

Investigation of the Effect of Anxiety Disorder on Time Perception with Zimbardo Time Perspective Inventory

Abstract

Background: Linguists first coined the term anxiety in the 1600s to define a state of severe restlessness and worry. When we look at the Turkish dictionaries and printed sources, we see that the definition of anxiety is made simply as anxiety, fear, and worry. Anxiety; which we can describe as a mental and physical reaction, a defense strategy, against an event or fear. It will threaten the survival of the life; it is seen in two ways as situational anxiety and trait anxiety. Situational anxiety, as the name suggests, arises when faced with a threat or stress factor, while trait anxiety is an anxiety that occurs internally, independent of the event or situation. **Aims and Objectives:** For the continuity of one's cognitive and behavioral abilities, not only anxiety but also the perception of time has a great place in the continuity of life. The findings that help us understand one's time perspective are internal clock models and related mechanisms. This study aims to investigate the effect of anxiety on time perspective. **Materials and Methods:** To this end, the Beck Anxiety Scale, the Zimbardo Time Perspective Inventory, and the demographic information form were used to collect data. Data were collected from a total of 168 participants, 44 females and 124 males. **Results and Conclusion:** When the findings are evaluated in general terms, there was a moderately negative relationship between anxiety and past positive perspective and a moderately positive relationship between past negative perspective. Based on this result, anxiety prevents a positive perception of the past; on the contrary, it can be said that it causes a negative perception of the past.

Keywords: Anxiety, Beck Anxiety Inventory, time perception, Zimbardo Time Perspective Inventory

Introduction

Anxiety was used by linguists for the first time in the 1600s in the sense of severe restlessness and anxiety.^[1] When we look at the Turkish dictionaries and printed sources, we see that the definition of anxiety is made simply as anxiety, fear, and worry.

Contrary to popular belief, anxiety is not an entirely negative trait. An individual must live their life despite threats from the outside world.^[2,3] Anxiety prepares us for internal and external dangers we will encounter and saves our lives; it may also allow us to get good grades for an examination. Although they do not look the same, these two emotions, which show similar characteristics, contain a high level of arousal and a low level of satisfaction.^[2,4-7]

Anxiety; which we can describe as a mental and physical reaction, a defense strategy, against an event or fear. It will threaten the

survival of the life; it is seen in two ways as situational anxiety and trait anxiety.^[8-10]

Situational anxiety, as the name suggests, arises when faced with a threat or stress factor, while trait anxiety is an anxiety that occurs internally, independent of the event or situation. In situational anxiety, the severity of anxiety is directly proportional to the closeness of the event or condition to the person; such a relationship cannot be mentioned in trait anxiety. Studies show that people who experience high levels of trait anxiety experience situational anxiety more severely.^[5,9]

An anxiety disorder can occur even if the person develops anxiety without encountering any threat or objective fear, as if one has experienced such a situation. Although this is a psychopathological phenomenon, its severity or course varies greatly depending on the individual and requires pharmacological and/or psychological support.^[11-14]

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In psychology, there are different definitions of anxiety and fear that have been made over time. For example, the cognitive approach argues that fear is a cognitive response and anxiety is an emotional response. In other words, while fear is resorting to the ways the mind leads, anxiety is thinking about these ways and making an evaluation. Anxiety is not caused by an event but simply by erroneous perception and distorted interpretation.^[15,16] According to social learning, anxiety is a conditioned response acquired through social learning. Individuals react according to how they perceive the place and situation. According to the psychodynamic approach, anxiety appears as a result of unconscious contradictions and ego imbalance.^[17]

On the other hand, the existential approach focuses on the fear and anxiety that will be experienced if life becomes meaningless. In other words, unless a person enjoys life and is satisfied with his life, he cannot make sense of it and makes anxiety feel much more.^[15] In other words, the person defines life through anxiety and tries to drown the reaction of his emptiness and meaninglessness in this way.^[18-20]

The cognitive and emotional symptoms of anxiety observed in humans are as follows: perceiving the surroundings differently than normal, hyperarousal, excessive self-focus, memory problems, hanging around and diving far, distractibility, obsessive thoughts, difficulty concentrating, flight of ideas, the thought of being constantly harmed, fear of being poorly judged by people, despair, uneasiness, approval request, intolerance, horror, irritability, constant fear and irritability most of the day, fear of losing mind, and obsessive fearful thoughts.^[17,21-24]

