ABSTRACT

The effects of test difficulty on the perception of examination difficulties and state anxiety are investigated. Thirty undergraduate students were administered the Educational Psychology Recognition Test and Test Perception Inventory to assess task difficulty and perception of exam difficultness. A modified version of the State-Trait Anxiety Inventory measured state anxiety. Two separate one way analysis of variance procedures were used to analyze the data. Results indicated that test difficulty level did not significantly affect state anxiety, but did significantly affect perception of exam difficultness. Using the Mann-Whitney U Test an additional analysis of data indicated: (1) students administered the hard difficulty level test exhibited a perception of higher exam difficultness than did their peers taking the medium and easy forms; and (2) there was no significant difference for the perception of exam difficultness between students taking the medium and easy forms. (Author/PN)

The Effects of Test Difficulty Level on Undergraduates' Perception of Examination
Difficultness and their State Anxiety

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Running head: The Effects

Abstract

The purpose of this investigation was to determine the effects of test difficulty on the perception of examination difficultness and state anxiety (transitory anxiety that results from situations which are regarded as dangerous or difficult) of 30 undergraduates. Specially developed Educational Psychology Recognition Test and Test Perception Inventory assessed task difficulty and perception of exam difficultness, respectively. A modified version of the State - Trait Anxiety Inventory assessed state anxiety.

Even though test frequently are reported as being hard or easy based on differences in their number of errors, the percentage of errors is seldom indicated. Head and Lindsey (1983) did report empirically established levels of task difficulty (median p - values) that produced differences in state anxiety. These researchers interpreted their results as indicating that student perception of exam difficultness may be as important as actual test difficulty. This conclusion, however, was not subjected to empirical investigation.

Two separate one way analysis of variance procedures were used to analyze the data. Results indicated that test difficult level did not significantly affect state anxiety, $p > .05$, but it did significantly affect perception of exam difficultness, $p < .05$. Using the Mann - Whitney U Test an additional analysis of data indicated: (a) students administered the hard difficulty level test exhibited a perception of higher exam difficultness than did their peers taking the medium and easy forms, $p < .05$; and (b) there was no significant difference for the perception of exam difficultness between students taking the medium and easy forms, $p > .05$.

The Effects of Test Difficulty Level on Undergraduates' Perception of Examination

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A. ~ INTRODUCTION

Studies investigating task difficulty and anxiety on learning were often

reported in the literature (e.g. Korchin and Levine, 1957; Pickrel, 1958).

Most researchers (Taylor and Spence, 1952; Ramond, 1953; Harleston, 1962; Sarason,

1972; and others) concluded that only difficult tasks interact with anxiety to

decrease learning performance. However, Tobias (1977) indicated that difficulty

level has not been defined adequately by most researchers. Although tests frequently

are reported as being hard. or easy based on differences in their number of errors,

the percentage of errors is seldom indicated. Head and Lindsey (1983) did report

empirically established levels of task difficulty (median p - values) that produced

differences in state anxiety (transitory anxiety that results from particular

situations which are regarded as dangerous or difficult). These researchers inter-

preted their results as indicating that student perception of exam difficultness may

be as important as actual test difficulty. Yet, this conclusion was not subjected

to empirical investigation. The purpose of this study was to investigate the

effects of test difficulty not only on state anxiety but also on student perception

of test difficultness.

B. METHOD

Subjects were 30 undergraduates in an educational psychology course. The

students' mean chronological age was 23.7 (S.D. = 4.5). Their mean American College

Test (ACT) score was 18.8 (S.D. = 3.03) and mean grade point average (GPA) was

2.13 (S.D. = .47). They were randomly assigned to one of three treatment groups

(high, medium, low task difficulty) in an ANONA design. Dependent variables were

students' perception of test difficultness scores and their state anxiety scores.

An .05 probability level was the criterion for significance.

' Three instruments were used. A modified version of the Test Perception Inventory (TPI) was developed to assess student perception of test difficultness. This instrument had five items (e.g., "This test was difficult", "This test was simple") and employed a Likert format for item responses ("not at all", "somewhat", "moderately", and "extremely"). The alpha reliability for the TPI was .67.

