

Anxiety 101

Chapter 5 – How Does Anxiety Affect Cognitive Outcomes?

Zeidner & Matthews (2011)

Impact of Anxiety

- Anxiety can play a role in determining a wide array of unfavorable outcomes
 - Poor cognitive performance
 - Scholastic underachievement
 - Psychological distress
 - Ill health

Anxiety and Cognition

- High anxiety has been shown to negatively impact performance within
 - Mathematical ability
 - Academic tests
 - Working memory tasks
 - Reading comprehension
 - Social interactions
 - Sporting behaviors
 - Musical performance

Eysenck, Derakhshan, Santos, & Calvo (2007); Ashcraft & Moore (2009)

But...

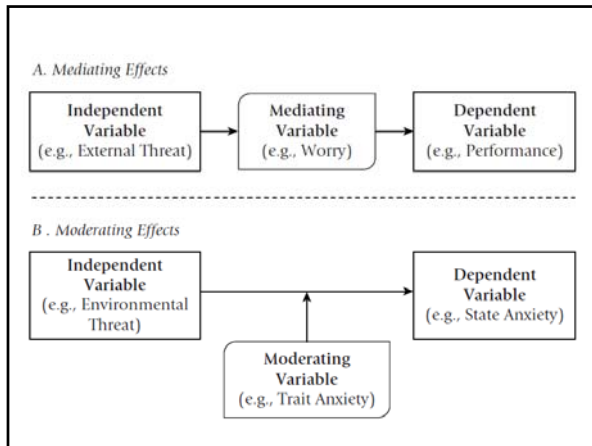
- What are the factors that *mediate* the effects of anxiety on poor performance?
- What are the personal and contextual factors that may *moderate* the anxiety-performance relationship?

Mediator Variables

- Transmits the influence of an independent variable (a “cause”) onto some dependent variable (an “effect”)
- A simple mediator model for anxiety is that an external threat raises worry, which impairs performance

Moderator Variables

- An additional variable that influences the effect of an IV on a DV
- Focus on moderators if the relationship between two variables differs from study to study
 - A third variable may be moderating the relationship



Theoretical Perspectives

- Three that are informative in explicating the causal process in the anxiety-performance interface:
- Information-Processing Models
- Attentional Control Theory
- Self-Regulative Theory of Anxiety

Information-Processing Models

- The classic models suppose that processing is supported by a series of discrete stages
- Sensory processing is followed by selective attention to the most important stimulus in the outside world, which is placed in short-term memory

Selective Attention

- Early cognitive theories emphasized the influence of anxiety on attention
- Anxious persons appear to be highly distractible
 - Have difficulty maintaining the focus of attention on the task stimuli
 - Instead, may self-focus attention

Sarason, 1980; Wine, 1980; Zeidner, 1998

Memory & Higher-Level Cognition

- Anxiety also impairs a variety of processes that operate following stimulus recognition
 - Working memory
 - Storing and retrieving information in LTM
 - Evaluating and judging stimuli
- Anxiety primarily influences the retrieval of previously acquired information from LTM

Cognitive Bias

- Effects of anxiety may depend on the nature of the stimulus attended to
- Anxiety may actually focus attention on threatening stimuli or potential threats
 - Emotional Stroop test & dot-probe task
- People high and people low in anxiety may inhabit different subjective worlds

Mathews and MacLeod (1994)

Attentional Control Theory

- A limitation of standard information-processing models is they fail to capture the dynamic nature of processing:
1. The brain is a parallel processing device
 2. It includes systems dedicated to regulating and controlling the executive functions
 3. Standard models see processing as a linear sequence from stimulus to response

Attentional Control Theory

- Supposes that attention depends on the dynamic balance between
 - Goal-directed (top-down) executive attentional system
 - Reflexive, stimulus-driven (bottom-up) system
- Anxiety causes increase in stimulus-driven system and decrease in goal-directed

Eysenck et al., (2007)

TABLE 5.1 INFORMATION-PROCESSING DEFICITS IN HIGH-ANXIOUS INDIVIDUALS

Deficit Area	Brief Description
<i>I. Information encoding</i>	
1. Encoding difficulties	Experiencing encoding difficulties.
2. Interpretive bias	Exhibiting selective attentional bias favoring threat.
3. Restricted range of cue utilization	Attending to fewer environmental features and having a narrow range of cue utilization.
4. Distractibility	Difficulty in concentrating on cognitive tasks, dividing their attention between the multiple requirements of the complex task and various task-irrelevant activities.

<i>II. Information storage and processing</i>	
5. Short-term storage	Reduction in cognitive capacity devoted to the task, thus reducing resources for short-term memory tasks in test-anxious persons. Working memory is particularly affected.
6. Long-term storage	Impaired retention of information in long-term memory, leading to greater retention loss over time.
7. Depth of processing	Emphasis on processing superficial features of verbal stimuli at the expense of deeper semantic processing and focusing on shallow or physical features rather than deep or semantic features of stimuli.
8. Elaboration and rehearsal	Failure to adequately rehearse or elaborate upon information.
9. Conceptual organization	Shallow encoding and organization of semantic material, by reducing the quality of elaborations and associative paths.
10. Strategic processing	Arousal hinders complex tasks requiring rehearsal or strategic operations, whereas automatic or highly learned operations are relatively unaffected.

TABLE 5.1 INFORMATION-PROCESSING DEFICITS IN HIGH-ANXIOUS INDIVIDUALS (CONTINUED)

Deficit Area	Brief Description
11. Language processing	Vocabulary deficits, deficiencies in comprehension and reading efficiency, selectively detrimental to the efficiency of text-level processes, such as those involving integrating information across sentences.
12. Decision making	Difficulty in absorbing decision-relevant information, difficulty in scanning of alternatives, and adoption of more cautious decisional criteria.
13. Metacognition	Deficient metacognitive knowledge, including knowledge and executive processes used to control learning.
<i>III. Information retrieval</i>	
14. Interference and anxiety blockage	Cognitive interference and self-preoccupations with task-irrelevant information.
15. Information retrieval	Impaired retrieval of material and lowered performance.
