DOCUMENT RESUME

ED 254 557 TM 850 171

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TITLE	Baccalaureate Nursing Students' Attributions of the Causes of Success and Failure in a Research Course.
PUB DATE	Mar 85
NOTE	21p.; Paper presented at the Annual Meeting of the American Educational Research Association (69th, Chicago, IL, March 31-April 4, 1985).
PUB TYPE	Speeches/Conference Papers (150) -- Tests/Evaluation Instruments (160) -- Reports - Research/Technical (143)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Achievement; Academic Failure; Affective Behavior; *Attribution Theory; Higher Education; *Locus of Control; Nursing Education; School Attitudes; *Statistics; *Student Attitudes; Test Construction
IDENTIFIERS	Mathematics Attribution Scale; *Nursing Students

ABSTRACT

The attributions of success and failure in a course in nursing research design and statistics were measured using a modified version of the Mathematics Attribution Scale. Eight subscales were formed by combining hypothetical success or failure events paired with each attribution category. The scales were success-task, success-environment, success-effort, success-ability, failure-task, failure-environment, failure-effort, and failure-ability. The group appeared to judge effort and environment--unstable attribution categories--as more important causes of success than task and ability--stable causes. Students also judged task and effort as more important causes of failure than ability and environment. When students were divided into groups according to reported level of comfort with the research course, significant differences were found in the importance attached to task and ability as determiners of success and failure. Instructor feedback should reinforce the students' attributions of success to internal causes such as effort and ability, and suggest that failure is due to lack of effort. (DWH)

Baccalaureate Nursing Students' Attributions of the Causes of Success and Failure in a Research Course

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Presented at the Annual Meeting of the American Educational Research Association, Chicago, April, 1985.

Since characteristics other than cognitive skills have been shown to affect performance on achievement tasks, measurement of the affective correlates of learning is generally held to be as important as the assessment of knowledge. One of the most active areas of research into affective learning is the study of causal attribution (Weiner et al., 1971; Bar-Tal, 1978; Pedro, Wolleat, Fennema and Becker, 1981). Based on the assumption that beliefs about the causes of success or failure mediate between perception of an achievement task and its actual performance, attribution theory has profound implications for teaching and learning. Attributions of success and failure can be categorized along two dimensions. One dimension distinguishes causal elements in terms of internality or externality; that is, according to whether they originate within or outside the person. Effort and ability originate within the person, and thus are considered internal causes; task difficulty and luck are regarded as external causes. A second dimension distinguishes causal elements according to whether they are stable (e.g., ability, task difficulty) or unstable (e.g., effort, luck). These two dimensions — locus of control and stability over time — have been found to be important in understanding affective responses to past success or failure, and variations in perceived probability of future success or failure. For example, pride and self-esteem are maximized when successful performance can be attributed to internal causes, while shame and loss of self-esteem are minimized when failure can be attributed to external causes. Cognitive changes in expectancy following success or failure are influenced by the stability dimension. If success is attributed to an unstable cause, such as luck, failure is perceived as likely in the future. Attribution of failure to lack of ability (a stable cause) leads to expectancy of future failure.

Most instruments developed to measure attributions of success or failure have referred to general constructs, or to performance on specific laboratory tasks. Relatively few studies have used measures which are appropriate to a content area such as mathematics or statistics. Fennema, Wolleat and Pedro (1979) have developed a mathematics attribution scale (MAS) for the specific purpose of measuring high school students' attributions of success and failure in algebra and geometry. The MAS is based on the classification scheme outlined in Figure 1.

Insert Figure 1 about here

It consists of eight subscales with success and failure events paired with each of tne four attribution categories. Subscale reliability coefficients range from 0.39 to 0.79.

In the present study, the MAS was modified by the investigators for use with a sample of undergraduate nursing students in order to measure attributions of success and failure in a course in nursing research design and statistics. Relationships between subscale scores and such background variables as age, academic achievement and degree of comfort with course material were also examined.

METHODS

Sample.

Ninety-eight students in four sections of an undergraduate course in nursing research methods participated voluntarily in this study. The mean reported age of the sample was 24.5 years. Ten students did not give their ages. Ninety-five percent of the students were women. Generic students

comprised 70 percent of the sample; registered nurses and those with other kinds of preparation, 30 percent.

