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# Multiple-Choice Questions With an Option to Comment: Student Attitudes and Use

Anthony F. Nield  
Maxine Gallander Wintre  
York University

*Introductory Psychology students were graded on four tests using multiple-choice questions with an explicit option to explain their answers (E-option), and were later asked how they would compare this format with short answer, essay, true/false, fill-in-the-blank, and regular multiple-choice. Students rated the E-option and short-answer formats as most preferred, and less frustrating and anxiety producing than other formats ( $p < .05$ ). Of 416 students, 173 used the E-option, averaging less than one explanation per test over the four tests. During the course, only 30 points were gained and 5 points lost due to E-option use. The E-option seems to be an efficient and humane technique for testing large classes.*

Large enrollments in college classes present teachers with a conflict between the restrictions on the time available for grading tests and papers, and their desire to employ valid and compassionate evaluation procedures. This situation has caused many teachers, who would prefer to use short-answer or essay tests, to turn to multiple-choice tests. Well-constructed multiple-choice items can be valid measures of student performance, but some students complain that these tests do not effectively tap their knowledge. Those who complain might not represent the opinions of all students, and we have found no information in the literature concerning students' actual preferences. Most articles on testing concentrate more on the validity and rigor of the tests than on the problems of the students who take them.

Student feelings about the appropriateness of the testing method are a legitimate concern of the tester. If students are indignant, anxious, or frustrated in the test situation, then the validity of the test is in question. Also, a good relationship between the students, teaching assistants, and faculty is enhanced when the students feel that they are being tested fairly. In a preliminary survey, 343 Introductory Psychology students were asked to rate the statement "If I have to take a test in the social sciences I would prefer to take a \_\_\_\_\_ test" on a scale ranging from *strongly agree* (1) to *strongly disagree* (5). The results indicated that they preferred short-answer tests, followed in order by multiple-choice, essay, fill-in-the-blank, and true/false tests.

Student complaints about multiple-choice tests center on the frustration and lack of control they feel in the test situation. They feel anxious, helpless, and stressed when forced to select one "best" answer. Although many teachers read and evaluate comments on objective tests, we have found only a few students who claim to have been given this ex-

PLICIT option in either college or high school. Books and articles on test-taking skills often recommend that students comment on objective tests (e.g., Feder, 1979); however, they may be reluctant to do so.

A number of studies have shown that performance on multiple-choice tests improves when the students are explicitly given an opportunity to comment. This improvement is assumed to stem from a decrease in anxiety and is greatest in highly test-anxious students (Calvin, McGuigan, & Sullivan, 1957; McKeachie, Pollie, & Speisman, 1955; R. E. Smith, 1971; W. F. Smith & Rockett, 1958). The largest effect is produced when the students perceive the opportunity to comment as indicating a permissive, nonthreatening atmosphere (McKeachie, 1984; McKeachie et al., 1955). If students are told that the comments will not be taken into account in the grading, the opportunity to comment seems to make them more anxious (Wittmaier, 1976), possibly due to uncertainty as to the purpose of the comments.

There is considerable evidence that even when other aspects of a stressful situation remain unchanged, perceived control leads to a decrease in feelings of stress and anxiety (Thompson, 1981). We believe that the option to comment provides students with an increased sense of control in the test situation, which leads to a corresponding reduction in both anxiety and frustration.

For several years, we have been using four-alternative, multiple-choice tests in large Introductory Psychology classes. In addition to selecting the "best" answer to each question, the students have been explicitly allowed to comment on the questions by marking their preferred answer and an additional alternative (E), with space provided for their comments. This strategy allows rapid stencil or computer grading and alerts the grader to the presence of written responses. Student feedback has been useful in exposing students' misconceptions and in evaluating new questions. When we discuss the tests in class, we can more easily distinguish students who genuinely recognize a difficulty with a question from those who jump on the bandwagon after the more competent students have pointed out a problem.

