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The Relationship Between Students' Evaluation of Faculty and Students' Grades

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THE RELATIONSHIP BETWEEN STUDENTS' EVALUATION OF FACULTY AND STUDENTS' GRADES

by

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Eun-hee Shin

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ABSTRACT

The Relationship Between Students' Evaluation of Faculty and Students' Grades

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The study examined (a) the relationship between the grade students expect to receive and their evaluation rating, (b) the relationship between students' prior cumulative GPA and their evaluation rating, and (c) to what extent do other variables account for the relationship between grade and evaluation rating.

The present study found a significant, consistent relationship between students' expected grades and their evaluation ratings of professor. The relationship between students' cumulative GPA and ratings is negligible and should not be considered an important score of bias. The implication of this study is that great caution should be exercised when using such ratings to make key career decisions about professors.

(64 pages)

RESEARCH PROBLEM

The importance of students' evaluation of professors' course instruction is obvious to thoughtful educators. Student ratings are used by administrators to make decisions about tenure and salaries. They are also used by students in deciding whether or not to choose a particular course. Professors use student ratings to get feedback from students about their course and their instruction.

Despite such widespread use of student ratings, many university and college faculties and administrators doubt the validity or reliability of students' evaluation (e.g., Marsh, 1982, 1984; Aleamoni, 1981; Scriven, 1980; Doyle & Crichton, 1978). Although students may feel they can judge the quality of the instruction and the overall course, there are a variety of extraneous variables that might influence and confound their ratings. Examples of such confounding factors are the size of the class (e.g., Aleamoni, 1981; Elmore & Pohlmann, 1978), whether the course is required vs. elective (e.g., Aleamoni & Thomas, 1980; Krambule, 1976), status (rank) of the professor (lecturer, assistant professor, associate professor, and so on) (e.g., Hamilton, 1980; Aleamoni & Hexner, 1980), or the grades the students were expecting (e.g., Feldman, 1976; Stumpf & Freedman, 1979). Until more is known about how much student ratings are influenced by extraneous variables, great caution should

be exercised in using such ratings to make key career decisions about professors.

Among the various extraneous factors studied, one of the most controversial is the grade given to the student. Grade inflation could well result from professors attempting to "bribe" students to give high ratings, while unfair retaliation in the form of low ratings might occur with students who recognize that their grade will be low. Similarly, the possibility exists that students who are academically successful not only in a particular course, but in course-work in general (thus having higher cumulated GPAs) may hold more positive attitudes and thus rate their professors and courses higher.

Many prior research studies have investigated the relationship between students' grades and students' course ratings, or relationship between students' course ratings and their cumulative GPA, but the results are contradictory and confusing. Some researchers found no relationship between students' grades and their ratings of the course and professor (e.g., Peterson & Cooper, 1980; Hoffman, 1983), while other studies concluded that student grades biased their evaluation of the course and the professor (e.g., Hamilton, 1980; Powell, 1977).

Unfortunately, many of these studies suffer from conceptual or methodological problems that make their validity suspect, as will be demonstrated later in the

review of literature. Also, part of the confusion may lie in the different operational definitions of variables examined by different researchers. For example, some studies have correlated final grades of students with student ratings of the course and professor (e.g., Cooper, Stewart, & Gudykunst, 1982; Hamilton, 1980). Others have looked at the relationship between student ratings and the expected grades of students (the final end-of-term grade the student anticipates or predicts at the time the evaluation is done) (e.g., Scheurich, Graham, & Drolette, 1983). Still others have looked at whether a student's previous academic performance (e.g., cumulative GPA) is related in any way to their later ratings of courses (e.g., Bausell & Magoon, 1972; Frey, Leonard, & Beatty, 1975).

Thus the previous research in this area is not conclusive largely because it is flawed by conceptual or procedural problems and by differing definitions of the variables investigated. It is safe to say that we still do not know how or whether student ratings of a course and the professor's instruction are related to the grades the students receive or anticipated receiving in that course, or to their cumulative GPA. This study is proposed to provide valid information about this issue and thus to clarify the relationships between student evaluation of course instruction and their anticipated academic performance in that course, as well as their overall GPA.

OBJECTIVES AND RESEARCH QUESTIONS

The overall objective of this research is to determine whether students' expected grades and cumulative GPA are significantly related to those students' evaluation of the relevant courses and the professors' instruction in those courses.

The research questions to be answered by this study are:

1. Is there any relationship between the grade students expect to receive in a course and their evaluation rating of the professor?

2. Is there any relationship between students' prior cumulative GPAs and their evaluation score in rating a course and professor?

3. To what extent do other variables (such as level of the class, class size, gender, student age, student satisfaction with the time of the class, and whether class is required or elective) account for the relationships between (a) expected grade and evaluation rating, and (b) cumulative GPA and evaluation rating?

REVIEW OF LITERATURE

Numerous studies have examined the relationship between the grades of students and students' evaluation of courses and instructions. However, the results of this body of research are inconclusive, and individual studies often yield conflicting results.

Many researchers have reported significant positive relationships between grades of students and their ratings of courses (e.g., Stumpf & Freedman, 1979; Powell, 1977; Holmes, 1972); many others reported no relationship between these two variables (e.g., Peterson & Cooper, 1980; Aleamoni & Hexner, 1980). Possible explanations of the conflicts in findings of such studies will be discussed later in this review of literature.

Even when the various researchers reported positive relationships between student grades and student ratings of courses (hereafter referred to as "grade-rating relationships"), they have disagreed on interpretations of the results. Some researchers have suggested that students' evaluations of courses are <u>biased</u> by the grades they receive (or expect to receive); thus, if professors gave generally high grades to students, they would receive generally good ratings from those students. The other possible interpretation does not suggest bias, but rather that there is a <u>natural</u> relationship between high (earned) grades and

high ratings. For example, students who have high motivation and interest, who learn more, would likely earn higher grades, and also they would likely give higher ratings to the professor. So a positive grade-rating relationship is not necessarily associated with bias.

