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GIVING CREDIT WHERE CREDIT IS DUE;
ATTRIBUTIONS BY ACTORS AND OBSERVERS
IN A TEACHING SITUATION

by

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B.Sc., M.A.

A thesis submitted to the Faculty of
Graduate Studies in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

Department of Psychology
Carleton University
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February, 1974

The undersigned recommend to the Faculty
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Abstract

This study examined the effect of a student's performance on an active-teacher's, active-observer's, and passive-observer's attributions of causality. In Experiment 1, each active-teacher taught a fictitious student in a limited communication situation for four five-minute periods. An active-observer watched the active-teacher's lessons. Four patterns of student performance were used. Student's performance was manipulated through variation of examination papers, supposedly filled out by the fictitious students after each teaching trial. In the L-L condition, the student's performance remained poor throughout the teaching trials. In the H-H condition the student's performance remained adequate throughout the teaching trials. In the L-H condition, the student's performance improved over trials. In the H-L condition the student's performance deteriorated over trials.

Consideration of attribution differences to student or teacher lend only partial support to the hypotheses regarding ego-relevant attribution when events have positive or negative affective significance.

Active-teachers attributed responsibility to causes external to themselves when their student's performance declined, but to the student when his performance was consistently adequate. They did not attribute causality for a student's performance to themselves when their student's performance improved. Active-observers differed from active-teachers in the L-H condition only, where the former attributed responsibility to the teacher as predicted. Subjects who played the role of the active-observer in a role-play replication of Experiment 1, did not make attributions statistically different from those of active observers.

A comparison of subjects' responses for open-ended and structured questions leads to inconsistencies in data interpretation. For the purposes of the current experiments, greatest weight is best given to the open-ended data. A number of alternative explanations are examined in an attempt to account for the experimental results.

A serendipitous finding indicates a contradiction to the "contrast effect" found in the literature dealing with the gain and loss of self-esteem in an interpersonal attraction situation. The results of the present study appear to support a primary effect.

Some theoretical and educational implications
of the study are discussed.

TABLE OF CONTENTS

Chapter		Page
	INTRODUCTION.....	1
1	REVIEW OF THE RELEVANT LITERATURE	6
	Causal Attribution.....	6
	Heider.....	6
	Jones and Davis	15
	Kelley.....	16
	De Charms.....	16
	Sources of error in attribution processes....	17
	Ego-defensive and ego-enhancing attribution..	21
	Attribution of causes by teachers:	
	experimental literature.....	23
	The Information Available to Actors and	
	Observers.....	29
	Comparison of Actor and Observer Attributions:	
	Experimental Evidence.....	30
	Actor-Observer Differences in Attributions...	32
	Methodological considerations leading to	
	the present study.....	35
	The Present Problem: General Statement.....	38
	Specific Hypotheses.....	42
113	METHOD	44
	Experiment 1	
	Subjects.....	45
	Apparatus.....	45
	General Instructions.....	46
	Experiment 2	
	Subjects.....	63
	Procedure.....	63
111	RESULTS.....	67
1V	DISCUSSION.....	110
	BIBLIOGRAPHY.....	134

TABLE OF CONTENTS

Chapter	Page
Appendix	
1. Tables.....	141
2. Lesson plans, problems, answers, experimental questionnaires.....	164
3. Social Evaluation Scale.....	216
4. Instructions for Experiment 2.....	222
5. Closed-Circuit Television Data.....	242

LIST OF FIGURES

Figure	Page
1. Possible alternatives for the perceiver's analysis of an action outcome.....	11
2. Room plan.....	47
3a. Discriminant function contrast scores for the effect of experimental manipulation of student's performance, Experiment 1: Factor 1, reflection of the experimental manipulations.....	71
3b. Discriminant function contrast scores for the effect of experimental manipulation of student's performance, Experiment 1: Factor 11, relation of student performance and teacher evaluation...	72
4a. Total mean differences, Rating 2-Rating 1, for Experiment 1, Active-teachers' and active-observers' confidence in estimations of ability and effort.....	74
4b. Total mean differences, Rating 2-Rating 1, for Experiment 1, Active-teachers' and Active-observers' estimations of performance, ability, effort and teacher evaluation.....	75
5. Discriminant function contrast scores for the effect of experimental manipulation of student's performance, Experiment 1: Factor 1, reflection of experimental manipulations.....	79
6. Total mean differences, Rating 2-Rating 1, for Experiment 2, Passive-observers' estimations of performance, ability, effort, teacher evaluation, and confidence estimation of ability.....	82

LIST OF TABLES

Table	Page
1. Summary of the student's performance in all experimental conditions.....	142
2. The multivariate analysis of variance for the interaction effect of experimental manipulation of subject's performance by teacher's role.....	143
3. The multivariate analysis of variance for the effect of teacher's role.....	144
4. The multivariate analysis of variance for the effect of experimental manipulation of student's performance.....	145
5. Mean ratings of performance, ability, and effort of teachers and observers in each outcome condition for Experiment 1.....	146
6. The multivariate analysis of variance, Experiment 2, for the interaction effect of experimental manipulation of subject's performance by teacher's role.....	147
7. The multivariate analysis of variance for the effect of sex of subject, Experiment 2.....	148
8. The multivariate analysis of variance for the effect of experimental manipulation of student's performance, Experiment 2.....	149
9. Mean ratings of performance, ability, and effort, sex factor combined for each experimental manipulation, in Experiment 2.....	150
10. Summary of analysis of variance for self-esteem and competency measures respectively, Experiment 1.....	151

Table		Page
11.	Summary of analyses of variance for self-esteem and competency measures, respectively, Experiment 2.....	151
12.	Proportion and number of subjects for Experiments 1 and 2, in each outcome condition naming a particular category as a causal factor determining the student's performance.....	152
13.	The proportion of subjects in each experimental group making teacher attributions.....	154
14.	Results of a test of proportions for each experimental group comparing teacher to non-teacher attributions for the open-ended data...	155
15.	Number of subjects in each experimental group making student or other/situation attributions (Results of a binomial test given in brackets).	156
16.	Number of subjects in each experimental condition making qualified open-ended attributions for student performance.....	157
17.	Kendall coefficients of concordance (W), rank-ordering of causal categories from structured questions and sums of ranks (Rj).....	158
18.	Summary of analysis of variance for student-teacher difference scores based on structured question scores, Experiment 1.....	159
19.	Summary of analysis of variance for student-teacher difference scores based on structured question scores, Experiment 1 (expanded analysis).....	160
20.	Mean difference scores for each experimental group, based on data from the structured-question, and summary of <u>t</u> tests (one-tailed) based on above-mentioned scores, given in brackets.....	161

Table /

Page

21.	Response frequencies relating to questions regarding the use of closed-circuit television as an instruction medium, Experiment 1.....	162
22.	Response frequencies relating to questions regarding the use of closed-circuit television as an instruction medium, Experiment 2.....	163

INTRODUCTION

If we define a cause to be, "an object precedent and contiguous to another, and so united with it in the imagination, that the idea of the one determines the mind to form the idea of the other, and the impression of the one to form a more lively idea of the other."

David Hume -
A Treatise of
Human Nature

Attribution theory is derived from a study of the processes of sensing, recognizing, categorizing, and predicting characteristics of persons, things, and events. In Kelley's (1967) discussion of attribution theory, he points out that "the theory describes processes that operate as if the individual were motivated to attain a cognitive mastery of the causal structure of his environment" (p.193).

According to Brunswick (1952), it is useful to conceive of the perceptual process as a perceptual arc encompassing two end points - the object, i.e. the part of the environment toward which perception is directed and the percept, i.e., the way the object appears to us. The former has also been referred to as the distal stimulus since it is something outside the person's skin, at a distance from the person. The latter has been designated the proximal stimulus as it is the stimulus that is physically in direct contact with the person. Our perceptions and actions tend

to be directed to the contents of the distal environment.

Thus, we try to make "sense of" the many proximal stimuli by ordering them in terms of distal-invariants and their relevant dispositional properties.

This ordering and classifying can often be considered a process of attribution. For example, "a chest does not usually move unless there is a visible cause for its movement, that is, unless the cause belongs to the order of things" (Heider, 1926, p.11). Causal attributions emerge when we go beyond the phenomenal description, or the nature of the contact between the person and his environment as directly experienced by the person, and focus upon causal description, or analyzing the underlying conditions that give rise to perceptual experience.

Of particular importance for the interpretation of the social world is the separation of the factors located in persons from those that have their source in the environment of these persons. The basis for this analysis is often a series of observations which can give information about events and dispositional entities. The analysis facilitates the disentangling of causal "belonging together", and potentially leads to a veridical assessment of the important features of the environment. However, in many cases the attribution is dictated by personal preferences or needs, and results in distorted views.

This study investigates how an active-teacher¹ and active-(passive-) observer attribute responsibility for a student's performance. The effects of differential patterns of success and failure of the student upon the active-teacher's and active-(passive-) observer's causal attribution and evaluation are examined. It is a premise of this study that the cues given by a student's performance influence how his teacher perceives him. It was hypothesized that the student's performance affects not only the teacher's belief concerning his own competence, but also the teacher's attribution of the causal source of the student's performance.

This influence of the student's performance on the teacher's beliefs demands investigation because these beliefs in turn, influence the student's learning and ultimate achievement level. Heider (1958, p.97) has stated:

"What we can do, is influenced by what we think

we can do, and what we think we can do is

influenced by what other people think we can do."

The teacher may arrive at an attribution of low ability from the observation of a student's low performance, which may not be truly indicative of ability. The teacher may then

1. Nixon's (1972) classification for participants in experiments is utilized here. "Active-teachers" actually do the teaching, while "active-observers" observe the former. Passive-observers are "remote", in that they are temporally and physically removed from the teaching events about which their inferences are elicited.

induce in the student the idea that his ability is low. Consequently, the student's consistently low level of aspiration may cause his own underestimation of his ability to go uncorrected. The student never lives up to his unrealized potential.

A teacher's high expectations concerning students' superior performance can also become unintended determinants of students' academic competence (Rosenthal & Jacobsen, 1966). In the Rosenthal and Jacobsen study students whom the teachers falsely believed had superior intellectual capabilities improved more in intellectual competence than did other students.

A person's expectation of how well he can perform on tasks is closely related to self-esteem and self-confidence (Heider, 1958, p.171). The idea that the opinions of others can produce lasting effects on personality by creating permanent feelings of inferiority or lack of confidence, forms the core of Merton's "self-fulfilling prophecy" (Merton, 1949).

As the events of the teacher-student interaction may permanently alter a student's performance and self-confidence, it is imperative that we try to examine the sources of the teacher's expectations and behaviour. This study examines how active-teachers and both active

5.

and passive observers form opinions of a student. It investigates the ways in which the student's performance affects the teacher's (observer's) attribution of responsibility for that performance and his expectations concerning his efficacy as a causal source.

CHAPTER 1

REVIEW OF THE RELEVANT LITERATURE

Causal Attribution

As the hypotheses under investigation were derived from the work of Fritz Heider (1944, 1958), acquaintance with the main features of his theory and related notions is offered in the following pages.

Heider

Heider (1944, 1958) outlines three important assumptions relevant for the area of a person's phenomenology² about social behaviour. First, the understanding of people's social behaviour rests on a description of how they perceive and report their social world. Because the description of people is based on the phenomenology of the average person who relies heavily on "common-sense" language, Heider (1958, p.5) labelled his psychology "naive". Second, Heider assumes that people wish both to predict and control their environments. This means they feel that they can both anticipate the effects of their own behaviour and produce favourable outcomes as a result of interacting with others. Third, he believes predictability in the social world is achieved essentially by the same process as that in predicting causality in

2. "By phenomenal description is meant the nature of the contact between the person and his environment as directly experienced by the person." (Heider, 1958, p.22)

the physical environment. The core of Heider's position on the perception of causality lies in the idea that man perceives behaviour as being caused, whether the causal locus is the perceiver or the environment.

Michotte (1946) reported many simple experiments which convinced him that people immediately perceived physical causality: "L'effet Lancement...les observateurs voient l'object A donner un choc a l'object B et le chaser, le lancer en avant, le projeter, lui donner une impulsion". (pp.17-18). That is, object A (a dot) moves toward a stationary object B (another dot), hits it, apparently propelling it ahead of A. The launching of B in this case, begins to approximate the perception that B's movement was merely "occasioned" by A. "L'effet Entrainement" corresponds fairly closely to the perception that B is inert and carried by A. Heider and Simmel (1944) and Greenberg and Strickland (1973) demonstrated similar effects when subjects made attributions of dispositional "traits" to account for apparent behaviour of physical objects (in these cases a large triangle, a small triangle and a circle).

The interpretation of Michotte's and Heider and Simmel's manipulation of simple movement-contact combinations varies according to the unit seen as the origin of the movement. "The production of such phenomena is dependent upon a dynamic pattern of stimulation...involving the approach and withdrawal of one object in regard to another in its environment" (Heider, 1948, p.43). This organization has many advantages from the point of view of adaptation of the organism to the environment. The movements of the object(s), when identified with a constant figural unit, no longer follow each other in an unconnected way. They are connected with invariable characteristics of the environment, they are meaningfully embedded in our picture of reality.

Unit Formation

A useful hypothesis, applicable to the process described above, involves the notion of unit formation. The movements and changes are in some way identified with figural units and thereby gain significance as acts. Heider (1958) describes unit formation in the following manner: "Briefly, separate entities comprise a unit when they are seen as belonging together" (p.176).

Sentiments

A second important concept for Heider is called sentiments. Positive and negative sentiments may be held toward another person, his acts, or his attitudes.