A modified version of the State - Trait Anxiety Inventory (STAI) (A - State Scale) assessed state anxiety. This instrument also had five items (e.g., "I feel jittery","I feel relaxed") and used the Likert scale for item responses ("not at all", "somewhat", "moderately so", and "very much so"). The alpha reliability for the STAI was .85.

An Educational Psychology Recognition Test was developed to assess task difficulty: 21 multiple - choice items measured the retention of information presented during a 25 - minute videotaped lecture entitled "The Role of Research in Education." Three forms of this test exhibited varying difficulty levels: Form A (high, 30% median correct response, p - value range 0% to 70%), Form B (medium, 60% median correct response, p - value range 40% to 90%), and Form C (low, 80% median correct response, p - value range 50% to 100%).

Subjects were told to take notes as they viewed a 25 - minute videotaped lecture in order to prepare for a test following the presentation. After the lecture, subjects were allowed to study their notes for 12 minutes. Then the recognition tests were administered. Following this testing session, the TPI and STAI were administered.

C. RESULTS

Since the third ANCVA assumption (homogeneity of variance) was violated, the Kruskal - Wallis one-way analysis of variance by ranks was used to analyze the TPI scores. The resulting calculated H - test value after correcting for ties was 8.16, p = .017. Thus test difficulty significantly affected student perception of exam difficultness. The Mann - Whitney U test (Ferguson, 1976) indicated:

(a) subjects taking the high difficulty level test had statistically higher test perception scores than did subjects taking the medium - difficulty test (17.00 vs 14.3) and subjects taking the low - difficulty test (17.00 vs 13.5); and (b) there was no significant difference between test perception scores for subjects taking the medium - low - difficulty tests (14.3 vs 13.5).   Even though subjects taking the high - difficulty test exhibited higher state anxiety means than subjects taking the medium - difficulty test (14.8 vs 13.9) and subjects taking the low - difficulty test (14.8 vs 13.3), test difficulty did not significantly affect state anxiety, f(2, 27) = ,54, p > .05.

D. DISCUSSION

Undergraduates administered the high - difficulty test exhibited a perception of higher exam difficultness that was significantly greater than their peers administered the medium - and low - difficulty tests.   Students taking the test of medium - difficulty did not exhibit a perception of higher exam difficultness that was significantly greater than those students taking the test of low- difficulty.   Criterion test difficulty scores for variations in students' perception of exam difficultness can be inferred from these findings: a median correct response of 30 percent would define a difficult test and significantly promote a perception of high exam difficultness than would a medium difficulty test (60%, median p - value) or a low difficulty test (80%, median p - value); a median correct response of 60 percent would define an easier form of the same test and was not sufficiently more difficult to produce a significantly greater perception of higher exam difficultnes than a third form of the same test with a median correct response of 80 percent.

Although undergraduates administerd the high - difficulty test exhibited higher state anxiety than their peer administered either the medium - or low - difficulty tests, these differences were not statistically significant.   Therefore, it would be inappropriate to conclude that variations in student perception of exam difficultness rather than actual test difficulty generated differences in state

anxiety based on the integration of the aforementioned findings (i.e., significant differences in perception of exam difficultness corresponded more closely to actual exam difficulty than did nonsignificant state anxiety variations). However, several explanations of the state anxiety finding could be considered plausible. First, if larger samples had been available, significant variations in state anxiety may have occurred. Second, the experimental condition of students viewing the videotape for 25 - minutes, then studying for 12 - minutes, and immediately taking the examination possibly produced essentially equivalent levels of state anxiety. Third, if the interaction between trait anxiety and task difficulty had been investigated significant variations in state anxiety possibly could have occurred. Fourth, differences in the difficulty levels (i.e., variations in the median p - values and/or p - value ranges) of the hard and easy forms of the test were insufficient to generate statistical differences in state anxiety.

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