

---

# TEST ANXIETY AND ITS EFFECT ON THE PERSONALITY OF STUDENTS WITH LEARNING DISABILITIES

---

*Dubi Lufi, Susan Okasha, and Arie Cohen*

---

**Abstract.** The purpose of this study was to look for personality variables that characterized young adults with learning disabilities and test anxiety. Fifty-four Israeli adults diagnosed with learning disabilities participated in the study, 24 of them were diagnosed as having test anxiety; 30 did not have test anxiety. The participants completed the Test Anxiety Inventory (TAI) to validate the diagnosis of test anxiety and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) to assess the different personality profiles. The results showed significant differences between the two groups on 35 out of 68 measures of the MMPI-2. A discriminant-function analysis of the content scales, the supplementary scales, and the Harris-Lingoes scales of the MMPI-2 showed that one measure, College Maladjustment, explained most of the variance. Further analysis assessed the various test anxiety profiles of the two types of test anxiety, "emotionality" and "worry." The meaning of the results is discussed as a basis for explaining the profile of a student with learning disabilities and test anxiety.

---

*DUBI LUFU, Ph.D., is associate professor, Department of Behavioral Sciences, Emek Yizreel College, Israel.*

*SUSAN OKASHA, Emek Yizreel College, Israel.*

*ARIE COHEN is professor, Bar-Ilan University, Israel.*

---

Anxiety is probably one of the most researched human traits in recent years. Hundreds of articles have been published on this topic in almost every professional journal. It is common to divide anxiety into two domains: trait anxiety and state anxiety, a classification first made by Spielberger (1972). *Trait anxiety* is an individual tendency to perceive various situations as dangerous and threatening. *State anxiety*, in turn, is the perception of an emotional situation as unpleasant accompanied by a physiological reaction connected to the autonomic nervous system. Test anxiety, the focus of this study, is one form of state anxiety.

## **Test Anxiety**

Test anxiety affects people in every field of life, whenever people of all ages have to be evaluated, assessed, and graded with regard to their abilities, achievements, or interests. Birenbaum and Nasser (1994) claimed that test anxiety has become one of the most disruptive factors in school and other settings where testing is performed. It has been estimated that 30% of all students suffer from various levels of test anxiety (Shaked, 1996). Spielberger (1972) describes test anxious people as follows:

In essence, high test-anxious persons are characterized by acquired habits and attitudes that involve

---

negative self-perceptions and expectations. These self-deprecating habits and attitudes dispose test-anxious persons to experience fear and heightened physiological activity in situations such as examinations in which they are being evaluated, and influence the manner in which they interpret and respond to events in the environment. (p. 14)

Other researchers have defined additional dimensions of test anxiety. For example, Hong (1998) claimed that test anxiety is “a complex multidimensional construct involving cognitive, affective, physiological, and behavioral reactions to evaluative situations” (p. 51). Sarason (1984) divided test anxiety into the following four dimensions: worry, tension, test-irrelevant thinking, and bodily symptoms. Liebert and Morris (1967) used a two-dimensional conceptualization to define test anxiety as consisting of two major elements: worry and emotionality.

Using Liebert and Morris' (1967) two-dimensional construct, Spielberger and colleagues (1980) constructed their Test Anxiety Inventory (TAI). To date, the TAI remains the most popular measure of test anxiety used in clinical work and research. The TAI constructs of worry and emotionality are defined as follows: (a) “Worry” is cognitive distress connected to the testing situation; it consists of negative performance expectations or worry about the testing situation; and (b) “Emotionality” is the affective dimension; it refers to the physical reactions of students to the testing situation. Examples of such a reaction can be nervousness, fear, and physical discomfort. In theory, these two anxiety facets are independent even though they have fairly high correlations (Deffenbacher, 1980; Morris, Davis, & Hutchings, 1981). The TAI has been widely discussed in the literature (e.g., Benson & Bandalos 1992; Nasser & Takahashi 1996; O'Neil & Fukumura, 1992; Zeidner & Nevo 1992).

In her cognitive-attentional theory of test anxiety, Wine (1971, 1982) claimed that the negative influence of test anxiety is due to the fact that test-anxious persons divide their attention between personal variables and variables connected to the task. In contrast, non-test-anxious persons are able to focus their attention more on the task itself. Among test-anxious students these differences lead to a reduced ability to deal with cognitive tasks.

