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Differential Effects of the Discrete-option Multiple-choice Format on Test Takers’ Assessment Preparation and Scores

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Method

Hypothesis: Participants will prepare differently for assessments administered in the DOMC format.

Research Design
- Within-subjects design
- Dependent variables: Amount of recorded study time, quiz score, and responses to the survey items.
- Independent variable: Test format

Participants
- Experiment 1: 4 males, 4 females; psychology majors were not excluded
- Experiment 2: 3 males, 4 females; psychology majors were excluded
- No participants were currently enrolled in introductory psychology or had taken it the previous semester

Materials
- Study material and quiz items were selected from 10 chapters of an introductory psychology textbook (Carlson et al., 2007)
- Each study packet included 8-10 textbook pages and a study log
- Survey items included “What did you think the purpose of this study is?” and “How did you study for this quiz?”

Similarities
- Briefing about the new DOMC format
  * Informed consent
  * Option to take a practice quiz with the new format
- 10 quizzes in 3 weeks, randomly assigned
- Half in the DOMC format
- Half in the Traditional format
- Informed in advance of the format
- Participants took the untimed quizzes alone and were not permitted access to notes or the material
- A proctor was available to provide assistance if needed

Differences
- Experiment 1:
  * Daily sessions were available
  * Participants could come to the lab and study the material there for as long as they wanted and then take the quiz right after studying
- Experiment 2:
  * Participants received a packet to study on their own time at any location
  * Scheduled the quiz at their convenience
  * Anonymous score charts were posted

Background and Significance

Multiple-choice tests have not sufficiently evolved to counter test-wise individuals. By offering the discrete-option multiple-choice format (DOMC) as an alternative to the traditional format, educators can counter “extra-test” competency. That is, the DOMC format may be fairer.

The new format may encourage more thorough study of assigned material.

The DOMC format only displays one answer option on the screen at a time.

In this case, “29” was the first randomly selected option.

Test taker identifies option as correct or incorrect.

Not all options appear.

Discussion

Some of the differences in the two studies were a result of the change in study location:
- Experiment 1 demonstrated that the DOMC was significantly harder than the traditional format.
- Experiment 2: Participants may not have felt as much need to accommodate their studies to the proctor.
- Individual study styles were less restrained in experiment 2.
- One of the confounds in experiment 2 was the increased student workload at the end of the semester.
- We retained the null hypothesis: Participants, on average, did not study differently in preparation for the two test formats.
- There was no statistically-significant difference between study times for the two formats.
- The use of the DOMC format increased participants’ focus on understanding the content of the material instead of merely memorizing facts.
- Participants reported that they had to be more prepared (study harder) to take the quizzes with the DOMC format.

Scores from the DOMC format were significantly lower than those for the traditional format.

Results

Survey Data

- Test score for different formats: \( t = 2.43, \) NS
- Study time for different formats: \( t = 0.772, \) NS

Test Data

- Score/Study time correlation
  * DOMC: \( r = -0.41, \) NS
  * Traditional MC: \( r = -0.21, \) NS
- Paired samples t-test
  * Study time for different formats: \( t = -0.188, \) NS
  * Test score for different formats: \( t = -0.90, \) p = 0.008

- Score/Study time correlation
  * DOMC: \( r = -0.10, \) NS
  * Traditional MC: \( r = -0.64, \) NS
- Paired samples t-test
  * Study time for different formats: \( t = -2.43, \) NS