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Are There Differences in Test Anxiety Levels for Middle School Students  
with and without Disabilities?

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### Abstract

The purpose of this research was to determine if differences exist in test anxiety levels for students enrolled in regular education and those qualifying for special education services. Studies comparing test anxiety between regular education and special education students have been few in number. This research reviewed studies of test anxiety for these groups and presented detailed findings based on a study completed at a middle school in rural Ohio. The participants in this study consisted of 60 middle school students, 16 of whom received special education services, and 44 regular education students. Previous studies show that special education students experience a higher level of test anxiety than their regular education counterparts, but this study's findings revealed that, while students with learning disabilities experienced some higher levels of test anxiety, the regular education students exhibited a higher rate of high anxiety.

## Are There Differences in Test Anxiety Levels for Middle School Students with and without Disabilities?

There have been many studies conducted and research completed on test anxiety. With the No Child Left Behind Act of 2001, administrators and teachers feel added pressure for all students to perform well on tests. Of course, a great deal of extra pressure falls on the students to perform better, as well. This increased pressure brings with it increased test anxiety among students (Casbarro, 2005; Milloy Winans, Jehlen, Loshert, & O'Neil, 2003). In 1994, Birenbaum and Nasser remarked that test anxiety was "one of the most disruptive factors in school" and other evaluative settings (p. 176). Test anxiety is not only a problem in schools, but it also affects many people in various life stages and careers beyond school, whenever their abilities, achievements, or interests are evaluated or assessed (Lufi, Okasha, & Cohen, 2004).

Many studies exist regarding test anxiety, but not much is yet known about how it affects students with learning disabilities (LD). High-stakes testing has consequences for students with LD across all levels of education, as "standardized testing has become the 'centerpiece of accountability' in the K-12 public education setting" (Brinckerhoff & Banerjee, 2007). Another situation arising with regard to test anxiety and LD is the granting of accommodations to test takers with disabilities for high-stakes tests. Granting accommodations has no set policy; guidelines can be very broad, and requests for accommodations are growing rapidly. Not only are testing agencies looking at larger numbers of requests, but diagnoses of disabilities are becoming more complex (Lufi, Okasha, & Cohen, 2004).

Fritz (2007) predicted that students with LD have higher levels of test anxiety. The researcher also called for future studies to see if test anxiety research with students with LD might shape intervention strategies to reduce test anxiety in these students. The purpose of the current study was to further research into the levels of test anxiety experienced by students with LD to see if there is a difference in levels of test anxiety among students in special education and students in regular education settings, specifically middle school-aged students.

### Review of Literature

There are several definitions of test anxiety (Liebert & Morris, 1967; Nicaise, 1995; Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978; Suinn, 1968). One definition, as described by Nicaise (1995), defined test anxiety as “an individual’s physiological, cognitive, and behavioral responses that stimulate negative feelings about an evaluation” (p. 360). He proposed that when an individual becomes anxious, the physiological system becomes stimulated, causing faster heart beat and increased perspiration from the sweat glands, leading to feelings of apprehension and inadequacy. He believes that when experiencing test anxiety, individuals develop negative feelings about testing situations (Nicaise).

Suinn (1968) described test anxiety as “an inability to think or remember, a feeling of tension, and difficulty in reading and comprehending simple sentences or directions on an examination” (p. 385). Suinn’s definition is different from that of Spielberger and Vagg (1995) who described test anxiety as a “situation-specific form of trait anxiety”, which is explained as a “stable personality characteristic” and “state anxiety is a transitory emotional state” (Spielberger et al., 1978, p. 176). Individuals,

who tend to be test-anxious, will more than likely experience worry, or negative thoughts and tension in testing situations, which is trait anxiety; the trait anxiety of test-anxious individuals will cause them to experience more intense levels of state anxiety in an evaluative situation. These individuals experience physiological symptoms of test anxiety, which activates worry conditions stored in their memory and interferes with a person's performance on a test (Zeidner, 1998).