The physiological and behavioral symptoms of anxiety in humans can be listed as follows: compulsive behaviors, avoidance of anxiety, locking, speech disorder, restlessness in the limbs, pupillary enlargement, goose bump condition, thirst, pain and pain in the abdomen, pressure, nausea, difficulty defecating or diarrhea, dry mouth, blood pressure, irregular heartbeat, shortness of breath or frequent and shallow breathing, itching, sleep disturbance, early fatigue, inability to rest, sleeping disorders, muscle twitches, premature ejaculation, decrease in sexual desire, frequent toilet visits, tiredness, weakness muscle, and back pain is observed.^[21,22,3,5]

Most studies on time in psychology focus on the concept of time perspective, which was first observed by Levine and was formulated over time and brought to the world of science.^[25,26] This concept emphasizes that individuals' perceptions of time develop oriented to the past, future, or present. Studies on the effect of the focal point of one's daily routine on the rest of life reveal a series of outcomes such as learning and self-regulation of one's perception of time.^[30,26,24]

The most well-known and most influential time perception study conducted in this field is the Zimbardo Time

Perspective Scale study, developed by Zimbardo and Boyd, based on Lewin's studies.^[27] According to this study, perspectives in the scale were shown to be negatively related to the psychopathic tendencies of the individual and the general anxiety level.^[27-30]

For example, it is widely accepted that having a future perspective in the scale or giving this perspective more weight than others is related to positive results (Zimbardo and Boyd 1999). Future time perspective is defined as making plans for the future, setting goals, and focusing on the possible future effects of issues. The future perspective considered within the scope of this definition is associated with lower psychopathy tendencies; it has also been shown that future perspective is negatively related to general anxiety level.^[29,30]

Today, although many mental health experts and neuroscientists reveal that anxiety and time perception are related in different ways, this relationship still exists as a subject discussed on various platforms by the scientific world. Our research aims to contribute to the emergence of the relationship between anxiety and time perception by embodying the participants' attitudes, behaviors, and cognitive processes with the help of a self-reported scale.

Materials and Method

Ethics committee approval: The ethics committee approval has been obtained from Uskudar University Committee on Animal Use and Care (61351342/2020-302).

Sample

The research sample consists of 168 randomly selected participants who want to participate in the study and meet the appropriate conditions. The age ranges are between 16 and 52. During this study, we observed variables such as socioeconomic factors, the use of drugs that are thought to affect the study, alcohol use, smoking and substance use history, hunger and satiety, and sleep and hormone states (such as menstruation). These variables did not affect the research data. It was assumed that the participants answered the inventories and tests used in the research honestly and sincerely. The data of some people thought to have a negative impact on the study were excluded from the evaluation. Forty-four of the participants were women and 124 of them were men. Only 10.8% of the participants were in the age range of 16–20, 50.4% were 21–25, 24% were in the 26–30 age range, 9% were 31–39, and 4.6% were in the other age range. Only 10.7% of all samples are high school graduates, 65.5% university graduates, 22.6% graduate graduates, and 1.2% doctorate graduates.

Demographic information form

The purpose of using the demographic information form is to obtain detailed information about the individuals who contributed to the study and determine the effects on the hypothesis. In this regard, some questions were formed

to complement the data obtained during the experiment. Information such as age, gender, education, and so on was recorded via Google Forms.

Beck Anxiety Scale

This scale consists of 21 questions. Each question is evaluated between 0 (never) and 3 (severe), and high scores indicate increased anxiety complaints. Thus, the total score that can be obtained from this scale varies between 0 and 63. The high total score indicates the severity of the anxiety experienced by the individual. The Turkish adaptation of the scale was carried out by Ulusoy.^[31,32] It is an easy-to-apply scale that individuals can answer on their own. It is stated that the Cronbach's alpha internal consistency coefficient of the scale is 0.93, the item-total test correlation coefficients vary between 0.45 and 0.72, and the test-retest reliability coefficients are $r = .57$.^[31] Within the scope of the current study, the Cronbach's alpha value of the scale was calculated as 0.90.

Zimbardo Time Perspective Inventory

Zimbardo Time Perspective Inventory consists of a Likert-type 5-point scale and 56 items. As a result of the factor analysis performed by Zimbardo *et al.*, five different factors, namely five different time perspectives, were determined.^[30] (Positive evaluation of the past, negative evaluation of the past, fatalistic in the present, hedonistic in the present, and future tense perspective). According to the findings from 361 participants, factors explained 36% of the total variance. In the analysis, the reliability coefficients of the subscales were found to be satisfactory. The Cronbach's alpha value of the "past negative" factor, which was 0.1 in 10 items, was found to be 0.82, and this value explained 12% of the variance of the Time Perspective Inventory. The Cronbach's alpha value of the "present hedonistic" factor, which was 1 in 15 items, was calculated as 0.79, and this value explained 9% of the inventory variance. Cronbach's alpha value of the "future" factor, of which 0.1 was performed in 13 items, was calculated as 0.77, and this value explained 6% of the variance of the inventory. The Cronbach's alpha value of the "past positive" factor, of which 0.1 was performed in 9 items, was found to be 0.80, and this value explained 5% of the variance of the inventory. Finally, the Cronbach's alpha value of the "present fatalistic" factor, of which 1.1 was calculated in 9 items, was calculated as 0.74, and this value explained 4% of the variance of the inventory.^[30]