Materials

Test booklets were prepared, containing eight subscales with hypothetical success and failure events paired with each of the four attribution categories — task, environment, effort and ability. (See Appendix.) The success and failure events were all related to performance in the research methods course in which the participants were enrolled. The eight subscales thus formed were Success-Task, Success-Environment, Success-Effort, Success-Ability, Failure-Task, Failure-Environment, Failure-Effort, and Failure-Ability. The instrument itself consisted of eight clusters of items, four having success events as stems and four having failure events as stems. The stem for each cluster was a one-sentence description of a success or failure event, and was followed by four attribution statements (causes) corresponding to the four attribution categories. After reading the description of each event, students were instructed to rate their agreement or disagreement as to whether each cause listed below it could explain the event if it happened to them. A five-point Likert-type scale was used with 1 indicating strong agreem , 3 indicating uncertainty, and 5 indicating strong disagreement. Each of the eight subscales was scored separately. For instance, the Failure-Environment subscale was scored by summing the ratings given to the environment attributions across the four failure event stems. The eight clusters were arranged in random order in the test booklet.

Proce re.

The booklets were distributed to students during a regular post-midterm session of the research course, along with an answer sheet and a demographic questionnaire. The answer sheet provided space for the eight item clusters

described above. The demographic questionnaire elicited information about age, sex, and student status (generic or R.N.). In addition, students were asked to report their raw scores on the midterm examination in the research course, their junior year grade point average, and their level of comfort with the research course on a scale from 0 (extremely uncomfortable) to 9 (extremely comfortable).

RESULTS

The modal midterm examination raw score range for the sample was 52-54 out of a possible 60 points. The mean junior grade point average was 3.29. The mean reported comfort level with the research course was 5.29.

Examination of the attribution subscale means showed that, on the average, students judged environment as the most important cause of successful performance, with effort, ability and task ranking second, third, and fourth, respectively. On the other hand, students judged task as the most important cause of failure, with effort, ability and environment ranking second, third, and fourth, respectively (see Table 1).

Insert Table 1 about here

A canonical correlation analysis of the relationship between the set of background variables age, midterm examination score and comfort level, and the set of eight attribution subscale scores, yielded one significant pair of canonical variates (chi-square = 86.42, df = 24, p = .0000, canonical R = 0.76).

Examination of the coefficients for this pair of canonical variates indicated a tendency for students who felt uncomfortable with the research

course to attribute failure to lack of ability, while students who felt comfortable appeared to attribute success to ability (see Table 2).

Insert Table 2 about here

The significant relationship between comfort level and attributions of success or failure to ability or lack of it suggested that the general pattern of attributions may depend upon how comfortable the student feels with the task at hand. Data from the sample of students were next divided into two subgroups according to whether they indicated low to moderate comfort (0-5) or nigh comfort (6-9). A discriminant analysis performed on the groups defined by comfort level, using the eight subscale scores as discriminating variables, resulted in a significant discrimination function (chi-square = 47.61, df = 8, p = .000). Examination of the univariate F-ratios for group differences on the eight subscales showed significant ($p<.02$) differences between the two groups, in opposite directions, on the success-task, success-ability, failure-task and failure-ability subscales (see Table 3).

Insert Table 3 about here

In both the low-to-moderate and high comfort groups, students judged effort and environment as more important causes of successful performance than task or ability. In the low-moderate comfort group, task and ability were judged as more important causes of failure than effort and environment. In the high comfort group, task and effort were judged as more important causes of failure than ability and environment.

DISCUSSION

As a group, students appeared to judge effort and environment (unstable attribution categories) as more important causes of success than task and ability (stable causes), giving environment the most, and task the least, importance. In contrast, students judged task and effort as more important causes of failure than ability and environment, giving task the most, and environment the least, importance. According to the attribution model, ascribing success to an external, unstable cause such as environment leads to expectation of possible changes in future performance. Bar-Tal (1978) has reported several studies in which females tended to be more external, and to employ more unstable attributions, than males, particularly in success situations. It may be that the students in this sample, almost entirely female, lacked faith in their ability and put their trust instead in environmental factors such as teacher and peer support.

The pattern of causal attributions of failure is somewhat more difficult to interpret. Attributions of failure to external-stable causes, such as task difficulty, should lead to expectations of similar performance in the future. In summary, it would appear that this sample of students tended to regard failure as something they should expect, while success would be an unexpected bonus -- a somewhat pessimistic outlook in view of their above-average performance on the midterm examination.

