TOOLS FOR TEACHING: ENHANCING LEARNING THROUGH TECHNOLOGY

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The ancestral, traditional, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) People

TODAY

Outline main motivations behind integrating interactive videos into texts

Demonstrate a few videos and how I've gone about doing this.

Show some research demonstrating the efficacy of these videos

Provide some recommendations

...in 10 minutes.

BIG SHOUT OUT TO

Dr. Kayli Johnson

THE GOLD STANDARD

Active learning

(Freeman et al., 2014)

…THE PROBLEM…

THE PROBLEM

- A lot of work shifted online (videos / texts)
- The pandemic has also shifted work online (videos)
- Video and texts mimic passive learning
- Passive engagement with material also leads to poor performance (Mueller & Oppenheimer, 2014)
- Video delivery of content can lead to worse performance than text (Furnham, Gunter, & Green, 1990)
- Century of research showing active retrieval leads to better retention (Roediger & Karpicke, 2006)
- Incorrect answering of practice items promotes meaningful learning (Kornell, Hayes, & Bjork, 2009; Little & McDaniel, 2015) especially if followed up by feedback (Shute, 2008)

WHAT WE TRIED TO DO

Create interactive videos that

- encouraged active engagement with the material studied,
- made use of retrieval practice,
- encouraged mastery of content
- by providing timely feedback,
- gave students greater control over the pace or learning
- was entertaining

THREE EXAMPLES OF WHAT THESE VIDEOS LOOK LIKE

pressbooks.bccampus.ca/psychologyh5p/chapter/stages-of-sleep/

https://pressbooks.bccampus.ca/psychologyh5p/chapter/sleep-problems-and-disorders/

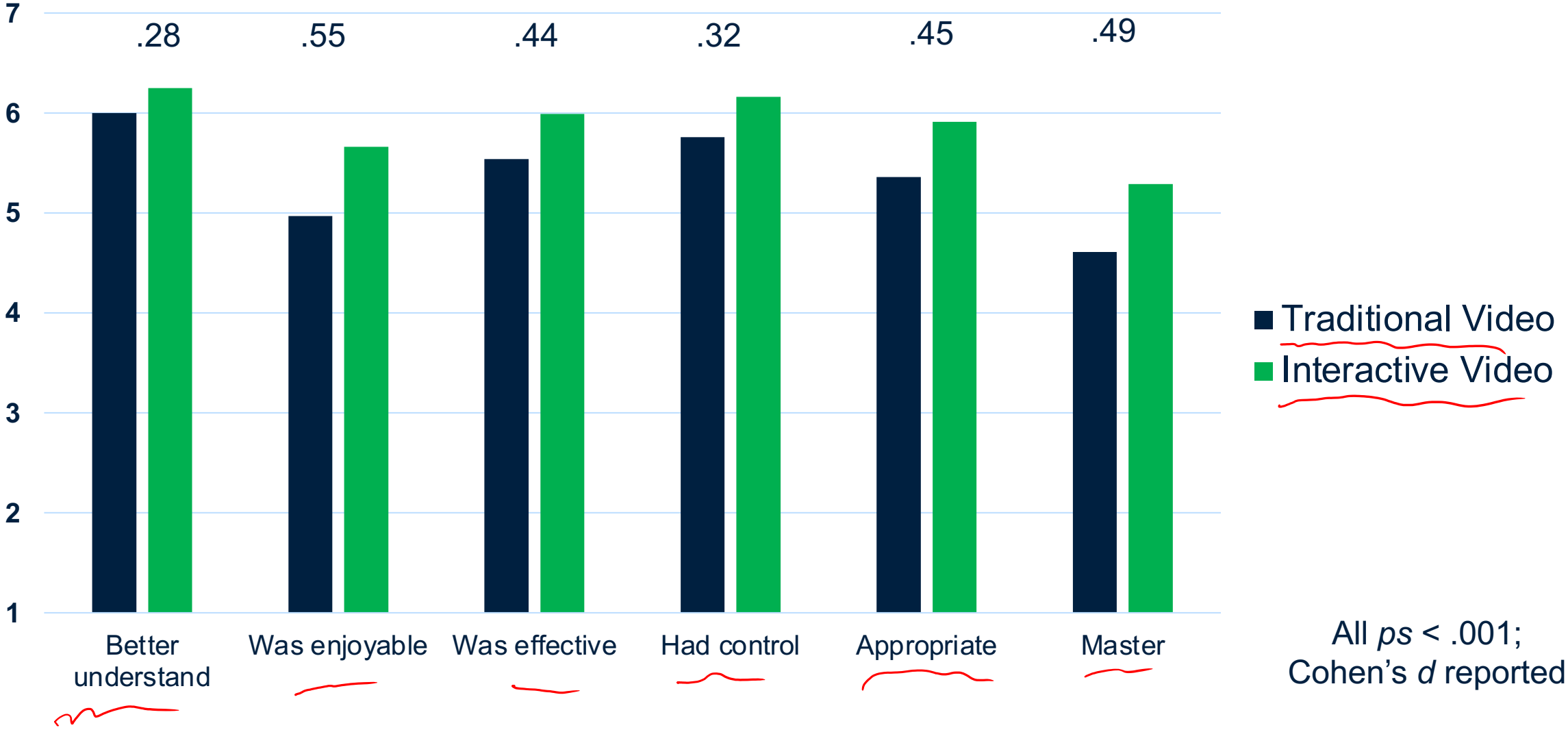
pressbooks.bccampus.ca/psychologyh5p/chapter/analyzing-findings/

