Relationship between State-Trait Anxiety and Memory difficulties among Adolescents
by Dr. Santhosh Kumar[a]

Abstract

The present study was aimed at assessing relationship between State-Trait Anxiety and Day-to-day Memory difficulties among college students. The subjects selected for the study included 50 students who belonged to the age range of 18 - 23 years. The socio-demographic details of all the subjects were obtained and were subjected to the assessment of the State-Trait anxiety (Spiel Berger, 1980), Day-to-day memory difficulties (Sunderland et al, 2012), and a Day - today memory checklist developed by the researcher, (2014).

The findings revealed that, there is statistically a significant relationship between trait anxiety and every day memory difficulties. State anxiety scores have not shown any significant relationship with Everyday memory difficulties and amount of memory difficulties expressed by subjects. However the correlation value of 0.27 has shown that there is a significant relationship between trait anxiety and everyday memory difficulties at 0.5 levels. It indicates that students with high scores on trait anxiety tend to be shown high scores on everyday memory difficulties. The importance and, limitations of the study with suggestions for further studies in future is also discussed.

Key Words: State Anxiety, Trait Anxiety, Memory Difficulties, Anxiety, & Adolescents

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1. Introduction

An important conceptual development in exploration of the phenomenon of anxiety can be attributed to the work of Spiel Berger (1980). Who has made a distinction between state and trait anxiety. State-Trait Anxiety Inventory is one of the most frequently used instruments employed to measure anxiety. It has been translated into numerous languages and has been the most frequently cited instrument within the anxiety literature for last three decades. STAI has two subscales, one for measurement of trait anxiety(STAI-T) and the other for measurement of trait anxiety (STAI-I). By introducing the distinction between trait and state anxiety, Spiel Berger et al. have emphasized that anxiety can be conceptualized in two ways, as a stable disposition and as a transient emotional state that everyone experiences from time to time.

Some authors believe that anxiety has a long history but short past. During this short past, starting from Freud onwards, there have been attempts to explain individual differences in anxious responding. Eysenck labeled the tendency to respond in an anxious way as Neuroticism, whereas Spiel Berger coined the term trait anxiety.
Therefore the present study is an attempt to understand the relationship between state-trait anxiety and everyday memory difficulties.

Anxiety is seen as a very uncomfortable feeling which is often vague and is associated with one or more physical feelings such as feeling an empty heart, palpitations, headache and sweating. In addition, stress and anxiety can occur in response to what that has threatened the self-confidence or by the appearance of a situation in which the person feels pressure due to not being able to do something that is beyond his abilities. The Theory of state-Trait Anxiety focuses on interaction between personal variable (Trait anxiety) and situational variables (state anxiety). By Trait anxiety, it means that this type of anxiety is seen as part of the person's traits and the person is anxious without paying attention to the situation and by state anxiety, it means that the person is anxious due to the internal or external situations. Reference has defined Trait anxiety as an emotional reaction. “The unpleasant feeling of anxiety is accompanied with tensions and unhappiness that is associated with the unconscious arousal activities of the automatic nerving system”. He also regards trait anxiety as the motivation or the background of the behavior that prepares the person to show his reaction in response to many situations that are not dangerous and the person becomes anxious in response to those situations. Anxiety in general is a factor which disrupts the person’s physical and psychological balance and subsequently gives raise to some psychosomatic and psychological problems which in turn decreases the individual's performance in different aspects of his life such as education, occupation, social ones.

2. Literature Review

The distinction between state and trait anxiety was introduced by Cattell (1966) and elaborated on by Spiel Berger (1966, 1972, and 1976). Spiel Berger (1983) described state anxiety as existing in a transitory emotional state that varies in intensity and fluctuates over time. On the other hand, trait anxiety refers to a stable susceptibility or a proneness to experience state anxiety frequently. Spiel Berger (1966) described this disposition to experience anxiety as a personality trait.

The initial conceptualization was based primarily on introspective reports, the validity of the state–trait anxiety distinction, as investigated through psychometric evaluation, has consistently been supported in the literature, Spiel Berger’s model of state and trait anxiety (1966, 1972) described the process of experiencing anxiety as resulting from a temporal sequence of interacting internal and external stimuli, cognitive factors, and defense mechanisms. Within the model, an anxious state, characterized by physiological arousal and thoughts of impending doom, is initiated by either an external stressor (e.g., threat of shock) or an internal cue (e.g., muscular or visceral activity). If the internal or external stimuli are cognitively appraised as threatening, an anxious state is caused and cognitive and behavioral defense processes are activated to combat the anxiety. Trait anxiety is described as a reflection of frequent past experiences of state anxiety, which increase an individual’s proneness or sensitivity to experience future state anxiety by interacting with the cognitive appraisal of threatening internal or external stimuli. Only few studies were conducted.
in the area of memory difficulties. The studies conducted are mostly related to the samples than normal samples.