In this study, we questioned students in two large classes to assess their attitudes toward our test format versus other formats they have experienced—regarding both their preferences and their reasons for them—and we asked how often they had encountered similar modifications of multiple-choice tests in other classes. We also collected data on how

they used their opportunity to comment, how much they used it, how their grade was affected when they did use it, and the effect on the work load of the graders.

## Method

### Subjects

The subjects were students enrolled in two, large, full-year sections of Introductory Psychology at York University—each section taught by one of the authors. The data on attitudes were collected from 201 students who were present on the day that the questionnaire was administered and who stayed to complete it. The data on usage came from an analysis of the use of the E-option by all the students who took each test. The numbers of students taking Tests 1 to 4 were 416, 399, 386, and 379, respectively.

### Procedure

In both sections, grades were based on the students' performance on four multiple-choice tests, each covering a separate unit of material, and each comprising 25% of the grade. The questions were different for the two sections, in that they reflected the different emphases of the instructors. However, more than two thirds of the questions came from the test file accompanying *Introduction to Psychology* by Atkinson, Atkinson, and Hilgard (Breland, 1983). On each test, the students were provided with an answer sheet, and the following instructions were both written at the top of the test and read aloud by the instructor.

Answer the questions on the answer sheet provided by marking an "X" on the letter identifying the best answer to each question. If you want to explain your answer, you should also mark an "X" on the choice "E," and write your explanation on the back of the answer sheet.

The tests were graded using a stencil overlay, and the students received 1 point for each correct answer. The students' comments were then read and evaluated to decide whether the grade should be changed. The students gained 1 point for a good explanation of a wrong answer and lost 1 point for a bad explanation of a right answer. Otherwise, their grade remained unchanged. Each use of the E-option was also scored as to type of use—a criticism of the question, an explanation of an answer, or "other" (which meant that the student had either misunderstood the question or had misused the E-option).

During a lecture period following the third test, the students were asked to fill out a questionnaire anonymously. In the questionnaire, we asked them about their attitudes toward the E-option format and the degree to which they had taken advantage of it. In addition, we asked about the students' attitudes toward multiple-choice (with no opportunity to comment), true/false, fill-in-the-blank, short-answer, and essay questions. Students responded on a 5-point scale with the following responses: *strongly agree* (1), *agree* (2), *no opinion* (3), *disagree* (4), and *strongly disagree* (5). The items on preference, anxiety, and frustration were: "When writing a test in the social sciences I would prefer to

write this type of test"; "I tend to feel anxious when writing this type of test"; and "I often find this type of test frustrating." We also asked the reasons for their attitudes.

## Results and Discussion

### Student Attitudes

The preference ratings were provided by 191 students and the anxiety and frustration ratings by 176 students. The decrease from the 201 students who answered the questionnaire was due to a misuse of the rating scales by some students. Because of the wording of the questions, a low mean rating indicates greater preference, but a high mean rating indicates greater anxiety and frustration.

Three repeated-measures analyses of variance showed a highly significant effect of test format on ratings of preference,  $F(5, 945) = 32.7, p < .001$ ; anxiety,  $F(5, 875) = 8.23, p < .001$ ; and frustration  $F(5, 875) = 21.52, p < .001$ . Short-answer questions were most preferred ( $M = 2.13$ ), followed by the E-option ( $M = 2.41$ ), essay ( $M = 2.77$ ), multiple-choice ( $M = 3.22$ ), fill-in-the blank ( $M = 3.40$ ), and true/false ( $M = 3.51$ ) questions. The E-option was rated as least anxiety provoking ( $M = 3.10$ ), followed by short answers ( $M = 2.93$ ), multiple-choice ( $M = 2.72$ ), essays ( $M = 2.59$ ), fill-in-the-blank ( $M = 2.54$ ), and true/false ( $M = 2.52$ ). The students rated the E-option as least frustrating ( $M = 3.44$ ), followed in order of increasing frustration by short-answer ( $M = 3.32$ ), essay ( $M = 2.77$ ), true/false ( $M = 2.67$ ), fill-in-the-blank ( $M = 2.58$ ), and multiple-choice ( $M = 2.50$ ) questions.

