

Debilitating and Facilitating Anxiety Effects on Identification

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Thirty-nine students and two employees at a public northeastern university voluntarily participated in the experiment. Participants were asked to complete an anxiety questionnaire, then to view briefly and identify in limited time one of two structures built of Wedgits, a building toy. Anxiety has been shown to affect performance even among subjects without clinical anxiety disorders. Debilitating Anxiety, associated with decreased problem solving coping (behaviors that address the stressor and improve performance), and Facilitating Anxiety, associated with enhanced and proactive problem solving coping, were assessed. The hypothesis that dominant Debilitating Anxiety would correspond to more errors than dominant Facilitating Anxiety was supported, $F(1,38) = 4.60, p < .05$, partial $\eta^2 = .11$, and the observed power = .55, $\alpha = .05$. The mean and standard deviation of anxiety scores for Debilitating Anxiety ($M = 30, SD = 5.66$), scored overall five points higher than Facilitating Anxiety, were very close to those for Facilitating Anxiety ($M = 23, SD = 5.10$).

It has been shown that deficits in sensory task completion exist in samples with clinical anxiety disorders as compared to the non-clinical population (Kaplan, et al., 2006). However, anxiety affects performance even among subjects without clinical anxiety disorders. Studies have shown that greater anxiety increases speed of response. Hainaut and Bolmont (2005) demonstrated that increased anxiety corresponds to faster auditory and visual muscle response. However, the faster response anxiety can trigger is associated with poor ability to discriminate among stimuli. Pollock, Carter, Amir, and Marks (2006) showed increased sensitivity to anxiety corresponds to poor ability to discriminate between abnormal heartbeats and background noise, and between abnormal and normal heartbeats. This finding was confirmed by Saleminck, van den Hout, and Kindt (2006). In their study, anxiety increased speed of orienting, but decreased the speed at which the type of visual probe could be identified.

Anxiety can affect performance through several mechanisms. Bolmont, Gangloff, Vouriot, and Perrin (2002) demonstrated that increased anxiety in healthy subjects decreases ability to maintain balance. Anxiety seems to affect balance through two different mechanisms, sensory organization and motor control. In Yechiam, et al. (2006), increased anxiety corresponded to decreased choice consistency, and to increased errors due to attention to rewards and punishment. How worried a participant typically is also contributes to anxiety effects. McKay (2005)

demonstrated that the performance of non-worriers improves with worry, while the performance of worriers decreased when worried.

Worriers and non-worriers identify their anxiety differently. The Alper and Haber Achievement Anxiety Test (1960) identifies anxiety related to academic tasks as either inhibiting ("Debilitating") or enhancing ("Facilitating") performance. When given the test, worriers identified increased anxiety as "Debilitating", while non-worriers identified increased anxiety as "Facilitating" (Hollandsworth, Glazeski, Kirkland, Jones, & Van Norman, 1978). Increased Debilitating Anxiety is associated with decreased problem solving coping (behaviors that address the stressor and improve performance), and decreased academic exam scores. Facilitating Anxiety is associated with enhanced and proactive problem solving coping (Rafferty, Smith, & Ptacek, 1997). Mellalieu, Hanton, and O'Brien (2004) showed that participation in gross explosive sports (in contrast to fine motor skill sports) and greater competitive experience are also associated with Facilitating Anxiety. However, in contrast to results of tests of high level athletes, Cunningham and Ashley (2002) found no difference in performance on a golf task between college students with Debilitating and Facilitating Anxiety, suggesting both skill and competition affect error rate.

In the current study, participants were asked to identify one of two Wedgits structures. Error rates for Debilitating and Facilitating Anxiety were evaluated. The identification was simple, so that participants were reasonably skilled at the task, and timed, creating competition. Increased anxiety was expected to decrease performance across conditions. It was hypothesized that dominant Debilitating Anxiety would correspond to more errors than dominant Facilitating Anxiety.

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Method

Participants

Thirty-nine students and two employees at a public northeastern university voluntarily participated in the experiment. At the discretion of their professors, some participants received extra academic credit.

Materials

Participants were asked to identify one of two structures built of Wedgits, a building toy. A box covered the structure. Numbered cards with ten different pictures of Wedgits structures were placed in envelopes. Participants also received the Alpert Haber Achievement Anxiety Test (AAT). The AAT is presented in the Appendix. The experimenter timed viewing and response time on a wristwatch with a second hand.