Of greater interest, perhaps, was the finding that, when students were divided into groups according to reported level of comfort with the research course, significant differences were found in the importance attached to task and ability as determiners of success and failure. Task ease or difficulty, and ability or lack of it, are both stable attributions; according to the attribution model, ascribing success or failure to stable causes results in

expectations of similar performance in the future. If this is so, then one might expect students who anticipate continued success, even in hypothetical situations, to be relatively comfortable, while those who anticipate continued failure would experience more discomfort. In particular, the fact that the less comfortable group showed a clear tendency to agree with task difficulty and lack of ability as causes of failure suggests that instructors should consider interventions aimed at changing maladaptive causal perceptions. Students in this group tended to underestimate the importance of lack of effort as a cause of failure, and to attribute failure to lack of ability. If tasks are assigned that are appropriate to the student's ability, the student may be encouraged to put forth more effort and experience success, and confidence in his or her ability may increase. Instructor feedback should reinforce the student's attribution of success to internal causes such as effort and ability, and suggest that failure is due to lack of effort. Although these interventions may be directed particularly toward students who show signs of discomfort and anxiety, all students may benefit from an approach that emphasizes ability and effort as determiners of success, and lack of effort as a cause of failure.

Figure 1

Attribution Categories

Stability	Locus of Control	
	Internal	External
Stable	Ability	Task
Unstable	Effort	Environment

Table 1

Means and Standard Deviations of Success and Failure Attribution Subscales

Subscale	$\overline{X}$	S.D.
Success-Task	13.74	2.71
Success-Effort	10.30	3.05
Success-Environment	8.76	2.61
Success-Ability	12.72	3.39
Failure-Task	11.69	2.32
Failure-Effort	12.05	3.47
Failure-Environment	14.48	2.30
Failure-Ability	12.98	3.35

Table 2

Coefficients for Canonical Correlation Between Age, Midterm Examination Scores, and Comfort Level and Attribution Subscale Scores

Variable	Coefficients
Success-Task	-0.055
Success-Effort	0.039
Success-Environment	0.158
Success-Ability	0.475
Failure-Task	-0.097
Failure-Effort	-0.010
Failure-Environment	-0.103
Failure-Ability	-0.614
Age	0.043
Midterm Score	0.016
Comfort Level	-0.994

Table 3

Means and Standard Deviations of Success and Failure Attribution Subscales for Low-Moderate and High Comfort Groups

Subscale	Comfort Level			
	Low-Moderate (N=38)		High (N=60)	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Success-Task	14.58	2.31	13.22	2.83
Success-Effort	9.66	2.56	10.70	3.29
Success-Environment	9.13	2.63	8.52	2.60
Success-Ability	13.74	3.06	11.45	2.96
Failure-Task	10.97	2.26	12.15	2.26
Failure-Effort	12.37	3.65	11.85	3.37
Failure-Environment	14.34	2.42	14.57	2.24
Failure-Ability	10.47	2.84	14.57	2.61

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N410 SURVEY

This survey concerns your reactions to certain events that could have happened in N410.

The information you furnish is confidential and will never be personally connected with you in any way. Naturally your participation is strictly voluntary. Should you decide to participate, your completion of the questionnaire will be considered to be your written, informed consent to participate.

THANK YOU.

N410 SURVEY

DIRECTIONS: Please read the following material which involves a number of different events which could have happened to you. Each description of an event is followed by four possible causes of that event. Please respond by expressing how strongly you agree or disagree about whether each cause listed could really explain the event if it happened to you.

To summarize, please carefully read about the event, and then respond to each cause. The first event is presented below.

EVENT A: A part of your N410 homework was wrong.

CAUSES

1. You just can't seem to remember to do the steps.
2. You were careless about completing it.
3. The part marked wrong included a step which was more difficult.
4. You were unlucky.

Event A says, "A part of your N410 homework was wrong." Number 1, 2, 3, and 4 are probable causes for that event. Look at Number 1. Think about whether this could be a cause for Event A. Cause 1 says, "You just can't seem to remember to do the steps." Do you STRONGLY AGREE or just AGREE? Are you UNDECIDED, do you DISAGREE, or STRONGLY DISAGREE with that as a cause of Event A? Find Number 1 on your answer sheet. Indicate how you feel about Number 1 as a cause of the event. Circle the appropriate response. You will note that SA=STRONGLY AGREE, A=AGREE, U=UNDECIDED, D=DISAGREE, AND SD=STRONGLY DISAGREE.

Now look at Number 2, "You were careless about completing it." Do you STRONGLY AGREE, AGREE, are you UNDECIDED, do you DISAGREE, or STRONGLY DISAGREE with Number 2 as a cause for Event A? Mark your answer sheet by circling the appropriate response. Now mark how you feel about Number 3 and 4 as possible causes of Event A. Then go to Event B, read it and mark on your answer sheet how you feel about each cause for that event, etc.

EVENT B: You got the grade you wanted for the semester in N410.