Another model explaining the poor performance of test-anxious students is the “deficit in study skills” model (Paulman & Kennelly, 1984; Wittmaier, 1972). This model views the low performance of test-anxious students as stemming from their deficient knowledge of the school material and their awareness that they are not well prepared for the test. Test anxiety reduces the performance of those who experience it (Sarason,

1980). In addition, it causes emotional suffering (Ben-Dov, 1992).

A somewhat different viewpoint was presented by Einat (2000), who claimed that severe test anxiety is caused by high personal standards of persons who expect maximum success and are afraid that they cannot meet their own standards. It has been proven that test-anxious students see the test situation as threatening, and often react by worrying and thinking irrelevant thoughts that interfere with effective performance (Liebert & Morris, 1967; Tobias, 1985; Wine, 1982). Additional findings concerning the negative effects of test anxiety on large percentages of those placed in testing situations may be found elsewhere (for a review, see Hembree, 1988; Seipp, 1991).

The negative influence of test anxiety on school performance is found already at a young age. For example, Hill and Sarason (1966) reported that highly test-anxious children were two years behind in basic reading and arithmetic skills by the end of elementary school, probably because of the test anxiety they experienced. Plass and Hill (1986) claimed that high-anxious children when tested under time pressure often do the tests too quickly which, in turn, results in low grades in standard testing conditions. Others have found that test anxiety is associated with depressed academic performance (Bryan, Sonnefeld, & Grabowski, 1983; Guttman, 1987; Zatz & Chassin, 1985).

### **Learning Disabilities**

Learning disabilities (LD) affect 2%-10% of the population (*Diagnostic and Statistical Manual-4th* edition; DSM-IV, 1994). Learning disabilities have been investigated extensively in the areas of definition, diagnosis, and treatment. Considerably less attention has been given to the effect of LD on personality structure.

Johnson and Blalock (1987) found that adults with LD had difficulties with self-concept and social acceptance. Similarly, various studies have shown that students with LD have a negative self-concept (Write & Stimmel, 1984), poor interpersonal skills (La Greca, 1987), and frail ego structures (Gaddes, 1985). Other studies found various personality deficiencies in children with LD, such as more external locus of control (Bendel, Tollefson, & Fine, 1980; Hallahan, Gajar, Cohen, & Tarver, 1978; Tarnowski & Nay, 1989; Tollefson, Tracy, Johnson, & Borgers, 1979), and higher anxiety levels, withdrawal, depression, low self-esteem, more rejection by others, and fewer social skills (see review by Noel, Hoy, King, Moreland, & Meera, 1992). Thus, it seems that learning disabilities have a lifelong impact on the personality of the children and adults they affect.

Only a few studies have used the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) with its

---

various versions to assess test anxiety. When Noel et al. (1992) used the MMPI-2 to investigate the profile of adults with LD, they raised the question of whether there are any specific personality profiles for individuals with learning disabilities. They found that students with LD in two settings – a rehabilitation setting and a university – differed from the normative college population in short- and long-term stress leading to anxiety.

In addition, each group of LD individuals had its unique personality characteristics. Turner (1996) found that anxiety measured by the Fears content scale of the MMPI explained significantly measures of immediate and delayed visual memory scores. In contrast, other measures of anxiety did not explain a significant amount of variance in various memory tasks. Similar results were found by Cannon (1999), who discovered that the Social Anxiety scale of the MMPI could predict poor performance on specific logical memory task.

### ***Test Anxiety and Learning Disabilities***

Only a few studies have dealt with the combination of test anxiety and learning disabilities. Lancaster, Mellard, and Hoffman (2001) reported that the greatest difficulties of students with LD was test anxiety, along with concentration, distraction, frustration, remembering, and mathematics. Stevens (2001) found that students with LD had higher levels of test anxiety compared to non-LD students. These differences were mainly in test-irrelevant thinking.

Different explanations of the connections between test anxiety and LD were found by Swanson and Howell (1996). In a study of 82 adolescents, these researchers noted a significant positive relationship between test anxiety and cognitive interference and a significant negative relationship between test anxiety and study habits. Based on these results, they claimed that cognitive interference was the most powerful predictor of test anxiety.

