and causal impact of anxiety on their ability to think, retrieve information from memory, and so forth. But the subjective experience of impaired cognition is what matters here. Thankfully, the maladaptive aspects of worries and perceptions of cognitive failure can be effectively addressed through a combination of psychoeducation, structured writing exercises, mindfulness and acceptance practices, and attention training (see Chapter 8)—as well as strategies for strengthening test preparation and test-taking skills to reduce the experience of cognitive failure itself, as discussed in Chapters 9 and 10.

Problem Behaviors Associated with Test Anxiety

Whereas students are typically all too aware of their physiological and cognitive symptoms, the problem behaviors associated with their test anxiety may be even more important, consisting of the actions that students take and do not take. Like other anxiety-motivated behaviors, actions prompted by test anxiety are maintained through operant conditioning processes. More specifically, the actions yield immediate negative reinforcement through removal or postponement of a threatening aversive stimulus. Students with test anxiety perceive tests as strong aversive stimuli, and therefore, they have a strong motivation to avoid and escape test-related materials and cues. A student may procrastinate studying for a difficult exam, fail to set reminders to study, or use superficial study methods that are less like taking an exam (e.g., rereading material rather than self-quizzing). A college student may select courses and professors that do not have exams, or cancel a scheduled admissions or certification test. A high school student may feign illness to avoid going to school on the day of an exam, plead with a teacher for an alternative way of attaining credit, or make college application decisions based on which colleges require admissions testing.

Just like worries, escape and avoidance behaviors have the potential to be adaptive, but in cases of clinical test anxiety, they usually are not. For instance, procrastinating studying and using superficial study methods will typically lead to *lower* test performance and hence are counterproductive to the student's own goals. Similarly, it is often in a student's long-term best interest to take more rigorous courses or to attend a particular college that requires admissions test scores. More generally, escape and avoidance are only adaptive when a stimulus is a genuine threat to safety; an academic test is not, even if it is sometimes perceived that way.

Other problem behaviors manifest during the test itself. For instance, some students with test anxiety do not read the test directions carefully, do not manage their time well, and do not check their work for mistakes before turning in the exam. Instead of spending the available time working on their exam, these students look around the room at their peers, stare out the window, check and recheck the time, and play with their pencils (cf. Wren & Benson, 2004). These students are apt to score poorly on tests and then attribute their poor performance to anxiety. However, in reality, their ineffective test-taking behaviors were the direct cause of the poor performance. Interestingly, the same is true for students who obsess over individual test items and check and recheck answers before going on,

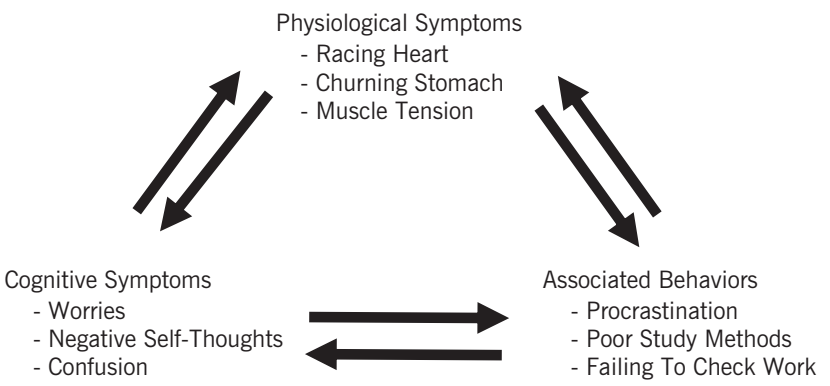

FIGURE 1.1. Bidirectional relationships between test anxiety components and associated behaviors.

rather than allocating their time in an efficient manner. Either way, good test-taking skills are needed. Happily, such skills can be taught, and in Chapters 9 and 10, we discuss how to remediate deficits in study and test-taking skills.

Finally, it is important to acknowledge that some students with high levels of cognitive and physiological symptoms of test anxiety do not show associated problem behaviors. Consider Adam, a top student in the sixth grade who seems to be in a continuous state of worry prior to tests, and who then experiences considerable physiological symptoms during the test itself. He sometimes breaks out in a sweat as the exam starts and feels embarrassed as his sweat leaves his exam paper wet. He nonetheless has excellent study habits and nearly straight-A grades. Like Adam, students who lack the problem behaviors associated with test anxiety tend to be high achievers, often with some degree of perfectionism. They study assiduously, have good test-taking skills, and do well on exams, while still worrying a great deal about their performance and finding that tests induce unpleasant physiological arousal. In such students, treatment can focus preferentially on the cognitive and physiological symptoms of test anxiety, with a minimal focus on studying and test-taking behaviors. This is an advantage of the modular therapy approach detailed in Part II of the book.

