IB PSYCHOLOGY EXTENDED ESSAY

THE EFFECTS OF EXAM ON HIGH SCHOOL STUDENTS' ANXIETY

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Abstract

"Do written examinations have an effect on the anxiety level of high school students?" In the beginning, this paper explains anxiety, a physical state that is experienced by every human being, from different views. Then, it considers the psychoanalytic meaning of anxiety, symptoms of anxiety and the other researches about anxiety. Next, it displays the study that is made to compare the level of pre and post exam anxiety levels to answer the research question of "Do written examinations have an effect on the anxiety of high school students?'.

The 'State Anxiety Disorder Inventory' by Spielberger was made 15 minutes before and after the exam. The post-exam mean SAI scores were higher than the pre-exam mean SAI scores (55.42 ± 4.89 and 49.62 ± 9.02 respectively). The difference between the scores were statistically significant ($t=-3.1$, $p=0.005$). It was also found that the increase in the level of the anxiety is in females higher than it is in males , and this difference was significant (9.55 ± 7.74 for females and 3.00 ± 8.26 for males) ; ($z=-1.95$, $p=0.05$) , the economic position(7.21 ± 9.08 for good and 3.00 ± 7.04 for very good) ; ($z=-1.42$, $p=0.15$) , and the sibling state does not affect the anxiety (2.75 ± 9.19 for only child , 7.69 ± 7.85 for 'having a sibling '); ($z= ,1.34$, $p=0.18$)

The conclusion of the essay displays that the written examinations do have an increasing effect on the level of anxiety of the students, proving our hypothesis, which was 'The high school student's anxiety level is increased by the written examinations' .In addition, the socio-demographic investigation showed that the increase in the level of the anxiety is higher for females than it is for males and neither the economical position, nor the sibling state effects the anxiety level.

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*"Men ought to know that from the brain, and from the brain only arise our pleasures, joys, laughter and jests, as well as our sorrows, pains, grief and tears. Through it, in particular, we think, see, hear and distinguish the ugly from the beautiful, the bad from the good the pleasant from the unpleasant. It makes us mad or delirious, inspires us with fear, and brings sleeplessness and aimless anxieties... In these ways I hold that the brain is **the most powerful organ in the human body"***

Hippocrates BC(460-377)

Store(1977)(1)

INTRODUCTION

Anxiety is a physical and a psychic state experienced by every human being during lifetime. Anxiety had been present, even before the human beings as an adaptive mechanism for more simple organisms and had never been drawn apart from our lives thereafter. (2) Anxiety and fear were two main defenses against any kind of danger. In this regard, presence of an acceptable level of anxiety and fear is logical, even more, vital (3).

Anxiety, compared to perception of a threat, is unproportional. Anxiety is generally perceived as an expectation of bad things that are going to happen. It has both subjective and objective signs that are readily unpleasant and emotionally negative. In most conditions that we face in our daily lives (For instance, exams, being in unfamiliar places etc.) we have to keep in mind that the anxiety is a usual and understandable emotion. The anxiety that exceeds the normal level, in other words when the anxiety is more severe or longer than expected effects the daily life of a person in a negative way, and is considered as pathological.(3)

Freud, described the presence of fear as a reaction to a real threat and the presence of anxiety as a reaction to an inner threat. The significant feature that forms the anxiety is the unpresence and uncertainty of the attributable causes. In the state of anxiety, the threat is subjective and hidden. In the state of fear the threat is objective and unhidden.(2)

The origin of the word 'anxiety' comes from Indo-European Language; ancient Greek. 'Ankho' which is later translated to Latin as 'ango' or'anxio'. In Greek, 'Anxio' refers to a feeling of compression usually perceived in chest or neck. On the other hand, 'Ango' refers to both throttling and torturing. In ancient Roman Empire, the word "anxieties" actually defined a continuous state of fear whereas the word "angor" was defined,   as a sudden and intense fear and resembles to the contemporary definition of panic attacks. Angor emphasizes somatic aspects of fear and it is present in the root of the word "angina". The word "anguista", meaning stricture, has derived from Ango and was also used in Roman ages. In French that is preceded by the traditional Latin Language has the reflections of both words; "anxiete" and "angisse". In English, the word "anxiety" has derived from the word   "anxietas" and in German , "angst" that was derived from angustia is the preferred word for anxiety. (3)

