

Anxiety and Word Learning in College Students

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Background

- Anxiety can impede cognitive functions such as memory, learning, or attention but can be beneficial in other facets of life, like detecting or avoiding danger (Robinson et al., 2013).
- There are two types of anxiety: *state* and *trait* anxiety.
 - State anxiety is a direct and temporary response to an event; it can be associated with a temporary increase of the sympathetic nervous system (Saviola et al., 2020) and can directly interfere with cognitive functioning (Robinson et al., 2013).
 - Trait anxiety is component of one's personality and is related to how one consistently responds to adverse events; it is rooted in psychopathology and can also impact cognitive functioning (Saviola et al., 2020).
- Little is understood or known about the direct and exact implications that anxiety has on cognitive processes, such as word learning.



Research Question

Is there a connection between anxiety and word learning?

Methods

Participants

- 21 participants (18 female, 3 male; Mage = 19.57, SDage = 1.54) participated in a word learning experiment

Stimuli/Word Learning Task

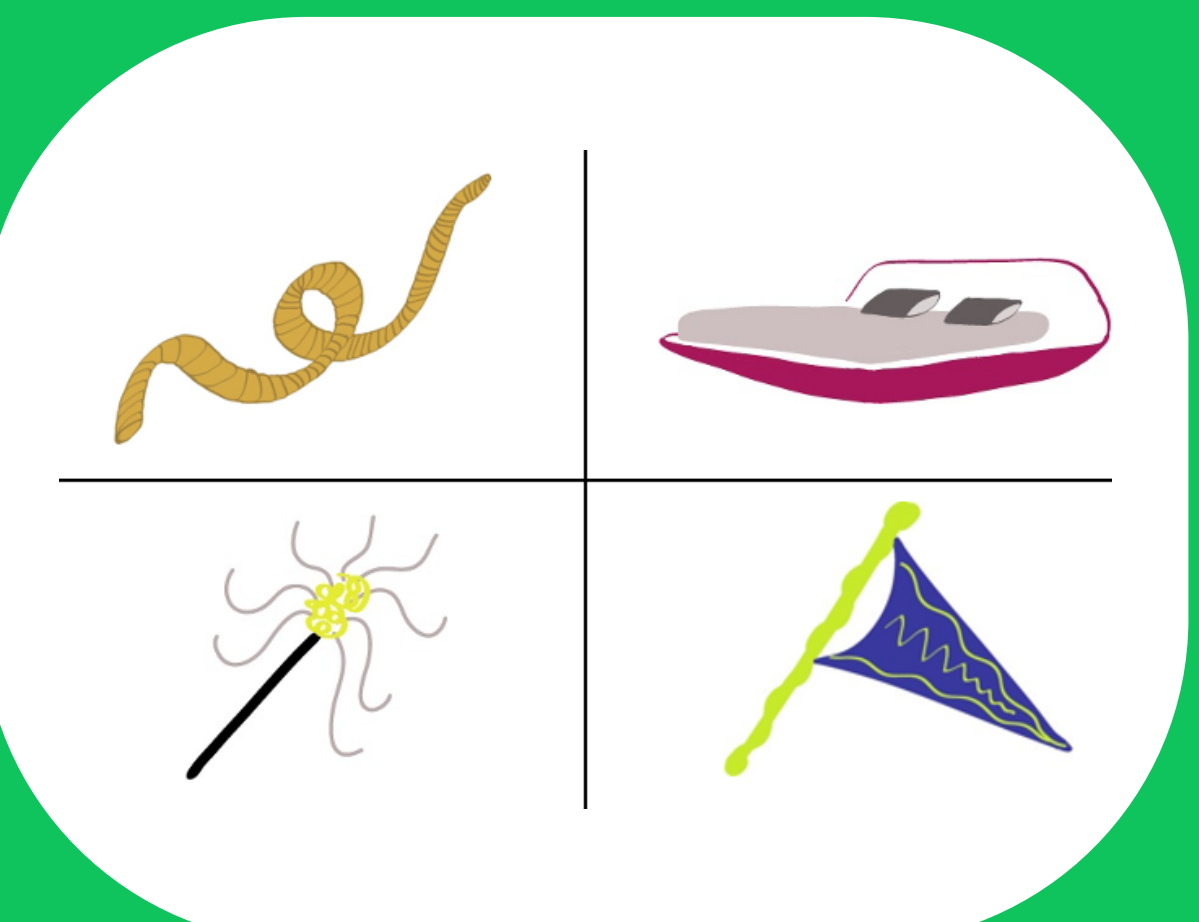
- Exposure: Participants were introduced to a novel word (NW) in a sentence. The NW was defined contextually in the sentence and by a representative image (RI) displayed while listening to the sentence. Upon hearing the sentence and seeing the RI, participants were asked whether or not they knew what the NW meant. Participants were exposed to 15 NWs; each NW was heard four times; the learning judgement was presented after each sentence.
- Post-Test 1: To test whether the NW was learned for each image, participants engaged in a four-alternative forced choice task. Four images appeared on the screen and one of the NWs was presented auditorally. Participants were asked to choose which of the four images was the NW that they heard.
- Post-Test 2: Participants heard an entire sentence with a NW from the exposure and were prompted to choose the image from an array of four (similar to that in post-test 1) that went with the sentence.