"Sentiment refers to the way a person p , feels about, or evaluates something. The something may be either another person, q , or an impersonal identity, x . Sentiments may be roughly classified as positive and negative" (Heider, 1958, p.174).

Balance

The concept of balance refers to a situation in which the perceived units and the experienced sentiments co-exist without stress, and as a result, there is no pressure toward change, either in the cognitive organization or in the sentiment.

Effective Forces of the Person and Environment in the Action Outcome

Heider's "common sense psychology" further distinguishes between impersonal and personal causality. "Attribution in terms of impersonal and personal causes, and with the latter, in terms of intent, are everyday occurrences that determine much of our understanding of and reaction to our surroundings" (Heider, 1958, p.16). The perceiver tries hard to find reasons why the target person acts and why the act takes on a certain

form. Unlike in the process of impersonal analysis (i.e., the regression of cause and effect in a scientific analysis) the perceiver's explanation normally ends when he assigns a motive or reason for the person acting in a particular manner. There are several preconditions for the assignment of intention. The perceiver must infer the person has the ability to perform the action and that he was motivated to do it, i.e. that he tried.

Heider's analysis may be summarized in the following equation:

Effect = f (Environmental force + Personal force (Ability x Trying), that is, "an action outcome is perceived to be an additive function of the effective environmental force and the effective personal force which is in turn a multiplicative function of the other's power or ability and the effort he exerts (trying)" (Hastorf, Schneider, & Polefka, 1970, p.64). This equation figured in the derivation of the hypotheses of the present study.

The possible alternatives for the perceiver's analysis of an action outcomes are illustrated in Figure 1. Attribution may be to either the person or the environment, i.e., the distinction between the perception of internal

Figure 1: Possible alternatives for the perceiver's analysis of an action outcome.

and external causality. An attribution of external causality (or impersonal causality) may be a result either of environmental forces or unintended personal forces. An attribution of internal causality (or personal causality) depends only on those events that the stimulus person intended to produce, i.e. personal forces. Effective personal force, in turn, depends on (a) the dispositional property of can, which has an internal component of ability and an external component of environmental forces, and (b) the perception of try with its component of intention and exertion.

The concepts of both can and try have an internal and external component. The internal component of can is ability, the external component, environmental forces. Regarding the latter, very easy or difficult problems make attributions of can on the basis of ability unimportant, as we impute either that everyone or no-one can perform the task. Moderately difficult tasks provide maximal information about ability provided that environmental force (e.g. luck) does not enter the issue.

The components of trying are what a person wants to do (intention) and how hard he tries to do it (exertion). The latter is related both to a person's abilities and environmental difficulty. People of low ability obviously must work harder on a task than people of high ability; difficult tasks require greater trying than easier ones.

The Balance Model of Heider

How is a positive or negative unit relation reflected in behaviour? It is assumed the unit relation can be coordinated to judgments concerning responsibility for outcomes. A positive unit relation between self and outcome (success or failure) implies that the outcome is seen as belonging to the self, as owned by the self. A negative unit relation implies the outcome is not seen as belonging to the self, as disowned and not caused by the self. Such cognitive interpretations should be indicated by judgments people make. This model enables one to predict that when self-evaluation is positive success following effort expenditure will be attributed to self, and failure to outside influences. However, when self-evaluation is negative, success will be attributed to external factors and failure to personal inadequacy. In Heiderian terms, if p likes x , then p is united with positive entities (x),

or harmony exists when entities with equal value are united. Alternatively, if x dislikes himself he might reject a positive x as too good for himself (Heider, 1958, p.210).

Summary of Heider's Theory

The attribution process plays an important role in creating a stable and sensible social world. It is a phenomenological fact that our perception of others does not stop with the observation of their behaviour. Others are perceived as causal agents, or at least as capable of being causal agents. Heider's reference to a naive analysis of action means that "in our perceptions we go beyond behaviour and make causal inferences about why the behaviour occurred. When we observe a person's actions, we are impelled to explain why he did what he did" (Hastorf, Schneider, & Folefka, 1970, p.89).

The naive analysis begins with an evaluation of the strength of external forces as compared with the strength of internal forces. Internal forces are separated into the components of ability (can) and effort (try). Inferring that the combination of ability and effort was stronger than the external forces, results in an inference of internal causality. In the analysis, can and try are the two necessary and sufficient conditions of purposive action (Heider, 1958).

There are several other theoretical approaches to causal attribution processes which must be acknowledged, each of which has acknowledged debt to Heider.

Jones and Davis

Jones and Davis (1965) are concerned only with attribution to persons other than self. They are thus concerned primarily with "internal causality", and thus emphasize only part of what Heider's theory tries to embrace. They argue that the perceiver assumes the actor to be aware of what effects would result from his action, and that he has the ability to perform the action. The perceiver then tries to infer what effects the actor intended to create, and under certain conditions, those intentions are used to infer dispositional properties of the person.

Jones and Davis (1965) use the term correspondence to refer to the extent to which an act and its underlying attribute are similarly described by an inference. Defined operationally, correspondence is the "perceiver's certainty that the actor is extreme on a trait which provides sufficient reason for the action's occurrence" (Jones & Davis, 1965, p.224). Greenberg (1976) provides some evidence for the use of confidence scores in measuring Jones and Davis' (1965) notion of correspondence.

Kelley

Kelley's (1967) analysis of the attribution process is related to the theory of correspondent inferences in that both derive from Heider's work. Whereas Jones and Davis (1965) were concerned with the circumstances under which an actor is seen as the cause of given effects, Kelley was concerned with attributions to the environment. Kelley's general hypothesis is that attribution to the environment rather than the self requires the actor to respond differentially to the thing (entity), that he respond consistently over time and over modalities, and that his response be in agreement with the consensus of other person's responses to the entity. The degree to which a person's attributions fulfill these four criteria determines how confident he feels that he has a valid picture of his external world.

De Charms

De Charms (1968) takes Heider's (1944, 1958) viewpoint that man is perceived as a locus of causality under certain conditions one step further. He states that man is the locus of causality for his behaviour (de Charms, 1968, p. 273). He further distinguishes between the concepts "Origin" and "Pawn", as terms to connote the distinction between "free" and "force".

"An Origin is a person who perceives his behaviour as determined by his own choosing; a Pawn is a person who perceives his behaviour as determined by external forces beyond his control" (de Charms, 1968, p.273). De Charm's work is not a theory, but a clarification and integration effort of earlier Heiderian notions.

Although there exists a number of "attribution theories", Heider's (1958) theoretical formulations appear to be the most comprehensive to date, and will therefore be emphasized for purposes of this study.

Sources of error in attribution processes

A major function of causal attribution is that veridical interpretation of causal relationships helps adaptation and survival in the environment. However, there may be situations in which misattribution services an adaptive function for the individual, i.e., biased attribution is consonant with a person's perception of himself and his world.

It is evident that biases or errors of attributional processes may sometimes occur. Kelley (1967) lists five factors which lead to errors in attribution. Although only one of these is of great importance to this experiment, we shall consider them all briefly.

1. The relevant situation is not perceptible.

One type of disregard for the relevant situation is seen in superstitious behaviour (Wright, 1962). Here, covariation

between one's actions and certain consequences help to create a strong feeling of control where actual control does not exist. Too much significance is attached to the behaviour. This type of behaviour occurs when a task is thought to be a test of skill, while in reality it is chance controlled or experimenter controlled. An attributional error of this type will most probably be asymmetrical, that is it will occur only in situations of total or increasing regard. Phares (1957) found that the increments and decrements on a betting task (in this case, the number of chips a subject would bet on his probability of being correct on the succeeding trial) following success and failure, respectively, were significantly greater after skill instructions than after chance instructions. Reinforcements in skill conditions had a greater effect on raising or lowering expectancies for future reinforcements. Furthermore, he found that subjects shifted or changed their expectancies more often under skill conditions. Finally, there was a strong trend towards unusual shifts in expectancies, up after failure, down after success (the gambler's fallacy) under chance conditions.

2. The relevant situation is misleading.

Kelley (1967, Pp. 219-235) suggests the existence of attributional illusions within the experimental procedures used commonly in cognitive dissonance research. First, in the forced compliance studies an "illusion of freedom" occurs that induces a person to feel he has total freedom, when in fact he has none. Almost all subjects in forced compliance studies (e.g., Festinger & Carlsmith, 1959) comply with the request to perform a dissonant act, but the strong situational demands are disguised by a network of cues which appear to indicate self-choice. Here the attributional error is to assume volition and, therefore, conscious motivation and intention present when, in fact, personal choice is absent. Secondly, in the fait accompli studies (e.g. Brehm, 1959), when the dissonant factors and consequences are introduced after an action has been taken, the person is lead to believe he is responsible for unanticipated consequences. Here, claims Kelley, the person is led to believe his behaviour was under the influence of cues which, in fact, were known to him only after the behaviour itself occurred.

3. Experiments which deliberately induce the subject to make an attributional error.

Hidden causal factors introduced by the experimenter may affect the person's actual response. For example, Barefoot and Straub (1971) manipulated the subject's opportunity for information search following the presentation of false information about his heart rate reactions to photographs of female nudes. Subjects who viewed the slides for a very short period of time during the feedback presentation were not affected by the feedback. Those subjects having ample opportunity to view the slides rated the slides accompanied by false information of a heart-rate changes as more attractive than other slides which were not paired with a change in heart-rate.

4. The magnitude and direction of the affective consequences.

Each event has an affective component, it is to some extent positive or negative, agreeable or disagreeable. Thus, causal attribution involves evaluation. Events have positive or negative affective significance for an individual.

5. Egocentric orientations

When the evidence for attribution is incomplete or ambiguous to the perceiver, egocentric assumptions are particularly important. A person involved in an outcome may have only a minimal data pattern. An observer will also have evidence of his own reactions to an event. The observer will often attribute the action to forces within the person, while the individual, himself, makes an external attribution. When an individual shows a different reaction from his own, the observer is inclined to attribute this reaction to personal factors. In contrast, the person attributes his own reaction to the object world.

The notion of egocentric orientations is of most importance here, and will therefore receive extended consideration.

Ego-defensive and ego-enhancing attribution

In certain cases it may be more adaptive for the individual to assign credit or blame to a particular person or external force although objective criteria of attribution are hidden. An individual may even be unconsciously motivated to misperceive and misattribute an event despite the objective signs which are present (Freud, 1962).

The two factors that determine the attribution chosen are:

1. The attributed reason must be congruent with personal ego-protective needs.
2. The attributed reason must be perceived as plausibly derived from the "facts".

The influence of affective significance on causal attribution often provides an explanation of the dynamics underlying rationalization and its ego-protective attribution. Avoidance of a negative self-image may be a strongly motivated force whose function is to maintain high self-esteem. For example, consider the case of the high school teacher who says, "I think I am a very good teacher. Nevertheless, my students are never accepted for entrance into university". The "facts" the teacher faces are that his students have been judged by others as poor. If he accepts this conclusion, the teacher must feel that he too is inadequate. If he thinks highly of himself a reason for this contradiction must be found.

During the past ten years, a number of interesting studies have appeared in the literature examining teachers' attributions of causality for their students' performance. Each of these studies has been incomplete in one way or another. The following is a discussion of these studies, their findings, methodological and theoretical problems.

Attribution of causes by teachers: experimental literature

Directly relevant to the problem of ego-protective attribution and affective significance is a study by Johnson, Feigenbaum and Weiby (1964). Eighty subjects taught arithmetic concepts to fictitious students who then performed high (Student A) or low (Student B) on a related task. The cause of this performance was perceived as internal to the students, and positive characteristics were attributed to A, negative to B. Sentiments expressed for A were also different from B. The subjects then presented a second concept on which A again performed at a high level and B performed at either a high or low level. When B's second performance was high, subjects tended to perceive themselves as responsible for the improvement, but perceived B as responsible when his performance remained low. There was also less difference for the sentiments expressed for A and B when B improved. This result was in accord with Heider's hypothesis that sentiment and causal unit formation tend toward a balanced state, hence sentiments should be expressed which are congruent with the actions of the actor.

Kelley (1971) advised caution in accepting an interpretation of the above results as implying teachers have made an attributional error by failing to see why they were not responsible for the improvement. Insofar as the teacher

may have tried harder after B's poor initial performance, the available information pattern shows a strong positive covariation between her own behaviour and that of the improving student, but negative or noncovariance between her own behaviour and that of a consistently poor performer. "By the covariation principle, the former would warrant a self-attribution, and the latter, not." (Kelley, 1971, p.20)

More recently, Johnson, Baldwin, and Wiley (1969) have confirmed these earlier findings. An added condition in this second study indicated that, when a "student's" performance unexpectedly declined teachers tended to attribute the cause to factors internal to the student.

Feather (1969, p.130) has considered the following predictions concerning attributions:

1. (a) When self-evaluation is positive, success at a task will be attributed to personal factors such as ability and failure to external factors such as bad luck.

1. (b) When self-evaluation is negative, success will be attributed to external factors such as good luck, and failure to personal factors, such as lack of ability.

2. When an expectation of success at a task is grounded in a stable estimate of ability, and when a person considers he has expended the same amount of effort he has in the past, disconfirmation of the outcome (success or failure) expectation will be more likely attributed to variable environmental factors (e.g. luck) than confirmation of the expectation, i.e. there will be a stronger tendency to attribute the unexpected event to environmental factors.

