DOCUMENT RESUME

ED 298 156 TM 012 259

AUTHOR Bender, Timothy A.; Hom, Harry L., Jr.
TITLE Individual Differences in Achievement Orientation and Use of Classroom Feedback.
PUB DATE Apr 88
NOTE 18p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 5-9, 1988).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Academically Gifted; *Achievement Need; Classroom Techniques; Elementary School Students; *Feedback; Grade 7; Grade 8; *Individual Differences; Junior High Schools; Reading Tests; *Student Motivation
IDENTIFIERS *Motivational Orientation Scale

ABSTRACT

Individual differences in achievement orientation are compared with differences in gifted students' use of feedback on a classroom exam. The achievement orientation of 57 seventh- and eighth-grade gifted students was measured using the Motivational Orientation Scale (MOS). There were 33 males and 24 females. As part of their regular classroom experience, the students read a 16-paragraph fictional, anthropological report; answered a 30-item multiple-choice test covering the material; and received feedback within two minutes of completing the test. Two days later, all students completed the same test. Correct response and error analysis scores were compared with scores on the MOS. The analyses included regressional analyses and a full correlation matrix consisting of five motivation subscale scores, pre- and post-test scores, and conditional probabilities of five response patterns. Individual differences in motivational orientation was found to be related to post-test performance and the students' use of feedback. Four data tables and a flowchart conclude the document. (TJH)

Individual Differences in Achievement Orientation and Use of Classroom Feedback

Timothy A. Bender

Harry L. Hom, Jr.

Southwest Missouri State University

Paper presented in a poster session at the annual meeting of the American Educational Research Association, New Orleans, LA, April, 1988.

Abstract

Individual differences in achievement orientation are compared with differences in gifted students' use of feedback on a classroom exam. The achievement orientation of 57 seventh- and eighth-grade gifted students was measured using the Motivational Orientation Scale (MOS, Harter, 1981). As part of their regular classroom experience, the students read a 16 paragraph fictional, anthropological report, answered a 30-item multiple-choice test over the material, and received feedback within two minutes of completing the test. Two days later, all students completed the same test. Correct response and error analysis scores were compared with scores on the MOS. Individual differences in motivational orientation was found to be related to posttest performance and students' use of feedback.

Individual Differences in Achievement Orientation

and Use of Classroom Feedback

It is generally accepted that differences in achievement motivation are related to differences in academic performance. However, questions remain concerning the cognitive mechanisms through which motivation affects learning. The objective of the present study is to present information regarding the relationship between differences in achievement motivation and the cognitive processes of one particular learning situation, that of using feedback on classroom tests. Feedback was chosen as the learning situation because it is through feedback that students discover whether or not their current learning attempts are appropriate. It was predicted that differences in achievement motivation would be be related to specific differences in students' use of classroom feedback.

Harter (1981) argues that achievement motivation should be investigated in terms of its components rather than as a unitary construct. Harter developed the Motivation Orientation Scale (MOS), which reflects the internal versus external achievement orientation of school children along five subscales. The first subscale, called challenge, reflects students' preference for challenging versus easy work. The second subscale, curiosity, reflects the degree to which learning is motivated by curiosity versus a need for teacher approval. Mastery reflects a desire for independent mastery versus dependence on the teacher for mastery of the material. The fourth subscale, judgment, reflects a reliance on independent judgments of success or failure versus the teacher's judgments. Finally, criteria reflects students' preference for internal versus external criteria for recognizing success or failure. Harter suggests the first three subscales reflect a more traditional internal/external motivational orientation, while the last two subscales reflect a more cognitive, internal/external preference for information used in evaluating successes and failures (Harter, 1981).

Students' use of feedback has also recently been conceptualized as a multi-component process (Bender, 1986; Phye and Bender, 1988). Feedback is a source of information, the meaning of which is limited by how students process that information. When ideally processed, feedback functions to serve three possible functions: confirming correct knowledge, disconfirming incorrect knowledge, and correcting the disconfirmed knowledge (Bender, 1986). The study of these functions provides better information about students' use of feedback than does the study of correct response data alone. Using a pre-post testing procedure researchers have examined various types of error and correct response patterns to more fully understand how students' processing of feedback is affected by various physical characteristics of the feedback situation (Kulhavy, White, Topp, Chan, & Adams, 1985; Peeck, 1979, Phye, 1979). This procedure is extended in the current study to investigate how students' processing of feedback is related to various cognitive components of achievement motivation.