This researcher uses the Spielberger definition of test anxiety. The data collection instrument for this particular study was Spielberger's *Test Anxiety Inventory*, which measures worry and emotionality state anxieties as influenced by the testing environment.

After examining the definitions of test anxiety, it is important to examine the many dimensions of test anxiety. Researchers agree that test anxiety is complex and consists of many dimensions (Benson, 1998; Zeidner, 1998). Based on nearly a century of research, test anxiety consists of "emotionality, worry, cognitive interference, and a lack of self-confidence" (Hodapp, 1995). Researchers, Hodapp and Benson(1997) also believe there is a possibility of a lack of self-efficacy. In a 1999 study, Libert, Morris, Spielberger and Vagg named this "emotionality" aspect of test anxiety as "physiological hyperarousal". Physical symptoms include "sweaty palms, increased heart rate, or shallow breathing and rapid breathing when an individual prepares for and takes a test" (Beidel, 1998). Liebert and Morris emphasized worry as one of the key elements when examining test anxiety (1967). This *worry* aspect is in reference to "negative self-talk and negative cognitions" a person may experience when testing. Test-anxious students, as acknowledged by Cizek and Burg, "do not approach a task such as a test with a positive outlook or expectation of success, but with dread regarding the potential for

negative evaluation or failure” (Cizek & Burg, 2005, p. 17). It is believed by Hembree (1988) that this worry component may play a stronger role in test anxiety and cause lower test performance than the emotionality component. In fact, other researchers, like Stöber and Pekrun (2004) thought there was a direct link between lower test performance and worry.

Another dimension researchers focus on is cognitive obstruction. This is described as “the degree to which test anxiety disrupts the ability of an individual to organize his or her thoughts or to concentrate on the task at hand” (Hodapp, 1995, p. 361). Another important dimension of test anxiety is social humiliation, which occurs when one fears or worries that “others will deride or disparage one’s performance on a test” (Sena, Lowe, & Lee, 2007). Friedman and Bendas-Jacob (1997) concluded this was a “salient feature of test anxiety” during their analytic and cross-validation study.

It is a combination of these various components that make up the different dimensions of test anxiety. Some studies, however, show how these components can actually lead to increased performance during testing. One such study was completed by Yerkes and Dodson (1908) and another by Alpert and Haber (1960). Their findings concluded that “some test anxiety actually enhances or facilitates test performance” (Sena, Lowe, & Lee, 2007, p. 361). Because of these dimensions, Lee and DeRuyck (2004) believe new measures should be developed based on “a broader conceptualization of the test anxiety construct to assess test anxiety in elementary and secondary school students.”

Administrators, teachers, and researchers realize there are a number of students who suffer from test anxiety. A recent study completed in 2004 concluded that at least

33% of all students experience some form of test anxiety (Methia, 2004). It is obvious that as a result of increased testing and testing requirements, there has been a steady increase in those who experience test anxiety, which is having a negative effect on students (Casbarro, 2005; Wren & Benson, 2004). Based on studies completed by Hancock (2001) and Hembree (1988), students suffering from test anxiety do not perform up to their potential when put in testing situations. In fact, it can lead to poor classroom performance and trouble learning new information (Chapell et al., 2005).

Very few test anxiety studies have been completed comparing students with and without disabilities. Many components and dimensions of test anxiety have been identified, and the negative effects on students' test performance and how it extends into the classroom has been described. But what about the differences between school-aged students with disabilities and those without disabilities who are experiencing test anxiety? Hancock (2001) believed that problems already faced by students with learning disabilities create a perceived threat associated with tests that increases their test anxiety. Research focusing on students with learning disabilities has shown that these students definitely experience more problems when in an evaluative situation than students without disabilities (Bryan, Sonnefeld, & Grabowski, 1983; Heiman & Precel, 2003; Swanson & Howell, 1996).

Swanson and Howell (1996) completed a study of 82 students with learning disabilities comparing test anxiety and its relationship between academic achievement, self-concept, cognitive interference, and study habits. They found test anxiety did in fact correlate negatively in all areas mentioned above, except cognitive interference, in which it correlated positively (Swanson & Howell, 1996). In 1991, Hughes reported that

students with learning disabilities admitted they had difficulty studying and taking tests. Nearly 84% of students with LD requested and received test accommodations. During their testing, these students reported they were more stressed, nervous, frustrated, felt more helpless and uncertain than their peers without LD (Heiman & Precel, 2003).