Various studies have attempted to reduce test anxiety among students with LD. For example, Wachelha and Katz (1999) tried to lower test anxiety levels in high school and junior college students with LD. After eight weeks of cognitive behavioral treatment their participants demonstrated reduced test anxiety levels and improved study skills and academic self-esteem compared to a control group. Their cognitive-behavioral treatment included progressive muscle relaxation, guided imagery, self-instruction training, and training in study and test-taking skills.

A similar study with college students (Giordano, 2000) found that academic skills training improved study skills but had mixed effects on anxious behaviors and academic performance. In contrast, exposure therapy decreased anxious behaviors and improved academic performance.

Despite such far-reaching personality implications, this topic has not been investigated thoroughly enough in the research literature; and despite the popularity of the topic of test anxiety among researchers and the extensive attention given to the topic of learning disability, not much attention has been paid to their combined effect on the personality of those who suffer from them.

The purpose of the present study was to explore the personality structure of a specific population of adults who had both LD and test anxiety compared to a population of other adults with LD but no test anxiety.

## **METHOD**

### ***Participants***

Fifty-four Israeli adults, 31 men and 23 women, who were first-year students or planned to attend institutions of higher education in the near future, participated in this study. The participants were self-referred for assessment of LD because of difficulties in the past and/or the present. Each had received a diagnosis of LD according to the DSM-IV (1994) in one or more of three categories: dyslexia, dysgraphia or dyscalculus.

Twenty-four of the subjects (mean age 23.19) were also diagnosed as having test anxiety based on self-reports. The symptoms described by these subjects included apprehension in testing situations, tension and anxiety prior to examination, difficulties falling asleep or eating before an important test, pressure during tests, and sweating or various pains during tests. Thirty of the participants (mean age 24.05) did not have test anxiety. The groups did not differ in age or intellectual ability as measured by the Wechsler Adult Intelligence Scale-Revised (WAIS-R, 1981).

## **MATERIALS**

All the subjects filled out two questionnaires. First they completed the TAI, Test Anxiety Inventory (Spielberger et al., 1980), which was translated into Hebrew and standardized for the Israeli population by Zeidner and Nevo (1988). The TAI is a self-report measure of test anxiety that uses a Likert-like 4-point scale (from 1 = almost never, to 4 = almost always) aimed at measuring test anxiety as a "situation-specific personality trait" (Spielberger et al., 1980). The questionnaire includes 20 items. It yields an overall score, as well as scores for the "worry" and "emotionality" components of test anxiety.

The second questionnaire used was the Minnesota Multiphasic Personality Inventory-Version 2, MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). This is an updated version of the MMPI, which is one of the most frequently used personality tests in the history of testing (Lubin, Larson, Matarazzo, & Seever,

**Table 1**

*Means and Standard Deviations of Age, IQ, and Test Anxiety Inventory of the Test-Anxious LD Group (N = 24) Compared to the Non-Test-Anxious LD Group (N = 30)*

Variable	Test-Anxious Group		Non-Test-Anxious Group		t
	Mean	SD	Mean	SD	
Age	23.19	1.83	24.05	2.99	1.43
Total IQ	91.57	8.01	95.89	7.52	1.96
Verbal IQ	91.13	9.61	99.93	7.46	3.22**
Performance IQ	94.14	9.84	94.14	10.51	1.06
<b>TAI</b>					
Emotionality	28.17	2.87	18.40	5.13	8.84***
Worry	23.79	3.32	14.53	4.13	8.91***
Total	64.33	5.71	40.40	9.56	11.41***

Note. TAI = Test Anxiety Inventory.  
\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

1985). The MMPI-2 has been extensively used in research with various populations (see review by Noel et al., 1992).

The MMPI-2 includes 567 items answered true or false. The test has 10 clinical scales, 6 validity scales, 15 content scales, 15 supplementary scales, and 28 Harris-Lingoes scales. The test has been translated into Hebrew and was found to be useful for the Israeli population by Almagor, Budesco, Nevo, and Montag (1993).