Memory is the means by which we draw on our past experiences in order to use information in the present (Sternberg, 1999.). It refers to the processes that are used to acquire, store, retain later retrieve information. There are three major processes involved in memory: encoding, storage and retrieval. Anxiety is an unpleasant state of inner turmoil often accompanied by nervous behavior, such as pacing back and forth, somatic complaints and rumination. It is the subjectively unpleasant feelings of dread over something unlikely to happen, such as the feeling of eminent death.

**Types of memory:** Mainly there are three types of memories. They are:

**Sensory memory:** Sensory memory holds sensory information for a few seconds or less after an item is perceived. The ability to look at an item, and remember what it looked like with just a second of observation, or memorization, is an example of sensory memory.

**Short-term memory:** Short-term memory allows recall for a period of several seconds to a minute without rehearsal. Its capacity is also very limited: George A. Miller (1956), when working at Bell Laboratories, conducted experiments showing that the store of short-term memory was 7±2 items (the title of his famous paper, "The magical number 7±2"). Modern estimates of the capacity of short-term memory are lower, typically of the order of 4–5 items; however, memory capacity can be increased through a process called chunking.

**Long-term memory:** The storage in sensory memory and short-term memory generally has a strictly limited capacity and duration, which means that information, is not retained indefinitely. By contrast, long-term memory can store much larger quantities of information for potentially unlimited duration (sometimes a whole life span). Its capacity is immeasurably large.

Mainly there are two types of Anxiety:

**State-Anxiety:** Trait anxiety refers to a general level of stress that is characteristic of an individual, that is, a trait relate to personality. Trait anxiety varies according to how individuals have conditioned themselves to respond to and manage the stress. People with high levels of trait anxiety are often quite easily stressed and anxious. (Spielberg 1980)

**Trait-Anxiety:** State anxiety is characterized by a state of heightened emotions that develop in response to a fear or danger of a particular situation. (Spielberg 1980)

Anxiety is a common phenomenon of everyday life. It is one of the most dominant emotional factors affecting the physical and mental abilities of an individual. Studies have been examined individuals with anxiety disorders as well as individuals with high trait anxiety to see whether they exhibit memory bias. Anxiety can be either a state or an inherent trait, both ways it is harmful to the individual.

**3. Importance of the Study**

Anxiety is a common phenomenon of everyday life. It is one of the most dominant emotional factors affecting the physical and mental abilities of an individual. Studies have been conducted to examine individuals with anxiety disorders as well as individuals with high trait anxiety to see whether they exhibit memory bias. Anxiety can be
either a state or an inherent trait, both ways it is harmful to the individual. Anxiety can cause so many psychological and physiological causes.

An important conceptual development in exploration of the phenomenon of anxiety can be attributed to the work of Spiel Berger. Who has made a distinction between state and trait anxiety. State-Trait Anxiety Inventory is one of the most frequently used instruments employed to measure anxiety. It has been translated into numerous languages and has been the most frequently cited instrument within the anxiety literature for last three decades. STAI has two subscales, one for measurement of trait anxiety(STAI-T) and the other for measurement of trait anxiety (STAI-I). By introducing the distinction between trait and state anxiety, Spiel Berger et al. have emphasized that anxiety can be conceptualized in two ways, as a stable disposition and as a transient emotional state that everyone experiences from time to time.

Memory problems are common. Everyone's memory can fail them at one time or another. Forgetting the name of someone you just met; been unable to put a name to the face of a neighbor you saw at the movies; failed to get the one item you actually went to the market to buy; forgotten your new phone number at work; missed the birthday of someone for whom you already bought a card; forgotten where you parked the car at the mall; missed a Doctor's appointment; or forgotten to take the 8 pm dose of medication. Memory occurs in the brain, but it is not limited by the brain. Many things around us influence our ability to make and retrieve memories. Physiological, emotional, social, and environmental processes, as well as by cognitive processes.

4. Methodology

4.1 Aim

The present study aims at examining the relationship between the State-Trait Anxiety and Day-today memory difficulties among college students.

4.2 Operational Definitions

State Anxiety: State anxiety is characterized by a state of heightened emotions that develop in response to a fear or danger of a particular situation. State anxiety can contribute to a degree of physical and mental paralysis, preventing performance of a task or where performance is severely affected, such as forgetting movements during a dance or gymnastic routine; to breaking in sprint or swim starts or missing relatively easy shots at goal i.e. pressure situations.