The oldest sign of anxiety was written in BC 3000,"Epic Gilgamesh". In this epic, Gilgamesh utters his worries about his immortality. (1)

According to Hippocrates, who had added the terms mania, melancholy, hysteria to psychiatric terminology, every sign of psychiatry is the brain(1). In Ancient History, mania, melancholy, hysteria were defined but anxiety was not defined as a syndrome. Anxiety was firstly included to the medical sciences in 19th century; but there was not any specialized word that could define anxiety. In the first half of the 19th century, in French medical publications, the terms "anxiete" and "agnoisse" were initially used. In 1871, Da Costa defined the

'disorder of panic' as the state that the heart becomes irritable, in the absence of a direct cardiac pathology. In 1895, Sigmund Freud defined –nervous anxiety- , that is based on core symptoms of anxiety, as an independent syndrome. (3)

Later, investigators attempted to determine the symptomatic limits of anxiety. The Meanwhile, the relationship between the anxiety and fear was also clarified. The first man who had separately defined anxiety and fear was the philosopher Soren Kierkegaard (1844). Freud, emphasized that fear and the anxiety were different concepts. The classical formulation that is still valid was made by German physician Carl Jaspers(1913) who is also considered as one of the founders of psychopathology. According to Jaspers, fear is directed to an object, but anxiety is not. (2)

Anxiety and fear may be conceptualized as by-products of our existence. .Soren Kierkegaard claims that the source of this dread is occurred as a result of human existence. We always seek underlying causes of our existence in order to understand our nature. In existancialistic philosophy, life always has an uncertainty that brings together a feeling called 'the pain of existence'. This feeling can only be cured by the very human being. Kierkegaard separately defines dread and anxiety in his famous book "The Concept of Anxiety". To him, dread is associated to loss of an   object while anxiety is not. Kierkegaard defines anxiety as a psychic state. The term 'Angst' that is used by Martin Heidegger was used while expressing the anxiety that arised because of a mental state, when the human faces that there is no reference point that he can check the validity of the choices he makes. A human, continuously comes through point to decide .When there is no reference point that the human can trust, the high responsibility of deciding on the key points about life inevitably evoked anxiety. . According to Heidegger, there is no obligation for anxiety to be clear and visible.

Nervousness relies to uncertainty, therefore cannot be defined separately. To him, the descriptions about nervousness are exclusive. The definition of Heidegger for dread and anxiety is very likely to that of Kierkegaard. To him, dread is directed into an object whereas anxiety is not. In his novel 'Anxiety', Jean Paul Sartre gives information about the anxiety that human beings experience when we face the uncertainty of the 'psychic world', taking all considerations of nature in parenthesis. Harry Stack Sullivan, emphasized the role of the personal relationships in the occurrence of the anxiety. A human being has a need of being confirmed. The expectation of being refused or disproved may lead to anxiety.

Regarding the Sullivan's statement, it can be stated that an important cause of anxiety in students is the exams, since students are afraid of disapproval of their parents and possibly their anger, also the threat is their feelings of self worth and the projected fear of failing as an adult in a highly competitive society by not getting into a good university.
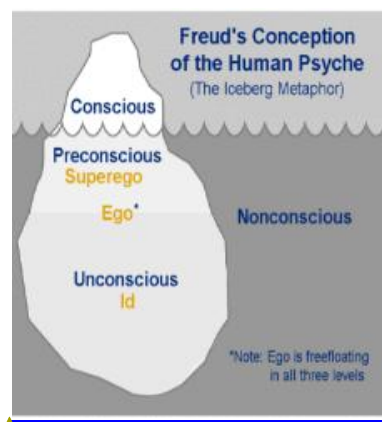
REASONS FOR ANXIETY