### **Design and Procedure**

The assessment was carried out by a licensed and experienced clinical psychologist who specializes in testing. At the beginning of the meeting with the subjects, a thorough interview was conducted, asking about personal background, school history, and information about learning difficulties and test anxiety. This clinical evaluation based on self-reports was used to diagnose the subjects as having test anxiety (placed in the "high test-anxious group" – HTAG) or not having test-anxiety (placed in the "non-test-anxious group" – NTAG). The criteria used for diagnosis of test anxiety were based on the diagnostic criteria for social phobia described by the DSM-IV (1994). (In the DSM-IV test anxiety is categorized under social phobia.)

At the end of the interview an assessment of learning difficulties was performed, which determined if participants had learning disabilities and the type. The diagnosis of learning disabilities was based on the criteria of

the DSM-IV (1994) calling for two standard deviations between achievement and IQ, or in some cases a smaller discrepancy – between one and two standard deviations – as specified by the manual. A Hebrew version of the WAIS-R (Wechsler, 1981) was used to assess IQ, while other specific measures of reading, writing, and arithmetic were used to assess the specific learning disability of each participant. Three participants who were not diagnosed as having LD were excluded from the study.

At the end of this part of the assessment, the following questionnaires were administered: (a) TAI and (b) MMPI-2. The reason the clinical interview was used for the diagnosis of test anxiety was to allow the researchers to use the TAI for additional analysis, not only for the selection procedure. Also, the TAI was used to further validate the existence or non-existence of test anxiety among the two groups.

### **RESULTS**

The high-test-anxious group (HTAG) and the non-test-anxious group (NTAG) were compared on age, total IQ, Verbal IQ, Performance IQ, and the TAI and its two submeasures (Worry and Emotionality). The results showed significant differences on Verbal IQ and, as expected, on all three measures of the TAI. These results are shown in Table 1.

Assessment of the MMPI-2 and its measures using *t*-tests was carried out to compare the two groups (using an overall *p* level of 0.05; a Bonferroni procedure was used to control for experiment-wise Type I error, yielding *p* of 0.001 for each individual *t*-test). The comparison showed significant differences in 35 out of 68 measures of the MMPI-2 (4 out of the 10 clinical scales, 7 out of 15 content scales, 7 out of the 15 supplementary scales, and 17 out of 28 of the Harris-Lingoes scales). The results of a comparison of the two groups on the most important measures of the MMPI, the 10 clinical scales of the MMPI-2, are shown in Table 2.

The most important measures separating the two groups were determined by using a stepwise discriminant-function analysis (a stepwise discriminant function with Bonferroni procedure was used to avoid increased type I error rate due to many variable used in the analysis). The analysis of the content scales, the supplementary scales, and the Harris-Lingoes scales (without the 10 clinical scales) showed that one scale could explain most of the variance between the HTAG and the NTAG, College Maladjustment (MT). Specifically, the discriminant function

could differentiate between the two groups with 79.6% accuracy.

The next assessment consisted of comparing the HTAG and the NTAG to the population mean of the MMPI-2 clinical scales. Only one clinical scale in the HTAG, Scale 7, Psychasthenia (Pt), was above the clinical level considered significantly high (*t*-score of 65); this was true for both males and females. This comparison is shown in Table 3.

One intriguing issue in test anxiety relates to the unique relationships between MMPI-2 variables and the aspect of "emotionality" versus "worry." This issue was explored by employing a stepwise regression where the "emotionality" subscale was used as the dependent variable whereas the "worry" subscale was introduced as the forced variable in the first block of the stepwise regression, with the MMPI-2 clinical scales following in a stepwise manner in a second block.

This analysis indicated that the depression subscale explained an additional 5.7% of the variance of "emotionality" beyond the 58% of the common variance between the "emotionality" subscale and the "worry" subscale. In contrast, when the position of

**Table 2**

***Means and Standard Deviations of MMPI-2 Results of the High-Test-Anxious LD Group (N = 24) Compared to the Non-Test-Anxious LD Group (N = 30)***

Variable	High-Test-Anxious Group		Non-Test-Anxious Group		<i>t</i> <sup>1</sup>
	Mean	SD	Mean	SD	
<b>MMPI-2</b>					
Hypochondriasis	16.96	4.20	16.10	3.90	.78
Depression	25.04	4.53	20.93	4.04	3.52*
Hysteria	24.33	3.41	24.73	4.84	.34
Psychopathic Deviate	26.46	4.97	23.37	3.97	2.60
Masculinity-Femininity	31.29	5.41	28.47	5.51	1.89
Paranoia	13.21	3.48	10.97	2.30	2.72
Psychasthenia	35.83	6.27	29.33	4.29	4.29**
Schizophrenia	34.21	5.76	28.93	5.09	3.57*
Hypomania	22.92	4.58	20.03	3.55	2.61
Social Introversion	33.00	7.55	26.03	6.79	3.56*

<sup>1</sup>The Bonferroni procedure was used to control for Type 1 error.  
\* *p* < .05. \*\* *p* < .01.