Figure 1 illustrates an idealized model of the processing

Insert Figure One About Here

of feedback on classroom exam items (Bender, 1986). The functions of feedback are labelled at those locations in the model where they would be fulfilled. Obviously, such ideal feedback processing rarely occurs.

In a pretest-feedback-posttest design, one of three types of errors may occur, each indicating a different failure in fulfilling the functions of feedback (Peeck, 1979; Phye, 1979, 1986). A 'new' error reflects failure of the use of feedback to confirm a response which was correct on the pretest (R1W2). A 'same' error reflects failure of the use of feedback to disconfirm an incorrect response (W1W2s). A 'different' error reflects use of the feedback to disconfirm an incorrect response, but failure to correct it (W1W2d).

Besides error patterns, the pre-post design will reveal two correct-response patterns. (Peeck, 1979; Phye, 1979). Correct-response patterns include responses that are correct on both the pretest and posttest (R1R2) and responses that are incorrect on the pretest but corrected on the posttest (W1R2). The R1R2 pattern reflects information which is well learned, while the W1R2 pattern reflects information which has been corrected by the feedback.

Seventh- and eighth-grade gifted students were chosen as the subject population. Hom (1988) found that gifted students tended to be more intrinsically motivated than the normal population and that those gifted students who measured higher in intrinsic motivation tended to perceive more pressure in evaluation situations than did less intrinsically motivated students. Grolnick and Ryan (1987) found that for some students, the perceived pressure in a controlling, evaluation task leads to lower performance. Thus, it was predicted that individual differences in intrinsic motivation, even in relatively homogeneous groups such as the gifted, are related to performance differences. Furthermore, it was expected that these differences would appear in students' use of feedback.

It was assumed that gifted students would tend to be more uniformly intrinsic than the nongifted. This tendency toward a restricted range of motivation, albeit intrinsic motivation, should provide a stringent test of these hypotheses.

Method

Subjects

Subjects consisted of 57 seventh- and eighth-grade students enrolled in a public school gifted program. There were 33 males and 24 females, with a mean age of 12-9.

As part of a related study, Harter's (1981) Motivational Orientation Scale (MOS) was administered to the subjects. Scores on the subscales can range from 1 to 4. A higher score represents the more internal orientation on each subscale. The five subscale scores were computed for all subjects. Table 1

Insert Table 1 about here

lists the means for each MOS subscale for the subjects in this study and those in the norms provided by Harter. Obtained means tended to be larger than those reported by Harter (1980), but most of the standard deviations were similar. Only the standard deviations for the mastery and criteria subscales appeared to be smaller for the gifted subjects than for Harter's norms.

Procedure

As part of the regular classroom experience, subjects were asked to read a short, fictional, anthropological passage (Anderson & Myrow, 1971). Immediately upon reading the report, subjects were asked to complete a paper and pencil multiple-choice test composed of 30 questions about the content of the report. Their responses were scored and returned within two minutes of finishing the test. Subjects were asked to review the test and passage until they felt satisfied they understood the correct responses. Two days later, subjects were asked to complete the same test once more.

On the basis of the subjects' performance on the two tests, the conditional probabilities of the 3 error response patterns and two correct response patterns were derived. The total correct on the pre- and posttests was also determined. Conditional probabilities of the response patterns were used instead of relative proportions because the conditional probabilities approach conceptually matches the model of feedback processing (Bender, 1988). All conditional probabilities were transformed using the arcsin transformation (Kirk, 1982).

Results

The analyses included a full correlation matrix consisting of the 5 motivation subscale scores, pretest and posttest scores, and the conditional probabilities of the five response patterns. Seven regression analyses were also conducted with the dependent measures of the pretest scores, posttest scores, conditional probabilities of new errors, same errors, different errors, W1R2 patterns, and R1R2 patterns regressed on the five achievement subscales.