ARE THESE VIDEOS WORTH THE EFFORT?

With Dr. Kayli Johnson, we have run several in-class (chemistry) and laboratory (psychology) experiments.

Short answer is yes!

CHEMISTRY CLASS EXPERIMENT (N = 625 STUDENTS)



All *ps* < .001;
Cohen's *d* reported

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Short answer is yes!

Showed, amongst other things, greater perceived **mastery** and **control**

-- greater engagement (Lewin, 1952)

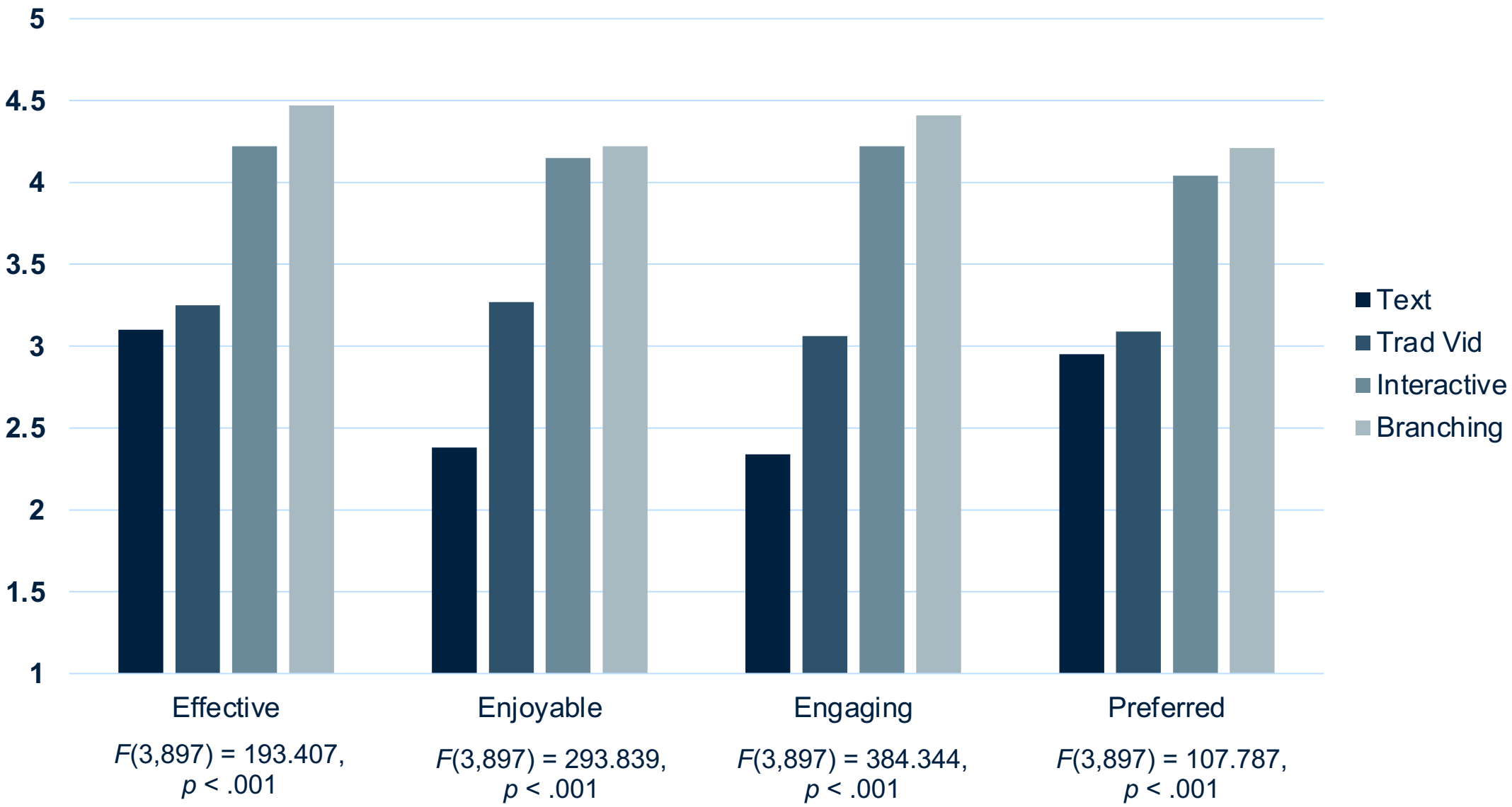
-- learning (Cordova & Lepper, 1996)