Before subjects performed an "intellectual task", self-evaluation measures were taken (self-esteem, competence, inadequacy). There was also a measure of the subjects' initial confidence. This measured the confidence of each subject that he could succeed in solving ten anagrams. The attribution measure was an attempt to ascertain whether each subject thought the outcome was due to good luck, to bad luck, or to his own ability.

Results indicated that females were more likely to attribute their success or failure to luck (assign an external causal locus) than were males. The attribution scores revealed no significant interaction between any of the self-evaluation measures and outcome. The first hypothesis, based on Heider's Balance model, was supported in neither

the success nor failure condition. Scores were further analyzed in both conditions in relation to performance. This measure indicated how close scores were to the pass-fail point. In the success condition, those who received high scores tended to make fewer attributions to an external causal locus than did those who scored near the pass-fail point. This effect in the failure condition was in the opposite direction but not significant. In general, there was a greater tendency for external attribution when the subject's performance scores were close to the pass-fail point than when at either extreme.

Feather's second hypothesis concerning the subject's initial confidence was confirmed. If the individual was initially confident of his own success, the tendency was to attribute failure to "bad luck" and success to his own ability. Lack of initial confidence led to an external attribution, to "good luck" in the case of success, and to an internal attribution for failure. When the outcome of a subject's endeavour (success or failure) was unexpected, external attribution was the more typical response.

The results of the above studies were consistent with the naive analysis model of Heider. That is, when a person's expectation of success is disconfirmed by an outcome he will appeal to chance factors to explain the outcome since other possible causes (ability, task, difficulty) are assumed stable.

Feather and Simon (1971) replicated most of Feather's (1969) results. However, the hypothesis that an unexpected outcome leads to external attributions, and expected outcome to internal attributions was not supported. On a 10-point scale, where 1 was internal and 10 external, the mean attribution ratings for expected success and unexpected failure were close to five when attributions concerning own outcome in relation to own expectancy were considered.

Beckman's Teacher-Student Study

Beckman (1970) has also considered ego-relevant attributions with events having affective significance. In a study utilizing a paradigm similar to Johnson et al (1964), subjects taught fictitious "students" who either improved their performance, remained consistent, or declined in their performance. In each of the three performance conditions, the causal attributions of active-teachers were compared with the causal attributions of passive-observers, to whom the teaching situation and its outcomes were described. When the students succeeded, active-teachers tended to make internal (to self) attributions. When the students failed, teachers tended to make attributions to the students - to lack of ability in the case of a consistently poor performance and to lack of motivation in the case of a declining performance.

The result was consistent regardless of whether the pattern for failure was a consistently poor performance (low-low condition) or a decline in performance (high-low condition). Apparently, the affective significance of failure eliminated self-attributions of influence. Similar attributional biases were not found for the passive-observers, who supposedly, would not feel the need for ego protection. Active-teachers' evaluations were lower for the children whose performance went from high to low than for those whose performance was consistently at a low level.

Beckman has noted the possibility that the subjects, who were in fact actual student-teacher volunteers, were responding to the starkness of the teaching situation in disclaiming responsibility for failure. Furthermore, her subjects simultaneously taught a student who performed in a consistently successful fashion and (or with) a student whose performance varied across time. It is almost certainly inevitable that comparisons between the performance of the two students would occur, and probably augment ego-saving mechanisms. Minimally, the teacher knows her interventions do not predictably produce low performance.

The results of these studies generally indicate that teachers attribute responsibility for a student's improved performance to themselves, but a student's consistently poor performance to the student, or a decline in performance to external factors.

A student's consistently adequate performance is attributed to the student. However, observers, to whom the teaching situation and its outcomes were described, did not attribute improved performance to the teacher. This latter result may be explained by the fact that the observer subjects did not have evidence regarding the variations in the teacher's manner or intensity of effort; that is, they lacked the covariation data that the teacher herself had (Kelley, 1971). This then leads to the question of how observers, actually present during a teacher's performance, will attribute responsibility for the student's performance. Furthermore, will the attributions of an observer actually present in the teaching situation be coincident with an observer's attributions, to whom the situation is only passively described?

The Information Available to Actors and Observers

Bem's (1965, 1967, 1972) proposals emphasize the convergent perception of actors and observers. Bem argued that people use the same kind of evidence and follow the same logic whether they are making self-attributions or attributions to others. Actors are self-observers, viewing their own behaviour in terms of their environment, and inferring what their attitudes must have been. Actors are more likely than observers to see their actions as constrained by the situations:

Despite the elegance of Bem's proposal, there is a major problem with the epistemological status of Bem's analysis, "Bem shows only that observers of a subject's behaviour can produce results which are similar to the subject's real responses. This does not, of course, mean that the subjects do act as observers of their own behaviour, although there is certainly a reasonable possibility that they do". (Hastorf, Schneider, & Polefka, 1970, p.85).

Despite the criticism Bemian interpersonal simulations have received, such techniques have gained favourability as an alternative to the conventional laboratory experiment. Interpersonal simulations can deal with empirical problems beyond the scope of conventional experimentation. "The conventional naturalistic experiment is well suited to study performance within the role/rule context of the social psychological experiment. Attempts to extend that context by engaging in deception are morally objectionable, not subject to clear interpretation, and unnecessary". (Nixon, 1972, p.33).

Comparison of Actor and Observer Attributions: Experimental Evidence

Recently, a number of studies (e.g. Jones, Rock, Shaver, Goethals, & Ward, 1968; Jones, Worchel, Goethals, & Grumet, 1971; McArthur, 1970; Nisbett & Caputo, 1971; Nisbett, Caputo, Legant, and Marecek, 1973; Ruble, 1973) have compared the

attributions made by actor-subjects with those made by observer-subjects. Nisbett and Caputo's (1971) study tests the proposition that actors attribute cause to situations while observers attribute cause to dispositions. Subjects were asked to write a paragraph stating why they had chosen their major field of study and why they liked the girl they dated most frequently. Subjects were asked to write similar paragraphs explaining why their best friends had chosen their majors and their girl friends. Answers were coded into stimulus attributions ("She's a very warm person") or person attribution ("I like warm girls"). When answering for himself, the average subject listed roughly the same number of stimulus and person reasons for choosing his major and twice as many stimulus as person reasons for choosing his girl friend. For the subject's best friend on the other hand, answers indicated three times as many person as stimulus reasons for choosing the major and roughly the same number of stimulus as person reasons for choosing the girl friend. Thus, subjects described their choices of a girl friend and college major in terms referring to the properties of the chosen object; but described the similar choices of their friends in terms referring to disposition qualities of their friends.

Actor-Observer Differences In Attributions

Jones and Nisbett (1971) have divided the data available for the attribution process into effect data and cause data. Effect data are of three types: data about the nature of the act itself (what was done), data about the environmental outcomes of the act (e.g. success and failure), and data about the actor's experiences (pleasure, anger, embarrassment). Cause data are of two types: environmental causes (e.g. task difficulty) and intention data (what the actor meant to do).

Dealing first with the issue of effect data, the actor and the observer can have equivalent information about the nature of the act and about environmental outcomes. However, the observer can have no direct knowledge of the experiential accompaniments of the act for the actor.

The observer, may, however, make inferences about the actor's feelings from physiognomic and gestural cues, and judgments based on the observer's knowledge of what others and he himself have felt in similar situations.

Regarding the issue of perceived causes, there can be almost equal knowledge of the proximal environmental stimuli operating on the actor. For example, the observer may know that the recipient of an actor's insult had previously taunted the actor.

As with the actor's feeling states, his intentions can never be directly known to the observer. As with feeling states, "knowledge of intentions is indirect, usually quite inferior, and highly subject to error" (Jones & Nisbett, 1971, p.6).

A further data source accounting for the discrepancy between the perspectiveness of the actor and the observer arises from the difference between the observer's inferred history of "everyman" and the specific history of the actor himself. Kelley (1967) proposes that the attributor possesses three kinds of information corresponding to different causal possibilities: consensus information (do other actors behave in the same way to the given stimulus); consistency information (does the actor behave in the same way to the given stimulus across time and situational contexts?); and distinctiveness information (Does the actor respond to the stimulus in its presence and not in its absence?). According to Kelley, the observer lacks some of the distinctiveness and consistency information the actor possesses due to his own history.

Thus, there is a good reason to believe that actors and observers bring different information to bear on their inferences about the actor and his environment. Typically, the actor has more information regarding his intentions and emotional state. Furthermore, the observer in the absence of knowledge of the actor's history, must deal with him as a model case and ignore his unique history.

Aside from different background data, Jones and Nisbett (1971, p.7) contend the major reason for the divergent perspectives of actors and observers is probably a simple perceptual one. The actor's attention at the moment of action is focused on the situational cues (the environmental attractions, repulsions, and constraints) with which his behaviour is coordinated. Thus, it will appear to the actor that his behaviour is a response to these cues, that is, caused by them. For the observer, however, it is not the situational cues that are salient, but the behaviour of the actor. The observer is therefore more likely to perceive the actor's behaviour as a manifestation of the actor and to perceive the cause of behaviour to be a trait or quality inherent in the actor.

Thus Jones and Nisbett agree with Bem that actors often reflect on their own actions to check on the direction and intensity of their attitudes, but contend that actors are more likely than observers to see those actions as environmentally constrained. Observers may make dispositional inferences from behaviours which are interpreted differently by actors. Consequently, an active-teacher and active-observer presented with the task of attributing responsibility for a student's decline in performance should make different attributions. For the active-observer, the proximal cause of

action is the active-teacher; for the active-teacher the proximal cause lies in the environment.

Methodological considerations leading to the present study.

After a critical examination of the teacher-student studies, a number of methodological problems are evident.

The subjects in the observer condition of the Beckman teaching study (1970) discussed above did not attribute responsibility differentially in different performance conditions. The basis of any difference may have been due to subject and procedural differences between the participant and observer conditions. Real student-teachers were used to play the role of the student teacher in the participant conditions. On the other hand, subjects in the observer conditions were non-student teachers enrolled in introductory psychology classes. Secondly, in the observer condition, subjects were told in the description that the teacher was in face-to-face contact with the children, while in the participant condition the student teacher believed the children to be on the other side of a one-way mirror. Thirdly, the observer condition was an attempted interpersonal simulation (see preceding discussion of Bem) using subjects as role players (passive-observers). It leaves open the question of whether active-observers, actually present in the situation

would make similar or different attributions from that of participant subjects. Are the attributions of active- and passive-observers identical?

The utility of the passive-observer condition is emphasized by Nixon (1972). Passive-observers can be used to examine role/rule-governed behaviour in situations where competing definitions of the situation are suspected. Such is the possibility here, where active-observers may define the situation differently, according to the teacher's actual performance.

One additional problem in the studies by Johnson et al. and Beckman is the experimenter's lack of control over the nature of the influence attempt. In both experiments the teacher-subjects were free to do and say almost whatever they wished. In addition, the superior-subordinate relationship between teacher and student was emphasized. These factors also add to the likelihood of internal attributions. For the active-observer, the proximal cause of action is the active-teacher; for the active-teacher the proximal cause lies in the environment.

Schopler and Layton (1972) provide a framework for making attributions of interpersonal power and influence. This framework is based upon Heider's early work. The first component of their framework focuses upon the target of an influence attempt. The underlying assumption is that the

perceiver has knowledge of the target person's behaviour at two points in time. "When the target person's behaviour at Time 2 is unexpected from what was known of his behaviour at Time 1, the ideal condition exists for assigning causal responsibility for the Time 2 state to an external agent" (Schopler & Layton, 1972, p.6). The second component specifies the relationship necessary between the influencing agent and the target of influence for making attributions of causal responsibility to any agent. It is based on estimates for B's behaviour at Time 2 following A's intervention.

Thibaut and Riecken (1955) examined a superior-subordinate relationship, and found subjects attributed the high-status person's compliance to an internal cause and the low-status person's compliance to an external cause. In terms of the Schopler and Layton framework, these results can be interpreted as a manipulation of the values of A's intervention (Component 2). The power to resist, presumably associated with status, can be viewed as meaning that the probability of a request producing conformity is lower when directed toward a high-status person, than when directed toward a low-status person.

In summary then, problems are evident with regard to the nature of the subject population and the nature of the information provided to role-players in the Beckman (1970) experiment. Furthermore, a systematic comparison of the attributions of active- and passive-observers has yet to be made in this context.

The Present Problem: General Statement

The present experiment was intended to provide an opportunity to examine systematically the inferences made by an actor and an observer in a teaching situation.³

Two separate experiments made up the present study. The first involved an active-teacher-subject teaching a student certain statistical concepts. An active-observer subject monitored the active-teaching through a one-way mirror. The superior-subordinate difference was not emphasized, as all subjects were students, generally from the introductory psychology class. Furthermore, the teaching task was well structured and followed closely by subjects due to their lack of teaching experience. The second experiment was a role-play replication of the first experiment, involving passive-observers. This latter experiment was intended to be a partial replication of Beckman's (1970) study.

3. It is interesting to note that in the classroom situation, in-class teachers are often observers. They are in the position of having a similar background to the teacher, however, their attention is more likely to be focused upon the teacher, rather than the external environment.

As has probably become obvious, within the field of social perception, a number of theories, including Heider's (1958) "naïve psychology" theory, Jones and Davis' (1965) "correspondence" theory, and Kelley's (1967) "attribution" theory, can provide a possible conceptual frame work for hypothesis derivation in this area. As has been acknowledged by both Kelley (1967) and Jones and Davis (1965), attribution theory and the theory of correspondent inferences both derive from Heider's work. Heider's (1958) theory is currently the most comprehensive, and is therefore used for purposes of hypothesis derivation in this study.