A study completed by Bryan et al. (1983) examined the relationships of students with and without LD and their test anxiety scores combined with the relationships between test anxiety scores of LD students and their reading and mathematics achievement test scores. In this research, 30 students with LD and 30 students without were tested in grades 3 through 8. The students completed the *Test Anxiety Scale for Children* (TASC; Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). They also completed the *Lie Scale for Children* (LSC; Sarason, Hill, & Zimbardo, 1964), as well as the *Understand Scale* (Bryan et al., 1983). The findings of the study showed “that students with LD were more test anxious than students without learning disabilities, and students with LDs’ test anxiety scores were a significant predictor of their reading and mathematics achievement test scores” (Sena, Lowe & Lee, 2007, p. 362).

In their 1985 study, Ford, Pelham, and Ross tested students with attention deficits with and without a reading disability and high and low test anxiety. They studied 115 boys, split into groups of equal numbers with and without reading disabilities. Researchers administered the TASC and the *Defensiveness Scale for Children* (DSC; Sarason et al., 1960). Students with DSC scores in the upper 10% were excluded from the study, leaving ninety-three students who continued. Of these students, “25 students with a reading disability had high test anxiety, 17 students with a reading disability had low test anxiety, 21 students without a reading disability had high test anxiety, and 30

students without a reading disability had low test anxiety” (Ford et al., 1985, p. 15).

Although there were no real differences between high and low test-anxious students, they discovered that older students with reading disabilities were higher test-anxious compared to those without a reading disability.

While there have been many studies of test anxiety, its components, and its effects on students, there are few studies that have compared test anxiety differences between students with and without learning disabilities and its effect on testing. This study hypothesized that students with learning disabilities experienced a higher level of test anxiety than those in a regular classroom setting.

### Method

#### *Location*

The middle school selected for this study is located in a rural area of the Appalachian region of Southeastern Ohio. The participants were all students enrolled in middle school and range from high levels of functioning (gifted) to lower levels (students with identified disabilities). Although some students with disabilities are served in regular education classrooms, there are some who attend special education classes either full-time or part-time. This particular setting was selected as a sample of convenience, as the researcher has worked extensively in the school as a substitute teacher. Inviting all students in the school to be participants provided results that would give a better idea of the differences between students receiving special education and their typically developing peers and how they deal with test anxiety.

### *Participants*

A total of 421 middle school students were invited to participate in this research. Of the 421 students, 60 returned parental consent and student assent forms and were able to complete the survey. This represents a 14% response rate. The participants included 16 students receiving special education services and 44 general education students. The participants' ages ranged from 9 to 13 years, in a middle school setting serving grades 6 to 8.

### *Instrument*

The instrument chosen for data collection in this study was a survey designed to measure test anxiety. The survey, entitled the *Test Anxiety Inventory* was developed by Charles Spielberger and colleagues in 1980, and measures worry and emotionality, two major elements of test anxiety (Lufi, Okasha, & Cohen, 2004). Spielberger reported the results of the survey as reliable and valid. It "remains the most popular measure of test anxiety used in clinical work and research" (Lufi, Okasha, & Cohen, 2004, p. 177).

The *Test Anxiety Inventory* is a self-report instrument that provides a direct measure of how the student feels about testing. The survey consists of 19 questions. Students are instructed to circle a number 1, 2, 3 or 4. A 1 reflects an answer of "Almost never"; a 2 is "Sometimes"; a 3 represents an answer of "Often"; and a 4 signifies "Almost always." A sample question is, "Thoughts of doing poorly interfere with my concentration on tests." A copy of the survey can be found in Appendix A. Typically, an answer of 1 will indicate the least level of anxiety but, depending upon the question's wording, could indicate a high anxiety level. Such a question is reverse coded when scored.