-- faster overcoming setbacks (Patall et al., 2008)

What about branching interactive vs. interactive?

-- evidence is more mixed...

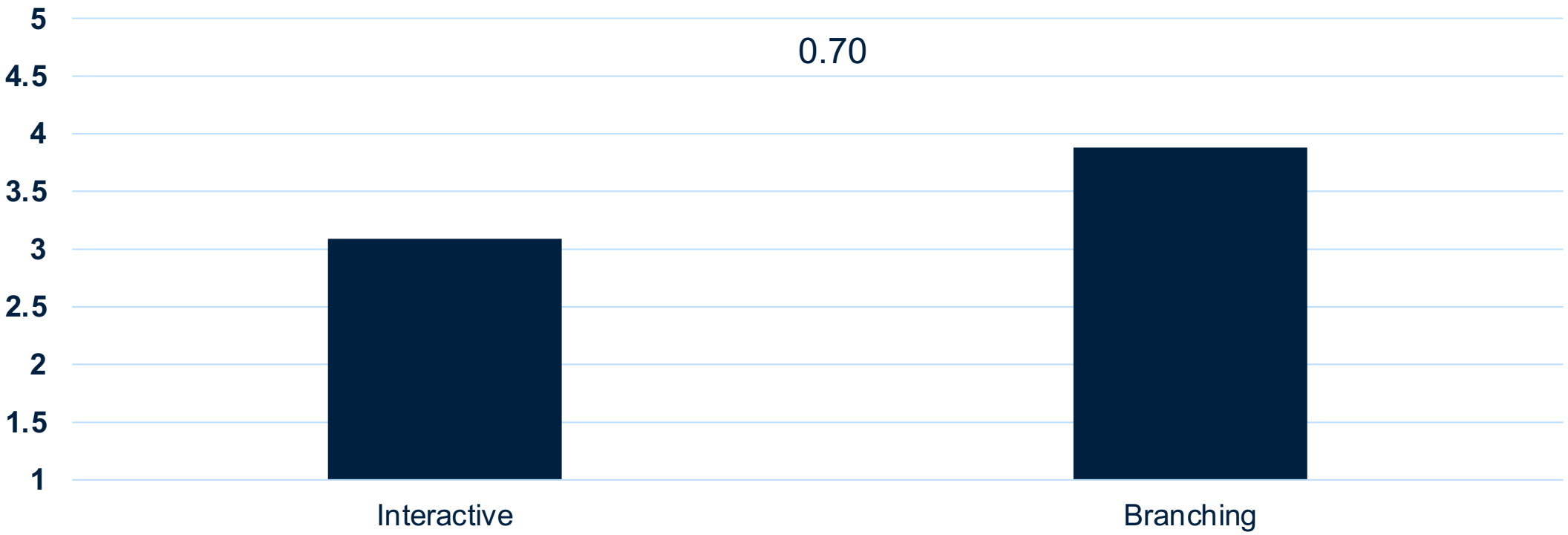
LABORATORY EXPERIMENT (N = ~400 STUDENTS)