Process

The scales were given to the individuals participating in the study, accompanied by standard instructions. They were randomly selected and asked whether they would like to participate in the research. The volunteers were read the informed consent form requested by the ethics committee,

and their approval was obtained (61351342/2020-302). The study was carried out online due to the COVID-19 global epidemic.

Results

Before the research analysis, the accuracy of the data entry and the compatibility of the distributions of the variables with the assumptions of multivariate statistical analysis were tested. In the test phase, to obtain more reliable data from the sample group, variables that were thought to affect the results of the study adversely were detected in 44 of 212 participants, so they were excluded from the evaluation, and the study was continued with the data of 168 participants. With the tests performed, it was observed that the population variances were equal, and it was decided that the two groups were comparable.

As shown in Table 1, there is a significant difference according to the results of the independent *t*-test applied to find out whether there is a substantial difference between the anxiety scale scores of the sample group and the gender variable. In addition, there is no significant difference between the variables of age, marital status and education level, and anxiety scale results.

As shown in Table 2, the independent *t*-test applied to find the significant difference in the scores of the sample group according to the Zimbardo Time Perspective Inventory according to the anxiety variable is given in the table.

According to the independent *t*-test applied to find the significant difference between the scores they received according to the past positive subscale, according to the anxiety variable, there is a substantial difference as the option "No signs of anxiety" in the past positive subscale gets more points.

According to the independent *t*-test applied to find the significant difference between the scores they received according to the past negative subscale, according to the anxiety variable, there is a significant difference since the anxiety symptom scores are higher in the past negative subscale.

According to the results of the independent *t*-test applied to find the significant difference, according to the anxiety variable, there is no significant difference in the scores of the present hedonistic, present fatalistic, and future subscales.

Relationships between variables

Correlation analysis was performed to determine the relationship between anxiety symptoms and Zimbardo Time Perspective Inventory.

Between the Beck Anxiety Inventory and the Zimbardo Time Perspective Inventory, past positive subscale score was moderate and negative; there is a moderate and positive correlation between the past negative subscale score.

Table 1: Independent *t*-test analysis result table for the difference between age, marital status, and education level variables according to the gender variable of the sample

	Beck Anxiety Scale	<i>n</i>	\bar{X}	SS	<i>t</i>	SD	<i>P</i>
Gender	There are signs of anxiety	117	1.79	0.406	2.38	166	0.02
	No signs of anxiety	51	1.61	0.493			
Age	There are signs of anxiety	117	26	6.382	-0.743	166	0.459
	No signs of anxiety	51	26.84	7.351			
Marital status	There are signs of anxiety	117	1.31	0.725	-1.404	166	0.162
	No signs of anxiety	51	1.49	0.880			
Level of education	There are signs of anxiety	117	2.16	0.587	0.636	166	0.526
	No signs of anxiety	51	2.10	0.640			

$P < 0.05$. *n*: Population size, \bar{X} : Mean, SS: The sum of squares, SD: Standard deviation

Table 2: Results table of independent *t*-test analysis applied for the difference between Zimbardo Time Perspective Inventory scores according to the anxiety variable of the sample

	Beck Anxiety Scale	<i>n</i>	\bar{X}	SS	<i>t</i>	SD	<i>P</i>
Past positive	There are signs of anxiety	117	3.3371	0.62666	-2.755	166	0.007
	No signs of anxiety	51	3.6144	0.53211			
Past negative	There are signs of anxiety	117	3.4598	0.77371	4.751	166	0.000
	No signs of anxiety	51	2.8725	0.64252			
Present hedonistic	There are signs of anxiety	117	3.5624	0.53228	-0.422	166	0.674
	No signs of anxiety.	51	3.5987	0.46562			
Present fatalistic	There are signs of anxiety	117	2.8490	0.53615	0.938	166	0.350
	No signs of anxiety.	51	2.7691	0.43538			
Future	There are signs of anxiety	117	3.6003	0.45656	-1.733	166	0.085
	No signs of anxiety	51	3.4646	0.48941			

$P < 0.05$. *n*: Population size, \bar{X} : Mean, SS: The sum of squares, SD: Standard deviation

There is a moderate and negative correlation between the past positive subscale and past negative subscale scores of the Zimbardo Time Perception Inventory. In addition, there is a moderate and positive relationship between past positive subscale and present hedonistic subscale scores, and there is a moderate and positive correlation between past negative subscale and now fatalistic subscale scores.