### *Procedures*

After receiving approval from the university's Internal Review Board for Human Subjects, the researcher delivered parent consent and student assent forms to all homeroom teachers so forms could be distributed to all students in the school. The forms were then sent home with the students for parent consent. The researcher answered any questions and clarified the purpose of the study as needed. Homeroom teachers were instructed to distribute the consent forms and have them returned within two days. The homeroom teachers addressed the students by saying, "Please have your parents fill out the permission form. If they do not want you to participate in the research study, please have them check the box where it says, 'I do not want my child to participate in the study.'" Once the parents signed the consent forms, the children could then sign the assent forms if they were willing to participate. When the students returned the consent and assent forms, they were given a pencil as a token of appreciation. The researcher then returned to the homerooms, when convenient and agreeable to the teacher, and distributed the surveys. At that time, the researcher answered any questions the students had about the survey. The homeroom teacher was asked to collect the completed surveys, and the researcher returned to each room and collected the completed surveys from the teachers.

### Results

The researcher created tables to plot and analyze the responses to the 19 questions on the survey. (See Tables 2 and 4, Appendix B and C). The answers of 1 (Almost never), 2 (Sometimes), 3 (Often), or 4 (Almost always) correlated with levels of anxiety, with a 1 being least anxious to a 4 being most anxious; but, depending upon the wording

of the question, the item was reverse scored. For example, the first question, “I feel confident and relaxed while taking tests,” was reverse scored, since an answer of 1 (almost never) indicates a high level of anxiety rather than the usual low level associated with an answer of 1.

The researcher totaled the answers to each question, then, depending on the questions’ anxiety level, summed all the responses and presented them in a chart of the anxiety levels, with percentages and ranges from 1 (Least anxious) to 4 (Most anxious).

#### *All Students*

Sixty students returned the surveys for a total of 1134 answers. All 44 general education students answered all 19 questions on the survey. Of the 16 special education students’ surveys, six questions were not answered. Of the 19 questions, the total of the anxiety level 1 (Least anxious) responses was 373, which means that 32.9% of the time, the students are ‘rarely’ anxious about tests. Level 2 (Some anxiety) answers were marked a total of 314 times, for a ‘sometimes’ anxiety rate of 27.7%. Level 3 (Often anxious) was indicated 207 times, 18.3%. Level 4 (Most anxious) was marked a total of 240 times, for a rate of 21.2%.

#### *Special Education*

The 16 students receiving special education services provided 298 answers on their surveys. Anxiety level 1 (Least anxious) was given 96 times, so they are least anxious 32.2% of the time they take tests. They answered 2 (Sometimes anxious) 89 times, for a “sometimes anxious” rate of 29.9%. “Often anxious”, or level 3 was indicated 60 times, for a rate of 20.1%. Level 4 responses, (Most anxious) were marked 53 times, for an anxiety level of 17.8%. (See Table 1).

Table 1

## Distribution of Self-Reported Anxiety Levels for Students

## Enrolled in Special Education

Anxiety Level	Number of Responses	Percent of Respondents
1 (least)	96	32.2%
2 (some)	89	29.9%
3 (often)	60	20.1%
4 (most)	53	17.8%

*General Education*

All 44 general education students answered all 19 questions on the survey for a total of 836 answers. A level 1 response (Least anxious) was answered on the survey 277 times; this gave a least anxious rate of 33.1%. A level 2 (Sometimes anxious) indication was marked 225 times for a rate of 26.9%. They answered with a level 3 (Often anxious) 147 times, 17.6%. A level 4, (Most anxious) was given 187 times, for a rate of 22.4%. (See Table 3).