Anxiety Measures

- State Trait Anxiety Inventory (STAI) (Self-reported) (state $\alpha = 0.89$, trait $\alpha = 0.895$)



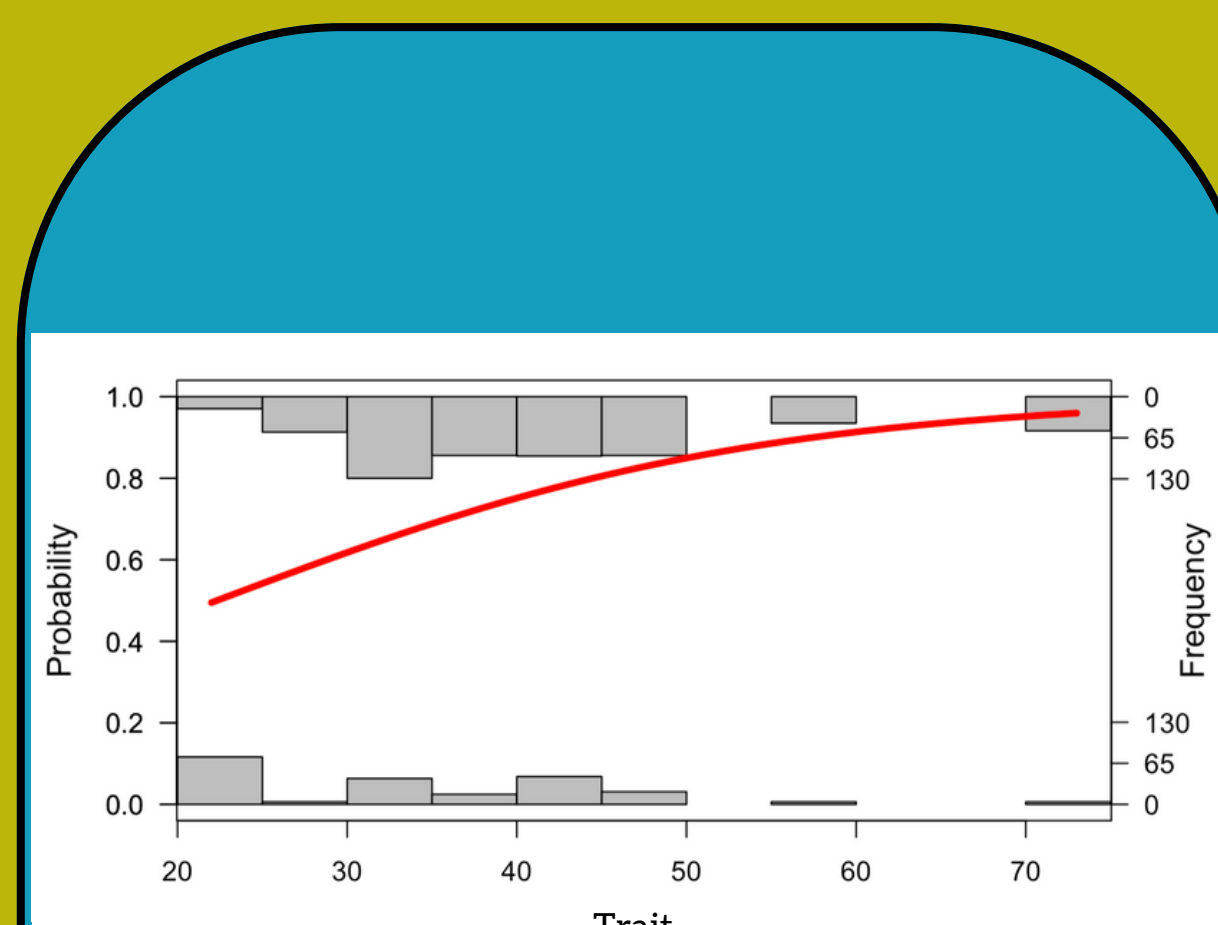
"Your mind may wander as you fall asleep in your wom."