CAUSES

5. The content of the class is easy.
6. You spent a lot of time studying the material.
7. The teacher is good at explaining the material.
8. You have a special talent for the material.

C O N T I N U E D

EVENT C: You had trouble with some of the problems in the N410 assignment.

CAUSES

9. There was no time to get help because of a busy schedule.
10. You don't think in the logical way that research & statistics require.
11. You didn't take time to look at the book.
12. They were difficult problems.

EVENT D: You have not been able to keep up with most of the class in N410.

CAUSES

13. Students sitting around you didn't pay attention.
14. You haven't spent much time working on it.
15. The material is difficult.
16. You have always had a difficult time in classes having anything to do with numbers.

EVENT E: You have been able to complete your last few N410 assignments easily.

CAUSES

17. The assignments were more interesting.
18. The effort you put into studying at the beginning helped.
19. You're a very able research & statistics student.
20. You lucked into working with a helpful group.

EVENT F: You were able to understand a difficult session of N410.

CAUSES

21. The way the instructor presented the material helped.
22. Your ability is more obvious when you are challenged.
23. You put extra study time into it.
24. The concepts were easy because they had been covered before.

EVENT G: You received a low grade on a quiz in N410.

CAUSES

25. You're not the best student in anything to do with numbers.
26. You studied, but not hard enough.
27. There were questions you'd never seen before.
28. The instructor had spent too little class time on the material.

EVENT H: You have passed most NA10 tests with no trouble.

CAUSES

29. The instructor made learning the material interesting.
30. Like everyone says, you're talented in research & statistics.
31. But, you spent hours of extra time on this class.
32. The material was elementary and easy.

EVENT I: There were times when you were not able to answer NA10 questions.

CAUSES

33. It was a task which didn't interest you.
34. Despite studying, you didn't understand it well enough.
35. Your friends' lack of attention in class was part of the problem.
36. But then you didn't spend time doing the reading assignments.

After responding to each of these events on the ANSWER SHEET, will you then please complete the DEMOGRAPHIC QUESTIONNAIRE? Thank you for your cooperation.

ANSWER SHEET AND DEMOGRAPHIC QUESTIONNAIRE

ANSWER SHEET

EVENT A	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1.	SA	A	U	D	SD
2.	SA	A	U	D	SD
3.	SA	A	U	D	SD
4.	SA	A	U	D	SD
EVENT B					
5.	SA	A	U	D	SD
6.	SA	A	U	D	SD
7.	SA	A	U	D	SD
8.	SA	A	U	D	SD
EVENT C					
9.	SA	A	U	D	SD
10.	SA	A	U	D	SD
11.	SA	A	U	D	SD
12.	SA	A	U	D	SD
EVENT D					
13.	SA	A	U	D	SD
14.	SA	A	U	D	SD
15.	SA	A	U	D	SD
16.	SA	A	U	D	SD
EVENT E					
17.	SA	A	U	D	SD
18.	SA	A	U	D	SD
19.	SA	A	U	D	SD
20.	SA	A	U	D	SD

EVENT F	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
21.	SA	A	U	D	SD
22.	SA	A	U	D	SD
23.	SA	A	U	D	SD
24.	SA	A	U	D	SD
EVENT G					
25.	SA	A	U	D	SD
26.	SA	A	U	D	SD
27.	SA	A	U	D	SD
28.	SA	A	U	D	SD
EVENT H					
29.	SA	A	U	D	SD
30.	SA	A	U	D	SD
31.	SA	A	U	D	SD
32.	SA	A	U	D	SD
EVENT I					
33.	SA	A	U	D	SD
34.	SA	A	U	D	SD
35.	SA	A	U	D	SD
36.	SA	A	U	D	SD

PLEASE COMPLETE DEMOGRAPHIC QUESTIONNAIRE ON NEXT PAGE.

DEMOGRAPHIC QUESTIONNAIRE

1. Are you:

Male_____ Female_____

2. Are you a Registered Nurse?

Yes_____ No_____

3. May we have your age?_____

4. Please check the appropriate line to indicate your raw score (number correct out of 60 items) on the N410 Midterm:

_____34 or less

_____37 to 39

_____40 to 42

_____43 to 45

_____46 to 48

_____49 to 51

_____52 to 54

_____55 to 57

_____58 to 60

5. May we have your Grade Point Average for your junior year?_____

6. Please circle the number below that best represents how UNCOMFORTABLE or COMFORTABLE you feel about N410.

0	1	2	3	4	5	6	7	8	9
EXTREMELY UNCOMFORTABLE									EXTREMELY COMFORTABLE