The preference for short-answer questions, even though they are more frustrating and anxiety producing than the E-option, implies that preferences are based on more than the avoidance of anxiety and frustration. However, no differences between the E-option and the short-answer formats were significant. A Tukey post-hoc test comparing the E-option with the other formats showed it to be significantly better ( $p < .05$ ) than all except short answer for preference, anxiety, and frustration.

In describing the advantages of the various formats, the students liked true/false and multiple-choice because the answers were provided (which allowed them to guess), and because these formats, along with fill-in-the-blank questions, required little mental or physical effort. The E-option provided the advantages of multiple-choice, along with the possibility of explaining their answer (a point mentioned by 70% of the respondents). The students liked essay and short-answer formats because they could fully indicate what they had learned, show their ability to organize the material, and earn partial credit. In addition, short-answer format did not assign too many points to any one question.

When asked about disadvantages, 32% of the students stated that the E-option offered no disadvantages, compared with 16% for short-answer questions and 5% or fewer for each of the other formats. They considered true/false, multiple-choice, and fill-in-the-blank questions to be tricky, picky, and confusing, and hence anxiety producing. The E-option questions were considered potentially too time consuming, with the added risk of losing a point for an in-

appropriate explanation of a correct answer. Both essay and short-answer questions were considered too easy to misinterpret and too reliant on writing skills. In addition, essay questions were considered too long and worth too many points per question, and short-answer questions required the students to be concise and to the point. In rating both essay and short-answer questions relative to the objective formats, students considered effort to be a major cause for concern.

In previous classes, when one of the authors (A. F. N.) provided students with a choice between answering short-answer questions and E-option questions, only about 10% of them chose the short-answer questions. This may seem surprising in light of our students' expressed preferences, but our data may provide a possible explanation. When the students are answering a questionnaire, and weeks away from the next test, the positive preference values may dominate, causing them to prefer short-answer questions. However, in the anxiety-arousing test situation, the relatively greater effort, anxiety, or frustration associated with the short-answer questions may lead them to choose the E-option questions. This view would be consonant with the traditional findings on conflict (Miller, 1959).

#### Stated Use of the E-Option

Of the students who answered the questionnaire, only 15% claimed to have previously encountered a similar option in either college or high school. Forty percent stated that they liked the availability of the E-option and had used it at least once during the year. Of those who did not use it, 50% gave no explanation, 40% said they had no need for it (25% of these volunteered that they were glad the option was available), and 10% gave as their reasons for not using it either their fear of being wrong or their concern that it would take too much time. One student thought the whole exercise a stupid waste of time.

Because we assumed that anonymity would lead to less biased responding, the students were asked neither to identify themselves on the questionnaires nor to tell us their current grade in the course. We were, therefore, unable to match the students' stated usage of the E-option with their actual usage.

#### Actual Use of the E-Option

The E-option was used at least once by 173 (41%) of the 416 students who took one or more of the four tests. Almost twice as many students used the E-option on the first test as on any succeeding test, with 118 students (28%) using the option on Test 1, 63 (15%) on Test 2, 64 (16%) on Test 3, and 65 (17%) on Test 4. Repeat users represented 73% of the users on Test 2, 67% on Test 3, and 74% on Test 4. The top half of the class contributed 99 users and the bottom half 74, but this difference was not significant,  $\chi^2(1, N = 173) = 3.36$ .

The drop in usage from Test 1 to Test 2 cannot be accounted for by students dropping the course, because only one of the 17 who dropped the course between the two tests had used the E-option on Test 1. Over the four tests, there

was no apparent relationship between test difficulty, as measured by class average (%), and E-option use. It may be that an initial enthusiasm for the E-option produced an inflated usage on Test 1. When few points were gained as a result of their comments, and some were lost, the students may have used the option more selectively on future tests.