RESULTS STUDY 2 – PERSONALIZED INFORMATION

The feedback in the interactive and branching interactive were near identical.

Did the students perceive the feedback as more personal when it was text or spoken?



$t(298) = 12{,}158$, $p < .001$

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Branching videos that explain errors have an advantage of interactive that uses text

IN BOTH STUDIES, WE SOLICITED STUDENT FEEDBACK

I think when I am forced to interact, I am able to take more risks and therefore learn more from the material being presented (Chemistry study)

Promotes active listening/ gives me free practice. When the video solves the question for me immediately, it discourages me from actually doing the work (because I'm lazy), which lessens my understanding (Chemistry study)

It's really interesting! It actually made me laugh and kept me engaged. The integration of video-based feedback also seemed like an extra practice situation instead of a process of elimination since you got a question wrong. It seemed to provide more information and context about the right answer. (Laboratory study)

The additional videos that the video-based feedback gave really stuck in my head and I was able to see/remember them a week later. (Laboratory study)

SOME STUDENTS STILL HAVE A PREFERENCE FOR INTERACTIVE VS BRANCHING

Shorter time than branched interactive video and can do some practice exercises

It feels like the best combination of being engaging and time efficient.

RECOMMENDATIONS

Adding interactivity has benefits for student motivation and experience of the material.

Branching interactive videos performed the best, but they are time consuming to make and don't add appreciable improvement over interactive videos in terms of student experience.

Branching do have some benefits (explanations are experienced as more personable)
-- students may become frustrated if reviewing the video again

Can consider using "branching scenario" for using traditional videos to give a sense of control

CONSIDERATIONS

Some students like print books.

Could use a QR code

It is much more likely that both ice cream sales and crime rates are related to the temperature outside. When the temperature is warm, there are lots of people out of their houses, interacting with each other, getting annoyed with one another, and sometimes committing crimes. Also, when it is warm outside, we are more likely to seek a cool treat like ice cream. How do we determine if there is indeed a relationship between two things? And when there is a relationship, how can we discern whether it is attributable to coincidence or causation?

Correlational Research

Correlation means that there is a relationship between two or more variables (such as ice cream consumption and crime), but this relationship does not necessarily imply cause and effect. When two variables are correlated, it simply means that as one variable changes, so does the other. We can measure correlation by calculating a statistic known as a correlation coefficient. A correlation coefficient is a number from -1 to +1 that indicates the strength and direction of the relationship between variables. The correlation coefficient is usually represented by the letter *r*.

The number portion of the correlation coefficient indicates the strength of the relationship. The closer the number is to 1 (be it negative or positive), the more strongly related the variables are, and the more predictable changes in one variable will be as the other variable changes. The closer the number is to zero, the weaker the relationship, and the less predictable the relationships between the variables becomes. For instance, a correlation coefficient of 0.9 indicates a far stronger relationship than a correlation coefficient of 0.3. If the