Table 3

Distribution of Self-Reported Anxiety Levels for General  
Education Students

Anxiety Level	Number of Responses	Percent of Respondents
1 (least)	277	33.1%
2 (some)	225	26.9%
3 (often)	147	17.6%
4 (most)	187	22.4%

A t-test was calculated comparing the two groups of students for each level of anxiety. The results for level 1 (least anxious) were  $t_1 = 10.83$ ; for level 2 (sometimes anxious)  $t_2 = 9.81$ ; for level 3 (often anxious)  $t_3 = 7.76$ , and level 4 (most anxious)  $t_4 = 10.07$ . Looking at a table of t distribution critical values (Appendix D, Table 5), an alpha level of  $p = .0005$ , with a t-value greater than 3.496 and 3.46, for 50 and 60 degrees of freedom ( $df = \text{total number of test subjects } (n) - 2$ ) [the  $df$  for this test was 58 ( $60-2$ )] gives a confidence level greater than 99.9%. All t-values for the 4 levels of anxiety between the two groups were greater than the alpha level  $p = .0005$  t-values of the table. Therefore, the differences in each level of anxiety between the two groups was significant, and not due to chance. The results can, therefore be considered true for this set of test subjects.

All students surveyed reported noticeable levels of anxiety when taking tests. The special education group had higher anxiety rates for two of the three (higher) levels of

anxiety – Sometimes and Often. The LD group also had a lower rate of least anxiety, but the students in the regular classroom setting had a higher incidence of showing most (highest level) anxiety.

### Discussion and Recommendations

The survey results confirm previous research findings, for the most part, and partially support the hypothesis that students who have a learning disability, experience some higher levels of test anxiety than those without disabilities.

If the survey was completed by more students, with even numbers of participants in both groups (more students with LD completing the survey), perhaps the results may have indicated significant differences and higher levels of test anxiety in students with LD. Perhaps the unanswered questions from the students with disabilities skewed the results some. With further testing, it should be emphasized that *all* questions be answered.

The common thread in the articles reviewed for this study indicated that students facing a test experience worry, which leads to tension, negative thoughts, and a lack of self-confidence. Worry then triggers physical hyper arousal such as increased perspiration, rapid heartbeat, and rapid breathing. The combination of worry and its physical manifestations can lead to the students performing poorly on tests.

Since research in this area is sparse, more information is needed so that as educators, we can fully understand the effects of test anxiety on students with learning disabilities. Once a clear understanding is gained as to why this occurs, we can then begin to focus on preparing students and helping them overcome testing anxiety. Test

anxiety not only influences test scores, but as Spielberger (1972) indicated, it also influences performance in the classroom as well as overall self-esteem.

### Implications for Practice

As a way to address test anxiety, educators could use strategies such as scheduling more study sessions in class so the teacher is available to answer questions. Teachers could also interact with students by using study games before a test to help better prepare them. Working with the students in a more relaxed setting could lead to them feeling less tension about the test. Another option would be to have the students form study groups within the classroom. The students could work together and look up answers to a study guide. This would not only be a learning experience, but it would be enjoyable because students often enjoy working together. Another strategy that could be used would be to have a quick question and answer review time prior to the test. The combination of these strategies would work well with all students to reduce their test anxiety.

### Conclusion

In conclusion, the results indicated that all students experience some degree of test anxiety. By adopting a variety of pre-test study techniques, such as the students working together in study groups and having review sessions before tests, teachers could reduce test anxiety for their students. Implementing the additional study support in the classroom would promote student confidence when taking tests, producing positive outcomes. This would not only increase their confidence in the classroom, but in other academic areas, as well. These strategies lead to reduced stress in the classroom environment for the students, and less stress would lead to more positive educational experiences.

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## Appendix A

Age:  
 Gender:  
 Grade:  
 Homeroom Teacher:

**Test Anxiety Survey**

Directions: Please circle 1-4 to indicate how you feel when you are taking a test.