There is a weak and positive correlation between now hedonist subscale and now fatalistic subscale scores. There is a weak and negative correlation between the hedonist now subscale and the future subscale scores. There is a moderate and negative relationship between the fatalistic now subscale and the future subscale scores.

Conclusion

Perception of time is one of our most important skills, which enables us to subjectively predict, perceive and understand the duration of experiences, feelings, and achievements, which is necessary for us to maintain our daily practices and make long-term plans.^[32-35]

The deterioration observed in the perception of time in people with psychiatric disorders has inspired many studies both in the past and in the future. Different results were obtained in these studies, which were mainly carried out on attention deficit and hyperactivity disorder, parkinsonism,

depression, and schizophrenia, and these studies also aroused great repercussions.^[5,9]

Anxiety is a condition that varies according to the event and situation, although there is no pathology. Therefore, it is very difficult to examine the relationship between the perception of time and the anxiety experienced within the limits of normality. Currently, it is also thought that the physical symptoms of anxiety affect cognitive processes.^[28,36] Anxiety, is observed both alone and in combination with many disorders. It has also been claimed that there may be a relationship between the perception of time and some findings related to the subject. Some of these findings show us that people with anxiety disorder have an accelerated perception of time and a shorter perception estimation. More significant differences were found in studies with adolescents.^[7,28,37,38]

When the findings are evaluated in general, there was a moderately negative relationship between anxiety and past positive perspective and a moderately positive relationship between past negative perspective. According to this result, anxiety prevents positive perception of the past; on the contrary, it can be said that it causes a negative perception of the past as shown in Table 3.^[39,40]

On the other hand, the scores of the past positive subscale and the now hedonist subscale are moderately positive, the past negative Subscale and the now fatalist subscale are moderately positive, and the now hedonic subscale and the

Table 3: Correlation chart between Beck Anxiety Scale and Zimbardo Time Perspective Inventory

	Beck Anxiety Scale	Past positive	Past negative	Present hedonistic	Present fatalistic	Future
Beck Anxiety Scale						
<i>R</i>	1					
<i>P</i>						
<i>N</i>	168					
Past positive						
<i>R</i>	-0.345**	1				
<i>P</i>	0.000					
<i>N</i>	168	168				
Past negative						
<i>R</i>	0.436**	-0.307**	1			
<i>P</i>	0.000	0.000				
<i>N</i>	168	168	168			
Present hedonistic						
<i>R</i>	-0.087	0.357**	-0.058	1		
<i>P</i>	0.260	0.000	0.459			
<i>N</i>	168	168	168	168		
Present fatalistic						
<i>R</i>	0.078	0.064	0.436**	0.207**	1	
<i>P</i>	0.315	0.408	0.000	0.007		
<i>N</i>	168	168	168	168	168	
Future						
<i>R</i>	0.114	0.002	0.069	-0.225**	-0.300**	1
<i>P</i>	0.142	0.983	0.372	0.003	0.000	
<i>N</i>	168	168	168	168	168	168

$P < 0.01/P < 0.05$. *n*: Population Size, \bar{X} : Mean, SS: The sum of squares, SD: Standard deviation

present fatalistic subscale are weak and positive. There is a weak and negative relationship between the now hedonist subscale and the future subscale scores and a moderate and negative relationship between the now fatalistic Subscale and the future subscale scores. According to these results, people with a positive perspective on the past avoid perceiving the past negatively and enjoy the present; those who remember the past negatively have a more fatalistic attitude in the present. It can be argued that hedonistic people have a more negative perspective on the future in the present and fatalistic people have a negative perspective on the future in the present.^[41-43]

Patient informed consent

Patient informed consent was obtained.

Ethics committee approval

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Conflicts of interest

There are no conflicts of interest.

Author contribution subject and rate

Huseyin Oğuzhan ŞAN (55%): Design the research, data collection and analyses and wrote the whole manuscript.

Sultan TARLACI (15%): Organized the research and supervised the article write-up.

Korkut ULUCAN (15%): Contributed with comments on research design and slides interpretation.

Tolga POLAT (5%): Data collection and analyses.

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