Table 2 presents the intercorrelations between the MOS

Insert Table Two About Here

---

subscales. The motivational subscales are highly intercorrelated and somewhat related to one of the cognitive subscales. However, the two cognitive subscales are not intercorrelated. The correlations of the challenge with curiosity, mastery, and criterion subscale scores are significant $r(55) = .6921$, $.5960$, and $.5711$, $p < .05$, respectively. The correlations of curiosity with mastery and criterion are also significant $r(55) = .4816$ and $.4317$, $p < .05$, respectively. The correlations of mastery with judgment and criterion are significant $r(55) = .3079$ and $.5352$, $p < .05$, respectively.

Table 3 presents the intercorrelations between the test

Insert Table Three About Here

---

scores and the response patterns. The correlations of pretest scores with posttest scores and the conditional probabilities of same errors are significant $r(55) = .5304$ and $-.2687$, $p < .05$, respectively. The correlations of posttest scores with new errors, same errors, correct responses, and corrected responses are also significant $r(55) = -.7981$, $-.4303$, $.7980$, and $.2750$, $p < .05$, respectively. By virtue of the definition of new errors and corrected errors, the correlations between these measures is -1.0000. Finally, the correlations of corrected errors with same and different errors are significant $r(55) = -.4639$ and $-.3796$, $p < .05$, respectively.

Table Four presents the correlations between the MOS

Insert Table Four About Here

---

subscale scores and the dependent measures. Correlations of the criterion score with same and different errors are significant $r(55) = -.3434$ and $.2688$, $p < .05$, respectively.

The regression of posttest scores on response patterns is significant $F(5,51) = 48.999$, $p < .0001$, with an adjusted R-squared of .81. Significant coefficients included same errors $t(51) = -4.737$, $p < .00002$, partial r-squared = .3055, and different errors $t(5,51) = -4.606$, $p < .00003$, partial r-squared = .2938.

The regression of pretest scores on MOS subscales is only marginally significant ($p < .08$), with a significant coefficient of the mastery score $t(51) = -2.51$, $p < .02$, partial r-squared = .1099.

The regression of posttest scores on MOS subscales is significant $F(5,51) = 4.536$, $p < .002$, with an adjusted R-squared of .24. Significant coefficients included the subscales of mastery $t(51) = -3.346$, $p < .002$, partial r-squared = .18, judgment $t(51) = 2.059$, $p < .05$, partial r-squared = .0767, and criterion $t(51) = 3.231$, $p < .003$, r-squared = .1699.

The regression of new errors on MOS subscales is significant $F(6,50) = 2.605$, $p < .03$, with an adjusted R-squared of .1467. Significant coefficients included the subscales of curiosity $t(50) = 2.23$, $p < .04$, partial r-squared = .0905 and mastery $t(50) = 2.367$, $p < .03$, partial r-squared = .1007.

The regression of R1R2 response patterns on MOS subscales is also significant. Since the conditional probabilities of new errors and R1R2 patterns sums to 1.00, the regression data are almost identical. The direction of the relationship of the coefficients is reversed.

Discussion

These results support the hypothesis that differences in the components of achievement motivation relate to differences in student learning. Specifically, it is found that differences in particular components of students' achievement orientation are related to how students process feedback on classroom exams. This is found to be true even for a group of highly intrinsically motivated gifted students. However, the expected restriction in the range of the intrinsic motivation did not appear across all subscales. Only the subscales of mastery and criteria appeared to have a smaller range. Furthermore, the high means and comparable standard deviations on these scales implies that differences between higher and lower scores reflect differences between strongly intrinsically oriented students and intrinsically oriented students.

The simple correlation matrix between the dependent variables and the MOS subscales indicates that those students who score more intrinsically on the criteria subscale process feedback well enough to benefit from its disconfirming function, but not well enough to use the feedback to its fullest corrective effect. That is, students who rely more upon their own standards for performance tend to process feedback on classroom tests well enough to recognize a previously incorrect answer, but not well enough to learn the correct response. During the feedback sessions, students were not provided any structure concerning how to use the feedback. Apparently, in a relatively unstructured feedback situation, students who strongly rely on internal criteria for recognizing their success or failures focus on the incorrect answers, i.e., the perceived failures, but do not adequately process the correct information. Similar results have been found for general undergraduate college samples (Bender, 1986).