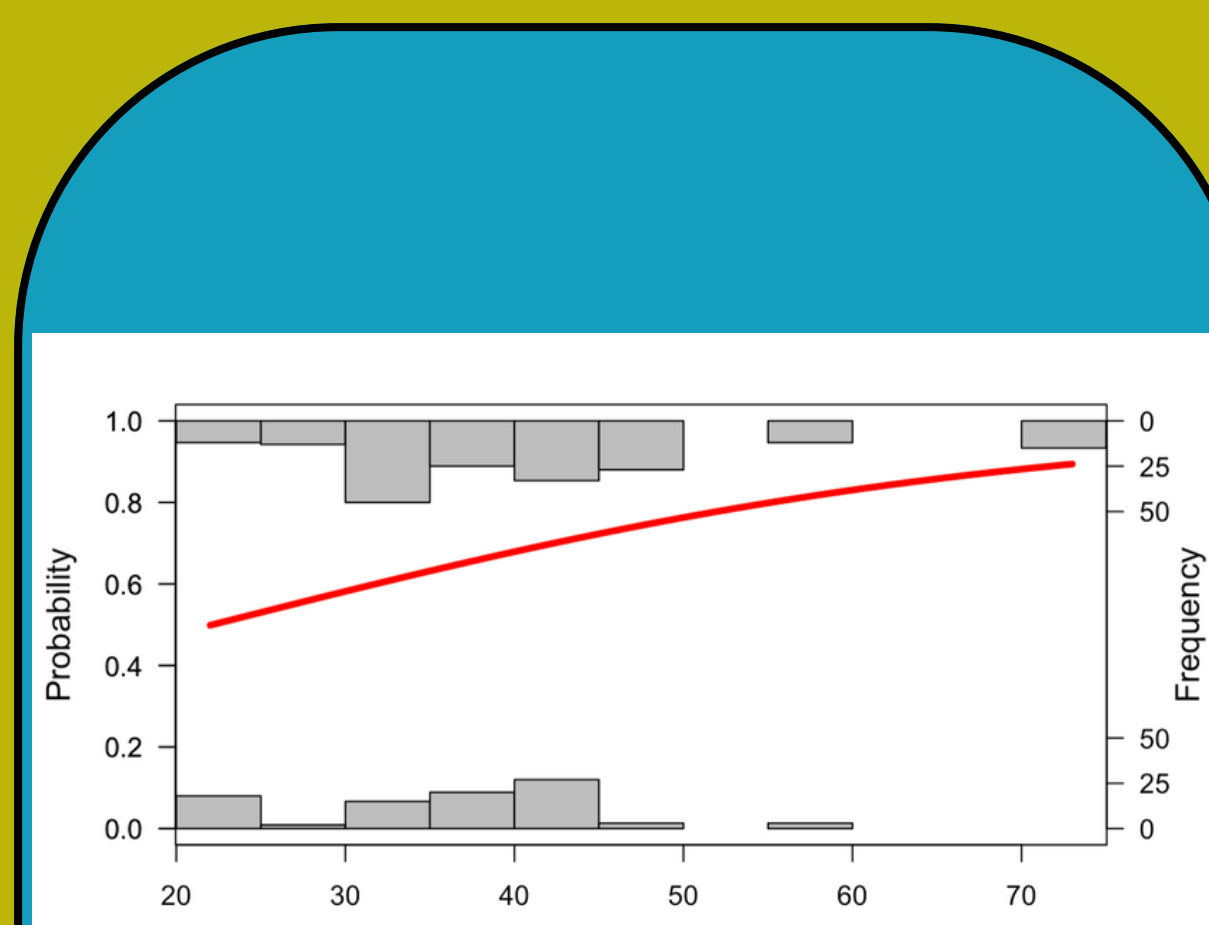
Results

Logistic Regression Analyses were utilized to address the following two questions:

