



Larence Becker, J. Craig Clarke, Thomas J. Tomcho,
Victoria Barreira*, Oluchi Dan-Egwu*, Meredith
Hannahs*, Pauline Nsimba*, Abby Wiles*
(* = student)

Salisbury University

Meaningful Variable Names Facilitate Processing of 2x2 Interaction Graphs

*Response times suggest students use
variable names to create a context for
interpreting graphical information*

INTRO

- This study is an extension of a larger research program from Ali and Peebles' (2012) on how student's interpret graphs of two-way interactions. Instead of using their format of open-ended questions we used an original multiple-choice question format to investigate graphs with 2 x 2 interactions with either meaningful or neutral variables. Our goal was to find which graphs were the most efficient in understanding how advanced graphs are interpreted.

METHODS

- Participants: N = 32
- Used psychology students from the courses General Psychology and Cognitive Psychology
- Materials and Procedure:
- Students were randomly assigned to either the meaningful variables group or the neutral variables group. They were then asked to observe the respective graphs on a PowerPoint slideshow.
- After observing graphs, students were then asked to answer a series of questions on a physical answer sheet. These series of questions were the same for both graphs and the only difference was the use of meaningful or neutral variables.

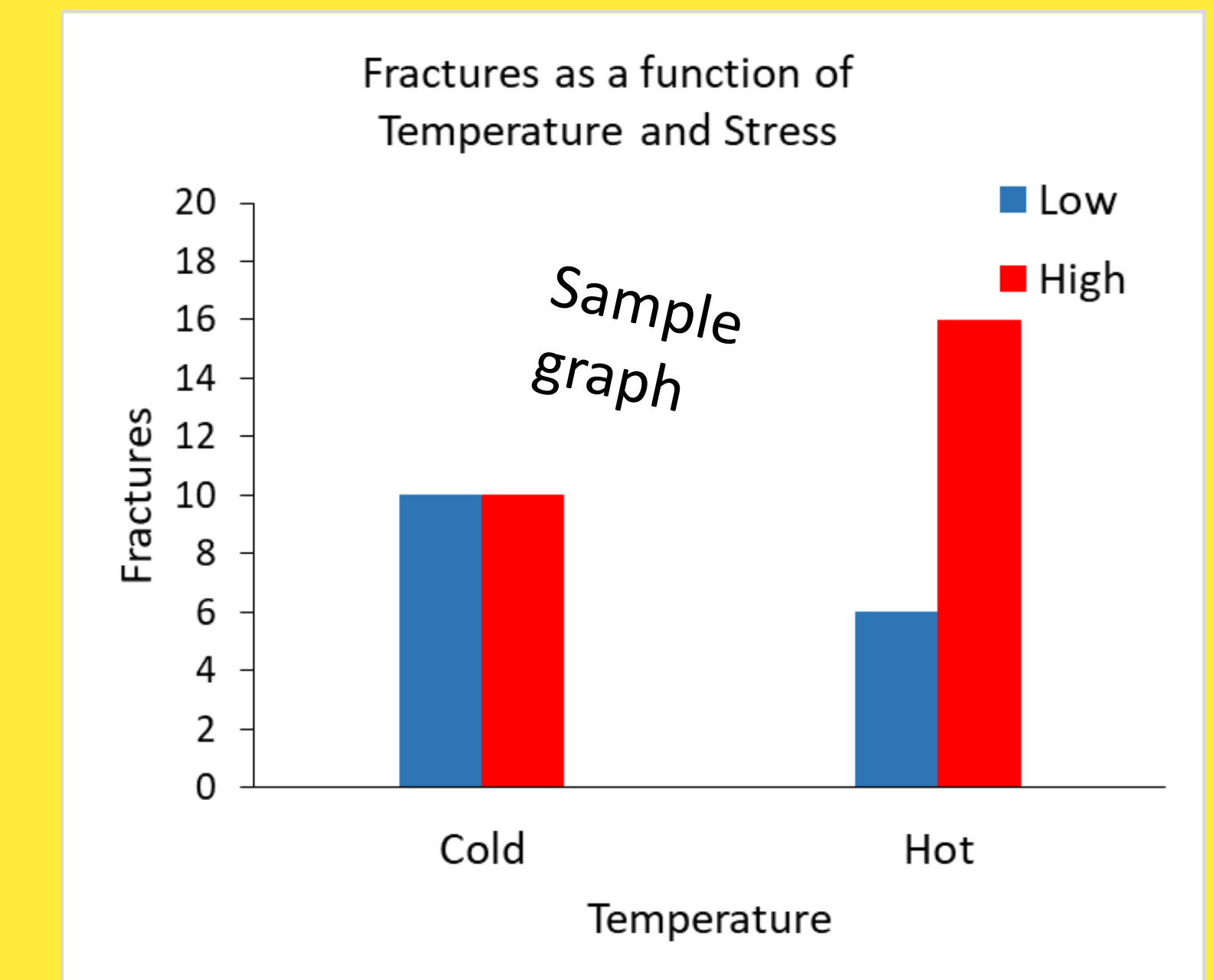
RESULTS

- There was a significant difference between the time to complete the meaningful variable graphs (M = 482.92 sec.) and neutral graphs (M = 402.75 sec, $t(28) = 2.56$, $p < .05$). However, participants were more accurate answering the questions for the meaningful variable graphs (M = 1.5 errors out of 24 questions) than the neutral graphs (M = 3.19, $t(20) = 2.21$, $p < .05$).

DISCUSSION

- The findings lead us to believe that meaningful variables help participants develop a narrative to more accurately understand data presented in a bar graph.
- To extrapolate upon the results, we believe an effective application of these findings would be to implement more meaningful variables when teaching students how to comprehend graphs.

Sample graph: **Meaningful Variable Names**



Sample graph: **Neutral Variable Names**