1= Almost never  
 2= Sometimes  
 3= Often  
 4= Almost Always

1. I feel confident and relaxed while taking tests.  
 1                      2                      3                      4
2. Thinking about the grade I may get in a course interferes with my work on tests.  
 1                      2                      3                      4
3. I freeze up on final exams.  
 1                      2                      3                      4
4. During tests I find myself wondering whether I will ever get through school.  
 1                      2                      3                      4
5. The harder I work at taking a test, the more confused I get.  
 1                      2                      3                      4
6. Thoughts of doing poorly interfere with my concentration on tests.  
 1                      2                      3                      4
7. I feel very jittery when taking an important test.  
 1                      2                      3                      4
8. Even when I am well prepared for a test, I feel very anxious about it.  
 1                      2                      3                      4
9. I start feeling very uneasy just before getting a test paper back.  
 1                      2                      3                      4
10. During tests I feel very tense.  
 1                      2                      3                      4

11. I wish tests did not bother me so much.  
1                    2                    3                    4
12. During important tests I am so tense that my stomach gets upset.  
1                    2                    3                    4
13. I seem to defeat myself while working on important tests.  
1                    2                    3                    4
14. I feel very panicky when I take an important exam.  
1                    2                    3                    4
15. If I were to take an important test, I would worry a great deal about taking it.  
1                    2                    3                    4
16. During tests I find myself thinking about the consequences of failing.  
1                    2                    3                    4
17. I feel my heart beating very fast during important tests.  
1                    2                    3                    4
18. As soon as a test is over I try to stop worrying about it, but I just cannot.  
1                    2                    3                    4
19. During a test I get so nervous that I forget facts I really know.  
1                    2                    3                    4

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## Appendix B

Table 2 *Special Education Survey Results*

<b>Question</b>	<b>1 Almost Never</b>	<b>2 Sometimes</b>	<b>3 Often</b>	<b>4 Almost Always</b>
I am confident and relaxed while taking tests	6	6	0	4
Thinking about course grade interferes with tests	2	7	6	1
I freeze up on final exams	8	2	4	2
During tests, I wonder if I will ever get through school	5	8	2	1
The harder I work at a test, more confused I get	4	3	3	4
Thoughts of doing poorly interfere with concentration	5	4	3	4
I Feel very jittery when taking an important test	2	8	1	4
Even when well prepared for a test, I feel very anxious	5	4	5	2
I start feeling very uneasy just before getting back a test paper	5	4	4	3
During tests, I feel very tense	4	6	2	4
I wish tests did not bother me so much	4	5	3	4
With important tests, I'm so tense my stomach gets upset	5	4	3	3
I seem to defeat myself while working on important tests	3	5	3	5
I feel very panicky when I take an important exam	7	3	3	1
Would worry a great deal before taking an important test	5	5	4	2
During tests, I think about the consequences of failing	3	9	2	2
My heart beats very fast during important tests	9	4	0	3
When test is over, I try not to worry, but just cannot stop	7	4	3	2
During test, I get so nervous I forget facts that I really know	9	4	3	0

## Appendix C

Table 4 *General Education Survey Results*

<b>Question</b>	<b>1 Almost Never</b>	<b>2 Sometimes</b>	<b>3 Often</b>	<b>4 Almost Always</b>
I am confident and relaxed while taking tests	15	10	13	6
Thinking about course grade interferes with tests	7	11	16	10
I freeze up on final exams	20	12	5	7
During tests, I wonder if I will ever get through school	21	8	5	10
The harder I work at a test, more confused I get	16	15	7	6
Thoughts of doing poorly interfere with concentration	10	14	6	14
I Feel very jittery when taking an important test	16	7	10	11
Even when well prepared for a test, I feel very anxious	11	18	7	8
I start feeling very uneasy just before getting back a test paper	14	12	11	7
During tests, I feel very tense	13	18	6	7
I wish tests did not bother me so much	12	11	2	19
With important tests, I'm so tense my stomach gets upset	24	8	6	6
I seem to defeat myself while working on important tests	18	12	9	5
I feel very panicky when I take an important exam	14	15	7	8
Would worry a great deal before taking an important test	13	11	7	13
During tests, I think about the consequences of failing	11	7	11	15
My heart beats very fast during important tests	15	11	9	9
When test is over, I try not to worry, but just cannot stop	21	11	6	6
During test, I get so nervous I forget facts that I really know	15	11	7	11