One may place himself in the position of teacher/observer and ask what alternative attribution possibilities are available regarding the performance of a student. As has been seen in the section on Ego-defensive and Ego-enhancing attributions, the choice appears to be between internal attribution to self and external attribution to the environment. Essentially, the study examines a situation in which biased attribution may occur because the relevant effects of an event have some affective component for the person involved (Kelley, 1967).

Suppose a student of average intellect performs adequately on a task of average difficulty. "Adequately" can be defined for our purposes as the student's obtaining eighty percent on his exercises. This provides the teacher

with information that the subject has the ability and, that he is trying (Heider, 1958). There is little reason for ego-defensive tendencies to be aroused in the teacher, so causality for the student's performance should be located internal to the student himself.

On the other hand, when a student performs consistently poorly (i.e. less than twenty percent on his exercises) on a task of average difficulty, doubt may arise in the teacher concerning the attribution of low ability. It is possible that the evidence indicates that ability is absent, motivation is low, or that the teacher's explanation was inadequate. In this case, responsibility acceptance implies the acceptance of blame which is threatening to a positive self-image. Thus, the teacher places responsibility for the student's performance on the student himself or upon external factors.

Suppose a student initially performs poorly, but then improves so his performance is adequate, on a task of average difficulty. Initially, the teacher has a number of reasons for the student's performance; either ability is absent, motivation is low, or the teacher's explanation was inadequate. The student's performance then improves. In this case, the teacher attempts to enhance his own self-esteem, by discounting possible external sources of causality, and attributes the causality for the student's performance as internal to himself, and external to the student.

Finally, a student might perform initially adequately on a task of average difficulty, but his performance may decline after successive instructional attempts. An initially adequate performance gives information of ability and trying. The decline in performance may be attributed by the teacher either to his teaching or to lack of motivation on the part of the student. As in the case of a student's improving performance, decline of performance can provide personal evidence indicating the ineffectiveness of the teacher. Unlike the case of a consistently poor performance, for a decline in performance, ability has been ruled out as a causal source. However, the teacher may find the declining situation more threatening since acceptance of blame implies his own incompetence. Therefore he is under more strain to find an adequate protective attribution, and attributes the student's failure to the student's motivation or external factors.

A comparison of the perceptions of observers who are not ego-involved leads to the prediction that observers will be inclined to attribute a student's declining or poor performance to the teacher and a student's improved or adequate performance more to the student than the active teacher.

Specific Hypotheses

In summary, a careful analysis of Heider's attribution theory and an examination of experimental evidence supporting the theory has led to the following hypotheses regarding the perceptions and attitudes of classroom teachers and observers. Attributional misperceptions often occur when ego-relevant mechanisms are operating. Incoming perceptions are interpreted so that they are consistent with existing attributions. An examination of the influence of affective significance on causal attribution leads us to hypothesize:

Hypothesis 1: When a student's performance is consistently poor on problems of average difficulty related to certain statistical concepts, the teacher will avoid a negative self-attribution, and attribute the cause of that behaviour as external to himself, and locate it in the student's low motivation or lack of ability.

Hypothesis 2: When a student's performance is consistently adequate on problems of average difficulty related to certain statistical concepts, ego-defensive tendencies will not be aroused and the teacher will attribute the cause of that behaviour as internal to the student, in his ability or motivation.

Hypothesis 3: When a student's performance is initially poor, then improves, on problems of average difficulty related to certain statistical concepts, the teacher will accept responsibility for the student's performance, as this is reinforcing to his positive self-image.

Hypothesis 4: When a student's performance is initially adequate, then declines, on problems of average difficulty related to statistical concepts, accepting the responsibility for the student's performance is threatening to a positive self-image. Thus, the teacher attributes the causal locus of behaviour as external to himself, in the student's ability and/or motivation.

As discussed earlier, there is evidence that ego-protective attribution and sentiments occur when a person is involved in a threatening situation, and do not occur when a person is only an observer in a situation. It is therefore predicted that:

Hypothesis 5: Observers will be inclined to attribute a student's poor performance more to the teacher and a student's adequate performance more to the student than the teacher.

CHAPTER 11

Method.

A simulated teaching task, modeled after Beckman (1970), was devised for Experiment 1. In this situation, a subject (active-teacher) attempted to teach a student (experimenter's confederate), ostensibly via closed-circuit television, a series of four lessons related to issues of frequency distribution and measures of central tendency. An active-observer watched the teacher from behind a one-way mirror. The subjects then had an opportunity to evaluate the students and to attribute responsibility for the student's performance.

In Experiment 11, the passive-observer experiment, subjects were asked to play the role of the observer in Experiment 1. They read about the teaching task in Experiment 1 and were then questioned (in a manner similar to Experiment 1) about why the student performed as he did. The procedures of these two experiments will be described separately.

Experiment 1

Subjects

One-hundred and twenty male subjects, volunteer undergraduates from Carleton University, were randomly assigned to the experimental conditions. Ninety-eight of the subjects were from the introductory psychology course, and received course point credit for their participation. All subjects were familiar with elementary statistical methods.

Apparatus

The experiment was conducted in three rooms, two of which were connected by a door and a one-way mirror (38.5" x 75"). The active-observer was located behind the one-way mirror. A microphone in the ceiling of the teacher's room was connected to an amplifier in the observer-teacher's room. The teacher was seated at a table facing the one-way mirror. Behind the teacher was a blackboard with chalk and erasers. In front, and to the left of the active-teacher, was a Sony video camera (Model 3600) and monitor. The camera was ostensibly connected to a similar monitor in the

student's room. Located in a cabinet in the student's room was a Sony 3600 videotape playback unit, connected to the monitor in the teacher's room. A switch on the student's desk was wired to a lightbulb suspended from the ceiling above the teacher's table (Figure 2).

General Instructions

The subjects, although originally scheduled to arrive successively, often arrived simultaneously. Therefore, the experimenter waited until all three subjects (the two genuine subjects and the confederate) were assembled. The experimenter explained that the initial instructions for the experiment were to be given individually. He then chose the subject closest to the door (always the confederate) and asked him to follow along for further instructions. The confederate was then seated outside the student's room, and after several minutes the experimenter returned to bring the first subject for the initial set of instructions. The experimenter escorted him into the student's room, and explained from memorized instructions that:

"The purpose of the study in which you are participating today is to learn about the teacher's role in the teacher-learning process and how it is affected by T.V. instruction.

Figure 2: Room Plan

As so often occurs, especially in practice teaching, there is both a teacher and observer-teacher present in the classroom. This is essentially the situation we will have here today.

As you can see, there is both a television camera and monitor. This will allow both the student and the teacher to monitor each other through our closed circuit television system. Note also the switch on the student's desk, which he will turn on at the beginning of each problem session. This switch turns on a lightbulb in the teacher's room and indicates the student is working on the problems. Should the light be turned off, this will indicate the student has given up working on the problems.

Now, if you will follow me, I'll show you where the observer-teacher will be located. You can wait there until the next subject receives his instructions and we continue with the experiment."

The subject was then shown the room with the one-way mirror, looking into the teaching room, and asked to await the other subject. The experimenter returned to the waiting room and escorted the other subject to the student's room, where he explained that:

"The purpose of the study in which you are participating today is to learn about the teacher's role in the teacher-learning process and how it is affected by T.V. instruction.

As so often occurs, especially in practice teaching, there is both a teacher and observer-teacher present in the classroom.

As you can see, there is both a television camera and monitor. This will allow both the student and the teacher to monitor each other through our closed circuit television system. Note also the switch on the student's desk, which he will turn on at the beginning of each problem session. This switch turns on a lightbulb in the teacher's room and indicates the

student is working on the problems. Should the light be turned off, this will indicate the student has given up working on the problem.

Now, if you will follow me, I'll show you where the observer-teacher will be located and introduce you to one of the other subjects."

The second subject was then brought into the observation room, and briefly introduced to the first subject. The experimenter then said:

"As I previously mentioned to both of you, there are two teaching roles in this experiment, a teacher and observer-teacher. We will decide by tossing a coin which one of you will be the teacher and which the observer-teacher."

The experimenter then left the designated observer in the observation room, and instructed him to

"Just watch the proceedings, and I will return shortly with some further instructions for you."

The experimenter then led the designated teacher into the teaching room on the other side of the one-way mirror. He pointed out the television camera and monitor, then seated the teacher at the table. He then instructed the teacher as follows:

"Your task today will be to teach the student certain statistical concepts concerning such ideas as frequency distribution and measures of central tendency (Appendix 2).

As you have already seen, the student will be watching you on his closed circuit television monitor. For awhile, at the beginning, you will be able to watch the student on the monitor over there beside the camera. However, for some people, we leave the monitor on during the lessons, and for others we turn it off. In your case, the monitor will be turned off before you begin the first lesson and not turned on again until you have completed all your lessons.

Here is the material which I would like you to present to the student. You will have approximately 20 minutes to present this material to the student. These 20 minutes will be broken into four, five minute periods. At the end of each period the student will do a set of problems. There will be six problems in each set. Thus, you will have an opportunity to evaluate his work through the problems that he will be doing. This opportunity will occur after each of the five minute periods. After you have scored the student's performance, please place the score in the appropriate place on the diagram on the board. Note that at the end of the four lessons, the student will be given a review set of problems. I will bring the problems to the student in order that you have an opportunity to prepare for the next lesson.

Now, please take the next few minutes to read over the background material and problems for the first lesson. You may wish to make your own notes on the paper provided. Any questions?"

The experimenter then left the room saying:

"I'm just going to give the observer his instructions."

The experimenter returned to the observer teacher and instructed him as follows:

"As you have heard, the teacher will be instructing the student about certain statistical concepts such as frequency distribution and measures of central tendency, and evaluating his progress through a number of different problem sets. The scores for each of these problem sets will be recorded on the board so you too will have an opportunity to view them. I would like you to follow closely both the teacher's and student's performances. Here is

a copy of the lesson plans, the problems and the answers to the problems. You may take notes as the lessons proceed. Any questions?

The experimenter returned to the teacher's room and said:

"I'm going now to get the student, settle him in his classroom, and explain to him his part in the study. You can watch while I give him his instructions, then continue with your lesson plans. I'll return shortly."

The experimenter then turned on the monitor and left the teacher's room. When he reached the student's room he started a pre-recorded videotape showing first the student's empty room, and then the experimenter ushering in the student and explaining to him his role in the experiment as follows:

"Your job today is really quite simple. We're going to have someone try to teach you something over T.V. instead of in a classroom. On your monitor you will see your teacher who will

be teaching you four brief lessons about certain statistical concepts such as frequency distribution and measures of central tendency. After each lesson, you will have a few problems to do. So it is important that you listen closely and do your best. Do you have any questions?"

"No", answered the student.

The experimenter then returned to the teacher's room, shut off the monitor, and ostensibly prepared the television camera.

The teacher then gave his first lesson, after which the experimenter took the first problem set to the student. As he left he said to the teacher:

"Plan what you are going to say next."

The experimenter turned off the tape in the student's room.

After approximately five minutes, the experimenter returned with the student's completed paper. The teacher then corrected the paper, and had an opportunity to ask questions of the experimenter concerning the

problems or their grading. The teacher then recorded the mark on the board. The active-teacher and active-observer were then given the first questionnaire to complete (Appendix 2, p.192). Meanwhile, the experimenter returned the corrected problem sheet to the student. The experimenter then returned and collected the completed questionnaires. The teacher completed his preparation for the next lesson, and then presented the material. The same procedure was used for each of the four lessons. A second questionnaire was administered at the end of the fourth problem set (Appendix 1, p.100). While the subjects were completing the second questionnaire, the experimenter brought the student a review set of problems, and returned with the completed problems about five minutes later. Before returning he started the videotape again. Upon returning to the teacher's room, the experimenter handed the review set of problems to the teacher, turned on the monitor which showed the student sitting quietly in his room, and said:

"I'm just going to dismiss the student.

I'll be back in several minutes."

Then the teacher and observer saw and heard the following via videotape:

"I would like to thank you for participating

in this experiment. I would like you to address this stamped envelope so that when we have completed the study we will send you a full summary. Please do not discuss the experiment with your friends as they may be participating at some future date.

Thank you for your cooperation."

The experimenter then returned to the teacher's room and turned off the teacher's monitor. When the subjects had completed their questionnaires, a debriefing session was held, with the experimenter noting any suspicions about the deception. The full rationale regarding the nature of the experiment was then explained to the subjects. Subjects also addressed envelopes in order to receive a summary of the results at a later date. Subjects were cautioned not to reveal the deception to their fellow students, and thanked for their participation and cooperation in the experiment.

The experimenter's plea to the subjects for confidentiality regarding the nature of the experiment appeared to have been successful. During many post-session interviews and debriefing sessions, subjects

indicated friends or room-mates had also participated but had refused to reveal the details of the experiment.

Summary of the Procedure

Subjects in Experiment 1 were informed they were participating in a study to learn about the teacher's role in the teacher-learning process and how it is affected by T.V. instruction. Two subjects, one randomly assigned to the teacher (active) role and the other to an active-observer role participated in each session. Active-teachers and active-observers were in two separate rooms divided by a one-way mirror. However, active-teachers were aware of the observer's presence. The active-teacher was required to teach a student (experimenter confederate) a series of four brief lessons concerning certain statistical concepts. The student completed a set of problems after each lesson. These problems were subsequently graded by the active-teacher and returned to the student before commencing the next lesson. The active-observer was informed of the student's performance by placement of the scores on the blackboard. Both active-teachers and active-observers completed questionnaires concerning

the student's and active-teacher's performance after the first and fourth lesson. All students subsequently completed a review set of problems on which performance was adequate.