**Table 3**

*Means of Raw Scores of MMPI-2 Results of the High-Test-Anxious LD Group (N = 24), the Non-Test-Anxious LD Group (N = 30), and Population Norm*

Variable	High-Test-Anxious	Non-Test-Anxious	Population Norm	
	Group Mean	Group Mean	Mean Males	Mean Females
<b>MMPI-2</b>				
Hypochondriasis	16.96	16.10	12.67	13.50
Depression	25.04	20.93	18.00	20.50
Hysteria	24.33	24.73	21.00	22.50
Psychopathic Deviate	26.46	23.37	23.00	22.50
Masculinity-Femininity	31.29	28.47	26.00	36.00
Paranoia	13.21	10.97	10.25	10.33
Psychasthenia	35.83 <sup>a,b</sup>	29.33	26.50	27.50
Schizophrenia	34.21	28.93	26.50	27.50
Hypomania	22.92	20.03	20.50	19.50
Social Introversion	33.00	26.03	25.50	28.00

<sup>a</sup> Raw score is higher than T-score of 65 of male norm.

<sup>b</sup> Raw score is higher than T-score of 65 of female norm.

emotionality and worry were reversed, and worry was used as the dependent variable, the MMPI-2 clinical scales did not contribute any additional explained variance of the worry subscale over the emotionality subscale. In other words, the addition of the MMPI-2 subscale of depression explained 5.7% of the emotionality factor in test anxiety, which is unrelated to the worry aspect of test anxiety.

### DISCUSSION

The results showed many differences between the two groups. The clear differences on the measures of test anxiety are logical since test anxiety was used to separate the two groups. The significant differences in Verbal IQ can be explained in one of two ways: (a) as found in previous studies, test anxiety causes lower academic performance (Bryan et al., 1983; Guttman, 1987; Zatz & Chassin, 1985); and (b) emotional difficulties experienced by the HTAG has a negative effect on the verbal ability of those who suffer from test anxiety.

A significant difference found on many measures of the MMPI-2 requires serious attention. The fact that

among the clinical scales of the MMPI-2, 4 out of 10 showed significant differences indicates that LD students with test anxiety (HTAG) had higher levels of psychopathology. In other measures of the MMPI-2, there were also significant differences, with 31 out of the 58 additional measures showing higher levels of various difficulties in the HTAG. It was not expected that the two groups would differ in so many pathological and personality measures.

The clinical meaning of each of the four MMPI-2 clinical measures found to differentiate between the two groups is based on four clinical measures. Scale 7 (Psychasthenia) was aimed at measuring symptoms similar to those of clients with an obsessive-compulsive disorder. Graham (1990) described individuals with high scores on Scale 7 as "tend to be very anxious, tense, and agitated. They worry a great deal, even over very small problems, and they are fearful and apprehensive. High-strung and jumpy, they report difficulties in concentrating and often receive anxiety disorder diagnoses" (p. 74).

Individuals with high scores on Scale 2 (Depression) are described as having depressive symptoms, feel

---

unhappy, blue, dysphoric, and pessimistic. They have self-deprecatory and guilt feelings, often cry, show psychomotor retardation, and refuse to speak. They tend to be agitated and tense (Graham, 1990).

Individuals who score high on Scale 8 (Schizophrenia) may have psychotic disorder, and can be disorganized, confused, and disoriented. Often they report unusual thoughts or hallucinations, or attitudes. In addition, they may have poor judgment and live a schizoid life-style (Graham, 1990).