Prior research on this topic has taken several different approaches, including (a) secondary reviews of existing literature, (b) analyses of non-manipulated data, and (c) experimental or quasi-experimental research where variables were manipulated. These categories of research will be used to organize the remainder of this literature review.

Secondary Reviews of Prior Research

Feldman (1976), Stumpf and Freedman (1979), Aleamoni and Hexner (1980), and Marsh (1987) all reviewed substantial numbers of research studies on grade-rating relationships. The reviews by Marsh and by Aleamoni and Hexner covered a variety of general issues about student evaluations of which the grade-rating relationship was only one. By contrast, Feldman's and Stumpf and Freedman's reviews were focused specifically on the relationship between grades and student evaluation.

Aleamoni and Hexner (1980) did an extensive review of research on the relationships of several variables (e.g., class size, required versus elective courses, instructor's

academic rank, and grades or marks students receive or expect to receive) to student ratings of courses and instructors. Aleamoni and Hexner indicated that considerable controversy centered on the relationship between students' ratings and their actual or expected grades. Although too many studies were reviewed to provide specific details, they listed a number of researchers who have found near zero grade-rating relationships and others who reported significant positive relationships between these two variables.

Marsh (1987) provided an overview of research findings and methodological issues on the topic of student evaluation of teaching effectiveness including a report of ten years of his own research on student evaluations. Even though Marsh presented critical analyses of existing research, the emphasis was on his own work and his instrument, Students' Evaluation of Educational Quality (SEEQ). This heavy emphasis on personal work could be a weakness to the extent that it underrepresents other researchers' contributions, limits generalizability of the findings (a concern expressed in a review of Marsh's work; Abrami, 1989), or reveals possible bias of the author. The possibility of such bias is suggested by the subtitle of Marsh's chapter that deals with the relationship between student evaluation and confounding variables--"The Witch Hunt for Potential Biases in Students' Evaluations." As Abrami (1989) pointed out,

one could guess the author's sentiments about the research in this area from the subtitle. Marsh objected to the notion of 'bias' in student evaluations, arguing that research that reported such ratings are biased are suspect for two reasons: (a) methodological weaknesses in the "bias research" studies, and (b) alternative theoretical definitions of bias. Although much of Marsh's work was of high quality, and could be helpful to researchers in this area, as well as to faculties, administrators and other users of student evaluations, the present investigator feels that Marsh's vested interest, as the author of SEEQ, has likely contributed to his discounting and explaining away other studies that disagreed with his own beliefs in ways that allowed bias to creep into his own work. Also, Marsh (1987) failed to report actual correlation coefficients of studies he reviewed, although he reported they were moderate, but not unimportant.

One of the most frequently cited reviews of research about the grade-rating relationship was provided by Feldman (1976). Feldman examined prior research in relation to an important methodological issue, the unit of analysis. He divided existing research into studies that used the student as the unit of analysis and those that used the class as the unit of analysis. Among studies where the student unit of analysis was used, Feldman also differentiated between studies where the analysis was done on data that had been

pooled (unweighted) across classes and studies where the analysis was done separately for each class. He reviewed an extensive number of studies and summarized each study separately. Given the large body of research he reviewed, it is regrettable that he did not use meta-analysis to strengthen his review.

Feldman concluded that when a student is used as the unit of analysis, grade-rating correlation coefficients range between .15 and .28. Even though there are not large correlations, Feldman suggested that it could be premature to dismiss them as unimportant on the grounds of size alone, given the fact that relationships found in behavioral and social science are often weak. He explained that correlation coefficients (assuming as they do the linearity of relationships) may somewhat underestimate the strength of associations between grades and evaluation. When the class is used as the unit of analysis, Feldman concluded that grade-rating relationships tend to be positive.

In their review of prior research, Stumpf and Freedman (1979) also focused on the unit of analysis in examining the grade-rating relationships reported in those studies, hoping to identify some patterns that may explain part of the variance in the reported results. Stumpf and Freedman's investigation suggested that grade-rating relationship correlation coefficients when the class is used as the unit of analysis are larger (median correlation = .37) than when

the unit is the individual student (median correlation = .18). They warned against researchers comparing results based on different unit of analysis. To further investigate this phenomenon, they analyzed grade-rating relationship using the same data for both units of analysis, and confirmed their finding. Frey et al. (1975) also conducted similar research to that of Stumpf and Freedman, and reported the same results. Based on these studies, Stumpf and Freedman and Frey suggested that a possible explanation of this difference is that students would be more influenced by the faculty's grading policies than by their individual grades. This explanation was supported by Powell's (1977) experimental study about the relationship between grading criteria and student evaluation. Powell reported that as the stringency of grading criteria increased, the student ratings of course instruction decreased. (Powell's study will be discussed further in the 'Experimental Studies' section.)

Table 1 is provided to summarize graphically the most important information reported on those review articles.

Studies Using Non-manipulated Variables

Many researchers tried to get information about the relationship of actual or expected grades and student evaluation, either by calculating correlation coefficients between the two variables or by using multiple regression

Table 1

Summary of Review Articles

STUDY	UNIT OF ANALYSIS	MEASURE OF GRADES USED IN STUDIES REVIEWED	FINDINGS (Range of Correlation Coefficients between grade & ratings of faculty)	CONFIDENCE WARRANTED BY REVIEW FINDINGS**
Aleamoni & Hexner* (1980)	no distinction	actual and/or expected	inconsistent relationship median r = .14 mean r = .18	Medium
Marsh (1987)	class	expected	"moderate but not unimportant correlations" (actual r's not reported)	Low
Feldman (1976)	student	actual and/or expected	r = .14 to .27 median r = .17	High
	student	overall GPA	r = near zero	
	class	actual and/or expected	median r = .24	
Stumpf & Freedman (1979)	student	actual	median r = .07	High
		expected	median r = .17	
		actual and/or expected	median r = .13	

(Table continues)

STUDY	UNIT OF ANALYSIS	MEASURE OF GRADES USED IN STUDIES REVIEWED	FINDINGS (Range of Correlation Coefficients between grade & ratings of faculty)	CONFIDENCE WARRANTED BY REVIEW FINDINGS**
Stumpf & Freedman (1979)	class	actual	median r = .35	High
		expected	median r = .42	
		actual and/or expected	median r = .37	

* Only the grade & rating of faculty variables from this study are included in this table.
** As judged by the present author

analysis (e.g., Elmore & Pohlmann, 1978; Hamilton, 1980). Some researchers divided students into categories according to the grades and compared the mean ranking of each category (e.g., Kennedy, 1975; Bausell & Magoon, 1972). The results are very contradictory. Some reported positive relationships or significant differences; others found near zero correlations, or non-significant differences.