The Mental Origin of Anxiety

In Anxiety Disorders, psychodynamic factors, mislearning and biological factors contribute to etiology together none of which predominate. . But, while dealing with the etiology, it should be kept in mind that all should be considered. (4)

Psychoanalytic View

According to the Psychoanalytic Theory, anxiety is an event that occurs due to intra psychic conflicts. According to the Structural Postulate of Psychodynamic Theory, the conflict is between the ego and the –id- or ego and the superego. The ego tries to balance the unconscious drives of id, if for some reason it weakens or the strength of the drive increases, a

conflict arises between the ego and the id. In the case of a prolonged conflict, the ego cannot find any solution to these drives anymore, in other words -can't deal with it-. These drives begin to be regarded as danger. Anxiety is the sign of the danger in the ego.

Figure 1: Freud's Conception of the Human Psyche (The Iceberg Metaphor)

Behavioral View

According to the behavioral view, anxiety and phobias are learned behaviors. Dread, is biologically centered and directed to a pain-giving and dangerous stimulus. If a human being occasionally faces a non-dangerous stimuli at the same time he faces a dangerous, pain giving stimuli, then an avoidance behavior will occur as a reaction to the non-dangerous stimuli.(4)

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View of Consciousness

In last years, the psychological evaluations about anxiety disorders are centered on worry. In the arousal and progressing of some diseases, the role of this and the conscious progress is being investigated. (4)

Intolerance of Uncertainty View

Different from the dread, anxiety can be undirected and uncertain and what makes anxiety a threat is this uncertainty. In people who have tendency to anxiety, there is a negative expectation from the unclear condition. No matter how low the probability of this event is small, this kind of expectation is seen.(4)

Cognitive Theorem of Panic

As explained before, in the cognitive definition of anxiety, the perception of threat has a very important role. When the patients interpret the physical symptoms of anxiety as a violent threat, a disaster, panic seizures occurs. This wrong interpretation of the physical symptoms of anxiety leads to the aggravation of the symptoms and with feedback system, and the panic seizure occurs. For example, patients interpret the palpitation or the increase in the heart beat number as heart attack. This interpretation leads to an intense anxiety as well as physiological stimulus signs such as palpitation, dizziness. With aggravation and variation of the symptoms, the first interpretation is confirmed and the patient sees that the passed panic seizure did not end with the expected catastrophe. (4)

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External Factors

Events that had happened in the first years of the life :

It is believed that the generalized anxiety disorder is associated with the childhood, when the child gets unsafely connected to the person who looks after him. Unsafely connect causes the change of roles between the cared person and the person who cares. Child becomes extra sensitive to the possible threats and stars to worry about both himself and for the one who cares him. It is not a surprise that a child who grew in such environment will believe that the world is very unsafe and the best way to cope with that is to worry when he is adult.

Also, the traumatic events that had happened may have negative effects on the traits of the person in adulthood .Epidemiologic studies show that most of the people who has anxiety disorder had been sexually or physically abused in their childhood.(4)

Biological Origin of Anxiety :

In last 20 years it is certainly understood that the biological factors have a role in the anxiety, panic disorder and phobia .From then on , in the etiology of these ,not only psychoanalytic and behavior- cognitive views but also biological factors are also studied.(4)
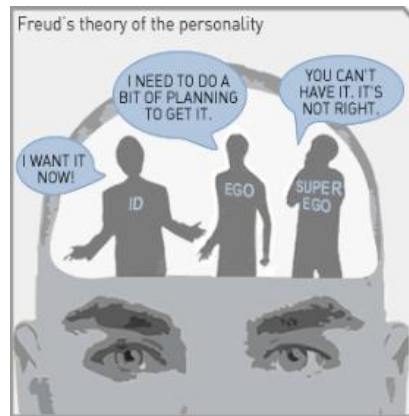
Genetic Inheritance