Trait Anxiety: Trait anxiety refers to a general level of stress that is characteristics of an individual, that is, a trait related to personality. Trait anxiety varies according to how individuals have conditioned themselves to respond to and manage the stress. What may cause anxiety and stress in one person may not generate any emotion in another. People with high levels of trait anxiety are often quite easily stressed and anxious.

Everyday Memory Difficulties: The term Every-day memory difficulties in the present study defined as forgetting to attend a particular task or to recall names, place, objects, or to recall one or more events attended by a person in a span of 24 hrs.
4.3 Pilot Study

Prior to the main study, a pilot study was conducted among ten students of the proposed sample population drawn from CUK. The pilot study was conducted with the objective of evaluating and finalizing the choice of tests and tool to be used for the main study, to determine the adequacy and appropriateness of the inclusions and exclusions criteria for the main study and to gain familiarity and expertise in the use of the psychological instrument. The pilot study was conducted on 10 students and based on the results; main study began with no changes made in the instruments.

4.4 Objectives

The objectives of the present study are:

1) To assess the state-anxiety level among college students.
2) To assess the trait-anxiety level among college students.
3) To assess the day-to-day memory difficulties among college students.
4) To assess the amount of memory difficulties experienced by students.
5) To study the relationship between state –trait anxiety and day-to-day memory difficulties among college students.

4.5 Hypotheses

H: 1: State – anxiety and every Day –today memory difficulties of college students will be significantly correlated.
H: 2 Trait-anxiety and Day-today memory difficulties of college students will be significantly correlated.
H: 3 State-Trait anxiety and Every Day –to day memory difficulties of college students will be correlated.

4.6 Research Design:

The present study was designed to determine the relationship between state trait anxiety and day –today memory difficulties among college students. The samples for the main study are drawn by convenient sampling; even though the best sampling method is random sampling, due to certain reasons, convenient sampling was used.

Sample:

Sample selection criteria

The sample for the study was drawn from the College Students population. For the present study samples of 50 College students have been drawn.

a) Subjects who are in the age group of 18-23 years.
b) Subjects who have the ability to communicate fluently in English.

Assessment Tools:

Following are the assessment tools used in the present study:

1) Personal data sheet.
2) Self-Evaluation Questionnaire STAI form Y-1 and Form Y-2
3) Everyday Memory Questionnaire
4) Everyday Memory Checklist
Tools

1) Personal Data Sheet: The Personal data sheet developed by the researcher for the purpose of collecting Socio-demographic data of the participants. It includes the information regarding Name, Age, Sex and Educational qualification.

2) The every-day memory questionnaire (EMQ) was proposed by Sunderland et al. It contains 40 items with 4 alternative options. In its original version the EMQ comprised 35 items describing memory failures of everyday life. It was later modified to 28 items. The factor structure of the EMQ has been studied in closed head injury patients (12) elderly adults (13) and multiple sclerosis patients (14). Sunderland et al. (13) applied EMQ to a group of elderly adults and found that it had low test-retest reliability.

3) The State-Trait Anxiety Inventory (STAI) is a psychological inventory based on a 4-point Likert scale and consists of 40 questions on a self-report basis. The STAI measures two types of anxiety - state anxiety, or anxiety about an event, and trait anxiety, or anxiety level as a personal characteristic. Higher scores are positively correlated with higher levels of anxiety. Its most current revision is Form Y and it is offered in 12 languages. It was developed by psychologists Charles Spielberg Gorsuch, and Lushene (1980). Their goal in creating the inventory was to create a set of questions that could be applied towards assessing different types of anxiety. This was a new development because all other questionnaires focused on one type of anxiety at the time. It is used in diagnoses, in both clinical and other medical settings, as well as in research and differentiating between anxiety and depression.

4) The everyday memory checklist developed by the researcher for the research purpose. It contains 20 items, related the amount of memory difficulties with 4 alternative options.

4.7 Procedure

The study was carried out over a period of week. After selecting the samples pursuing their studies in the Central University of Karnataka based on the selection criteria, the researcher developed a rapport with the participants, and the purpose of the data collection was explained. The socio-demographic data from the samples are obtained before the administration of the questionnaires. Firstly, the two questionnaires are administered to the sample group on a one-to-one basis. The questionnaires are administered in the following order Self Evaluation Questionnaire STAI Form Y-1, Self Evaluation Questionnaire STAI Form Y-2, Everyday Memory Questionnaire, and Everyday Memory Checklist.