Most research studies that reported near zero grade-rating correlations tend not to have focused particularly on the relationship between student grades and student ratings of course and instructors, but rather included these variables along with other factors like class size, gender

bias, personal relationship with the instructor, and so on.

Frey et al. (1975) investigated the correlations between student evaluation ratings and educational achievement score (measured using the same final exams in several sections of a class), student's grade point average (GPA) and Math Aptitude Score from the SAT. Achievement scores were found to be highly correlated with evaluation ratings, but GPA and SAT scores did not systematically vary with evaluation ratings. Aleamoni and Hexner (1980) also conducted a study to investigate the correlations between student ratings and ACT (American College Testing Program), score, actual grade and expected grade. They found that ACT score and actual or expected grade didn't influence the student evaluation of course.

Cooper et al. (1982) performed a multiple regression analysis with student evaluation rating of courses/professors as the dependent variable and actual grades, self-concept, achievement (measured using a standardized speech evaluation form, which was part of a study done in a speech communication course), relationship with the instructor, and so on, as independent variables. They reported that; (a) a students' relationship with the instructor was the best predictor of student ratings, and (b) actual grade was not useful in predicting the overall evaluation of the instructor. Scheurich et al.(1983) also used multiple regression analysis to examine the

relationships among the dependent variable, the overall evaluation of the teacher (the last item of the evaluation form), and independent variables consisting of each of the remaining items in the evaluation form and students' expected grade. They concluded that the students' expected grade was the last variable to enter the equation and added nothing to the predictability of the overall evaluation. This is not too surprising, however, considering that the combination of all the other independent variables were items from the same evaluation form, while grade was from another dimension.

Elmore and Pohlmann (1978) investigated correlations between student ratings of professors and a variety of other factors, including grades. They included 14 teacher-student-class characteristics, including class size, instructor rank, student GPA and expected grade and found that the student characteristic that correlated highest with student ratings was their expected grade. Thus, these investigators suggested that grading leniency of the faculty could be an important factor in influencing student evaluations. Hamilton (1980) depended on previous research findings and suggestions of other researchers in choosing to correlate student ratings with instructor status (rank) and actual grade. He found that the correlation between students' actual grades and their evaluation was moderately positive ($r = .24$).

Peterson and Cooper (1980) approached this issue somewhat differently comparing the evaluations of the same teacher by students who were graded and students who were ungraded. The study was conducted in a very unusual environment, at two colleges with a coordinate relationship. Students from one school received grades from their instructors, but students in the same class from the other school, were not graded. Peterson and Cooper concluded that graded and ungraded students' evaluations were generally similar, although they found some positive correlations between grades and evaluation ratings of the students who were graded.

As Stumpf and Freedman (1979) pointed out, the unit of analysis should be regarded as an important methodological consideration in the correlational studies. DuCette and Kenney (1982) investigated the correlations between expected grade and student evaluation by doing separate analyses, using both the individual student score and class mean. They subdivided the sample into groups of similar courses and conducted separate analyses for these subgroups. Student evaluations correlated positively with expected grades in most courses using both units of analysis. This result was consistent with Stumpf and Freedman's analysis. DuCette and Kenney also found that the strongest correlations occurred, in general, in the courses required outside of the student's major department.

Bausell and Magoon (1972) and Kennedy (1975) all approached this topic with a similar methodological design that was slightly different from prior studies. They divided the students in their samples into grade categories (A, B, C and D) and compared the mean evaluation ratings given by students in each category. The rank ordering of the mean evaluation rating for each category matched perfectly the rank order of the grade category (e.g., students in the "A" grade category gave the highest ratings of courses). Mean differences in student ratings between the grade categories were statistically significant ($\underline{P} < .001$ in Bausell and Magoon's study ; $\underline{P} < .05$ in Kennedy's study). Bausell and Magoon also compared student-expected grades with their GPA, and found that students expecting grades lower than they normally received (according to their GPA) rated teachers lower than did students who expected grades equal to or higher than their GPA. Kennedy also found that students who got grades higher than expected gave significantly higher evaluation ratings of courses and professors than did students who received either grades equal to, or lower than their expected grades.

Hoffman (1983) examined this issue using a sample of professors who taught both seminar courses and structured content courses. He compared grade means and student evaluation ratings between four courses (three core courses and one seminar). He reported that when professors assigned

higher grades in courses, student ratings of courses tend to be higher as well. Grades in seminars were higher than the grades in the structured core classes, and student ratings of faculty performance were parallel to this grading pattern.

There are three types of grade variables -- expected course grade, actual course grade and overall GPA. As noted earlier, the choice of which grade variable was investigated is one of the key differences in correlational studies in this area. The findings of each correlational study are summarized in Table 2, organized by the type of grade variable investigated. The results of the studies which used analysis of variance to compare the mean ranking of each grade category, are summarized in Table 3.

It is obvious from Tables 2 and 3 that the studies do not agree on whether or not student ratings are significantly correlated with actual grade, expected grade, or GPA. These disagreements may be accounted for, at least in part, by methodological differences in this area (Scheurich et al., 1983). There could be many explanations for the different findings of the studies in this area. Among these, the following four could be proposed and summarized.