Researches has shown that not the symptoms but the over-sensitive autonomic nervous system is genetically inherited and the symptoms shape according to the environment lived in. (4)

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<u>The Psychoanalytic Meaning of Anxiety</u>

Its very hard for humans to fulfill their compulsions, it is probable that you can't do what you are urged to at the time you want, if you can it is not sufficient. Starting from the childhood, we have learned to wait the perfect time for our wants, sometimes just give up them, or try to fulfill them from another ways. The pleasure principle is the principle that is sovereign at the first years of the childhood. This principle changes with the reality principle with time; but our needs and compulsions do not vanish, they continue even in a more developed way and effect the way we behave. Therefore, at the one corner there is the seek for the fulfill the compulsions and at the other corner there is the obligation of obeying the realities and trying to fulfill the compulsions in the most suitable way to the environment. This two corners are, as explained before, called the ego and the id. The super ego is the rules stated to the child such as ethics and family rules.

The activities of the ego, id and the superego are mostly unconscious. The inner conflict is the state of unbalance, incompatibility between them. For example, the id , trying so hard to fulfill what it wants or the restraint of the ethics by the superego to the ego abolishes the balance and the inner conflict occurs. This unconscious conflict is perceived as a threat to the ego and reactions to this occur. (4)

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Picture 3: Freud's Theory of the Personality; the Id, Ego and the Super Ego.

The emotional reaction that is directed to an external threat is called the dread. Dread, is the emotion that starts the escaping progress from the threat to the existence or ego. If dread was not present, human beings would not be able to save themselves from external threats since dread has a homeostatic role.(4)

The threats to the human being are not always external and objective. A human being can also be afraid of the urges, tendencies, and the memories from the past. Actually, a human being is afraid of anything that puts him in an unwanted condition. Some urges or environmental conditions may ruin the balance and may be perceived as a threat. (4) An example for that is that in exams, I used to panic a lot thinking that I won't be able to do any question and my family would be mad at me because I was not successful. In other words, the ego was not able to balance the drives of the id, pointing the danger, which in this case was failing in the exam.

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Symptoms of Anxiety

Anxiety is an emotion similar to dread. A human being perceives it like a discomfort, worry that the reason is not clear. This worry can be in a range from a little tenseness to a panic. When the intensity of this worry is high, the person feels suppressed by the psychic pain. Some patients had stated that even the most intense physical pain is not as disturbing as the anxiety , even an operation pain is less painful (4). In the state of anxiety, physiologic symptoms such as increase in the blood pressure, number of heart beat ; pupil of the eye gets wider, reflexes increase , drying in the mouth, over-sweating, dyspnea , tenseness, increase in the number of breathing , increase in the number of defecation, nausea are seen. Increase in the movements, sometimes decrease, freezing can be seen (5). These all symptoms show that the organism is getting ready to an emergent defeat to a threat or getting ready to escape. The physiological symptoms above occur as a defense to a generalized, powerful treat , the reason for this threat is not-known, by the sympathetic nervous system.(4)

It is not right to totally assume anxiety as the group of clinical symptoms. In the greatest sense, the anxiety occurs as tenseness and sneaky nervousness. When there is a stronger threat, the defense mechanism is stimulated. The conscious distresses have physiologic symptoms and emotional experiences. Conversely, anxiety is effective in the ego of the human. This activity shows itself with the defense mechanisms of the ego. If the defense does not start or it is insufficient, the clinical symptoms above arouse with the conscious anxiety (4).

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<u>Researches About Anxiety</u>

When I was 13-14 years old , mathematics was a very big problem for me . It was as if there were a voice inside me saying that I was going to fail. I became enable to identify that feeling after I learned what anxiety is. Thus, I wondered whether my friends were also experiencing it. Therefore , I decided to make a test to my classmates which would display their levels of anxiety. While trying to decide the method for the test, I came across some studies of Rüstemli , Züleyman and Kozacıoğlu some of which inspired me .