The physiological and cognitive symptoms of test anxiety, and the problem behaviors associated with them, all interact with each other, as shown in Figure 1.1. Each component can cause the others, exacerbating test anxiety over time.

TWO REPRESENTATIVE CASE STUDIES

The following two case studies, composites of students we have seen, help to illustrate how test anxiety manifests in different individuals.

Case 1: Samantha

Samantha is a 16-year-old White female living and attending school in a suburb of a large city in the northeastern United States. She has no history of psychiatric diagnoses or psy-

chotherapy and has a general history of positive social adjustment and satisfactory academic functioning. She just started her junior year at a high-achieving public school, where she has typically performed in the average range academically, with most grades in the B range, and a few As in the humanities. Her teachers have emphasized how important junior year performance is for college applications, and she will be taking the PSAT in a month. Her 10th grade PSAT scores were at about the 60th percentile nationally, but this was significantly below average for her school and her group of friends.

Samantha has a long history of feeling at least mild anxiety around tests, mainly worries and feelings of restlessness, but she has performed relatively well on classroom tests, and so for most of her schooling, there was never much concern about the anxiety. However, once she received her 10th grade PSAT scores, her confidence faltered, and her anxiety before and during classroom tests increased markedly. Her test performance did not change appreciably, but she seemed to spend more time talking about her worries regarding upcoming tests. She often slept poorly the night before major tests. Moreover, on exam days in school, she experienced physiological symptoms such as heart palpitations, dry mouth, and nausea. While taking most exams, she found herself distracted by intrusive thoughts about how she was going to fail the exam. Before the final exam in her 10th grade biology class, she ran to the bathroom and vomited due to extreme anxiety.

Samantha's parents had hoped that she would relax over the summer vacation after 10th grade. The break from school was in fact somewhat helpful, but Samantha was already worried about the 11th grade PSAT. Her parents purchased numerous study materials for her and offered to pay for a prep course. Samantha declined to take the prep course and spent very little time actually using the study materials, although she often brought up the PSAT as a stressor that she needed to contend with. Now, with her junior year starting, she is already feeling nervous about upcoming classroom tests, as well as what will be her final chance to score very highly on the PSAT.

Case 2: Christopher

Christopher is a 25-year-old African American male in his second year of training at an osteopathic medical school in a large city in the midwestern United States. He had done well on classroom tests in his K–12 schooling, and although he reports having been a driven student and feeling some pressure to do well, he did not experience typical test anxiety symptoms at that time. He had attended high-need, under-resourced K–12 schools, and in retrospect, he views his high school's standards as having been "really easy." His composite (overall) ACT score was in the 42nd percentile nationally, and when he matriculated to a regional state university, he found the coursework far more challenging than in high school, especially in the courses for his pre-med major. His adjustment to college was difficult, and he had a particularly hard time paying attention in his classes and focusing on studying outside of class. Christopher began to experience significant anxiety studying for exams, taking them, and then anticipating test feedback. During his sophomore year, a family physician diagnosed him with ADHD and prescribed stimulant medication. The medication seemed to help him focus when studying, but he actually did not take it on exam days because it aggravated his physiological symptoms of anxiety.

Christopher graduated college with a 3.1 GPA (with better grades in his last two years, after the stimulant medication was started), and he obtained a full-time job while using his free time to study for the Medical College Admission Test (MCAT). His MCAT scores were middling—around the 50th percentile for all MCAT examinees, and around the 30th percentile for enrolled medical students. Nonetheless, he obtained admission to an osteopathic medical school, where he has found the coursework to be extremely challenging. For him, the cognitive symptoms of test anxiety have been most prominent. He describes himself as worrying "all the time" about tests and their consequences for his medical career, to the point that he finds it difficult to pay attention. In addition, after experiencing several of what he calls "panic attacks," he has stopped taking his stimulant medication, out of concern that the medication might exacerbate any cardiac symptoms of anxiety. He passed almost all of his medical school classes, where exams are heavily weighted, although his grades were often just above the passing cutoff. In two classes, he failed on the first attempt, and he retook the classes and passed. Any students who fail a class are automatically referred to the school's academic support office, where tutoring and more general academic counseling are available, but Christopher never followed up on the referral and admits that his embarrassment about failing classes likely played a role. He is proud that he managed to pass the classes on his second try without formal support from the school.

