Learning Styles to the Test: An Experimental Investigation of the Effect of Matching Learning Preferences with Learning Context

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Method

Participants: 151 students in three sections of Psychology 100 during the Spring 2011 semester. The procedure took place over two class sessions. A total of 140 students were in class for both sessions. Both 5 students did not complete the pre-test section of the practice session, and a post-test on classical conditioning.

Students were informed of the basic design of the research through standard IIB procedures. Students gave permissions to access their GPA and incoming ACT scores via their student ID number. One the day the GPA was released, all information tied to their personal identity was erased from the dataset. Students were also informed that their performance on the pre- and post-tests would not influence their grade in the course.

Participants: Test completed a pre-test on classical conditioning (range 8%-100%). The test included both multiple-choice and short answer questions on classical conditioning. They were then presented with a new form of practice context with a different learning style, but they were not informed that they were practicing for the post-test.

As we received formal instruction on the topic from a guest faculty member (one of the researchers), participants were randomly assigned, via color of their practice sheet, to one of two practice conditions: context-conocentric practice alone or practice in a small group of 3 students. All students completed the same practice sheet and were given the same amount of time to work through it.

On 0 to 100% scales, students reported their enjoyment of the practice session and estimated how well they would do on a post-test. Furthermore, students received an actual post-test, which was parallel in form to the pre-test. The questions were of similar form but not identical.

Pre-test, Practice, and Post-test Materials

The pre-test on classical conditioning was worth 13 points. A sample question (worth 4 points in all) is displayed below:

Joey goes to his favorite taco joint, Sam’s Place, one evening for dinner. Later that night, he notices that his plate is cold. His friend is less than impressed with his meal. However, he sees on the news that Sam’s Place has put out a warning that it has contaminated their meal. Joey’s concern was nothing but food poisoning. Three months later, though, Joey is still nauseous at the thought of eating tacos from anywhere.

What is the UCS (unconditioned stimulus)?
What is the UCS (unconditioned response)?
What is the CS (conditioned stimulus)?
What is the CR (conditioned response)?

After the pre-test, Dr. Goodman provided formal instruction and examples of classical conditioning. Then, students practiced either alone or in small groups with cases such as the following:

Marie is driving in her car down I-94 on her way to school one morning. As she is making her turn onto Hwy53, she hears a loud horn blaring somewhere nearby. She looks around but sees nothing but the light, early morning traffic. The sound gets louder and as she pulls up to the next stop light she looks in her rearview mirror just in time to see a huge truck racing out of control towards her. Marie panics as she desperately tries to get out of the way. Her heart races and pounding and she’s sweating profusely but she manages to pull out of the way just in time. Although she avoided the disaster, Marie now notices her heart racing and her palms sweating whenever she hears a horn.

What is the unconditional stimulus (UCS)?
What is the unconditional response (UCR)?
What is the conditioned stimulus (CS)?
What is the conditioned response (CR)?

Participant Characteristics

Figure 1 (left). Students were more likely to report a preference for practicing new information alone in small groups (with 2 or 3 other people).

Figure 2 (right). Students who reported a preference for practicing new material on their own (M = 71.77, SD = 21.05) did not differ significantly from those who preferred to work in small groups (M = 67.97, SD = 19.32), t(147) = 1.12, p = .265, although the direction of the means favored those who preferred to work alone, d = .18.

Figure 3 (left). On the classical conditioning pre-test, students who preferred to practice new material on their own (M = 37.50, SD = 13.98) did not differ significantly from those who preferred to work in small groups (M = 34.70, SD = 14.58), t(146) = 1.68, p = .098, d = .30.

Figure 4 (right). Students with higher cumulative GPAs performed better on the post-test, t(141) = (18), p = .03.

Effects of Matching Practice Preference with Practice Context

Figure 5 (left). As expected, matching preferred mode of practice with actual form of practice was tied to enjoyment of the practice session, F(1, 134) = 7.23, p = .008, partial η² = .05. Those who preferred to work in groups enjoyed the session more if they worked in a small group rather than alone (p = .03). Those who preferred to work alone tended toward a more favorable response if they worked alone rather than in a small group (p = .11).

Figure 6 (right). Matching preferred mode of practice with actual form of practice was not tied to foreseen performance on post-test, F(1, 135) = 0.42, p = .517, partial η² = .003. There was no main effect of practice context on foreseen performance, F(1, 135) = 0.34, p = .559, partial η² = .001, nor was there a main effect of practice context on post-test performance, F(1, 134) = 0.04, p = .833, partial η² = .000, or was there a main effect of practice context on foreseen performance, F(1, 135) = 0.76, p = .385, partial η² = .006.

Discussion

The current research used an experimental manipulation to test the hypothesis that matching the students’ preferred mode of practice with their assigned mode of practice optimizes performance. Although matching current preference and actual practice context optimizes enjoyment, matching did not optimize student learning, as assessed via pre- and post-tests, or at least better than scores from students who preferred one design that has tested learning styles models, yet have failed to report on the effects of matching both learning style and practice context. Students have learning style preferences, and those preferences may be linked to the students’ enjoyment of various forms of instruction, but matching these preferences to various forms of instruction does not translate to differences in learning.

As implied by authors of a recent review on the learning styles hypotheses (Paix, 2009), we suggest that educators review the experimental literature carefully before framing their classroom instruction around learning styles.

References


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