In his research about the relationship self-esteem and the anxiety Rüstemli(6) used the State-Trait Anxiety Inventory by Spielberger . As a result, he saw that the student who has high anxiety has low self-esteem and vice versa. The results were correct according to the Rogers's theorem and the anxiety theorem.

Züleyman(7) made a research on the 9th grade students about the anxiety during an exam and by cognitive treatment, desensitizing treatment, and cognitive trait change treatment he tried to lower the anxiety levels and he determined the anxiety levels of these students by State-Trait Anxiety Inventory by Spielberger . After treatments, which had been made for 1 hour/week and lasted for 8 weeks, he saw that the cognitive trait change treatment was the most effective when lowering the anxiety level.

Kozacıoğlu(8), determined the anxiety levels of 150 students with their families from 3 different Istanbul high schools where the students come from 3 different socioeconomic levels labeled low, moderate and high. The aim of the research was to compare the effect of the family and the anxiety level with the students from different socioeconomic states. Results showed that there is no significant difference between the anxiety levels between the students but the students that represent the low socioeconomic level had higher trait anxiety points then the others.

These studies inspired me to regard some socio-demographical information such as gender, economical state, number of sisters and brothers. In addition to this, I made a research on the 'State – Trait Anxiety Inventory by Spielberger' which was used by Züleyman and decided to use that test on my investigation too.

INVESTIGATING THE EXAM ANXIETY

The aim of this study was to investigate the relationship between written exam and anxiety level, where the exam is the independent variable and the anxiety is the dependent variable, comparing the before-exam anxiety level and after-exam anxiety level regarding the socio-demographic information. The research question was 'Do written examinations have an effect on the anxiety of high school students?' and the hypothesis was 'The high school student's anxiety level is increased by the written examinations'.

The inventory was made on 11st March 2010, at TED Ankara College to a randomly picked class which has 21 students. Firstly, the students were asked to fill their personal information (shown in Table 1) in the blanks. Afterwards, 'State and Trait Anxiety Disorder' by Spielberger was made 15 minutes before and the same test was 15 minutes after the exam.

To investigate the anxiety level of the students, The State-Trait Anxiety Inventory(STAI) by Spielberger was used. The STAI by Spielberger has 40 statements, 20 about State and 20 About Trait anxiety. The standardization to the Turkish society was made by Öner(9). The statement confidence of the State Anxiety Inventory is between 0.42 and 0.85. The confidence of Test after test confidence is between 0.26 and 0.68. Structural validity and the criteria validity was found to be high which is very important.

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The results of the test were calculated via SPSS.

Gender
a) Woman(N=9) (42.85%)   b) Man (N=12) (57.14 %)
Economical State
a)Good (at least 4 Thousand Dollars Monthly) (n=14)(66,67%)   b)Very Good (at least 9 Thousand Dollars Monthly) (n=7)(33,33)
Number of Brothers/Sisters
a)Non(Only- Child) (N=8)(38,10%)   b) 2 or more (N=13)(61,90%)

Table 1: The distribution of the students according to gender, economical state, and number of brothers and sisters. (The percentage calculations were made by TI 84+ SilverEdition)

Normal Distribution Analyze:

If the group of data is normally distributed, parametric tests can be made, if the data are not normally distributed, then non-parametric tests should be made. Parametric tests are more confidential then non-parametric tests, so having a normally distributed data is a great advantage on the way to reach at true calculations and statistics.

The indication of the 'normal distribution' of the data was investigated by the Kolmogorof Smirnof test. As a result of this test, it was seen that both for before and after tests, the significance was found out to be 0.200 which shows that the data are normally distributed.