Regression analyses involving the MOS subscales gives merit to Harter's (1981) suggestion that achievement motivation should be studied as a multi-component construct. The best posttest performance is displayed by students who are less intrinsically mastery oriented and by those who have a more internal cognitive orientation. That is, students who still depend somewhat on the teacher for mastery of the material and those with more internal cognitive-informational orientations tend to be better processors of the information available in feedback. As this is not a difference which appears in the pretest, the effect of these orientation differences may be on students' use of feedback, not simply their performance on tests.

The negative relationship between being highly intrinsic in mastery orientation and performance on the posttest, and possibly the pretest, argues that there may exist such a phenomenon as too much intrinsic motivation, at least too much of an internal orientation towards mastery. Hom (1988) found evidence to suggest the highly internally mastery oriented students perceived more pressure in evaluation situations than did students who were less highly intrinsically mastery oriented. Further support for a perceived pressure interpretation is provided by Grolnick & Ryan (1987), who found that students who were tested in a controlling, evaluation format perceived more pressure and exhibited a drop in rote memory performance. An interpretation similar to the Yerkes-Dodson Law may explain these results. Assuming similar pressure effects to be operating with the students in this study, it is possible that the combination of their already existing motivation, combined with the perceived pressure of the evaluation of the test, resulted in too much arousal and a subsequent drop in performance.

The response pattern analysis provides some additional information concerning the feedback processing performance of the students and a strongly intrinsic motivational orientation. A positive relationship appears between committing new errors and a strong internal orientation towards curiosity and mastery. Students who demonstrate a strong motivation by curiosity and those who demonstrate a strong desire for mastery independent of the teacher, appear to focus more on initially incorrect items than those they answered correctly. It is these highly intrinsically motivated students who were found by Hom (1988) to perceive more pressure in evaluational situations. Perhaps perceived pressure interferes with processing of the feedback for its confirming functions.

Two questions quickly arise from these results. The first concerns the traditionally perceived value of intrinsic motivation. Do these results suggest that teachers should not try to increase the intrinsic motivation of their students? The second question concerns the generalizability of these results to nongifted populations. The answer to first relates these questions. This answer is a qualified negative. For most students an increase in their intrinsic motivation would be of great value. The qualification comes into the answer with students who are already strongly intrinsically motivated. It appears that for some gifted students, their existing intrinsic motivation provides enough motivation for their optimal performance. In terms of the Yerkes-Dodson Law, additional sources of motivation serve to detract from their performance. For some students, additional motivation, whether intrinsic or extrinsic, is not warranted.

The question of whether these specific results can be generalized to non-gifted students is an empirical one. However, it is apparent that the general hypothesis that students' learning through feedback is affected by individual differences in their achievement motivation, can be applied beyond the gifted population. As reported in Hom (1988) and as can be seen by the means MOS scores for the gifted students, gifted students are more intrinsically motivated than the general population. Yet, even in this population variance in the motivational orientation is demonstrated. Individual differences in the components of achievement motivation affect these students' processing of feedback and subsequent performance on a posttest. Similar effects are in the general population.

These data do support the contention of teachers of the gifted that their students are motivationally unique when compared to the general population. Harter (1981) found a developmental trend towards a more extrinsic motivational orientation from grades 3 through nine, but a trend towards a more intrinsic cognitive-informational orientation. Means in the current study and those found in Hom (1988) indicate less tendency for an extrinsic motivational orientation. Thus, while nongifted students may lose their intrinsic motivational orientation as they progress through school, gifted students remain relatively intrinsic.

This maintenance of an intrinsic orientation by the gifted may also explain why the intercorrelations between the subscales in the MOS in this study differed somewhat from those found by Harter (1981). Harter found two distinct groupings in the subscales, with challenge, mastery, and curiosity grouping together to form a motivational component, and criterion and judgment combining to form a cognitive-informational component. The correlation matrix for the current study indicates significant positive correlations between the subscales of challenge, curiosity, mastery, and criterion. The judgment subscale is not related with any of the other subscales except for a moderate correlation with mastery. This does not detract from the value of Harter's MOS or her multi-component approach to achievement motivation. Rather it supports the MOS as a valuable research tool for differences in the motivational patterns of various student populations.

In closing, a clearer picture of how motivation affects classroom performance can be found when both motivation and learning are investigated in terms of their component processes. Individual differences in the components of motivation have been found to affect performance even when the subject population is more strongly intrinsically motivated and the range of motivational differences is restricted.