Manipulation of Student's Performance

The problem sets received by the teacher after each lesson informed him of the student's performance. Each of the four problem sets consisted of six problems, while the review set had seven problems. One group of students, hereafter referred to as High-High (H-H) always performed well on the four examination sets. The performance of a second group of students in the Low-Low (L-L) condition, remained at a low level throughout the teaching sessions. In the Low-High (L-H) condition the student's performance began at a low level and increased until it finally equalled the performance of the student in the H-H condition on the final problem set. In the High-Low (H-L) condition, the student's performance declined over the four lessons from the high performance on the first problem set until it was as low as the last set of the student's performance in the L-L condition. All students completed a review set of problems after the fourth problem set,

on which they all performed adequately (Appendix 1, Table 1, p.142). The purpose of this review set of problems was to provide subjects, particularly those in the L-L and H-L conditions, with information that the student could in fact do well on the problems. This was an attempt to counteract possible lowered self-esteem of active-teachers.

Personality Measures

Before the briefing session, each subject was asked to complete a "Social Evaluation Scale" (Appendix 3, p.216). The purpose of this scale was to ascertain that the subjects in each condition did not differ in their perceived level of self-esteem or competence, which might be reflected in their teaching experience (for active-teachers). The scale is modeled after a similar one by Feather (1969) and consists of ratings on eleven semantic differential items for each of four potentially different persons, including "yourself". From this latter rating, two indices were derived. The first was a measure of "competency" derived from the items "incompetent-competent" and "successful-unsuccessful". The second was a measure of "self-esteem" derived from the items "bad-good", "worthless-valuable" and "deplorable-admirable".

Postsession Dependent Measures

After the first presentation, both active-teacher and active-observer subjects were asked to rate the teacher's performance, the student's performance, ability, and effort, and their confidence in their ratings of performance, ability, and effort (Appendix 2, p.192). The confidence measure was on a ten point scale and all other measures on five point scales, where one was low and five (ten), high.

The above mentioned measures were included in order to test certain assumptions underlying the hypothesis. First, the subject's estimate of the student's performance and his actual performance should be veridical (eg. a student in the H-H condition should rank the student as high in performance). Second, there must also be evidence indicating the student has (some) ability and effort. Thirdly, subjects must demonstrate confidence in these estimates. Otherwise, the probability of differential person-situation attributions would be considerably diminished.

Postexperimental Dependent Measures

This question set included both open-ended (eg. Why did the student perform as he did?) and forced-choice (eg. Which factor was more important in determining the student's performance? Student's ability? Student's motivation? Teacher's presentation? Situation? Other?) questions concerning attribution of causality. Subjects were again asked to rate the teacher's performance, and the student's performance, ability and effort. (Appendix 1, p.230)

A number of open-ended questions regarding the use of closed circuit television in this experiment in particular, and for universities and students in general, were included as filler items.⁴

4. The results and discussion of these "Filler" questions regarding the use of closed-circuit television are presented in Appendix 5, p.242.

Experiment 11

Passive Observers

Subjects

Forty undergraduate students (20 female, 20 male) enrolled in the introductory psychology course at Carleton University were randomly assigned to four experimental conditions. There were equal numbers of females and males in each experimental condition. Subjects received course point credit for their participation.

Procedure

The subjects were tested in groups of two to four individuals. The members of any particular group were of the same sex.

The subjects were seated, one to a table, in an otherwise empty seminar room. A booklet distributed to each of the subjects described (a) the experimental situation, (b) the performance of one particular student, which varied according to the experimental conditions (H-H, L-H, H-L, L-L) and (c) the experimental questionnaires, (d) the "Social Evaluation Scale". (Appendix 3, p.216)

The physical layout of Experiment 1 was illustrated on the blackboard. The subjects were then asked to follow the introduction as it was read to them as follows:

"On the following pages you will be provided with information concerning the interaction between a student and a teacher. Also present in the situation was an observer-teacher who monitored the teacher's performance and that of the student.

You are to take the role of the observer-teacher.

That is, you must place yourself in the position of the observer and interpret the information as you believe the observer-teacher would have interpreted it.

You have been provided with a copy of the instructions and procedure from the experiment. There are also the results of a particular subject.

Follow the text closely as it is played on the tape-recorder. At the

appropriate intervals, you will be given ample time to complete a number of short questions.

Do you have any questions about the procedure? Remember, you are to play the part of the observer-teacher."

Questions were answered, then the playing of the pre-recorded tape with the experimental instructions commenced. A complete copy of the text appears in Appendix 4. (p.222). The text illustrated is for a student in the L-H condition. Dependent measures were identical to those of the observer-teacher in Experiment 1.

Summary of Variables for Data Analysis

In Experiment 1, the independent variables for the multivariate analysis of variances were the student's performance (H-H, L-H, H-L, L-L) and the teacher's role (active-teacher, active-observer). The dependent variable scores for this analysis were based upon the difference scores between the first and second questionnaire ratings, on the following items: subject's performance, subject's rating of the student's

ability, subject's rating of the student's effort, subjects confidence in rating of student's performance, subject's confidence in rating of student's ability, subject's confidence in rating of student's effort and subject's rating of teacher's performance.

In Experiment 2, the passive-observer study, the independent variables for the multivariate analysis of variance were the student's performance (H-H, L-H, H-L, L-L) and the sex of the subject (female, male). The dependent variables were identical to those of Experiment 1.

CHAPTER 111

RESULTS

The data derived from the two experiments can be divided into the following broad areas: test of underlying assumptions and manipulations, sample check, and attribution of causal loci. Each of these three areas will be discussed in turn. Results for Experiment I (the active-teacher, active-observer experiment) and Experiment II (the passive-observer experiment) are discussed conjointly so that differences in the results of the two experiments are made evident.

Multivariate Analysis

Univariate analyses of several dependent measures ignore correlative information provided by other variables, and may therefore lead to an erroneous answer to the basic question: How likely or unlikely is it to get the sample at hand when the null hypothesis is true? Therefore, multivariate analyses of variance (Kramer & Jensen, 1969) for a two factor experiment (manipulation of the student's performance; teacher role) were performed utilizing the following dependent measures: 1) subject's estimate of

the student's performance; 2) subject's estimate of the student's ability; 3) subject's estimate of the student's effort; 4) subject's confidence in the estimation of performance to the student; 5) subject's confidence in the estimation of ability to the student; 6) subject's confidence in estimation of effort to the student; 7) subject's estimation of teacher performance. . A. there were two sets of ratings, one after the first lesson, and a second after the fourth lesson. A difference score based on Rating 2 minus Rating 1 was constructed so that the amount of change could be measured.

The multivariate analysis of variance (MANOVA) compared the patterns of response measures by first forming the one linear combination of measures that best discriminates between the treatment conditions. Thus, a new dependent variable Y_1 is calculated; this "derived" variable is a linear function of the scores on the original measures ($Y_1 = A_1X_1 + A_2X_2 + \dots + A_nX_n$). The method may be thought of as testing the effects of the treatments on the new variable Y_1 . The correlations between all variables are taken into account in the analysis and the confidence region is adjusted accordingly. The standardized discriminant

2. X represents scores on a particular variable; A represents the weights assigned each variable.

function coefficients are used to interpret the relative contribution of each dependent measure to the linear combination. Multiple standardized discriminant function coefficients are possible, varying directly upon the number of significant roots in the multivariate analysis.

1. Test of Underlying Assumptions and Manipulation

Experiment 1

A multivariate approximate F test (Rao, 1958) based upon Wilk's Lambda Criterion was computed from the data from all seven dependent variables. The results of a multivariate analysis of variance using difference scores between the first and second ratings are presented in Tables 2, 3, and 4 (Appendix 1, p. 142-145). The multivariate F test for the interaction effect of student's performance with the teacher's role was not significant ($F(11, 305) = 1.715, p < .815$; Appendix 1, Table 2a, p. 142). The multivariate F test for the main effect of teacher's role was also not significant ($F(7, 196) = 1.211, p < .084$; Appendix 1, Table 2a, p. 142). The multivariate F test for the effect of experimental manipulation of the student's performance was significant on two dimensions ($F(12, 305) = 12.558, p < .001$; $F(12, 113) = 2.109, p < .004$, Appendix 1, Table 4, p. 145).

6. The number of dimensions to the data is represented by the number of significant discriminant functions. The number of possible discriminant functions is the lesser of the degrees of freedom between groups or the number of dependent variables.

The examination of the discriminant contrast scores gives meaning to the above two dimensions. The discriminant contrast scores represent the overall contribution of the discriminant functions to each of the four levels of the factor representing the student's performance.

The first discriminant contrast scores are plotted in Figure 2a. Examination of that dimension indicated a significant difference between the L-L and H-H groups from rating one to rating two, but significant differences for the H-L (negative direction) and L-H (positive direction) groups. This is consistent with the requirement that subjects in the L-L and H-H groups should be relatively stable in their ratings, whereas subjects confronted with shifts in student performance, should modify their ratings accordingly, with subjects in the L-H condition showing an increase in ratings, and subjects in the H-L condition showing a decrease in ratings. The dependent variables correlating most highly with the composite scores on the first factor are subjects' estimated performance ($r = .886$), ability ($r = .617$), and effort ($r = .510$), respectively. This factor, then, appears to reflect satisfactory experimental manipulations. Subjects saw the student's performance veridically, and estimated potential ability and effort appropriately. The means for the performance, ability, and effort ratings are

Figure 3a: Discriminant function contrast scores for the effect of experimental manipulation of student's performance, Experiment 1: Factor 1, reflection of the experimental manipulations.

Figure 3b: Discriminant function contrast scores for the effect of experimental manipulation of student's performance, Experiment 1: Factor 11, relation of student performance and teacher evaluation.

presented in Table 5 (Appendix 1, p.146). On a five point scale, average ratings of subjects ranged between 3.80 to 5.00 (i.e., medium-high to high ratings) in the H-H conditions, and 1.20 to 2.40 (i.e., low to medium ratings) in the L-L conditions, with little change from the first to the second rating. Subjects' first ratings in the H-L condition were similar in value to those of subjects in the H-H condition, but were significantly lower on the second rating, ranging from 2.33 to 3.33. Subjects' first ratings in the L-H condition were similar to those in the L-L condition, but were significantly higher on the second rating, ranging from 3.33 to 4.17.

The second dimension, represented by Factor 11 (Figure 3B) indicates the H-L, H-H, and L-H groups are not different from each other, and differ from the L-L group on the new multivariate variable. The correlations between the dependent variables and composite scores for the second factor indicate a relatively high negative correlation of teachers' evaluations ($r = -.523$) and a positive correlation of ratings of students' performance ($r = .404$). This dimension appears to be one on which student performance may be contrasted with teacher evaluation. This would indicate a failure of meeting the condition that teachers perceive themselves as adequate teachers, a condition

Total mean difference, Rating 2-Rating 1

Figure 14a: Total mean difference, Rating 2-Rating 1, for Experiment 1, Active-teachers' and Active-observers' confidence in estimations of ability and effort.

Figure 4b: Total mean differences, Rating 2-Rating 1, for Experiment 1, Active-teachers' and active-observers' estimations of performance, ability, effort, and teacher evaluation.

necessary to test Hypothesis 1; in the cases where there is a consistently poor performance (L-L), the teachers tend to evaluate their presentations in a negative manner.

Univariate F Tests

Subsequent to completion of the multivariate analysis, the appropriate univariate analyses are completed (by the MANOVA subroutines) for each of the dependent variables. The univariate design consists of three factors: two between subject factors (experimental group and teacher's role) and a within subject factor (first and second sets of subject ratings).

Table 4 (Appendix 1, p.145) indicates the analysis yielded six significant univariate F tests. The mean differences (rating 2-rating 1, scores combined across the teacher-role variable) for each of the experimental groups on the six significant dependent variables are plotted in Figures 4a and 4b. Only the subject's confidence in rating the student's performance was not significantly different between experimental groups ($F(3,112) = .624, p < .605$).

Examination of Figures 4a and 4b indicates that the general pattern of results for the six significant dependent variables reflects the pattern of scores in

the discriminant contrast scores. The scores for the H-H and L-L groups were generally similar, the latter being slightly lower, and did not change from the first to second rating. The significant interaction⁷ between experimental condition and rating time can be accounted for by the subjects in the L-H and H-L groups. Generally, on the second rating, subjects in the L-H condition significantly raised their estimation of the students with regard to their performance, ability, and effort, etc., while subjects in the H-L condition lowered their estimations of these factors regarding the student. These results lend general support to the effectiveness of the experimental manipulations, and indicate that active-teachers and active-observers generally perceived the student appropriately for his prescribed experimental role, although in the L-L condition, assumptions were not met for an appropriate test of Hypothesis 1.

Summary of Multivariate Analysis, Experiment 1

The single significant multivariate F test was for the effect of experimental manipulation of the student's performance. The analysis indicated two significant

7. The interactions between experimental condition and rating-time for the six significant univariate analyses are as follows: performance ($F(3,112)=106.06, p<.001$); effort ($F(3,112)=28.41, p<.001$); ability ($F(3,112)=51.73, p<.001$); confidence on ability ($F(3,112)=8.71, p<.001$); teacher evaluation ($F(3,112)=7.14, p<.001$).

dimensions. The first dimension may be interpreted as indicating a stability (H-H and L-L groups) versus a change (H-L and L-H groups) factor. Subjects in the former group remain relatively stable in their ratings, whereas the subjects in the latter group, confronted with a change in performance, modify their ratings accordingly. The second dimension indicates the L-L group differs from all other groups. As the correlations between the dependent variables and composite scores for the two dimensions indicate a high negative correlation of teacher's evaluation and a positive correlation of student's performance, this dimension appears to be one in which student performance may be compared with teacher evaluation.