Currently, Christopher strongly believes that his professors and the medical school administration think poorly of him, and he expects to be kicked out for poor performance, despite receiving no such feedback, and despite knowing some other students who also needed to retake selected classes. He has avoided looking up the school policies to check the official criteria for academic dismissal, out of worries that he will meet the listed criteria. Similarly, he recently waited a week to open a mailed letter from the medical school, fearing that it was a dismissal notice (it was in fact a fundraising solicitation for the medical school's affiliated hospital). He will need to take the first portion of his licensing exam this year, and the idea of the exam fills him with dread.

Comment on Case Studies

Samantha's and Christopher's cases illustrate both the heterogeneity of the test-anxious population and the features that members of the population have in common. Both Samantha and Christopher appear to have academic skills that are at least average relative to the general population, yet they appear deficient relative to either local norms (for Samatha's high school) or relative to ambitious standards (Christopher's aspiration to become a physician). Samantha did well enough but did not stand out in her high-achieving community, whereas Christopher overcame a less rigorous academic curriculum to work up to ever higher standards, with mixed success. While Samantha has a generally positive academic and social history, and no other clinical concerns, Christopher has a diagnosis of a learning problem (ADHD), and his early good grades may be due to lower standards. Both students have experienced significant cognitive and physiological symptoms of test anxiety. Finally, although problem behaviors associated with test anxiety are less prominent in these descriptions, both students exhibit avoidance in their own ways. Although Samantha is preoccupied with worries about the upcoming PSAT, she has also been avoiding preparing for it,

and Christopher is so worried about failing out of medical school that he is not even engaging with any administrative processes that might prevent his worry from becoming true.

HOW COMMON IS TEST ANXIETY?

How common are cases like those of Samantha and Christopher? Because test anxiety is not a recognized disorder in any official psychiatric classification system, it has never been included in large-scale population-level epidemiological studies of disorders. Furthermore, the prevalence of test anxiety is difficult to estimate because there is no single, consensus threshold at which test anxiety becomes clinically significant. However, research studies have repeatedly and consistently found that having some degree of test anxiety is very common:

- In a sample of 335 children in grades 3 through 5, 55% endorsed moderate or high levels of anxiety regarding classroom tests, and 68% endorsed moderate or high levels of anxiety about a state assessment (Segool et al., 2013).
- In a sample of 1,348 ninth and tenth graders, the average student reported experiencing test anxiety symptoms with a frequency between "sometimes" and "often" (Putwain, 2007).
- Of 3,021 community adolescents and young adults, 28.1% reported a fear of taking tests or exams (Knappe et al., 2011). This proportion is likely to be an underestimate since some young adults were not in educational or other settings where they would need to take tests.
- The norms for the Test Anxiety Inventory, a widely used assessment instrument, suggest that between 30% and 52% of college students report experiencing test anxiety "often" or "almost always" (McCarthy & Goffin, 2005).
- Macauley et al. (2018) found that high proportions of 183 healthcare professions graduate students (51% of females, and 37.5% of males) were classified by the Westside Test Anxiety Scale as having at least "moderately high" levels of test anxiety.

In a recent study, Lovett et al. (2024) examined the prevalence of specific test anxiety symptoms in a large sample of almost 3,000 college students at a flagship public university with selective admission standards. The researchers administered a 20-item test anxiety questionnaire, where the items represented many different symptoms. They found that only about 1% of the students failed to endorse any symptoms. Almost every student reported having at least one symptom at least some of the time when taking tests. Moreover, *most* of the students endorsed experiencing each of the following symptoms at least sometimes: feeling uneasy or upset during tests, difficulty concentrating on tests due to preoccupations with course grades, worrying a great deal prior to tests, and being unable to stop worrying about a test after it is over.

From a clinical perspective, the high prevalence of test anxiety suggests that test anxiety is an issue potentially worth addressing in many clients, including those who do not present for therapy for test anxiety *per se*. For instance, students who present to their school

psychologist or school counselor with primarily academic concerns often have test anxiety. In addition, test anxiety often accompanies more general mental health issues. Indeed, when a client has other anxiety problems, their chance of having significant test anxiety is even higher (Knappe et al., 2011).

PREDICTORS AND CAUSES OF TEST ANXIETY

Like any other psychological phenomenon, test anxiety has been hypothesized to result from a variety of causes. Different theoretical approaches have accounted for test anxiety in different ways. Sigmund Freud (1900/2010), in his magnum opus *The Interpretation of Dreams*, discussed "examination anxiety" (p. 291). He argued that dreams of failing past exams are the mind's way of preparing for other high-stakes tasks in life. Meanwhile, his colleague Wilhelm Stekel argued that matriculation tests were feared because graduating from school represented an initiation to sexual maturity ("matriculation" and "maturity" reportedly have the same etymological roots; cf. Freud, 1900/2010, p. 292). These explanations are no longer widely believed, and as psychological theory has evolved, so have perspectives on test anxiety. We discuss two types of predictors and potential causes of test anxiety here: internal personality processes and external factors in the environment. Practitioners should be aware of both types of factors—to help identify students at greater risk of having high test anxiety (and a corresponding need for intervention) and to understand associated features that often come up in clinical work with this population.