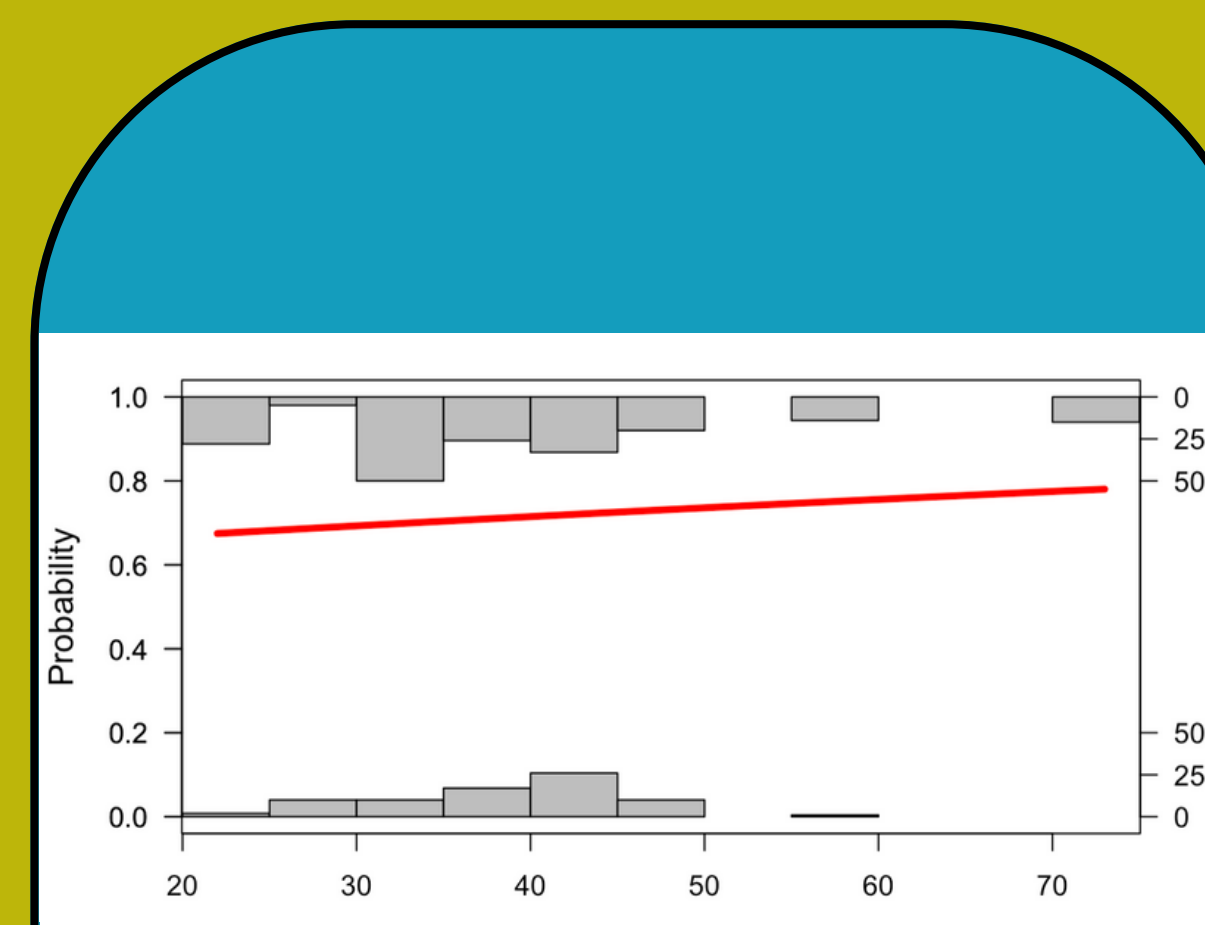
1. Does state or trait anxiety predict likelihood of reporting whether an individual knows or does not know the NW during exposure?
2. Does state or trait anxiety predict the likelihood of accurately selecting the NW during post-test 1 and 2?



Heightened State ($B = 0.06$, $p < 0.001$) and Trait Anxiety ($B = 0.05$, $p = 0.006$) were associated with individuals likelihood of stating they new the novel word during exposure.



Participants high in Trait Anxiety were more likely to accurately select the NW during post-test 1 ($B = 0.09$, $p = 0.002$).



Participants high in Trait Anxiety were moderately more likely to accurately select the NW during post-test 2 ($B = 0.05$, $p = 0.053$).

Procedure

1. Participants completed the STAI.
2. Participants completed the exposure and judged if they had learned they word or not, completed post-test1 followed by post-test 2.

Discussion

- The results indicate that trait anxiety may actually improve an individual's ability to learn and retain new information.
- Future steps should seek to identify mediators of this association.
- Further research should address (1) how anxiety affects those in the classroom and (2) identifying exact effects of anxiety on cognitive processes.

References

1. Robinson, O. J., Vytal, K., Cornwell, B. R., & Grillon, C. (2013). The impact of anxiety upon cognition: Perspectives from human threat of shock studies. *Frontiers in Human Neuroscience*, 7. <https://doi.org/libezp.lib.lsu.edu/10.3389/fnhum.2013.00203>
2. Saviola, F., Pappaiani, E., Monti, A. et al. Trait and state anxiety are mapped differently in the human brain. *Sci Rep* 10, 11112 (2020). <https://doi.org/10.1038/s41598-020-68008-z>