Finally, Scale 0 (Social Introversion) was constructed to assess clients' tendency to withdraw from responsibilities and social contacts. Individuals with high scores on this scale were described by Graham (1990) as

very insecure and uncomfortable in social situations. They tend to be shy, reserved, timid, and retiring. They feel more comfortable when alone or with a few close friends, and they do not participate in many social activities. They may be especially uncomfortable around members of the opposite sex. (p. 83)

The clinical explanation of the measure of College Maladjustment (MT), which was found to differentiate 79.6% of the subjects in the two groups, is as follows: high MT scores among college students is indicative of individuals who are ineffectual, pessimistic, anxious and worried, and who procrastinate, somatize, and feel that life is a strain much of the time. In contrast, those who score low on MT are described as optimistic, conscientious, and feeling relatively free of emotional discomfort (Graham, 1990). It is possible that the components of College Maladjustment serve as the main reasons for the difficulties of students who suffer from test anxiety. Therefore, reducing these problematic thoughts, feelings, and behaviors may decrease anxiety and improve optimism and constructive behaviors.

A possible explanation for these findings may be found in the fact that study participants had debilitating conditions: learning disabilities and test anxiety. This combination is presumably the important factor in creating higher levels of psychopathology as indicated by the personality profile of the HTAG. That is, learning disability causes feelings of failure, low self-esteem and inferiority. Test anxiety adds another dimension of not being able to deal with testing situations and presumably leads to additional corrosion of the student's self-esteem. This combination creates a situation in which the person has difficulties dealing with academic material; if he or she succeeds in typical class situations after a great deal of effort, even then he or she will likely be unable to perform adequately on tests, which is the only way to attain success in many academic settings. It seems that this com-

orbidity has an extremely significant influence on personality, to such an extent that in 35 out of 68 measures of the MMPI-2, the HTAG was showing more pathology. Another possibility is that for the combination of these two problems we have to create a new model explaining the poor performance in school, based on emotional problems as indicated by the findings of the present study.

The finding that Scale 7 (Psychasthenia) was in the significant range of the clinical level indicates a component of generalized anxiety within test anxiety. Perhaps test anxiety is not only a form of state anxiety, but also includes important trait anxiety components. Another possibility is that we need to form new terms of "trait test anxiety" and "state test anxiety." These are assumptions that have to be assessed further.

### ***Implications for Practice***

The attempt to explain the two different test anxiety profiles with personality structure found in the MMPI-2 showed a unique relationships between the MMPI-2 depression scale and the emotional element in test anxiety. It suggests that this element in test anxiety is distressing and relates more to the pathological characteristics of the student, as characterized by a high score on depression. The emotional factor of the TAI is the affective dimension; therefore, it is logical that those who are high on the affective dimension are more prone to be depressed as an emotional reaction to test anxious situations. In contrast, those with high "worry" scores on the TAI – the cognitive component – are less prone to experience depressive feelings as a reaction to test anxious situations. Perhaps these two types of test-anxious subjects need different treatment modalities based on the type of personality associated with each type of test anxiety. This assumption should be tested further in future research.

Finally, the findings presented here stress the need to assess further the influence of these two disabilities on students' personality. More assessment using a wider variety of research tools should improve our understanding of this problem. One additional interesting line of research would be to explore which aspects of depression relate to the unique emotional component of test anxiety. The findings of the present study also point to the need for specialized treatment for this population in order to allow them to function more effectively in an academic program.

### **REFERENCES**

- Almagor, M., Budesco, D., Nevo, B., & Montag, I. (1994). The Israeli MMPI-2. *News & Profiles*, 5, 4.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.