Personality Processes

Several personality constructs have been consistently related to test anxiety. One, the personality trait of *neuroticism*, has a strong correlation with test anxiety, with a correlation coefficient of about 0.45 (von der Embse et al., 2018). Neuroticism is one of the basic five traits—alongside extraversion, agreeableness, conscientiousness, and openness to experience—that appear to explain the majority of individual differences in personality (McCrae, 2020). Neuroticism is described by Tackett & Lahey (2017) as "a tendency to experience negative affect and emotions, including feelings of sadness, anxiety, and anger" (p. 48), and is strongly related to both physical and mental health outcomes, with higher levels of neuroticism predicting worse health. Individuals with high levels of neuroticism react with more severity to experiences of frustration and loss—such as test failure—and then do not recover as easily. Indeed, one statistical facet of neuroticism is anxiety, and other facets, such as self-consciousness and vulnerability, would also relate to negative reactions to tests (Costa & McCrae, 1995). Basic trait neuroticism may thus fuel test anxiety, since students with higher levels of neuroticism will have more extreme reactions to any stressor, including an academic test.

Another, related personality trait is *perfectionism*. Unsurprisingly, students who experience high levels of test anxiety often have extremely high self-standards. But many scholars believe that perfectionism consists of two distinct dimensions, and these relate differently to test anxiety. *Perfectionistic strivings* involve setting excessively high goals for oneself,

whereas *perfectionistic concerns* involve the effect of not meeting those goals on one's sense of self-worth (Osenk et al., 2020). Students with perfectionistic strivings focus on aiming high for themselves, whereas the focus of students with perfectionistic concerns is on worrying about possible mistakes and the consequences of imperfections. In a recent meta-analysis, Burcaş and Creţu (2021) found that perfectionistic concerns relate substantially to test anxiety (the overall correlation coefficient was 0.42), but perfectionistic strivings do not predict test anxiety (the overall correlation coefficient was 0.04). It appears that perfectionistic concerns drive avoidant coping strategies, which in turn cause higher levels of test anxiety (Weiner & Carton, 2012). The research on perfectionism and test anxiety has suggestive implications for intervention. Rather than focusing on reining in highly ambitious personal goals, which are not clearly dangerous, therapists should focus on the avoidant behaviors that appear in students who are preoccupied with concerns about failure.

Clinical anxiety disorders, and text anxiety as well, are associated with another construct known as intolerance of uncertainty (IU; Jacoby, 2020) (e.g., Huntley et al., 2020). Many clients with anxiety disorders—particularly those with prominent worry symptoms—have an excessive need for reassurance that bad things will definitely not happen (and that good things definitely *will* happen). IU manifests in two primary ways: (a) desperately seeking information about the future that is guaranteed to be accurate, and (b) feeling paralyzed and unable to act without such information. Some students with high levels of test anxiety exhibit both of these manifestations. For instance, they may pester teachers repeatedly for more information about what to expect on a test, what options they will have available if they do poorly on the test, and how the class as a whole performed on the test. They may feel unable to begin studying without extreme confidence in exactly what the test items will look like, and may even be unable to progress through the test until they work out their answer to one item repeatedly and feel absolutely certain that they answered it correctly.

A final personality-related construct known to relate to test anxiety is academic self-efficacy—the confidence that a student has in their ability to learn, understand academic material, and perform on academic tasks (e.g., Brandmo et al., 2019). Research has repeatedly found a negative correlation between the two variables, although it is not clear whether self-efficacy directly impacts test anxiety or whether, instead, actual low levels of skill or ability lead to both low self-efficacy and high test anxiety. Regardless of the exact cause–effect relations, as we discuss in detail in Chapters 9 and 10, interventions can build test-taking and study skills, which will boost confidence (test-taking self-efficacy, specifically) as well.

Environmental Factors

Environmental factors influencing test anxiety have proven more difficult to study. Ethical and logistical complications often preclude direct manipulation of these factors, and so most research asks students for their self-reports of perceived levels of environmental variables. Still, certain (reported) environmental factors have been consistently associated with test anxiety. These include pressure from parents and teachers. For instance, Putwain et al. (2010) found that students' reports of parental pressure (i.e., agreeing with statements such as "When it comes to school, my parents expect the impossible"; see Campbell, 1994) were associated with higher levels of worries about tests. The same study found an associa-

tion between worries about tests and students' perceptions of their teachers' "performance-avoidance goals" (i.e., agreeing with statements such as "My teacher tells us that it is important that we don't look stupid in class"; see Midgley et al., 2000).