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RESULTS

The results are going to be presented in two parts. First we are going to present our results regarding our main hypothesis and then we are going to present our results regarding the relationship of anxiety levels before and after the examination with the socio-demographic variables.

1- THE EFFECT OF THE WRITTEN EXAMINATION ON ANXIETY

The effect of the examination on anxiety was measured by analyzing pre-exam state anxiety scores and post-exam state anxiety scores in our sample. First we looked at the distribution of the pre-and post exam scores by Kolmogorof-Smirnoff Test to see if the data distributed normally. For both measurements, Kolmogorof Smirnoff Test revealed that the data was distributed normally (for the pre-exam scores; df=21, p=0.2; for the post exam scores df=21, p=0.2).
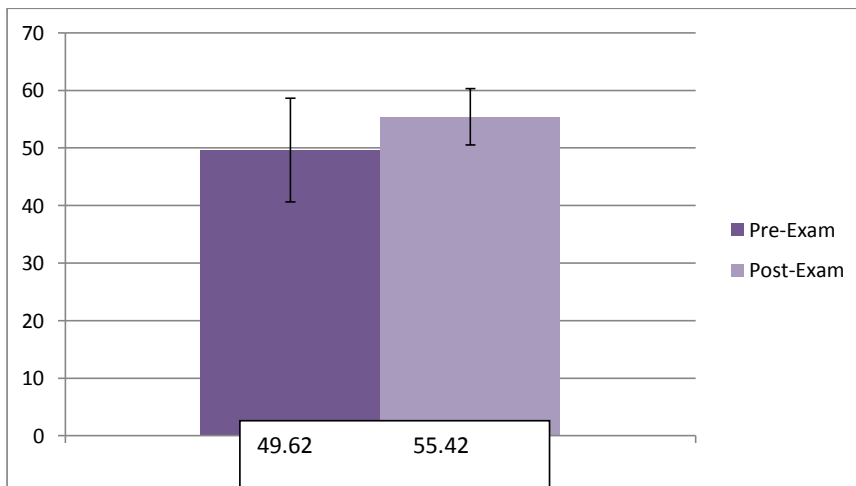
Since the data distribution was normal, we decided to employ a parametric test to compare if pre and post exam anxiety scores changed significantly in our sample. Paired Samples T-Test was used in order to compare the statistical significance. The results are presented in Table 1.

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TABLE 1: THE COMPARISON OF PRE-EXAM AND POST-EXAM ANXIETY SCORES (PAIRED SAMPLES T-TEST) (N=21)

	Mean± S.D	**Significance**
Pre-Exam SAI Scores	49.62±9.02	t=-3.1 p=0.005*
Post-Exam SAI Scores	55.42±4.89	

SAI=State Anxiety Inventory, S.D=Standard Deviation, *=Statistically Significant

As we can see in Table 1 the post-exam mean SAI scores were higher than the pre-exam mean SAI scores (55.42±4.89 and 49.62±9.02 respectively). The difference between the scores were statistically significant (t=-3.1, p=0.005).

Graph 1: Mean of Pre-Exam scores is lower than the mean of Post-Exam Scores, with uncertainty bars placed according to the uncertainties.

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2- THE RELATIONSHIP OF SOCIO-DEMOGRAPHIC VARIABLES AND ANXIETY

Although it was not our primary concern, we were also interested in the relationship of anxiety to some socio-demographic variables. We have collected data on gender, economic state, and sibling state. In order to analyze the relationship of anxiety to those parameters first we have defined a new variable namely; Change in Anxiety (CiA). CiA was calculated by subtracting the pre-exam SAI score from post-exam SAI score. The CiA was calculated to define the change in anxiety levels after the examination. Then we have compared CiA scores between female and male subjects. Since the sample size did not allow us to employ parametric tests we have employed the non-parametric equivalent of the T-Test instead, namely; Mann-Whitney U-Test. The relationship of CiA with gender is presented in Table 2.