Subsequent univariate analyses confirmed the stability versus change factor for the experimental groups. These results lend support to the effectiveness of the experimental manipulation, and indicate that active teachers and active observers generally perceived the student actor primarily for his prescribed experimental role.

Experiment 1

A multivariate approximate F test (SAS 1975) based on Wilk's Lambda Criterion was computed on the scores for all seven measures. The results of a multivariate analysis of variance using difference scores between the first and second ratings are presented in Tables 6, 7, and 8 (Appendix 1, p. 147). The multivariate F test for the interaction effect

Figure 5: Discriminant function contrast scores for the effect of experimental manipulation of student's performance. Experiment 1: Factor 1, reflection of experimental manipulations.

of experimental manipulation of subject's performance with teacher's role was not significant ($F(21,79) = 1.582$, $p < .077$; Table 6, Appendix 1, p. 147). The multivariate F test for the effect of experimental manipulation of the student's performance was significant ($F(21,79) = 2.784$, $p < .001$; Table 8, Appendix 1, p. 149) in a single dimension.

The examination of the discriminant contrast scores gives meaning to this dimension (Figure 1). There is a minimal difference between the L-L and H-H groups from rating one to rating two, but significant differences for the H-L (negative direction) and L-H (positive direction) conditions. This is again consistent with the requirement that all passive-observers in the L-L and H-H groups should be relatively stable in their ratings, whereas all subjects confronted with shifts in student performance, should modify their ratings accordingly. Further, the dependent variables correlating most highly with the composite scores on the first factor are subject's ratings of performance ($r = .747$), effort ($r = .617$), and subject's confidence in estimating ability ($r = .607$). This factor, then, appears to be primarily a test of experimental manipulations and their validity. These results lend support to the effectiveness of the experimental manipulations, as evidenced by the means for the subjects' estimates.

performance, ability, and effort (Appendix 1, Table 2, p. 150). On a scale of 5, ratings in the H-H condition ranged between 4.30 and 4.80 (i.e., high rating) on the first rating, and similarly for the second rating. The first L-L ratings varied between 1.80 and 2.20 (i.e., below the midpoint, 3.0) whereas the second ratings varied between 1.60 and 1.70. First ratings for subjects in the H-L condition varied between 3.70 and 4.00 (i.e., medium-high), whereas second ratings were lower, ranging from 3.20 to 3.30. In the L-H condition, first ratings ranged from 1.10 to 1.30 and second ratings from 1.00 to 1.10.

Univariate F Tests

Similar univariate F tests to Experiment 1 were completed for the data in Experiment 2. Table 3 (Appendix 1, p. 149) indicates the analysis yielded five significant univariate F tests. The total mean difference (rating 1 - rating 2) for each of the experimental groups on the five significant dependent variables is plotted in Figure 6.

Examination of Figure 6 indicates the general pattern of results for the five significant dependent variables reflects the pattern of scores in the discriminant contrast scores. The scores for the H-H and L-L groups were generally similar and did not change significantly

Figure 6: Total mean difference, Rating 2-Rating 1, for Experiment 1, Passive observers' estimations of performance, ability, effort, teacher evaluation, and confidence estimation of ability.

from the first to second rating. The significant interaction⁸ between experimental condition and rating-time can be accounted for by the subjects in the L-H and H-L conditions. Generally, on the second rating, subjects in the L-H condition significantly raised their estimation of the students with respect to their estimation of student's performance, ability, effort, confidence in the estimation of the students with respect to their estimation of student's performance, ability, effort, confidence in the estimation of ability, and the subject's teacher valuation, whereas subjects in the H-L condition lowered their estimation of these factors regarding the student. The results lend support to the effectiveness of the manipulation and indicate that passive-observers perceived the student appropriately, according to the intended experimental condition.

Summary of Multivariate Analysis, Experiment 1

The single significant multivariate F test was for the effect of experimental manipulation of the student's performance. The analysis was significant on a single dimension, similar to the first factor significant for the multivariate analysis in Experiment 1. Subjects in

8. The interactions between experimental condition and rating-time for the five significant univariate analyses are as follows: performance ($F(3, 32)=16.08, p<.001$); ability ($F(3, 32)=5.78, p<.003$); effort ($F(3, 32)=15.51, p<.001$); confidence on estimation of ability ($F(3, 32)=3.94, p<.017$); teacher evaluation ($F(3, 32)=3.31, p<.032$).

the L-L and H-H groups were stable in their ratings whereas subjects in the H-L and L-H groups varied their ratings from Time 1 to Time 2.

11. Sample Check

Analyses of variance for a three-factor experiment with repeated measures on one factor were performed for the competency and self-esteem measures. The factors for Experiment 1 were experimental manipulation of student's performance, teacher role, and time of rating the student; and for Experiment 2, experimental manipulation of student's performance, sex of subject, and time of rating the student. The rating-time measure was the repeated-measures factor. There were no significant differences in either Experiment 1 or Experiment 2 on the measure of self-esteem or the measure of competency (Table 1, & 11, Appendix 1, p. 111).

The overall means for the self-esteem measure were 4.19^a and 4.65 for Experiments 1 and 2, respectively, with no significant differences between experimental conditions ($F(3,111)=0.19, p<.09$; $F(3,33)=.47, p<.5$, respectively). The overall means for the competency measure were 4.55 and 4.61 for Experiments 1 and 2, respectively, with no significant differences between

^a9. Scale is scored 1-7, where one is low and seven is high.

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experimental conditions ($F(3,112)=.96, p<.41$; $F(3,32)=1.23, p<.31$, respectively). These results indicate there were no significant group to group variations on the measures of competency and self-esteem, and hence the groups were appropriately similar on these subject variables of possible relevance.

111. Attribution of Causal Loci

There are a number of alternatives available to assess the subjects' attributions for student performance. First, an examination can be made of subjects' responses to the open-ended question, "Why did the student perform as he did?" Secondly, an examination can be made of the responses to the structured question, where subjects were asked to rank-order a number of alternatives for the student's performance. A third possibility is to examine the relationship between a particular subject's primary open-ended attribution, and the attribution they place first when responding to the open-ended question. Each of these three alternatives will be examined the following sections.

(111.1) Unstructured Question

In both Experiments 1 and 2, answers to the open-ended question "Why did the student perform as he did?" elicited a variety of responses. These responses were coded into the following discrete categories: (1) "student's ability"; (2) "student's motivation"; (3) "teacher presentation"; (4) "situation" (e.g. one-way communication lack of preparation time on teacher's part, too many ideas to present in a short time); and (5) "other".

Each subject's primary assignment of responsibility was coded separately, and without knowledge of his experimental condition by the experimenter, into one of the above categories. Check coding of the above categories by an independent rater made over approximately 25 percent of the data (40 subjects, randomly selected) indicated 92 percent mutual agreement with the experimenter's coded responses. The proportion of subjects in each of the outcome conditions who were assigned a particular category is presented in Table 12 (Appendix 1, p.153).

Analysis of Subjects' Primary Attribution for Student Performance

Responses to the open-ended question yielded a rich array of attribution statements. The proportion of subjects in each experimental group making teacher attributions is presented in Table 13 (Appendix 1, p.154).

The results of a test of proportions for each of the experimental groups in Table 13 is presented in Table 14.

This test compares the proportion of subjects in each experimental group making teacher versus non-teacher attributions.

HIGH-HIGH CONDITION

As predicted in Hypothesis 2 teachers made non-teacher attributions in accounting for the students' performance ($Z = -2.18$ Table 14, Appendix 1).

Significantly more attributions were made to "student" reasons than "other" reasons for both the active-observers and passive-observers ($p < .059$; $p < .055$, respectively, Appendix 1, Table 15). Although more student attributions were made by active-teachers, the result was not statistically significant ($p < .194$, Appendix 1, Table 15).

Typical of subjects' responses in the H-H condition were:

"The student performed as he did because, in my opinion, he was of above average intelligence, has a good knowledge-capacity input, has an excellent attention-concentration span, and perhaps is mathematically

inclined" (a passive-observer, ability attribution), or

"I think he wanted to do well in this situation" (an active-teacher, motivation attribution).

LOW-HIGH CONDITION

Active-teacher subjects in the L-H condition made significantly more attributions to themselves, as predicted in Hypothesis 3. ($Z=1.71$, Appendix 1, Table 14). Non-teacher responses were almost equally divided between "student" and "other" attributions (Appendix 1, Table 15).

Active-teachers in the L-H condition made responses such as:

"I think my lessons were poorly presented" (an active-teacher: teacher attribution)

"I believe his score improved because he might have concentrated more" (an active-teacher; motivation attribution).

Active-observers in the L-H condition did not make significantly more teacher than non-teacher attributions. ($Z = -.156$, Appendix 1, Table 14). However, a significantly greater number of the non-teacher attributions were made to "student" than to "other" reasons ($p < .033$, Binomial test; Appendix 1, Table 15). Typical of active-observer responses were:

"Since no prior instructions were needed to answer the first set of problems sufficiently I have no answer as to the student's bad performance except perhaps, he may have needed to be put into the atmosphere and to adjust to it. With respect to the other three tests the student's performance improved at least in part due to the teacher's performance which improved after the first test."

(Active-observer, teacher attribution).

The student's performance tended to increase. The reason for this could be a familiarity with the work shown. This did not tend to agree

with the teacher's performance which was poor in the third session. The reason for this may have been the student could have taken the work before." (an active-observer; ability attribution).

Passive-observer subjects in the L-H condition did not make significantly more non-teacher first attributions.

($z = -.781$, Appendix 1, Table 14). Two-thirds of the non-teacher attributions were to "student", and the remainder to "other" reasons. This difference is not statistically significant ($p < .254$, Binomial test, Appendix 1, Table 15). Among the passive-observer's attributions were:

"Each problem series made him more familiar with the type of material he was being test on" (Passive-observer; other attribution).

"He was forced to work things out for himself and therefore improved with later tests" (Passive-observer; ability attribution).

HIGH-LOW CONDITION

Active-teachers in the H-L condition did not make significantly more non-teacher, attributions, as predicted by Hypothesis 4 ($Z=1.56$, Table 14, Appendix 1). However, significantly more of the non-teacher attributions were made to the student ($p .046$, Binomial Test, Table 15, Appendix 1). Active-teachers' attributions for performance included:

"The student must not have listened to the presentation of the material very closely, as the problems seemed straight forward" (Active-teacher; motivation attribution).

"Mathematical incompetence, failure to listen to the instructor." (Active-teacher; motivation attribution).

Active-observers in the H-L condition made significantly more teacher attributions for the student's performance, as predicted by Hypothesis 5 ($Z=1.71$, Appendix 1, Table 14). There was no statistically significant difference between attribution to "other" or "student" reasons. Examples of active-observer

attributions are:

"The teacher might have presented the material in a clearer manner" (Active-observer, motivation attribution).

"Teacher tended to skip portions of lessons." (Active-observer; teacher attribution)

Passive-observers in the H-L condition did not attribute responsibility for student performance to the teacher, as predicted in Hypothesis 5. Passive-observers' attributions for performance in the H-L condition included:

"Time-factor impeded learning." (Passive-observer; other attribution).

"Although the things he had to remember were a bit more complicated, I don't think they were presented in the most clear fashion." (Passive-observer, teacher attribution).

LOW-LOW CONDITION

In the L-L condition, active-teachers did not make significantly more teacher than non-teacher attributions ($Z = .968$, Appendix 1, Table 14). However,

all the non-teacher attributions were to the student ($p < .002$, Binomial test, Appendix 1, Table 15). Active-teachers' attributions for performance included:

"By the way it was presented which means that myself, as teacher, did a poor job in trying to convey the material."

(Active-teacher, teacher attribution).

"The student performed as he did because that was his ability and effort after learning abit from his teacher" (Active-teacher; ability attribution).

Active-observers in the L-L condition made significantly more teacher than non-teacher attributions as predicted by Hypothesis 5 ($Z = 1.71$, Appendix 1, Table 14). There were no significant differences in the number of "student" versus "other" attributions ($p < .500$, Binomial test, Appendix 1, Table 15). Among active-observer comments in the L-L condition were:

"I felt the student performed as he did because the teacher did not know what he was talking about,

he did not prepare effectively."

(Active-observer, teacher attribution).

"The situation was such that the teacher and student could not interact i.e. t.v. was on for the student only. He could not ask questions. This was probably why he did so poorly." (Active-observer, situation attribution).

Passive-observers in the L-L condition did not make significantly more non-teacher attributions than teacher attributions ($Z=0.00$, Appendix 1, Table 14). This does not support Hypothesis 5, which predicted more teacher than non-teacher attributions for observers in this condition. However, there was no difference in the number of "student" or "other" attributions ($p<.500$, Binomial test, Appendix 1, Table 15). Passive-observer attributions regarding student performance included:

"He apparently did not understand the material covered well enough to answer the problems correctly"

(Passive-observer; ability attribution).

"Possibly motivation was curtailed by the impersonality of the TV monitor and the mechanics involved with switch (Also of course by direct supervision and human charisma)" (Passive-observer; situation attribution).