THANK YOUS

Clint Lalonde

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Shrishti Ramaiah

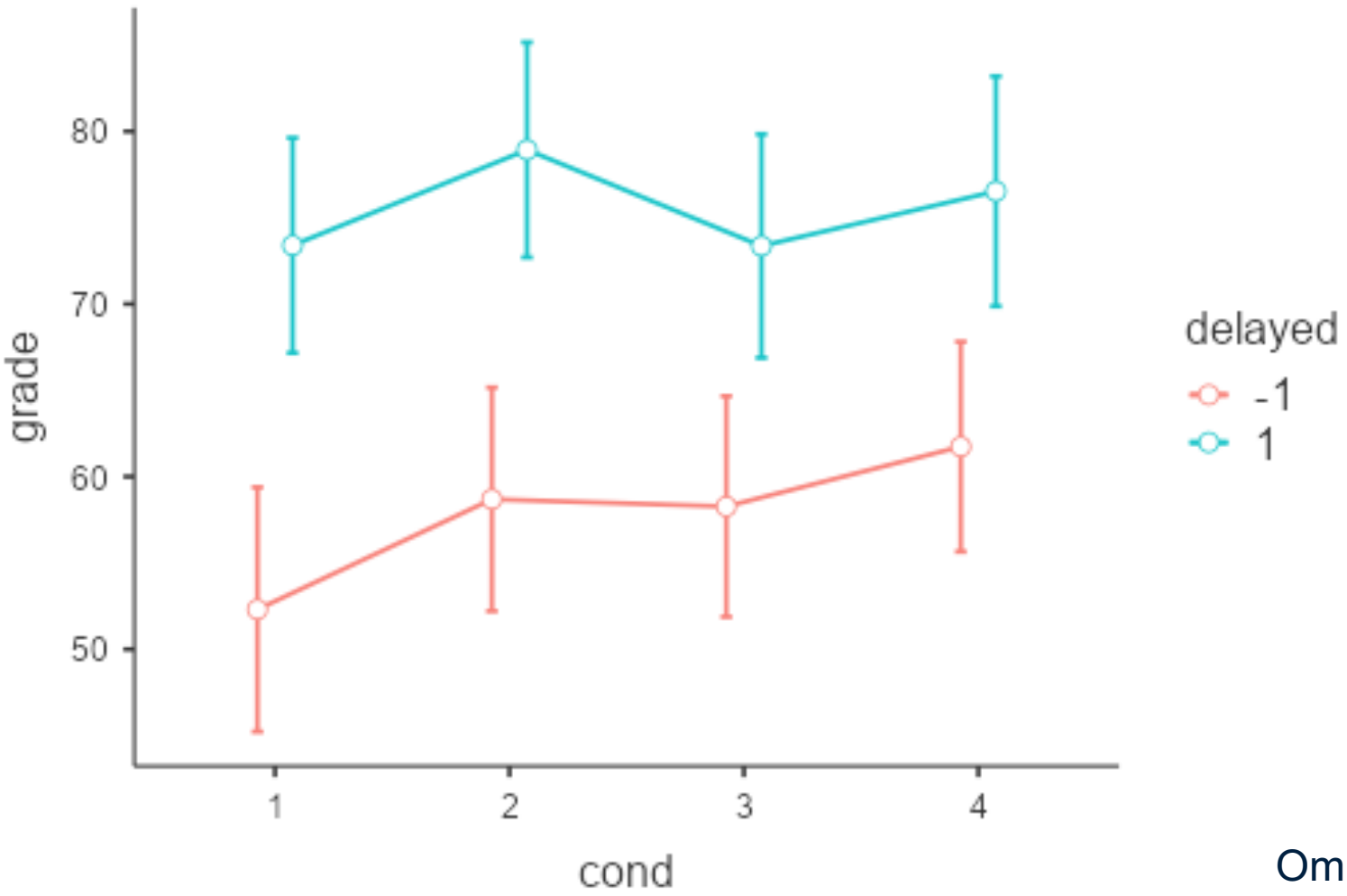
Dr. Steven Barnes

Dr. Kayli Johnson

BCcampus
connect.collaborate.innovate.

Elisha Fu

PERFORMANCE ON A MULTIPLE CHOICE QUESTION



Omnibus test was *ns*