## Appendix D

Table 5 *T Distribution Critical Values*

df	Tail probability $p$											
	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
1	1.000	1.376	1.963	3.078	6.314	12.71	15.89	31.82	63.66	127.3	318.3	636.6
2	0.816	1.061	1.386	1.886	2.920	4.303	4.849	6.965	9.925	14.09	22.33	31.60
3	<b>0.765</b>	0.978	1.250	1.638	2.353	3.182	3.482	4.541	5.841	7.453	10.21	12.92
4	<b>0.741</b>	0.941	1.190	1.533	2.132	2.776	2.999	<b>3.747</b>	4.604	5.598	7.173	8.610
5	<b>0.727</b>	0.920	1.156	1.476	2.015	2.571	<b>2.757</b>	3.365	4.032	<b>4.773</b>	5.893	6.869
6	<b>0.718</b>	0.906	1.134	1.440	1.943	2.447	2.612	3.143	3.707	4.317	5.208	5.959
7	<b>0.711</b>	0.896	1.119	1.415	1.895	2.365	2.517	2.998	3.499	4.029	4.785	5.408
8	<b>0.706</b>	0.889	1.108	1.397	1.860	2.306	2.449	2.896	3.355	3.833	4.501	5.041
9	<b>0.703</b>	0.883	1.100	1.383	1.833	2.262	2.398	2.821	3.250	3.690	4.297	<b>4.781</b>
10	<b>0.700</b>	0.879	1.093	1.372	1.812	2.228	2.359	<b>2.764</b>	3.169	3.581	4.144	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.328	<b>2.718</b>	3.106	3.497	4.025	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.303	2.681	3.055	3.428	3.930	4.318
13	0.694	0.870	1.079	1.350	<b>1.771</b>	2.160	2.282	2.650	3.012	<b>3.372</b>	3.852	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.264	2.624	2.977	3.326	3.787	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.249	2.602	2.947	3.286	3.733	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.235	2.583	2.921	3.252	3.686	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.224	<b>2.567</b>	2.898	3.222	3.646	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.214	2.552	2.878	3.197	3.611	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.205	2.539	2.861	<b>3.174</b>	3.579	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.197	2.528	2.845	3.153	3.552	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.189	2.518	2.831	3.135	3.527	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.183	2.508	2.819	3.119	3.505	<b>3.792</b>
23	0.685	0.858	1.060	1.319	1.714	2.069	2.177	2.500	2.807	3.104	3.485	<b>3.768</b>
24	0.685	<b>0.857</b>	1.059	1.318	1.711	2.064	2.172	2.492	2.797	3.091	3.467	<b>3.745</b>
25	0.684	0.856	1.058	1.316	1.708	2.060	2.167	2.485	2.787	<b>3.078</b>	3.450	<b>3.725</b>
26	0.684	0.856	1.058	1.315	1.706	2.056	2.162	2.479	2.779	3.067	3.435	<b>3.707</b>
27	0.684	0.855	1.057	1.314	1.703	2.052	2.158	2.473	2.771	3.057	3.421	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.154	<b>2.467</b>	2.763	3.047	3.408	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.150	2.462	2.756	3.038	3.396	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.147	<b>2.457</b>	2.750	3.030	3.385	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.123	2.423	2.704	<b>2.971</b>	3.307	3.551
50	0.679	0.849	1.047	1.299	<b>1.676</b>	2.009	2.109	2.403	2.678	2.937	3.261	3.496
60	0.679	0.848	1.045	1.296	<b>1.671</b>	2.000	2.099	2.390	2.660	2.915	3.232	3.460
80	0.678	0.846	1.043	1.292	1.664	1.990	2.088	2.374	2.639	2.887	3.195	3.416
100	0.677	0.845	1.042	1.290	1.660	1.984	2.081	2.364	2.626	<b>2.871</b>	3.174	3.390
1000	0.675	0.842	1.037	1.282	1.646	1.962	2.056	2.330	2.581	2.813	3.098	3.300
$\infty$	0.674	0.841	1.036	1.282	1.645	1.960	2.054	2.326	2.576	2.807	3.091	3.291
	50%	60%	70%	80%	90%	95%	96%	98%	99%	99.5%	99.8%	99.9%
Confidence level $C$												