Qualified Open-Ended Attributions

Not all subjects made unitary attributions when assigning responsibility for the student's performance. In many cases, subjects qualified their primary response with an alternative attribution (Appendix 1, Table 16). A comparison of qualified versus non-qualified attributions for active-teacher, active-observer, and passive-observer roles, regardless of experimental condition, indicates the groups are significantly different ($X^2=6.66, df=2, p<.05$). Examination of the groups indicates only one-third of the active-teachers made qualified attributions, whereas half the subjects in the active-observer and passive-observer groups made qualified attributions.

Summary of the Results based on Open-Ended Attributions

The results supported the hypotheses for the following conditions:

- (a) In the H-H condition, active-teachers attributed responsibility for student's performance to non-teacher reasons. This results supports Hypothesis 2.
- (b) In the L-H condition, active-teachers made significantly more teacher attributions as predicted by Hypothesis 3.
- (c) Active-observer subjects in the H-L and L-L conditions made significantly more teacher than non-teacher attributions in accounting for the student's performance, as predicted by Hypothesis 5.

(111.2) Structured Question

Subjects were asked to rank-order the following items as reasons for the subject's performance:

- (1) student's ability; (2) student's motivation;
 - (3) teacher's presentation; (4) situation; and (5) other
- (Appendix 2, p.202).

The association among K tests of rankings may be determined by using the Kendall Coefficient of Concordance, W (Siegel, 1958).¹⁰ The Kendall Coefficient of Concordance and the best estimate of the true rankings (R_j) for each experimental condition are presented in Table 17 (Appendix 1, p.158).

Active-teachers

Examination of the rankings for the active-teacher conditions indicates the results for the H-H and H-L conditions support Hypotheses 2 and 4 respectively.

In the H-H condition, active-teachers rank the student's ability as the main reason for his adequate performance ($W=.234, p<.01$; Appendix 1, Table 17, 1a, p.158) as predicted.

In the H-L condition, the active-teacher's attribution of responsibility for the student's performance is to the situation ($W=.557, p<.01$; Appendix 1, Table 17, 1c, p.158).

Active-teacher attributions in the H-L condition are thus external to themselves, but to the situation rather than the student. However, given that teachers in the L-L condition rated themselves as poor teachers, they nevertheless rank-ordered student's ability as the primary reason for his performance ($W=.527, p<.01$; Appendix 1, Table 17, 1d, p.158).

¹⁰. A significant value of W may be interpreted as meaning that the observers or judges are applying essentially the same standard in ranking the N objects under study (Siegel, 1958, p.237).

The results for the L-H condition do not support Hypothesis 3, as active-teachers ranked the student's ability highest, rather than the predicted teacher's presentation, as the primary cause of the student's performance ($W=6.04, p<.01$; Appendix 1, Table 17, 1b, p.158). Note however, that teacher presentation was ranked a close second. This point will be examined in greater detail in subsequent discussion.

Active-observers

Active-observers in the L-H condition attributed responsibility for the student's performance to the student's ability ($W=3.71, p<.01$; Appendix 1, Table 17, 2b, p.158), whereas in the H-L and L-L conditions, responsibility was attributed to the situation ($W=.420, p<.01$; $W=.588, p<.01$, respectively; Appendix 1, Table 17, 2c and 2d, p.158). Active-observers in the H-L and L-L conditions appear to be implying that the situation demands of the task make it impossible to adequately teach the student. A tendency to blame neither teacher nor student, but to displace blame for failure on external factors, is evident. There were no significant differences in the attribution of responsibility for the student's performance in the active-observer H-H condition (Appendix 1, Table 17, 2a, p.158). The results for the L-H, H-L, and L-L conditions lend some support to

Hypothesis 5, that observers are more likely to find cause for a student's good performance with the student and his poor performance external to the student.

Passive-observers

Passive-observers attributed responsibility for the student's performance in the H-H condition to the student's ability ($W=.532, p<.01$; Appendix 1, Table 17, 3a, p.158). In the H-L and L-L conditions, assignment of responsibility for the student's performance was made to the student's motivation ($W=.397, p<.01$; $W=.482, p<.01$, respectively; Appendix 1, Table 17, 3c and 3d, p.158). These data, for the H-L and L-L conditions, do not correspond with the results of the active-observers' in these two conditions. The differences in passive-observers' attributions for performance in the L-H condition were small and insignificant.

Summary of the Rank-Order Test Results

The results of the rank-order test indicate support for Hypotheses 2 and 4, the active-teacher H-H and H-L conditions, respectively. Active-teachers in the H-H condition attributed student's performance to student ability and in the H-L condition to the situation.

There was some support for Hypothesis 5. Active-observers in the L-H condition attributed performance to the student, and in the H-L and L-L conditions to the situation. Passive-observers in the H-H condition attributed student performance to student ability, lending further support to Hypothesis 5.

Passive-observers in the H-L and L-L conditions attributed responsibility to the student motivation.

Interpretation of these rank-order data is complicated by the fact that the sums of ranks (R_j) for the categories, particularly those ranked first and second, in most instances are separated only by several points (e.g. Appendix 1, Table 17, 1d, p. 158). Thus, a strict adherence to the rank-ordering of the causal categories may ignore more subtle information regarding the interrelationship of these categories.

A priori, the hypotheses for this study were stated in such a manner that the comparisons planned are between subjects' attributions for a student's performance to the teacher or to the student. Thus, the information

regarding attributions to "situation" or "other" were set aside for this next analysis.¹¹ An analysis of variance technique was used to examine differences between attributions to students or teachers using a derived "attribution score". Each subject's score for the analysis of variance was obtained in the following manner: (1) the subject's rank-ordering from first to fifth place received a score of 5, 4, 3, 2, and 1 respectively (thus, if "student ability" was in fourth position, it received a score of 2); (2) the following operation was then performed: (rank-order score of "ability" + rank-order score of "motivation" (2) - (rank-order score of "teacher")). Thus, for each subject, the difference score between attributions to student or teacher was computed. A positive mean score indicated a student attribution, a negative mean score a teacher

11. Consideration of subjects' attributions for student performances to the student (ability, motivation) or teacher, facilitates the acceptance of assumptions underlying the proposed analysis of variance. Using all five possible categories requires the data in each condition to sum to a constant (15) thereby indicating the data were not random. Using only three categories increases the likelihood that one is dealing with a normal distribution. Fortunately the F distribution is very robust with respect to violation of many of the assumptions associated with its mathematical derivation. Cochran (see Kirk, 1968, p. 60) has pointed out that "it is impossible to be certain that all required assumptions are exactly satisfied by a set of data. Thus, analysis of variance must be regarded as approximate rather than exact."

attribution. An analysis of variance for a 4X2 complete factorial design (Experiment 1) was then performed on these difference scores. The factors represent the student's performance level and whether the subject was an active-teacher or active-observer. The results of this analysis are presented in Table 18 (Appendix 1, p. 159). In this analysis, the interaction term of performance level by teacher was only marginally significant ($F(3,112)=2.236, p<.087$). This result can be further investigated to determine the factor causing this marginally significant result. Based upon the results of the earlier MANOVAS, which indicated that different composites are apparent for the change (L-H, H-L) versus the stable (H-H, L-L) groups, it is possible to break down the 4X2 analysis into a 2X2X2 design. The factors represented by this latter design are teacher (T), student's first performance (F), and student's second performance (S). Thus, the stable-change comparison comes out as a second order interaction in a 2X2X2 set-up, whereas it can only be obtained from the 4X2 set-up as one of three one-degree-of-freedom contrasts for the Performance factor. In the 4X2 format, the Performance by Teacher interaction has 3 d.f. and corresponds to FT, ST, and FST in the 2X2X2 format. The advantage of the 2X2X2 format is therefore that more specific interaction

effects can be studied. FST will indicate whether the stable-change effect (found in the earlier MANOVA) now interacts with the Teacher effect.

The results of the analysis (Table 19) indicate that the third-order interaction FST is not significant, so that the FS interaction ($F(1,112)=4.73, p<.03$), which corresponds to the stable-change factor, can be interpreted directly. Subjects for whom the student's performance was consistently high (H-H) attributed responsibility for performance to the student. In the L-H, H-L and L-L conditions, responsibility for student performance was attributed to the teacher.

The 2X2X2 analysis also indicated the student's second performance by teacher interaction (ST) term was significant ($F(1,112)=3.68, p<.054$). It is this ST term that caused the "marginally significant" interaction found in the 4X2 format. This interaction indicates that both active-teachers and active-observers attributed responsibility to their students when their second performance was high, but to the teacher when their second performance was low.

The mean difference scores for each experimental group, and t tests based on mean difference scores for each experimental group are presented in Table 20.

(Appendix 1, p.161). The t tests examine whether the mean difference score is significantly different from a score of zero, or in other words, the extent to which the attribution was to the student (positive direction) or to the teacher (negative direction).

Hypothesis 1 stated that when a student's performance is consistently poor on problems of average difficulty the teacher will avoid a negative self-attribution and attribute the cause of that behaviour as external to himself, and locate it in the student's low motivation or lack of ability.¹² Active-teachers in the L-L condition attribute responsibility to themselves rather than to the student, but the difference ($-.500$ vs. 0) is not statistically significant ($t = -.102, n.s.$; Appendix 1, Table 20, p.161). This is consistent with the failure of the experimental manipulation, where subjects in the L-L condition assumed self-responsibility for student performance, so that the hypothesis could not really be tested.

Hypothesis 2 stated that when a student's performance is consistently adequate on problems of average difficulty, ego-defensive tendencies will not be aroused and the teacher will attribute the cause of that

12. The level of difficulty for the problems was determined by pretesting and consultation with professors teaching statistics.

behaviour as internal to the student, in his ability or motivation. This hypothesis was supported; active-teachers in the H-H condition attributed responsibility for performance to the student (1.300 vs. 0, $t=3.33$, $df=14$, $p<.01$; Appendix 1, Table 20, p.161).

Hypothesis 3 stated that when a student's performance is initially poor on problems of average difficulty, and then improves performance to an adequate level, the teacher will accept responsibility for a student's performance as this is ego-enhancing. Active-teachers in the L-H condition tended to attribute responsibility for the student's improved performance to themselves ($X=-.567$ vs. 0), but the difference was not significant ($t=.134$, $df=14$, $p<.10$; Appendix 1, Table 20, p.161).

Hypothesis 4 stated that when a student's performance is initially adequate on problems of average difficulty, and then declines to a poor performance level, the teacher will attribute the causal locus of behaviour as external to himself, in the student's ability or motivation. This hypothesis was not supported, as active-teachers in the H-L condition tended to make attributions of responsibility for the student's performance to the teacher ($X=-.300$ vs. 0) but the difference was not statistically significant ($t=-.79$, n.s.; Appendix 1, Table 20, p.161).

In summary, then, this method of analysis indicates that only the hypothesis for the H-H condition is supported.

Attribution of Causal Loci for Active-Observers and Passive-Observers

The active-observer in the H-H condition attributed responsibility for the student's consistently adequate performance to the student ($t=2.56, df=14, p<.012$; Appendix 1, Table 20, p.161). In the L-H condition, the active-observers tended to place responsibility for improved performance with the student, although the difference was not statistically significant ($t=.95, n.s.$; Appendix 1, Table 20, p.161). In the H-L and L-L conditions, active observers placed responsibility with the teachers ($t=3.55$, and -2.75 , $df=14, p<.01$, respectively; Appendix 1, Table 20, p.161).

Passive-observers in the H-H and L-H conditions tended to attribute responsibility for student performance to the student, whereas in the H-L and L-L conditions they attributed responsibility for student performance to the teacher. However, the differences between the means scores and zero, for each experimental group were not statistically significant.

Active-teacher and active-observer differences

Hypothesis 5 predicted that active-teachers and (active-) observers would attribute causality differentially. The active-teacher should attribute the student's success to his teaching because such an attribution is ego-enhancing.

He should attribute the failure to other factors because that is ego-protective. On the other hand, active-observers should be free from such attributional biases.

Comparison of the means for active-teachers and active-observers indicated no significant differences between the means. There were no statistically significant differences when scores for active-observers and passive observers are compared.¹³

(111.3) Relationship Between Open-Ended and Structured Question

It is plausible to expect that a subject's primary attribution for student performance, and his first ranking of attribution for student performance, correspond. This would indicate some consistency in the subject's response. The contingency coefficient, C , is a measure of the extent of association or relation between two sets of attributes. i.e. a particular item is ranked first in both the row and column. Computation of the contingency coefficient indicated a significant relation between the open-ended and structured data ($X^2=23.81, df=4, C=.40, p<.001$). Thus, for example, subjects attributing causality for a student's performance to "ability" on the open-ended question are more likely to rank ability first on the structured question.

13. t tests were computed for active-observers versus passive-observers in each of the H-H, L-H, H-L, and L-L conditions. The t ratio (one-tailed $df=23$) were 0.861, 0.496, -1.609, and -1.569, respectively. (Active-observer, passive observer scores).

The columns of the contingency table can be represented by the categories utilized in the open-ended content analysis, while the rows of the contingency table can be represented by the categories used in the rank-order question. The frequency that a subject's primary attribution based on the open-ended question, and his first-ranked attribution based on the structured question are identical may be determined. The contingency coefficient scores are therefore represented by the frequency of "matches" between rows and columns.

In summary, the results of these two experiments offer only limited support for the hypotheses regarding ego-relevant attribution when events have positive and negative affective significance. Consideration of student/situation-teacher differences lends general support to the H-H and H-L conditions (Hypotheses 2 and 4, respectively). Active-teachers attributed a student's adequate performance to the student, whereas a student's decline in performance was attributed to non-teacher reasons; in the case of the open-ended data to the student and in the case of the structured data to the situation.