References

Anderson, R. C. & Myrow, D. L. (1971). Retroactive inhibition of meaningful discourse. Journal of Educational Psychology, 62, 148-156.

Bender, T. (1986, April). Classroom feedback and students' ability level. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Bender, T. (1988). Incorporating individual differences into the study of classroom examination feedback. Manuscript submitted for publication.

Gagne, E. D., Crutcher, R. J., Anzelc, J., Geisman, C., Hoffman, V. D., Schutz, P., & Lizcano, L. (1987). The role of student processing of feedback in classroom achievement. Cognition and Instruction, 4, 167-186.

Harter, S. (1980). A Scale of Intrinsic Versus Extrinsic Orientation in the Classroom. Denver: University of Denver.

Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. Developmental Psychology, 17, 300-312.

Hom, Harry L., Jr. (1988, April). Motivational orientation of the gifted student, threat of evaluation, and its impact on performance. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Kirk, R. E. (1982). Experimental Design: Procedures for the behavioral sciences (2nd ed.). Belmont, CA: Brooks/Cole Publishing Company.

Kulhavy, R. W., White, M. T., Topp, B. W., Chan, A. L., & Adams, J. (1985). Feedback complexity and corrective efficiency. Contemporary Educational Psychology, 10, 285-291.

Peeck, J. (1979). Effects of differential feedback on the answering of two types of questions by fifth- and sixth-graders. British Journal of Educational Psychology, 49, 87-92.

Phye, G. D. (1979). The processing of informative feedback about multiple-choice test performance. Contemporary Educational Psychology, 4, 381-394.

Phye, G. D. (1986). Practice and skilled classroom performance. In G. D. Phye and T. Andre (Eds.) Cognitive Classroom Learning: Understanding, thinking, and problem-solving, (141-168). Orlando, FL: Academic Press, Inc.

Phye, G. D. & Bender, T. (1988). Feedback complexity and practice: Response pattern analysis in retention and transfer. Manuscript submitted for publication.

Table 1

Mean MOS Subscale Scores and Seventh- and Eighth-Grade Norms

Subscale	Mean (s.d.)	Seventh-Grade Norms	Eighth-Grade Norms
Challenge	3.08 (.63)	2.54 (.63)	2.51 (.62)
Curiosity	2.97 (.51)	2.18 (.64)	2.09 (.52)
Mastery	3.15 (.49)	2.63 (.60)	2.68 (.53)
Judgment	3.16 (.53)	2.64 (.56)	2.61 (.52)
Criteria	3.29 (.41)	2.82 (.56)	2.77 (.63)

Table 2

Intercorrelations of the Motivational Orientation Scales

	Challenge	Curiosity	Mastery	Judgment
Curiosity	.6921 *			
Mastery	.5960 *	.4816 *		
Judgment	.1090	.1123	.3079 *	
Criterion	.5711 *	.4317 *	.5352 *	.1784

Note. All correlations marked with * are significantly greater than 0.00 at $p < .05$.

Table 3

Intercorrelations of Test Scores and Response Patterns

	Pretest	Posttest	R1W2	W1W2s	W1W2d	R1R2
Posttest	.5304 *					
R1W2	-.1749	-.7981 *				
W1W2s	-.2686 *	-.4303 *	.1411			
W1W2d	-.1666	-.2556	-.0399	-.0251		
R1R2	.1750	.7980 *	-1.0000 *	-.1408	.0400	
W1R2	.1157	.2750 *	-.0298	-.4639 *	-.3796 *	.0297