1. Unit of Analysis. Many researchers proposed that the different units of analysis may account, at least in part, for the differing research results (Scheurich et al.,

Table 2

Summary of Correlational Studies

STUDY	UNIT OF ANALYSIS	CORRELATION BETWEEN STUDENT RATINGS AND*		
		EXPECTED GRADE	ACTUAL	GPA
DuCette & Kenney (1982)	student	.15 ($P < .01$)		
	class	.19 ($P < .01$)		
Elmore & Pohlmann (1978)	class	.31		.16
Scheurich, Graham & Drolette (1983)	student	.26		
	class	.48		
Stumpf & Freedman (1979)	student	.18 ($P < .05$)		
	class	.31 ($P < .05$)		
Frey, Leonard & Beatty (1975)	student			.01
Hamilton (1980)	class		.24	
Peterson & Cooper (1980)	class		.42	

(Table continues)

*Note: where p levels are not reported, it is because they were not reported in the article reporting this research and could not be calculated from information reported in the article.

Table 3

Summary of Studies Used ANOVA

STUDY	UNIT OF ANALYSIS	ANOVA WITH STUDENT RATINGS AND		
		EXPECTED GRADE	ACTUAL	GPA
Bausell & Magoon (1972)	student	$P < .001$		NS*
Aleamoni & Hexner (1980)	class	NS		
Cooper, Stewart & Gudykunst (1982)	student		NS	
Kennedy (1975)	student	NS	$P < .05$	
Hoffman (1983)	student		$P < .01$	

*NS = not significantly different

1983; Feldman, 1976; Stumpf & Freedman, 1979; DuCette & Kenney, 1982).

2. Samples used. Some studies are based on small samples (Stumpf & Freedman, 1979; Scheurich et al., 1983; Kennedy, 1975). Some researchers employed narrow-scope or rather limited samples such as samples from a single course, a small number of classes or departments, or undergraduate students only (Scheurich et al., 1983; Bausell & Magoon, 1972; Hoffman, 1983).

3. Instruments used. Almost all the studies used different student rating forms. Some evaluation forms were developed by the student government committee for their own purposes. Many schools created their own evaluation form for both administrative uses and informational uses of students. The characteristics of the evaluation forms may be confounded with the grade-evaluation relationship (Stumpf & Freedman, 1979).

4. Nonresponse bias. Scheurich et al. (1983) pointed out that the possibility of nonresponse bias might influence the results in several studies where the response rate was not reported or where nonresponse bias checks were not conducted. Almost no study reported any information about the response rate and nonresponse bias check. Given the fact that anonymity is the key issue of the students' evaluation, nonresponse bias check is almost impossible.

Experimental and Quasi-experimental Studies

In order to best understand the nature of the relationship between grades and student ratings, some control of possible confounding variables would be necessary. Holmes (1972), Powell (1977), and Abrami, Dickens, Perry, and Leventhal (1980) examined grade-rating relationships when extraneous sources of variability were experimentally controlled. Unfortunately, their findings do not completely clarify such relationships.

Holmes (1972) conducted an experiment focused on the question of whether student ratings could be influenced by whether or not their grades were consistent with what they expected. Half of the students in an introductory psychology class who deserved and expected A's or B's were given their expected grades, while the other half were given grades one full grade lower than expected. He found that the students who received lower grades than expected gave their instructor poorer evaluations ($P < .05$). Holmes explained that this finding was due to the students' attempts to justify their unexpectedly low grades.

Powell (1977) used several sections of his class to conduct two experimental studies of the relationship between grading criteria, learning, and student ratings. He applied three grading criteria (stringent, moderate, and lenient) to five sections of his upper-level required class. The amount of learning was assessed by fill-in part of the last test.

He reported that as the stringency of grading criteria increased, the amount of learning increased, but the student ratings of the course instructor decreased. The median overall student ratings on the three groups which received different degrees of leniency in grading were as follows: stringent grading criteria = 3.3 rating of instructor (on a 5-point rating scale where 5 is high); moderate grading criteria = 4.0; lenient grading criteria = 4.2. Grades and student ratings were highly positively correlated.

Powell's (1977) second experiment was done in two sections of his general psychology class. He applied weekly testing for one section of class and biweekly testing for the other. The two groups were not different in terms of prior academic achievement, as measured by prior GPA. Powell reported that students in the biweekly testing section received lower grades than students in the weekly testing section and gave correspondingly lower evaluation ratings to the same teacher. The median overall instructor rating given by students in the weekly testing section (who got higher grades) was 4.12; the median rating given by students in the biweekly testing section (who got lower grades) was 3.50.

Based upon these two experiments, Powell explained that the strong grade-rating relationships may be due to a halo effect, where students form an overall impression of the instructor because of higher grades received or more lenient

grading standards, and responded to the course rating forms according to that impression. He pointed out that increased administrative use of student evaluation and 'grading inflation' in higher education had occurred over roughly the same period of time, and speculated that such administrative use had caused grading inflation. This has been supported by Rooker's (1981) opinion article and Jensen's (1987) paper about grade inflation.

Powell's (1977) study has some problems of generalization because the experiment was done by single instructor (himself) and on only two classes. An experimenter expectancy effect might affect the result (Abrami et al., 1980). Because there are some ethical concerns about such experimental manipulations in real educational courses where students are affected by the outcomes. In Powell's and Holmes's studies, students were not informed that they were participating in a research project, which was clearly a violation of human subject rights. In Holmes's study, there were no explanations of whether or not dehoaxing and desensitization took place. Powell mentioned that his research would be ethically justifiable because the result might be beneficial in the future to the student population.

Two other experiments in this area were conducted by Abrami et al. (1980) studying the same issue as Powell, but using a very different design and reporting different

result. After the students viewed video lectures, they took quizzes and filled out the evaluation forms about the video lectures. Grades were given according to the quiz results and grading standards. Grading standards were manipulated by setting the class average at various grades (e.g., B, C+ or C). They found no consistent relationship between the grading standards and student evaluations of the lecture.