Procedure

A 2 x 3 experiment was conducted. Participants were randomly assigned to view one of two Wedgits structures. Separately, each group was seated in a test room. Each participant's responses to an anxiety questionnaire determined which of three anxiety groups the participant was assigned to. The numbered anxiety questionnaire and the envelope containing the Wedgits cards, marked with the same number, were placed face down in front of each participant. All participants were asked to turn over the questionnaire and complete it. Participants were then told that a building toy was under the box. The participants would have five seconds to view the building. They would then open the envelope, and circle the number of the picture that corresponded to the structure they saw. Participants had ten seconds to identify the structure.

Results

A 2 x 3 between-subjects ANCOVA was used to analyze the results. The first, fixed factor was the condition, the two different Wedgits structures viewed. The second, covariant factor was the participant's anxiety type; facilitating, debilitating, or neutral. The dependent variable was correct identification of the Wedgits structure. The hypothesis that dominant Debilitating Anxiety would correspond to more errors than dominant Facilitating Anxiety was supported, $F(1,38) = 4.60, p < .05$, partial $\eta^2 = .11$, and the observed power = .55, $\alpha = .05$. Participants with dominant Debilitating Anxiety represented 66% of the total; with dominant Facilitating Anxiety 32%; with Neutral Anxiety 2%. The mean and standard deviation of anxiety scores for Debilitating Anxiety ($M = 30, SD = 5.66$), scored overall five points higher than Facilitating Anxiety, were very close to those for Facilitating Anxiety ($M = 23, SD = 5.10$). Descriptive statistics of these curves are presented in Table 1.

Table 1

Facilitating and Debilitating Anxiety Descriptive Statistics

	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>
Fac Anx	41	11	33	23.05	5.10
Deb Anx	41	19	44	30.00	5.66
Anx Type	41	-18	27	2.39	9.47
Overall Anx	41	43	63	52.98	4.22
Valid <i>N</i> (listwise)	41				

Discussion

The hypothesis that dominant Debilitating Anxiety would correspond to more errors than dominant Facilitating Anxiety was supported. However, a more informative test of performance would be to have each participant complete multiple timed identification trials. The number of errors would be scored as a ratio variable. The difference between a consistent pattern and one time error in identification could be shown. The relationship between number of errors and degree and type of anxiety could also be investigated.

The means and standard deviations for each anxiety type were very close. However, performance anxiety is usually understood as a bell curve (Yerkes-Dodson Law). Optimal performance is associated with anxiety levels in the middle of the bell curve. Lesser performance is associated with anxiety levels in the tails of the bell curve. Given this model, the standard deviation for Facilitating Anxiety was expected to be significantly smaller than the standard deviation for Debilitating Anxiety. That was not the case here. The results may be explained by the presence of skill and competitive components of the task. Those elements have been suggested to be necessary for anxiety type to affect performance. The results suggest anxiety is best understood in three dimensions. When skill and competition involved in a task are low, as anxiety increases, success increases then decreases along a single bell curve. Optimal performance is achieved by functioning at the level of anxiety around the peak of the curve. When skill and competition involved in a task are high, separate bell curves for Debilitating and Facilitating Anxiety emerge. Optimal performance is achieved at anxiety levels around the apex of the Facilitating Anxiety curve when overall Facilitating Anxiety is greater than overall Debilitating Anxiety. Given this model, perception of a participant's skills as equivalent to all other participants, and perception of the task as an individual effort rather than competition against others should eliminate the effects of anxiety type. Further research is needed to test this hypothesis.

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Appendix A

Questionnaire on Attitudes Toward Examination

Instructions

This questionnaire deals with your personal feelings, attitudes, and experiences about course examination. Some of the questions refer to your past experiences with examinations; when you answer these, think back to your school examinations of the last couple of years. Obviously there are no "right" or "wrong" answers to any of these kinds of questions. They merely offer an opportunity to express feelings and attitudes with regard to a large range of situations. The value of the results of this questionnaire will depend on how frank you are in stating your feelings and attitudes. Read each statement and set of alternatives carefully. For each of the 19 questions below, answer by circling the most appropriate statement. You can always go back to a question and change your response.