4.8 Statistical Analysis

The data collected from the responses of the sample on all are for the main study is statistically analyzed with descriptive statistics. In the main study, Pearson product Moment correlation coefficient is conducted to examine the relationship between the State-Trait Anxiety and Day-today memory difficulties among college students.
5. Results and Discussion

The present study was conducted to assess the relationship between State-Trait Anxiety and Every-day memory difficulties among college students. The study aimed at determining the relationship between state-trait anxiety, every-day memory difficulties and the amount of memory difficulties among college students. Based on the obtained data, statistical analyses were done to test the hypotheses. The results are discussed below.

Table 1 shows the Mean and S.Ds of variables such as SAT (State Anxiety Test), TAT (Trait Anxiety Test), EMQ (Every-day Memory difficulties Questionnaire), EMC (Every-day memory Checklist).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>S.D</th>
<th>Maximum possible score</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT (State Anxiety Test)</td>
<td>41.73</td>
<td>9.89</td>
<td>80</td>
</tr>
<tr>
<td>TAT (Trait Anxiety Test)</td>
<td>44.41</td>
<td>8.32</td>
<td>80</td>
</tr>
<tr>
<td>EMQ (Every-day Memory difficulties Questionnaire)</td>
<td>59.08</td>
<td>29.76</td>
<td>180</td>
</tr>
<tr>
<td>EMC(Every-day memory Checklist)</td>
<td>58.18</td>
<td>28.19</td>
<td>180</td>
</tr>
</tbody>
</table>

Table 4:1 depicts the obtained mean score for the sample on state anxiety is 41.73 (SD 9.89). The mean score for the trait anxiety is 44.41 (SD 8.32 ).The mean score for the every-day memory difficulties is 59.08 (SD 29.76).The mean score for the every-day memory checklist is 58.18 (SD 28.19).

Table: 4.2 shows the ‘r ’values between SAT (State Anxiety Test), TAT (Trait Anxiety Test), EMQ (Every-day Memory difficulties Questionnaire), and EMC (Every-day memory Checklist).

<table>
<thead>
<tr>
<th>State Anxiety</th>
<th>Trait Anxiety</th>
<th>Everyday memory questionnaire</th>
<th>Everyday memory checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Anxiety</td>
<td>0.67**</td>
<td>0.18</td>
<td>0.22</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>0.27*</td>
<td></td>
<td>0.28*</td>
</tr>
<tr>
<td>Every day memory questionnaire</td>
<td>0.68*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Table 4.2 depicts the obtained Pearson product moment correlation coefficient scores. The values between state anxiety and trait anxiety have shown a significant relationship at 0.1 levels. Students with trait anxiety tend to experience state anxiety in the same direction. A research finding of Zdenka, (2009) also is similar to the findings of the present study. A finding from the present study reveal that trait anxiety was significantly related to state anxiety. It implies that Hypotheses accepted that is there will be a significant relationship between state anxiety and trait anxiety.

State anxiety scores have not shown any significant relationship with Everyday memory difficulties and amount of memory difficulties expressed. However, the correlation value of 0.27 has shown that there is a significant relationship between trait anxiety and everyday memory difficulties at 0.5 level. These findings indicate that students with high scores on trait anxiety tend to show high scores on everyday memory difficulties. Hence the hypothesis is rejected that is there will be a significant relationship between state anxiety and memory difficulties.

The findings of previous study suggested that (Miller, B. 2014)- The connection between anxiety and memory loss is some of the side effects that come from experiencing frequent anxiety can lead to memory loss. When an individual experiences anxiety, the stress hormone cortisol is released, among others. This stress hormone serves a necessary purpose in daily life, allowing one to quickly respond to dangerous situations and to make snap decisions. If it is constantly released into the brain, however, it can begin to slow the communication between neurotransmitters, leading to more frequent anxiety and concurrent memory loss.

Anxiety and memory loss is very common, but this is generally relegated to difficulty concentrating or remembering short-term items. The description often used is a feeling of a "brain fog." Significant memory loss, such as the inability to remember names, places, or other long-term details should be addressed with a physician immediately, because it could be a sign of a more serious problem. The connection between anxiety and memory problems is typically not permanent, and if one receives treatment for anxiety and begins to feel better, the ability to concentrate and remember things should return fairly quickly. (B. Miller, 2014).

Physiologically speaking, in the brains of individuals with depression and anxiety, Gunther et.al (2004) propose a possible neurobiological explanations for memory impairment in children with depression involving regulation in the hypothalamic-pituitary-adrenal axis associated with high cortisol levels, which in turn affects cognitive neuroendocrine functioning.
### Table 4.3 Mean and standard deviation of memory difficulties obtained by the respondents.