There are some concerns about the generalizability of the video taped lectures to the real educational setting, because of their artificial and short term characteristic. Students who participated in the experiments of video lecture for credits would be different from those who took actual classes.

Table 4 is provided to summarize graphically the most important findings of these experimental and quasi-experimental studies.

Viewed collectively, the existing literature is very inconsistent, and gives no clear answer to this issue of grade-rating relationship. This study is proposed to add valid information and clarify the issue.

Table 4

Summary of Experimental and Quasi-experimental Studies

STUDY	NUMBER OF SUBJECTS	INDEPENDENT VARIABLE	CATEGORIES OF INDEPENDENT VARIABLE	DEPENDENT VARIABLE (MEAN EVALUATION RATINGS)	ANOVA (STATISTICAL SIGNIFICANCE)
Powell (1977)	150	grading criteria	stringent	3.3 (5-point scale where 5 is high)	no P-value
			moderate	4.0	
			lenient	4.2	
	125	different testing schedule	weekly tests (high grades)	4.12 (5-point scale where 5 is high)	no p-value
			Biweekly tests (low grades)	3.50	
Abrami, Dickens, Perry & Leventhal (1980)	143	grading standard	class average B	2.61 (5-point scale where 5 is high)	N.S.
			C+	2.82	
			C	2.40	

(Table continues)

STUDY	NUMBER OF SUBJECTS	INDEPENDENT VARIABLE	CATEGORIES OF INDEPENDENT VARIABLE	DEPENDENT VARIABLE (MEAN EVALUATION RATINGS)	ANOVA (STATISTICAL SIGNIFICANCE)
Abrami, Dickens, Perry & Leventhal (1980)	278	grading standard	class average B+ B C+ C	2.64 (5-point scale 2.59 where 5 is high) 2.49 2.58	$\underline{P} < .05$
Holmes (1972)	97	manipulation of actual grades	same actual grade as expected one grade lower than expected	5 of 10 instruction rating scale items were significantly different.	$\underline{P} < .05$

METHOD

Population and Sample

The target population for this research is, ideally, all undergraduate and graduate classes at institutions of higher education which use student ratings of courses and/or professors. Realistically, however, the available population was limited to all undergraduate and graduate classes at Utah State University (USU) which administer the USU course evaluation form (Appendix 1). Samples of such USU classes were drawn (using procedures described in the next section) as necessary to answer each of the research questions.

Methods for Answering Research Questions

Data to answer the research questions were provided by students in a sample of 26 USU classes in which the USU course evaluation was administered. The samples were not drawn randomly, but were consisted of the classes for which permission could be obtained by one of the following methods: (a) the researcher or her major professor knew the instructor and was able to obtain their agreement to cooperate; or (b) requests for cooperations were made to other departments. The personal acquaintance with instructors in the College of Education might result in overrepresentation of such classes in the sample. Fifteen

classes were used from the College of Education, however, eleven more classes were drawn from various other colleges in USU.

Data to answer Research Questions were then collected as outlined below.

Instruments and Data Collection

The following instruments were used to answer the research questions.

At the time a course was to be evaluated, students were given the USU course evaluation form, along with a brief questionnaire developed by the researcher. The questionnaire requested students to provide information about (a) the grade they expected in the course, (b) their cumulative GPA at the time they filled out the questionnaire, (c) the overall rating they had given to the professor on item 11 on the USU course evaluation form (the item that gives an omnibus rating to the professor on a scale of 1 to 10, with 10 being the very best and 1 being the poorest), (d) gender of the student, (e) age of the student, (f) whether the course was required or elective, and (g) degree of the satisfaction with the time of the class (Likert scale of 1 to 10, with 10 being completely satisfied and 1 being very unsatisfied). The questionnaire is provided in Appendix 1.

Professors' names and course numbers were removed by departmental clerical staff before questionnaires were

returned to the researcher to protect professors' confidentiality and to follow ethical standards for research outlined by APA.

Pilot study

Because student responses are to be anonymous in this study, there was previously no (certifiably accurate) way to obtain the actual cumulative GPA of each respondent, thus requiring students to provide their cumulative GPA. This raised the obvious question of how accurately students could (or would) provide this information. To answer this question, a pilot study was done to find out how accurately students could (or did) estimate their cumulative GPA. In the pilot study, the questionnaire was administered to 62 students, with one addition--students were requested to write down their student numbers (The questionnaire and cover letter is provided in Appendix 2). Then their reported GPA was compared, using their student numbers, with their actual GPA using the data gathered by the USU Academic Records Office. The Pearson Product Moment correlation coefficient between the two variables (reported GPA and actual GPA) was very high (.92). It was concluded that students' reported GPA was a valid estimate of their actual GPA and could be used to analyze the relationship between prior academic performance and student course ratings.

Statistical Analysis

For the data analysis aimed at answering Research Question 1, Pearson Product Moment correlation coefficients were calculated, using individual data for each student on the following two variables: (a) the student's expected grade, and (b) the student's overall rating of the professor on the course evaluation (item 11). Similarly, to answer Research Question 2, student's self-reported cumulative GPA was correlated with their overall rating of the professor on item 11 of the course evaluation.

Analyses of variance (ANOVA) was used to identify any significant differences among the mean overall student ratings of professors in the different categories. ANOVA was conducted using such dependent variables as student's evaluation rating, correlation coefficients of evaluation ratings with expected grade, and independent variables such as categories of expected grade, cumulative GPA and those 'six variables' described earlier.

Multiple regression analyses were performed in order to answer research question 3 with student evaluation rating of professor as the dependent variable and student's expected grade, cumulative GPA, and six factors as independent variables. Multiple regression analyses were done by the stepwise method. This multiple regression procedure allows the determination of the relative

contribution of each independent variable to variance in faculty evaluation ratings.

RESULTS AND DISCUSSION

The results and discussion are organized in this section by the three major research questions of this study.

Research Question 1: Is there any relationship between the grade students expect to receive in a course and their evaluation rating of the professor?