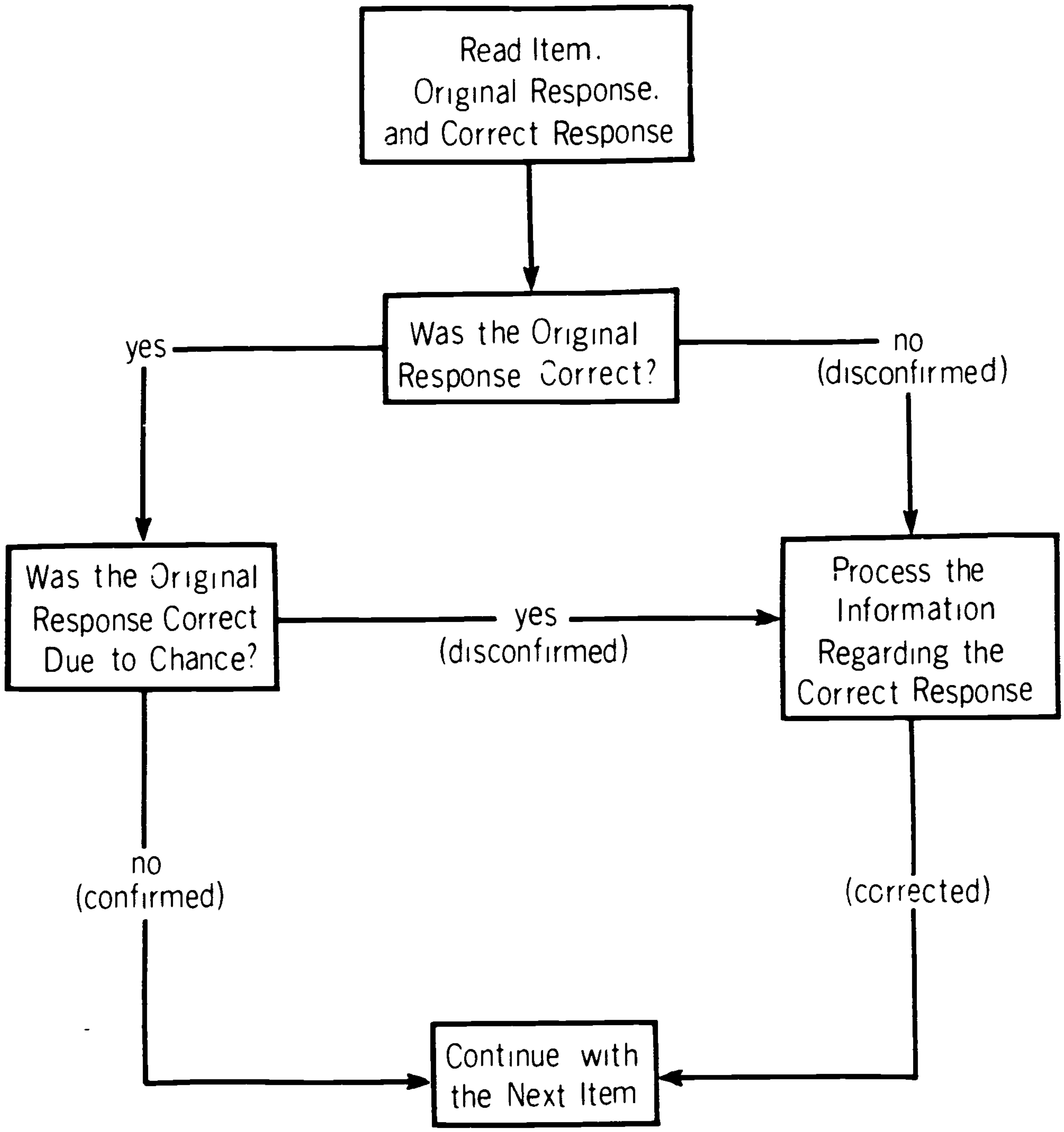
Note. All correlations marked with * are significantly greater than 0.00 at $p < .05$.

Table 4

Correlations Between MOS Subscales and Pretest, Posttest, and Response Patterns

	Pre	Post	R1W2	W1W2s	W1W2d	R1R2	W1R2
Challenge	.0414	-.0068	.0867	-.1113	.0400	-.0867	.21[illegible]
Curiosity	-.0737	-.1546	.2114	.0970	-.0780	-.2114	.1508
Mastery	-.1537	-.2100	.1539	-.0952	.0925	-.1540	.0781
Judgment	.1780	.1668	-.1618	-.0433	-.0576	.1620	-.1058
Criterion	.1422	.2363	-.1585	-.3434 *	.2688 *	.1585	.1527

Note. All correlations marked with * are significantly greater than 0.00 at $p < .05$.


Read Item.
Original Response.
and Correct Response
Was the Original
Response Correct?
yes
no
(disconfirmed)
Was the Original
Response Correct
Due to Chance?
yes
(disconfirmed)
Process the
Information
Regarding the
Correct Response
no
(confirmed)
(corrected)
Continue with
the Next Item