Another, related environmental variable is pressure regarding specific tests. In general, test anxiety can be reduced by presenting tests as learning activities or by using tests that are perceived by students as easier (correlation coefficients for these variables and test anxiety are in the range of 0.2 to 0.3; von der Embse et al., 2018). Of course, outside of experimental studies, changing these features of tests is easier said than done—just try convincing high school students that the SAT is a fun game! In addition, presenting tests as ungraded learning activities rather than as evaluative techniques can decrease effort, and describing tests as easier than they are can set up students for failure through lack of appropriate preparation. Even so, it is helpful to know that tests do not uniformly induce anxiety in any particular student. The level of anxiety depends in part on how the test is perceived and presented. Different students take the same test in very different social (family, school, peer, etc.) contexts, and the test can take on many different meanings, with consequences for anxiety.

TEST ANXIETY AND EQUITY OF EDUCATIONAL OPPORTUNITY

The importance of the social context of testing relates to our final topic: the role of test anxiety in threatening equity in academic access. Equity of educational opportunity is an old concept (Burbles et al., 1982) that has taken on more importance in recent years, as disparities in educational outcomes have become an increasingly pressing problem. Educational tests are not merely the means of measuring such disparities; the testing process itself is often thought to be the *cause* of the disparities (Jordan & Lovett, 2007). Since demographic groups do differ in average levels of test anxiety (see von der Embse et al., 2018, for a review), this sets up the possibility of such differences explaining performance gaps. For instance, gender differences in test anxiety are substantial and remarkably reliable, with girls and women exhibiting much higher average test anxiety levels than boys and men. Ethnic group differences in test anxiety are not as well understood, but von der Embse (2018) found data from several studies that yielded a significant difference between Black and White students' average levels, with Black students reporting more anxiety. Finally, students with various disability conditions (e.g., learning disabilities, ADHD, etc.) tend to have higher levels of test anxiety (e.g., Lovett et al., 2024).

Test anxiety has the potential to influence disparities in test performance in two ways. First, it is possible that group differences in test anxiety could lead to test performance gaps in high-stakes settings, even when groups have smaller or null differences in actual skill levels (as measured in low-stakes settings). The high stakes of the operational testing setting could prevent students from showing what they know. This mechanism has been argued to explain differences in SAT performance between boys and girls (Hannon, 2012) and between Hispanic and non-Hispanic students (Hannon, 2019). In this analysis, anxiety induces a type of bias in tests, such that the tests are measuring different constructs in students with low and high levels of anxiety.

As we discuss in Chapter 2, to the degree that test anxiety affects performance at all, the effects appear to be mostly indirect. Specifically, anxiety alters students' methods of test preparation and their behavior during tests, which in turn affects performance (e.g., Jenifer et al., 2023). This provides a second and more likely mechanism by which group differences in anxiety could lead to group differences in test performance. This has been a particularly influential argument in the context of STEM (science, technology, engineering, and mathematics) education, where students form beliefs about their abilities relatively early and can choose to either seek out or avoid more advanced instruction and training in those subject area (Daker et al., 2021). Not coincidentally, these are also subject areas where tests are prominent, and test-anxious students are more likely to prepare poorly for tests or even opt-out of any STEM coursework beyond the minimum that is required.

Regardless of the exact mechanism, test anxiety has substantial implications for equity of educational opportunity, both at the group and individual levels. Students with higher test anxiety are less likely to avail themselves of educational opportunities, simply because taking tests is so aversive. These students avoid testing themselves in preparation for actual tests, even though self-testing is the most effective type of studying. As they grow older and have more choice over their educational path, they avoid taking classes and attending educational institutions in which tests are required.

SUMMARY

Test anxiety is a remarkably common source of distress in students at all levels of education. Consisting of a mix of physiological and cognitive symptoms, test anxiety typically involves unwanted bodily arousal and intrusive worries. These symptoms are usually associated with maladaptive avoidance responses. Almost all students experience test anxiety at least some of the time, but higher levels accompany traits such as perfectionism and intolerance of uncertainty. Higher levels of test anxiety are also present when students feel more external pressures. Moreover, test anxiety is higher on average in female students relative to males, in Black students relative to White students, and in students with other disability conditions. Therefore, though not generally a disorder per se (as we discuss in Chapter 3), test anxiety merits attention from practitioners in schools and clinical settings seeing students of all ages.