Teach to learn (#688)

Author(s)
Matthew Miller (Auburn University) - mwm0024@auburn.edu

Created: 05/20/2016
Made public: 05/20/2016

1) What's the main question being asked or hypothesis being tested in this study?
Does teaching a motor skill aid in learning that respective motor skill?

2) Describe the key dependent variable(s) specifying how they will be measured.
The primary dependent variable is motor learning, which will be assessed by radial error (RE) and bivariate variable error (BVE) during blindfolded (BF) and non-blindfolded (NBF) posttests.

3) How many and which conditions will participants be assigned to?
Total of 4 conditions – prepare to teach/teach, prepare to teach/no teach, no prepare to teach/no teach, and no prepare to teach/teach.

4) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will conduct multiple linear regressions for RE and BVE, each averaged across BF and NBF posttests. The first step in each regression will include the following variables: Pretest RE/BVE (averaged across BF and NBF pretests), Putts (Taken During Practice), and Study (Time Taken During Practice). The second step of each regression will add the following variables: Preparation (Teach/No Teach) and Teach (Yes/No). The third step of each regression will add the interaction term: Preparation x Teach.

To justify averaging RE and BVE across BF and NBF posttests, we will precede the regressions with 2 (Preparation) x 2 (Teach) x 2 Posttest (BF/NBF) mixed ANCOVAs, with repeated measures on the final factor. The covariates will be pretest RE/BVE (averaged across BF and NBF), Putts, and Study. If posttest does not interact with preparation, teach, or the Preparation x Teach interaction term, then we are justified in averaging across BF and NBF pretests and posttests.

5) Any secondary analyses?
Group differences in intrinsic, internalized, and general motivation as well as pressure (measured with Intrinsic Motivation Inventory) will be assessed with independent sample t-tests. We will also assess engagement (measured with a modified version of O'Brien and Toms' engagement scale), putts, studying, and free recall of putting rules with independent sample t-tests, and these variables' relation to motor learning may be assessed via multiple linear regressions, with pretest and group (condition) being entered in a first step and the variable of interest in a second step.

6) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
Sample size of N = 84 (21/condition) participants based on a priori power analysis (G*Power 3.1.9.2: Statistical Power Analysis for Windows) for the "Linear multiple regression: Fixed model, R2 increase" test. This analysis was powered to detect small to moderate effect size (f2 = .1) assuming α = .05, β = .8, one predictor of interest (Preparation x Teach interaction), and five additional predictors (Pretest, Putts, Studying, Preparation, and Teach). At least 81 participants were needed to investigate the interaction between two main predictors (preparation and teach); 3 participants were added to create equal numbers in groups.

7) Anything else you would like to pre-register? (e.g., data exclusions, variables collected for exploratory purposes, unusual analyses planned?)
No

8) Have any data been collected for this study already?
No, no data have been collected for this study yet