Gender	CiA (Mean±S.D)	Significance
Males (N=12)	3.00±8.26	z=-1.95
Females (N=9)	9.55±7.74	p=0.05*

TABLE 2: THE RELATIONSHIP OF GENDER AND CiA (MANN WHITNEY U-TEST)

CiA=Change in Anxiety Scores, S.D=Standard Deviation, *=Statistically Significant

As we can see in Table 2, the anxiety levels were increased higher in female students than male students (9.55±7.74 for females and 3.00±8.26 for males). The results were statistically significant (z=-1.95, p=0.05).

The economic state of the sample was questioned subjectively in this study. All subjects were asked which of the following definitions describe the economic state of their family best; very good, good). Fourteen subjects described their economic position as good while 7 subjects as very good. The relationship of CiA with economic state is presented in Table 3.

Economic State	CiA (Mean±S.D)	Significance
Good (N=14)	7.21±9.08	z=-1.42
Very Good (N=7)	3.00±7.04	p=0.15

TABLE 3: THE RELATIONSHIP OF ECONOMIC STATE AND CiA (MANN-WHITNEY U TEST)

CiA=Change in Anxiety Scores, S.D=Standard Deviation

As we can see in Table 3 the anxiety levels after the exam seem to have changed more in the 'good economy' group than 'very good economy' group. But Mann-Whitney Test revealed that the difference between the groups was not statistically significant (z=-1.42, p=0.15). In other words, economic position of the parents did not have a significant effect on anxiety levels before and after the examination.

The subjects were also questioned for having a sibling or being brought up as the only child in the family. Based on their answers, the sample was divided into two groups; 'only child' group and 'has a sibling' group. The CiA levels were compared between these groups with the Mann-Whitney U Test. The relationship of sibling state and CiA is presented in Table 4.

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TABLE 4: THE RELATIONSHIP OF SIBLING STATE AND CiA (MANN-WHITNEY U

Sibling State	CiA (Mean±S.D)	Significance
Only Child (N=8)	2.75±9.19	z=-1.37
Has a sibling (N=13)	7.69±7.85	p=0.18

TEST)

CiA=Change in Anxiety Scores, S.D=Standard Deviation

As we can see in Table 4 although the anxiety levels seem to have changed more in the 'has a sibling group' in fact; the difference between the groups is not statistically significant (z=-1.37, p=0.18). The sibling state did not have a significant effect on anxiety levels before and after the examination.

CONCLUSION & EVALUATION

In the present study, we aimed to examine effects of a written examination on high school students' anxiety level. Our hypothesis was that the written examinations increase the anxiety level of a student.

We found that a written examination was associated with higher level of anxiety in our sample, so our hypothesis, the high school student's anxiety level is increased by the written examinations, was confirmed. We were also interested in the association of the change in anxiety level after the examination with socio-demographic variables such as; gender, economic position, and sibling state. We found that the increase in the anxiety level of female students is higher than the male's. Also we saw that the economical position and the sibling state have no significant effect in the anxiety level.

It is generally accepted that written examinations have less effect on the anxiety than oral examinations. However, we found that written examinations do have an effect on the anxiety. It is recommended for following studies to compare written and oral examinations on anxiety level on high school students. Regarding the psychoanalytic view, the Performance anxiety' which is defined as a heightened level of anxiety before and during the performed act occured, the ego was not able to balance the drives of the id and anxiety occured. However, the anxiety level is stipulated to be reduced after that act. Inversely, we found that anxiety level is not reduced but increased after the examination. This result might suggest that the increased anxiety after a written examination can only be explained by performance anxiety. Besides, expectation of success or fear of failing in the exam might be playing a role. As explained before, In our study we found that the gender does have an effect on the anxiety whereas the economical position and the sibling state does not .

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This study has prominent limitations. Small sample size is leading the limitation. If this study was made to a higher range of students, the results could have been more accurate. Another limitation is that, this study was carried out in a private school and therefore the results cannot be generalized to all students around the countries.

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