The average usage on each test was between 1.5 and 2 times per user. These means are slightly inflated because a few students used the E-option liberally, with one student using it 11 times on one test. A correlation of number of uses during the course with the users' final grades yielded a nonsignificant Pearson correlation coefficient,  $r = .08$ . Overall, the average use per user was 3.17 times during the course, or less than one use (0.79) per test. The average number of uses per student in the course was 1.31, or .32 explanations per student per test—not an onerous amount of reading for the graders.

The ways in which the E-option was used are shown in Table 1, which summarizes the number and percentage of students using each response category. Both the better and poorer students used the option to explain their answers more than twice as often as to criticize the question.

The effect of the use of the option on the students' grades is shown in Table 2. The use of the E-option had little effect on student grades overall, and the outcome was independent of a student's position in the class.

Overall, only 30 points were gained and 5 points lost during the course. Students in the top half of the class gained more points than those in the bottom half. Interestingly, they were also the ones who lost the 5 points. The net gain for both groups was about the same, 13 points for the better students, and 12 points for the poorer students. As might be expected, in the two "no change" categories the better students produced a higher proportion of right answers than the poorer students. The continued use of the E-option in the face of this lack of success reinforces our belief that the students find it useful for reasons other than obtaining extra points—presumably to relieve frustration and anxiety.

Although grades changed little as a direct result of student comments, they might have been improved by a reduction in anxiety due to the option to comment (Calvin et al., 1957; McKeachie et al., 1955; R. E. Smith, 1971; W. F. Smith & Rockett, 1958). However, we suspect that in our case this effect would be small due to the nature of our instructions. McKeachie et al. (1955) found that, although nonspecific instructions ("feel free to comment") produced a considerable improvement in the performance of test-anxious students, specific instructions ("please state your

**Table 1. Number and % of E-Option Uses by Category and User Class Position**

Class Position	Category of Use			
	Criticize	Explain	Other	Total
Above median	93 (28.3)	226 (68.7)	10 (3.0)	329 (100.0)
Below median	58 (26.4)	149 (67.7)	13 (5.9)	220 (100.0)
Total class	151 (27.5)	375 (68.3)	23 (4.2)	549 (100.0)

Note. Percentages in parentheses.



**Table 2. Number and % of E-Option Uses by Effect on Grade and User Class Position**

Class Position	Effect on Grade				Total
	Gain Point	Lose Point	No Change (Right)	No Change (Wrong)	
Above median	18 (5.5)	5 (1.5)	188 (57.1)	118 (35.9)	329 (100.0)
Below median	12 (5.5)	0 (0.0)	103 (46.8)	105 (47.7)	220 (100.0)
Total class	30 (5.5)	5 (1.0)	291 (53.0)	223 (40.5)	549 (100.0)

Note. Percentages in parentheses.

explanation of how you arrived at your particular answer” produced only a slight improvement.

We conclude that a multiple-choice format with a formal option to comment can be a useful alternative to short-answer questions. Grading effort is increased minimally by the addition of this option, and the instructor can retain the advantages of objectivity and rapid grading inherent in objective tests, yet still provide students with an opportunity to express themselves. Our students liked the E-option, even though they rarely used it, and it had little impact on their grades. Many students claimed that the option to comment relieved their anxiety and frustration in the test situation. Usage was kept low partly because of the penalty for inappropriate explanations. Presumably, the removal of this penalty would increase usage and decrease anxiety further. Nevertheless, we believe that this feature reflects a concern for a fair and accurate assessment of the students' knowledge of the material.

When students are encouraged to comment, their responses provide us with feedback, permitting us to change our grading scheme and revise our coverage of troublesome topics. Because both instructors have taught this course often, this feature was not well tested in this study. Nevertheless, student comments enabled us to identify, and compensate for, three unsatisfactory new questions.

Since adopting this test format, much less grader and instructor time is taken in confrontations with students, and we find rapport between the students and teachers to be improved. In short, we recommend multiple-choice with the E-option as an efficient and humane approach to testing large classes.

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3. Requests for reprints should be sent to Anthony F. Nield, Department of Psychology, York University, 4700 Keele Street, Downsview, Ontario, Canada, M3J 1P3.