To determine the relationship between students' expected grade and their evaluation of the instructor, an overall Pearson moment correlation coefficient between these two variables was computed. Using individual students (n = 1068) as the unit of analysis, the correlation coefficient was statistically significant ($P < .0001$), although the effect is not large ($r = .17$). When the correlation coefficient between the mean expected grade of each class and the mean evaluation rating of each class was computed (using each class as the unit of analysis), however, it was not significant ($r = .415$), possibly because of the small number of classes sampled ($n = 22$). Nonetheless, these correlations indicate that there is a linear relationship between the expected grade and their evaluation ratings, namely, students who expect a higher grade in the class tend to evaluate their instructor more positively.

A one-way ANOVA was conducted to determine the effect of expected grade on evaluation rating. In order to conduct the ANOVA, students' expected grades were categorized into four groups based on four letter grades (A, B, C, D --

almost no student was expecting F). The summary table for the analysis appears in Table 5.

Table 5

Analysis of Variance Summary Table of Expected Grade on Evaluation Rating

Source of Variation	SS	df	MS	F	P
Expected Grade	156.956	3	52.319	12.438	.000
Residual	4475.460	1064	4.206		
Total	4632.416	1067			

Note: Total degree of freedom differs slightly from one analysis to another due to missing data in a small number of cases.

The ANOVA revealed a significant effect of students' expected grade on their evaluation rating, F (3, 1064) = 12.438, MSe = 4.206, $P < .0001$. Additional Fisher LSD tests indicated that students who expected an 'A' grade evaluated their instructors significantly more positively ($P < .05$) than students who expected 'B', 'C', or 'D' grades.[1] Although the evaluation ratings among students who expected 'B', 'C', or 'D' grade were not significantly different, there was a trend in the data showing that the higher the expected grade, the more positive the evaluation. Table 6

presents the mean evaluation rating and standard deviation of each expected grade category.

Table 6

Mean and Standard Deviation of Evaluation Rating by Expected Grade

Expected Grade	N	Evaluation Rating	
		Mean*	SD
A	427	7.532	1.915
B	498	6.837	2.129
C	129	6.690	2.117
D	14	5.857	2.598

* These ratings are on a 10-scale where 1 is low and 10 is high.

The mean evaluation rating from the students who expect an 'A' grade is almost one scale point higher than those who expect a 'B' and 'C' grade, and almost two scale points higher than those who expect a 'D' grade (although it's hard to make valid comparison because of the small number of students who expect a 'D' grade). Table 7 presents the effect sizes of the mean differences between the 'A' grade group and the other categories.[2] Even though the evaluation rating was on a ten-point scale, the frequency distribution

(Table 8) showed that the distribution was narrow and skewed

Table 7

Effect Size Comparisons for Evaluation Ratings of Group Expecting A-grade with Other Group

Comparison	ES*	p-value
A vs B	.34	.000
A vs C	.43	.000
A vs D	.87	.002

* Effect size (ES) is defined here as the difference between the groups (A-group minus other group) on the mean scores, divided by the standard deviation of the combined group of comparison.

-- 87% of the ratings fell between from 5 and 10 on the scale, while 58% of the ratings fell between 8 and 10 on the scale. Therefore, a difference of one point on the scale is not trivial, given the truncated scale for most raters.

In view of these results, it appears that there is a positive relationship between the students' grades and their evaluation ratings. Students who expected 'A' grade evaluated their instructor more positively than students who expected grades of 'B' or less.

Research Question 2: Is there any relationship between students' prior cumulative GPAs and their evaluation score in rating a course and professor?

To determine the relationship between students'

Table 8

Frequency Distribution of Evaluation Rating

Value	Frequency	Percent	Cumulative Percent
1	13	1.2	1.2
2	19	1.8	3.0
3	46	4.3	7.3
4	57	5.3	12.6
5	107	10.0	22.6
6	110	10.3	32.9
7	178	16.6	49.5
8	236	22.0	71.5
9	210	19.6	91.1
10	95	8.9	100.0

cumulative GPA and their evaluation of the professor, an overall Pearson Product correlation coefficient was computed. The correlation coefficient between these two variables (r = -.044) was not statistically significant, despite the large sample size (n = 1071). Similarly, the correlation coefficient between the mean GPA of each class and the mean evaluation rating of that class was not statistically significant (r = -.001; n = 22). These correlation coefficients indicated that there is no

relationship between students' cumulative GPA and their evaluation of their professors.

A oneway ANOVA was conducted to determine the effect of GPA on evaluation rating. In order to conduct the ANOVA, students' GPAs were categorized in three groups based on letter grades (A, B, C and D)[3]. The summary table for the ANOVA appears in Table 9. Table 10 presents the mean evaluation ratings and standard deviations of each GPA categories. The ANOVA revealed that the effect of students' cumulative GPA on their evaluation rating of their professors was not significant; F (2, 1068) = .921, MSe = 4.350, P > .10. Thus it would appear that cumulative GPA has no influence on students' evaluation rating of their professors.

Table 9

Analysis of Variance Summary Table of GPA on Evaluation Rating

Source of Variation	SS	df	MS	F	P
GPA	8.010	2	4.005	.921	.3986
Residual	4645.595	1068	4.350		
Total	4653.604	1070			

Table 10

Mean and Standard Deviation of Evaluation Rating by GPA Category

GPA Category	N	Evaluation Rating	
		Mean	SD
A	237	7.232	2.007
B	445	7.005	2.081
C & D	389	7.082	2.138

Research Question 3: To what extent do other variables (such as level of the class, class size, gender, student age, student satisfaction with the time of the class, and whether class is required or elective) account for the relationships between (a)expected grade and evaluation rating, and (b)cumulative GPA and evaluation rating?

The Pearson product moment correlation coefficients between evaluation ratings and each of the demographic variables (described above) are shown in Table 11.