- Bendel, D., Tollefson, N., & Fine, M. (1980). Interaction of locus-of-control orientation and the performance of learning disabled adolescents. *Journal of Learning Disabilities, 13*, 32-35.
- Ben-Dov (1992). *Social skills and loneliness among adolescents with and without learning disabilities in the kibbutz and the city (Hebrew)*. Unpublished master's thesis, Tel-Aviv University, Israel.
- Benson, J., & Bandalos D. L. (1992). Second-order confirmatory factor analysis of the Reactions to Tests scale with cross-validation. *Multivariate Behavioral Research, 27*, 459-487.
- Birenbaum, M., & Nasser, F. (1994). On the relationship between test anxiety and test performance. *Measurement & Evaluation in Counseling & Development, 27*, 293-302.
- Bryan, J. H., Sonnefeld, L. J., & Grabowski, B. (1983). The relationship between fear of failure and learning disabilities. *Learning Disability Quarterly, 6*, 217-222.
- Butcher, J. N., Dahlstrom, W. G., Graham, J. R., Tellegen, A., & Kaemmer, B. (1989). *Minnesota Multiphasic Personality Inventory (MMPI-2). Manual for administration and scoring*. Minneapolis: University of Minnesota Press.
- Cannon, B. J. (1999). Relative interference on Logical Memory I Story A versus Story B of the Wechsler Memory Scale-Revised in a clinical sample. *Applied Neuropsychology, 6*, 178-180.
- Deffenbacher, J. L. (1980). Worry and emotionality in test anxiety. In I. G. Sarason (Ed.), *Test anxiety: Theory, research, and application* (pp. 111-128). Hillsdale, NJ: Erlbaum.
- Einat, A. (2000). *Learning disabilities – The challenge* (in Hebrew). Tel Aviv, Israel: Reches Publishers, Educational Projects.
- Gaddes, W. H. (1985). *Learning disabilities and brain function: A neuropsychological approach*. New York: Springer-Verlag.
- Giordano, L. A. (2000). Effects of test anxiety in control training on anxious behaviors and academic performance in college students with learning disabilities. *Dissertation Abstract International, 60*, 4196.
- Graham, J. R. (1990). *MMPI-2 assessing personality and psychopathology*. New York: Oxford University Press.
- Guttman, J. (1987). Test anxiety and performance of adolescent children of divorced parents. *Educational Psychology, 7*, 225-229.
- Hallahan, D. P., Gajar, A. H., Cohen, S. B., & Tarver, S. G. (1978). Selective attention and locus of control in learning disabled and normal children. *Journal of Learning Disabilities, 11*, 47-52.
- Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. *Review of Educational Research, 58*, 47-77.
- Hill, K. T., & Sarason, S. B. (1966). The relation of test anxiety and defensiveness to test and school performance over the elementary school years: A further longitudinal study. *Monograph of the Society for Research in Child Development, 31*, (Whole No. 2).
- Hong, E. (1998). Differential stability of individual differences in state and trait test anxiety. *Learning & Individual Differences, 10*, 51-70.
- Johnson, D. J., & Blalock, J. (1987). *Adults with learning disabilities*. Orlando, FL: Grune & Stratton.
- La Greca, A. M. (1987). Children with learning disabilities: Interpersonal skills and social competence. *Journal of Reading, Writing, and Learning Disabilities International, 3*, 167-185.
- Lancaster, S., Mellard, D., & Hoffman, L. (2001). *Experiences of students with disabilities in selected community and technical colleges. The individual accommodation model: Accommodating students with disabilities in postsecondary settings*. Lawrence: University of Kansas, Center for Research on Learning.
- Liebert, R. M., & Morris, L. W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports, 20*, 975-978.
- Lubin, B., Larson, R. M., Matarazzo, J. D., & Seever, M. (1985). Psychological test usage patterns in five professional settings. *American Psychologist, 40*, 857-861.
- Morris, L. W., Davis, M. A., & Hutchings, C. J. (1981). Cognitive and emotional components of anxiety: Literature review and a revised worry-emotionality scale. *Journal of Educational Psychology, 73*, 541-555.
- Nasser, F., & Takahashi T. (1996). *An application of confirmatory factor analysis with item parcels for testing the structure of test anxiety among Israeli-Arab high school students*. Paper presented at the annual meeting of the National Council on Measurement in Education, New York.
- Noel, G., Hoy, C., King, M., Moreland, C., & Meera, J. (1992). The MMPI-2 profile of adults with learning disabilities in university and rehabilitation settings. *Journal of Learning Disabilities, 25*, 386-395.
- O'Neil, H. F., & Fukumura T. (1992). Relationship of worry and emotionality to test performance in the Juku environment. *Anxiety, Stress and Coping: An International Journal, 5*, 241-251.
- Paulman, R. G., & Kennelly, K. J. (1984). Test anxiety and ineffective test taking: Different names, same construct. *Journal of Educational Psychology, 76*, 279-288.
- Plass, J., & Hill, K. T. (1986). Children's achievement strategies and test performance: The role of time pressure, evaluation anxiety, and sex. *Developmental Psychology, 22*, 31-36.
- Sarason, I. G. (1980). *Test anxiety: Theory, research and applications*. Hillsdale, NJ: Erlbaum.
- Sarason, I. G. (1984). Stress, anxiety, and cognitive interference: Reactions to tests. *Journal of Personality and Social Psychology, 46*, 929-938.
- Seipp, B. (1991). Anxiety and academic performance: A meta-analysis of findings. *Anxiety Research, 4*, 27-41.
- Shaked, Y. (1996, September 30). During the test I am in a shock. *Marive* (Israeli daily newspaper), A1, p. 6-7.
- Spielberger, C. D. (1972). Current trends in theory and research on anxiety. In C. D. Spielberger (Ed.), *Anxiety, current trends in theory and research*. New York and London: Academic Press.
- Spielberger, C. D., Gonzales, H. P., Taylor, C. J., Anton, W. D., Algaze, B., Ross, G. K., & Westberry, L. G. (1980). *Test Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Stevens, S. A. (2001). Test anxiety and beliefs about testing in college students with and without learning disabilities. *Dissertation Abstracts International, 61*, 7-A.
- Swanson, S., & Howell, C. C. (1996). Test anxiety in adolescents with learning disabilities and behavior disorder. *Exceptional Children, 62*, 389-397.
- Tarnowski, K. J., & Nay, S. M. (1989). Locus of control in children with learning disabilities and hyperactivity: A subgroup analysis. *Journal of Learning Disabilities, 22*, 381-384.
- Tobias, S. (1985). Test anxiety: Interference, defective skills and cognitive capacity. *Educational Psychologist, 50*, 343-373.
- Tollefson, N., Tracy, D. B., Johnson, E. P., & Borgers, S. (1979). *An application of attribution theory to self-concept development of learning disabled adolescents* (Technical Report). Lawrence: University of Kansas, Institute for Research on Learning Disabilities.
- Turner, D. E. (1996). The effects of anxiety on digit span and memory test performance. *Dissertation Abstract International, 57*, 3428.
- Wachelka, D., & Katz, R. C. (1999). Reducing test anxiety and improving academic self-esteem in high school and college students with learning disabilities. *Journal of Behavior Therapy and Experimental Psychiatry, 30*, 191-198.
- Wine, J. D. (1971). Test anxiety and direction of attention. *Psychological Bulletin, 76*, 92-104.