<table>
<thead>
<tr>
<th>Items</th>
<th>MEAN</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>3.14</td>
<td>2.49</td>
</tr>
<tr>
<td>Pass Words</td>
<td>2.32</td>
<td>2.0</td>
</tr>
<tr>
<td>Name of known people</td>
<td>2.42</td>
<td>1.90</td>
</tr>
<tr>
<td>Important occasions in your life</td>
<td>2.3</td>
<td>1.95</td>
</tr>
<tr>
<td>Forget to return borrowed items</td>
<td>3.52</td>
<td>2.31</td>
</tr>
<tr>
<td>Home</td>
<td>3.88</td>
<td>2.63</td>
</tr>
<tr>
<td>Turning off/unplugging the appliances (tv, gasetc)</td>
<td>3.14</td>
<td>2.60</td>
</tr>
<tr>
<td>To return phone calls</td>
<td>3.86</td>
<td>2.68</td>
</tr>
<tr>
<td>To replay emails</td>
<td>3.86</td>
<td>2.70</td>
</tr>
<tr>
<td>1Charging our phone</td>
<td>3.6</td>
<td>3.16</td>
</tr>
<tr>
<td>Forgetting date/month/year</td>
<td>4.04</td>
<td>2.81</td>
</tr>
<tr>
<td>Forget to change the calendar</td>
<td>2.92</td>
<td>2.59</td>
</tr>
<tr>
<td>Identity card</td>
<td>3.14</td>
<td>2.54</td>
</tr>
<tr>
<td>Bus pass</td>
<td>2.46</td>
<td>2.34</td>
</tr>
<tr>
<td>Forget to take mobile phone</td>
<td>2.52</td>
<td>1.91</td>
</tr>
<tr>
<td>Forget to take books/pen</td>
<td>3.36</td>
<td>2.46</td>
</tr>
<tr>
<td>Lunch box</td>
<td>2.96</td>
<td>2.62</td>
</tr>
<tr>
<td>ATM card</td>
<td>2.48</td>
<td>2.78</td>
</tr>
<tr>
<td>Locking the room</td>
<td>3.14</td>
<td>2.89</td>
</tr>
<tr>
<td>Purse</td>
<td>3.18</td>
<td>2.70</td>
</tr>
</tbody>
</table>

"Aano bhadraa krathavo yanthu vishwathaha" - "Let the noble thoughts come to all from all directions". Page No. 9

Acme Intellects Research Center- A wing of Help to Help Charitable Trust®
MEAN 3.14 2.32  
SD 2.49 2.0 

Table 4.3 showing mean and standard deviation of memory difficulties of respondents. From the table it can be inferred that the respondents obtained highest Mean score (4.04) with a standard deviation of 2.81 in the 11th item, i.e., Forgetting date/month/year. Second highest Mean score (3.88) is obtained for 6th item (Homework assignment), with a standard deviation of 2.63. 8th and 9th item (To replay emails) obtained same Mean scores (3.86), with a standard deviation of 2.68 for the first item and 2.70 for the 9th item.

6. Conclusions

The present study was aimed at examining the relationship between State-Trait anxiety and Day-today Memory difficulties among college students.

The subjects for the study consisted of students selected from Central University of Karnataka. The students were administered the three assessment tools in one single session. The responses were statistically analyzed to determine state-trait anxiety and day-today memory difficulties in the sample population.

The socio-demographic data of the subjects selected were homogenous in terms of their age (which ranged between 18 years and 23 years) and educational background (undergraduates and postgraduates). A correlation analysis was done to examine the interrelationship between state-trait anxiety and day today memory difficulties.

"Aano bhadraa krathavo yanthu vishwathaha"-“Let the noble thoughts come to all from all directions”. Page No.10
Further, the data obtained from the sample population was statistically analyzed and discussed. The findings revealed that, the values between state anxiety and trait anxiety have shown a significant relationship at 0.1 levels. Students with trait anxiety tend to experience state anxiety in same direction. State anxiety scores have not shown any significant relationship with Everyday memory difficulties and amount of memory difficulties expressed. However the correlation Value of 0.27 has shown that there is a significant relationship between trait anxiety and everyday memory difficulties at 0.5 levels. This finding indicates that students with high scores on trait anxiety tend to show high scores on everyday memory difficulties. There is a highly significant relationship between state trait anxiety and trait anxiety.

Thus it can be concluded that a significant relationship exists between state anxiety and trait anxiety and trait anxiety and day today memory difficulties and the amount of memory difficulties.

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