To determine the relative contribution of several potentially important variables on students' evaluation ratings, the data were analyzed using a stepwise multiple regression procedure. Table 12 presents a summary of the analysis for the relationship between variables such as level of class, class size, gender of student, age of

Table 11

Correlation Coefficients between Evaluation Rating and Demographic Variables

vs.	required elective	satisfaction with time	gender	student age	class level	class size
EV	.017	.260	.044	.140	.063	.059

Table 12

Multiple Regression on Evaluation Rating

Step	Variable	R	R^2	Beta	F
1	Class Time	.2604	.0678	.2604	68.980 **
2	Expected Grade	.3060	.0936	.1607	48.920 **
3	Student Age	.3386	.1134	.1409	40.347 **
4	Cumulative GPA	.3609	.1303	-.1457	35.386 **
5	Class Size	.3763	.1416	.1149	31.151 **
6	Class Level	.3946	.1557	.1581	28.985 **

** $P < .001$

student, satisfaction with class time, and whether or not the was mandated (required vs. elective), in addition to expected grade, cumulative GPA, and evaluation rating.

The stepwise regression yielded six variables that combined to serve were selected as predictors of students'

evaluation rating. As can be seen in Table 12, 16% of the variance in students' evaluation rating can be explained by the six independent variables (R = .395, R^2 = .156). Although explaining only a relatively small portion of the variance, the prediction of these six variables is statistically significant, as shown by the ANOVA for this regression effect; F (6, 943) = 28.985, P < .001. An examination of the standardized regression coefficients (Beta weights) allows for a comparison of the relevant contribution of the independent variables in predicting students' evaluation rating. The relative order of the variables (and their respective Beta weights) are as follows: (1) Satisfaction with the time of the class (.260); (2) expected grade (.161); (3) level of the class (.158); (4) cumulative GPA (-.146); (5) age of student (.141); (6) class size (.115). All of these Betas were significant (P < .001).

To determine the effects of class size and level of the class (100, 200, etc.) on the correlation between students' expected grades and evaluation ratings, two separate one-way ANOVAs were conducted upon the correlation coefficients from each class.

First, students class sizes were categorized into six groups (less than 20, 20 to 30, 30 to 50, 50 to 90, 90 to 150, greater than 150). When the correlation between expected grade and evaluation rating was examined across

different levels of class size, the size of the class did not have a significant effect, even though the ANOVA approached statistical significance; F (5, 16) = 2.338, MSe = .058, P = .0897. Table 13 shows the results of the ANOVA, and Table 14 presents the mean evaluation rating and standard deviation of each class size category.

Table 13

Analysis of Variance Summary Table for Correlation between Expected Grade and Evaluation Rating by Class Size

Source of Variation	SS	df	MS	F	P
Class Size	.679	5	.136	2.338	.089
Residual	.929	16	.058		
Total	1.608	21			

Second, the level of class did not have a statistically significant effect on the correlation between students' expected grade and evaluation rating; F (5, 16) = .847, MSe = .080, P > .10. The summary table for this ANOVA appears in Table 15 and the mean and standard deviation of the evaluation rating of each category of class level is presented in Table 16.

Thus it appears that other variables (such as level of the class, class size, gender, student age, student satisfaction with the time of the class, and whether class

Table 14

Mean and Standard Deviation of Correlation between Expected Grade and Evaluation Rating by Class Size Category

Class Size Category	N	Correlation coefficient	
		Mean	SD
Less than 20	5	-.177	.296
20 to 30	8	.283	.236
30 to 50	3	.173	.143
50 to 90	3	.196	.237
90 to 150	2	.105	.190
More than 150	1	.105	___

Table 15

Analysis of Variance Summary Table for Correlation between Expected Grade and Evaluation Rating by Level of Class

Source of Variation	SS	df	MS	F	P
Level of Class	.337	5	.067	.847	.536
Residual	1.271	16	.080		
Total	1.608	21			

is required or elective) do not yield important contribution to the relationship between expected grade and evaluation rating.

Table 16

Mean and Standard Deviation of Correlation between Expected Grade and Evaluation Rating by Class Level

Class Level	N	Correlation Coefficient	
		Mean	SD
100	7	.145	.173
200	1	.237	-
300	8	.164	.281
400	4	.007	.424
500	1	.456	-
600	1	-.255	-

SUMMARY AND CONCLUSION

The present study has resulted in three central findings.

First, students' expected grades in a class do positively correlate with the faculty evaluation ratings they give to the instructors of that class, although the correlation coefficients that yielded this finding are not overwhelming. The present study did find a consistent positive relationship between expected grade and evaluation rating, however, with students who expected 'A' grades giving significantly higher evaluation ratings to their professors than students who expect grades of B or less.

Second, the cumulative GPA of the student is not related to their evaluation of the professor. The correlation coefficient between cumulative GPA and evaluation rating of the faculty was almost zero. How the student performed previously at other classes seems not to influence current professor's evaluation rating. The relationship between cumulative GPA and evaluation rating is negligible, and should not be considered an important source of bias in the evaluation rating.

Third, other demographic variables such as level of the class, class size, gender of the student, student age, satisfaction with time of the class, and required vs. elective courses did not contribute significantly to the

relationship between students' grades and their evaluation rating of their professors.

Discussion of Results

Because this study is based on correlational, rather than experimental methods and data, no causal claims can be made in discussing results. Even though the data can not prove any alternative explanations of the relationships found in this study, speculations about the possible explanations underlying the relationships can be given.

The positive relationship between students' expected grades and their ratings of teachers could be interpreted in two different ways, as described earlier in the review of liturature section. One possible interpretation is that there is a natural relationship between high expected grades and high ratings. The students who can reasonably expect a higher grade because they (a) have learned more in this class, or (b) are bright enough to adjust sufficiently to the teaching style would likely give higher ratings to the professor. However, this explanation seems unlikely, because such factors should also lead to these students having higher cumulative GPA. But there were no significant relationships found between students' cumulative GPA and their evaluation ratings. The other alternative interpretation is that students' evaluations of the professors are biased by their expected grades in a "you

treat me nice, I will return the favor" way; thus, if professors gave more 'A' grades to the students, they would likely receive better ratings from the students, while professors who are tougher graders are likely to be rated lower by their students. However, the present study cannot resolve satisfactorily the issue of whether the natural or the biased relationship is the most correct interpretation of the relationship found between students' expected grades and their evaluation ratings.