- 
- Wine, J. D. (1982). Evaluation anxiety: A cognitive-attentional construct. In H. W. Krohne & L. Laux, *Achievement, stress and anxiety* (pp. 207-219). Washington, DC: Hemisphere.
- Wechsler, D. (1981). *Wechsler Adult Intelligence Scale-Revised*. New York: Psychological Corporation.
- Wittmaier, B. (1972). Test anxiety and study habits. *Journal of Educational Research*, 65, 852-854.
- Write, L. S., & Stimmel, T. (1984). Perceptions of parents and self among college students reporting learning disabilities. *The Exceptional Child*, 31, 203-208.
- Zatz, S., & Chassin, L. (1985). Cognitions of test-anxious children under naturalistic test-taking conditions. *Journal of Consulting and Clinical Psychology*, 53, 393-401.
- Zeidner, M., & Nevo, B. (1988). *Test Anxiety Inventory*, Hebrew Version, instructions to the user. The University of Haifa.
- Zeidner, M., & Nevo, B. (1992). Test anxiety in examinees in a college admission-testing situation: Incidence, dimensionality, and cognitive correlates. In *Advances in Test Anxiety Research* (Vol. 7), Series edited by H. M. van der Ploeg, R. Schwarzer, & C. D. Spielberger. Volume edited by K. A. Hagtvet & T. B. Johnson (pp. 288-303). Amsterdam/Lisse, The Netherlands: Swets & Zeitlinger.

### NOTES

We thank Jim Parish-Plass, Ph.D., for his assistance and editorial comments.

Requests for reprints should be addressed to: Dubi Lufi, Kibbutz Yifat 30069, Israel; [dubi\\_lufi@yifat.org.il](mailto:dubi_lufi@yifat.org.il)

**Visit CLD's website**

**[www.cldinternational.org](http://www.cldinternational.org)**