1. Nervousness while taking an exam or test hinders me from doing well.

- A. Always
- B. Often
- C. Sometimes
- D. Rarely
- E. Never

2. I work most effectively under pressure, as when the task is very important.

- A. Always
- B. Usually
- C. Sometimes
- D. Hardly ever
- E. Never

3. In a course where I have been doing poorly, my fear of a bad grade cuts down my efficiency.

- A. Never
- B. Hardly ever
- C. Sometimes
- D. Usually
- E. Always

4. When I am poorly prepared for an exam or test, I get upset, and do less well than even my restricted knowledge should allow.

- A. This never happens to me
- B. This hardly ever happens to me
- C. This sometimes happens to me
- D. This often happens to me
- E. This practically always happens to me

5. The more important the examination, the less well I seem to do.

- A. Always
- B. Usually
- C. Sometimes
- D. Hardly ever
- E. Never

6. While I may (or may not) be nervous before taking an exam, once I start, I seem to forget to be nervous.

- A. I always forget
- B. Usually
- C. Sometimes
- D. I often feel some nervousness
- E. I am always nervous during an exam

7. During exams or tests, I block on questions to which I know the answers, even though I might remember them as soon as the exam is over.

- A. This always happens to me
- B. This often happens to me
- C. This sometimes happens to me
- D. This hardly ever happens to me
- E. I never block on questions to which I know the answers

8. Nervousness while taking a test helps me do better.

- A. It never helps
- B. It usually doesn't help
- C. Now and then it helps
- D. It generally helps me a little
- E. It often helps

9. When I start a test, nothing is able to distract me.

- A. This is always true of me
- B. This is often true of me
- C. This is sometimes true of me
- D. This is hardly ever true of me
- E. This is never true of me

10. In courses in which the total grade is based on mainly "one" exam, I seem to do better than other people.

- A. Never
- B. Hardly ever
- C. Sometimes
- D. Quite often
- E. Almost always

11. I find that my mind goes blank at the beginning of an exam, and it takes me a few minutes before I can function.

- A. I almost always blank out first
- B. I usually blank out first
- C. I sometimes blank out first
- D. I hardly ever blank out first
- E. I never blank out first

12. I look forward to exams

- A. Never
- B. Hardly ever
- C. Sometimes
- D. Usually
- E. Always

13. I am so tired from worrying about an exam, that I find I almost don't care how well I do by the time I start the test.

- A. I never feel this way
- B. I hardly ever feel this way
- C. I sometimes feel this way
- D. I almost always feel this way

14. Time pressure on an exam causes me to do worse than the rest of the group under similar conditions

- A. Time pressure always seems to make me do worse on an exam than others
- B. Time pressure often seems to make me do worse on an exam than others
- C. Time pressure sometimes seems to make me do worse on an exam than others
- D. Time pressure hardly ever seems to make me to worse on an exam than others
- E. Time pressure never seems to make me do worse on an exam than others

15. Although "cramming" under pre examination pressure is not effective for most people, I find that if the need arises, I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use on the exam.

- A. I am always able to use the "crammed" material successfully
- B. I am usually able to use the "crammed" material successfully
- C. I sometimes can use the "crammed" material successfully
- D. I hardly ever use the "crammed" material successfully
- E. I am never able to use the "crammed" material successful

16. I enjoy taking a difficult exam more than an easy one.

- A. Always
- B. Often
- C. Sometimes
- D. Rarely
- E. Never

- A. This never happens to me
- B. This very rarely happens to me
- C. This sometimes happens to me
- D. This frequently happens to me
- E. This almost always happens to me

Scoring:

17. I find myself reading exam questions without understanding them, and I must go back over them so that they will make sense.

- A. Never
- B. Rarely
- C. Sometimes
- D. Often
- E. Almost Always

Facilitating Anxiety Score: Range 9-45

Items 2, 6, 9, 15, 16, and 18

Score a = 5, b = 4, c = 3, d = 2, e = 1

Items 8, 10, and 12

Score a = 1, b = 2, c = 3, d = 4, e = 5

18. The more important the exam or test, the better I seem to do.

- A. This is true of me
- B. This is true of me much of the time
- C. This is sometimes true of me
- D. This is rarely true of me
- E. This is not true of me

Debilitating Anxiety Score: Range 10-50

Items 1, 5, 7, 11, and 14

Score a = 5, b = 4, c = 3, d = 2, e = 1

Items 3, 4, 13, 17, and 19

19. When I don't do well on difficult items at the beginning of an exam, it tends to upset me so that I block on even easy questions later on.

Score a = 1, b = 2, c = 3, d = 4, e = 5