The present study suggested the proof of grade-evaluation trade-offs. Professors giving justifiably lower grades could be penalized in their students' evaluations. Some professors trying to make their courses more rigorous might receive spuriously low student evaluations. Therefore, a serious, conservative recommendation is required. Where student evaluations influence important decisions such as faculty promotion, tenure, or salary increase, these evaluation ratings should be examined with reference to the associated grade distributions. The department head or administrator should have that information regarding the grade while reviewing student evaluations. Similarly, although not the major form of this study, the interesting finding that satisfaction with time of the class was the most positively correlated variable with evaluation rating, suggests that administrators may

wish to take this into account when interpreting faculty evaluation ratings.

Limitations

The outcome of this study may be limited by any one or a combination of the following limitations.

First, this study could get only an overall rating of the professor, on one evaluation item. More detailed data (for example, individual item data about specific instructional variables such as lecture quality, fairness to the students, etc.) would give a more comprehensive analysis about this issue.

Second, the range of the responses was restricted. Variability in evaluation rating, expected grade and some other variables were not large enough to give clear-cut answers to the questions, because of this probable effect on reducing size of correlations.

Third, the sample was not a randomly stratified sample that would ensure adequate representation in all categories of demographic variables (for example, student age, level of the class, and class size), thus resulting in insufficient numbers in several cells to analyze this data properly. Fourth, many other potentially influential teacher and student characteristics were not included in this study, but such characteristics may related significantly to faculty evaluation ratings.

Suggestions for Further Research

The variables chosen for the present study were not systematically selected, and not conclusive to the student and professor's characteristics. Further research is strongly suggested which would provide more comprehensive investigation of the relationship between other student and teacher characteristic and evaluation ratings.

Experimental methods would be more powerful to clarify the issue of confounding variables regarding student evaluation. For example, if several class sections of one professor could be artificially manipulated to receive different grades, the relationship between students' grades and their evaluation of the professor would likely be clearer. However, in actual university classes, manipulating grades would evoke legitimate ethical concerns. Grading is a very sensitive issue to both students and teachers. If ethical concerns could be taken care of, an experimental approach could give more clear explanations than correlational studies.

The present study compared students' expected grades and their evaluation rating of the professor. Another possible study would be to compare the actual grade received by student with their evaluation of their professors. If faculty evaluation could be done more than one time, comparing the evaluation rating before and after the grade had been received would be an interesting study.

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ENDNOTES

1. Choice of the Fisher LSD test as preferable to the conservative Scheffe test was based on the research of Carmer and Swanson(1973) and Bernhardson(1975). They showed that combined use of the ANOVA F test and Fisher's LSD test resulted in lower experiment-wise error rates (type I error was not significantly inflated).
2. See Cohen (1977) and Glass (1976) for a general discussion of the concept of effect size.
3. Because few cumulative GPAs fell in the C and D categories, they were combined for this analysis.

APPENDICES

APPENDIX 1

PILOT STUDY

APPENDIX 1. Pilot Study

RESEARCH PROJECT 88-108: SURVEY QUESTIONS

Ms. Eun-Hee Shin, a master's degree candidate in the Department of Psychology, is conducting a thesis project on relationships among various demographic and instructional variables and student grades. To assist her in this effort, would you please take a moment and answer the questions below. They are only for the purpose of this research project; and your answers will not be related to the course evaluation sheet in any way. Your instructor will never see this sheet or the answers from it, and your anonymity will be strictly protected.

Please answer these questions as accurately as possible. Your responses will be held in strictest confidence. Thank you for your help.

Student number: _____

Your gender: _____

Your age: _____

1. What is your academic major? _____

2. Is this class required or elective for you? (Check one):

   ___ Required ___ Elective

3. To what extent are you satisfied with the time of day that this class is offered?

   Very unsatisfied 1 2 3 4 5 6 7 8 9 10 Completely satisfied

4. What grade do you expect to receive for this course? _____

5. What was your overall GPA at the end of last quarter? _____

6. Please compare the instructor in this class with others you have had, on a scale from 10 being the very best, 5 being the middle, 1 the poorest. (Provide the same answer here as you gave on item 11 on the course evaluation.)

   Please circle ONE

   10 9 8 7 6 5 4 3 2 1

APPENDIX 2

SURVEY QUESTIONS

APPENDIX 2. SURVEY QUESTIONS

RESEARCH PROJECT 88-108: SURVEY QUESTIONS

Ms. Eun-Hee Shin, a master's degree candidate in the Department of Psychology, is conducting a thesis project on relationships among various demographic and instructional variables and student grades. To assist her in this effort, would you please take a moment and answer the questions below. They are only for the purpose of this research project; and your answers will not be related to the course evaluation sheet in any way. Your instructor will never see this sheet or the answers from it, and your anonymity will be strictly protected.

Please answer these questions as accurately as possible. Your responses will be held in strictest confidence. Thank you for your help.

Department and number of this course _____
(Dept.) (Course #)

Your gender _____ Your age _____

1. What is your academic major? _____

2. Is this class required or elective for you? (Check one):

   ___ Required ___ Elective

3. To what extent are you satisfied with the time of day that this class is offered?

   Very unsatisfied 1 2 3 4 5 6 7 8 9 10 Completely satisfied

4. What grade do you expect to receive for this course? _____

5. What was your overall cumulative GPA at the end of last quarter? _____

6. Please compare the instructor in this class with others you have had, on a scale from 10 being the very best, 5 being the middle, 1 the poorest. (Provide the same answer here as you gave on item 11 on the course evaluation.)

   Please circle ONE

   10 9 8 7 6 5 4 3 2 1