Differences in evaluation of students and their performance clearly showed the effects of positive and negative affective significance. Students who performed better were generally evaluated higher by both teachers and observers. However, teachers evaluated the L-L student higher than the H-L student, despite the latter's better overall performance.

Chapter IV

Discussion

The results of these two experiments lend only partial support to the hypotheses regarding ego-relevant attribution when events have positive or negative affective significance. Teachers attributed responsibility to causes external to themselves when their student's performance declined. They did not, however, attribute causality for a student's performance to themselves when their student's performance improved. Observers differentially attributed responsibility for student performance only in the situation of a student improving his performance.

Differences in evaluation of students and their performance clearly showed the effects of positive and negative affective significance. Students who performed better generally were evaluated higher by both teachers and observers.

The attribution data for this experiment are based upon both open-ended and forced-choice questions. Comparisons of the two sets of data, indicate certain inconsistencies in subjects responses. For example,

the open-ended data for active-teachers in the H-L condition indicates responsibility is attributed to the student, whereas the rank-order data assigns responsibility to the situation. It would appear that, given the explicit option of not assigning responsibility to the student, but not wishing to personally accept responsibility, the outcome is attributed to the situation.

The conflicting nature of the data arising from the analyses of the structured attribution data reinforces the belief that all too often the scientific psychologist is observing not mind or behaviour but summed data and computer printout. For this reason, it is the author's belief that the open-ended data should be weighted most heavily, for these experiments, and in the development of future research.

As the nature of this study is such that it represents a partial replication of the earlier Johnson et al. (1964) and Beckman (1970) studies, a comparison of the current study with the former appears to be appropriate.

Comparison with Johnson's and Beckman's Results

Since the L-L and L-H performance conditions in Experiment 1 of the present study are conceptually and operationally similar to the performance conditions of the Johnson et. al. (1964) study, and the Beckman (1970) study, a comparison of the results of Experiment 1 and the Johnson and Beckman data was made.

Johnson's study coded only main reasons and assigned all subjects to one of two causal categories (internal or external), whereas Beckman's study and the current Experiment 1 looked at multiple causal reasons. However, the latter data allows subjects to be assigned to one of two groups, teacher caused or externally caused, in a manner similar to the Johnson study. When this is done, X^2 techniques show no significant differences in external-internal attributions for the L-L and L-H conditions ($X^2=.55, df=1, n.s.$), comparing Johnson's study with Experiment 1.

Perceived causality score was computed in the Johnson study by giving each subject a score of +1 if she said behaviour was due primarily to her own teaching and a score of -1 if she said behaviour was due to the student. This means that if half the subjects saw performance as due to the child or other external sources,

the mean "causality" score in Johnson's analysis would be 0.00. The actual mean score for the L-H condition in Johnson's data was .125, i.e., about 56 percent of the teachers in the L-H condition listed the child's improvement as being due to their own teaching. In Beckman's (1970) study, the percentage of subjects who listed their own teaching as the main reason for the child's success in the L-H condition was approximately 50 percent, while in Experiment 1 of the present study it was 40 percent (based upon open-ended data, as were the other studies). The mean causality score in the L-L condition in Johnson's data was -.55, i.e., about 80 percent of the teachers listed "motivation", "ability", etc., of the child as the main causal factor in the child's performance. In Beckman's (1970) study, about 87 percent of the subjects in the L-L condition listed reasons other than their own teaching as the main reason for the child's performance. This includes both attribution to the child and attribution to external situational demands. In Experiment 1 of the present study only 60 percent of the subjects (based upon open-ended data) listed reasons other than their own teaching as the main reason for the student's performance.

It is impossible to determine what percentage of Johnson's subjects listed situational demands as the dominant cause of low performance. Are these teachers coded in attribution to the child or attribution to teacher categories? If one assumes that they are coded as internal to the child, results of the three experiments are generally compatible. Thus, results of the present study (Experiment 1) coincide with the previous analyses of causal questions in the L-H experimental condition and the L-L condition, although it is not strictly legitimate to test the latter condition.

A similar consideration applied to the H-L condition indicates 85 percent of the subjects in Beckman's (1970) study listed reasons other than their own teaching as reasons for the student's performance, compared with about 75 percent in Experiment 1 (based upon open-ended data). Thus, the results of the two experiments appear to be similar for the H-L condition.

The forced-choice questions in Beckman's (1970) study allowed teachers to choose only between teaching, motivation, and ability. No category for situational factors was provided. Given this choice, (Beckman's) teachers tended in the L-L and H-L conditions to choose

teaching rather than the child's motivation or ability. This directly contradicts open-ended results and suggests teachers are willing to accept blame for failure. In Experiment 1 of this study, subjects were given the option of choosing between teacher, student's motivation, student's ability, situation, and other, as reasons for the student's performance. Given these causal categories, the active-teachers' choices were to the situation for the H-L condition, and the student for the L-L condition, although in the latter case the hypothesis was not directly testable. This pattern of results is as predicted, although not statistically significant, i.e., external to the active-teacher. Given a student's consistently poor performance (L-L condition), active-teachers place responsibility on the student's (lack of) ability. In the H-L condition, students performed well on the first task, but declined in performance on later trials. "Maximum performance on prior occasions also affects ability attributions, presumably because an individual who does well on one occasion has the capacity to do well again" (Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1971, p.5). A primacy effect apparently operated in ability inferences. Thus, the active-teacher has information

that the student has ability, and seeks information for an alternative explanation of his performance. Unwilling to accept personal responsibility, he indicates the situation is to blame.

The Observer

When passive-observers were given information in story form about the situation in Experiment 1, they did not clearly distinguish between outcome conditions. Active-observers attributed a student's poor performance to the situation, whereas passive-observers attributed similar outcomes to the student.¹⁴

Passive-observers were provided with a complete description of the experimental procedure. However, they lacked the phenomenological evidence of the teacher's actual performance. Passive-observers appear to assume an adequate performance on the part of the teacher, and consequently attribute a declining or poor performance to the student.

14. Passive-observer teacher ratings were above the midpoint of 2.5 for the H-H, H-L, and L-H conditions only, but below the midpoint for the L-L condition. Active-observer teacher ratings were adequate in the H-H, H-L, and L-H conditions (2.5 or higher) but below 2.0 for the L-L condition. Active-teacher self ratings were below 2.5 in all conditions.

If active-teacher subjects admit they are responsible for the student's performance, their ratings of own performance should drop as the student's performance deteriorates or even if it constantly remains low. Although active-teachers admit to some responsibility for the student's performance in the H-L and L-L conditions, their ratings do not drop. Ratings remained at a constant level possibly because of ego-protective attribution.

Jones and Nisbett (1971) suggest the bias is due to differences between actor and observer in the information available to them and in the salience of that information. Kelley (1973, p.125) notes that "This is interpretable within the analysis of variance conception of attribution in terms of differences between actor and observer in their respective information about possible causes and covariations." The actor ordinarily has more information about his own prior behaviour in similar related circumstances than does an observer of the present behaviour. The actor is aware of the inconsistencies and distinctiveness of his current behaviour, and out of this awareness he is inclined to make an external attribution for it. Further, the distinctive properties of the situation are salient to the actor. In contrast, the observer is more informed about the ways in which the actor's behaviour departs from that of other persons under similar circumstances. The observer, impressed by the uniqueness of the actor's behaviour, has cause to attribute the behaviour to the actor.

When actors and observers differ in evaluation competence in success and failure conditions, it is tempting to infer the subject is defensively trying to maintain self-esteem. But in fact, he may simply be veridical in his perception. Ross, Bierbrauer,

and Polly (1971) examined the attempts of professional teachers and college students to teach an 11 year-old boy the spelling of a list of commonly misspelled words. Contrary to "self-esteem" maintenance, participants rated "teacher" factors as more important when the child failed than when he succeeded, and "student" factors more important in success than failure conditions. This pattern was more pronounced for the professional teachers. There appears, then, to be evidence to challenge the assertion that esteem maintenance and ego-defensiveness become factors when outcomes are important or central to one's self concept. That is not to say that motivational distortions do not occur in self-attribution. But, self should be innocent until proven guilty (Bem, 1972).

Kelley and Other Attribution Theorists

Kelley (1973, p. 113) acknowledges the analysis of variance model to be somewhat idealized and not descriptive of most everyday attributions. The model may not warrant or permit the collection and processing of the necessary data for the ideal analysis. In such cases, a causal inference may be based upon a single

observation of the effect. Past experiences coupled with the present information may indicate the presence of certain plausible causes. The discounting principle provides a simple statement about how the attributor thinks about such cases; "the role of a given cause in producing a given effect is discounted if other plausible causes are also present" (Kelley, 1973, p. 113).¹⁵ Kelley extends the discounting principle to include the augmentation principle, which "refers to the familiar idea that when there are known to be constraints, costs, sacrifices, or risks involved in taking an action, the action once taken is attributed more to the actor than it would be otherwise" (Kelley, 1973 p. 114). This principle provides a possible clue to account for active-teachers' attributions in the present study. In as much as the teaching task may have proven difficult for the subjects, the tendency is to attribute the result more to themselves (i.e., the active-teachers assume responsibility for performance, particularly in the case of a poor final outcome for student performance).

15. This is similar to Bem's (1967) account of self-perceptions in forced-compliance experiments.

Conceptually and demonstrably it remains unclear as to which of Kelley's two notions, existing causal schemata or the analysis of variance model, attributors rely upon in the current study. Interpretation of the data favours the conception of the causal schema, i.e., "an assumed pattern of data in a complete analysis of variance framework" (Kelley, 1972, p.2).

Fitting Kelley's notions to the current study must await clearer evidence about the assumptions subjects do in fact make for various specific attributional problems.

Schopler and Layton (1972) provide an alternate framework based upon Heider's (1958) work to interpret the attributions of subjects in the current study. The first component of their framework focuses upon the target of an influence attempt. The underlying assumption is that the perceiver has knowledge of the target person's behaviour at two points in time. "When the target person's behaviour at Time 2 is unexpected from what was known of his behaviour at Time 1, then the ideal condition exists for assigning causal responsibility for the Time 2 state to an external agent" (Schopler & Layton, 1972, p.6). The second component specifies the relationship necessary between the

influencing agent and the target of influence for making attributions of causal responsibility to any agent. It is based on estimates for B's behaviour at Time 2 following A's intervention. "If the course of the interaction has relevance for this person making power attributions, such relevance will affect his attributions. For example, the participants in the interaction are likely to see their own actions in the most favourable light possible" (Schopler & Layton, 1972, p.7).

In the case of the H-H condition, the state at Time 2 is evaluatively positive, and predictable from Time 1. As A's intervention does not lead to a change in B predictable from B's initial state, A does not attribute much power to himself. Responsibility for performance is therefore placed with the student.

In the case of the L-H condition, the state at Time 2 is both evaluatively positive, and not predictable from the state at Time 1; the positive and end state is likely from teacher intervention, therefore there is a self-attribution for student's performance by the teacher. For the H-L condition, the state at Time 2 is both evaluatively negative, and not predictable from the state at Time 1; the negative and end-state

is not likely from teacher intervention. Schopler and Layton's framework predicts that affective significance should reduce, but not eliminate attributions of influence when unexpected behaviour is failure. The results of the present study lend support to this hypothesis, as active-teachers tended to ascribe responsibility to themselves rather than the student.

In the case of the L-L condition, the state at Time 2 is predictable from Time 1, not expected from teacher intervention and evaluatively negative. Therefore the teacher feels little influence. The applicability of the foregoing framework to the present study reinforces its future research utility in the study of attribution processes.

Alternate Explanations in Accounting for the Results

There are a number of alternative explanations which can be examined in an attempt to account for the experimental results of this study, as follows:

- (1) the experimental hypotheses are incorrect;
- (2) the dependent measures were inappropriate, and related to this;
- (3) the Social Psychology of the experiment influenced the outcome;

21 (4) with the wisdom of retrospection, although the experiment was appropriate in terms of traditional experimental settings, the hypotheses were herein difficult to test. Each of these alternatives will be examined in the following sections.

3 (1) The experimental hypotheses are incorrect. The first possible explanation for the results is that the hypotheses are incorrect. Research conducted in the area of attribution theory has tended to be based less on systematic theoretical analyses of the attribution process, than on intuitive hypotheses and speculations (Fishbein & Ajzen, 1973). Perhaps this accounts for so many studies in attribution theory yielding contradictory and inconclusive results, the current experiment included.

The possibility must therefore be entertained that Heider's (1958) theory of naive psychology is indeed naive, and unable to provide adequate information for the purposes of hypothesis formation. However, there is some conceptual support for the alternative, that is, acceptance of the notions of common-sense psychology as useful for purposes of hypothesis derivation.

Naive psychology is an essential part of the phenomena in which we are interested (Heider, 1958). In our daily lives, ideas are formed about other people, and social situations. Though the ideas are not completely formulated, they often function adequately. They achieve the end of making prediction possible.

Gergen (1973), has questioned the whole idea of making accurate predictions about social psychological phenomena. "The field can seldom yield principles from which reliable predictions can be made. Behaviour patterns are under constant modification" (Gergen, 1973, p. 317). He claims that what the field can and should provide is "research" informing the enquirer of a number of possible occurrences, thus expanding his sensitivities and readying him for more rapid accommodation to environmental change. It can provide the conceptual and methodological tools with which more discerning judgements can be made." (Gergen, 1973, p. 317).

(2) The dependent measures were inappropriate. Given that the experimental situation provided an appropriate test of the hypotheses, the attribution measures may have been inappropriate. Consideration must be given to the use of the questionnaire format. According to Aronson

and Carlsmith (1968) the manipulation of independent variables utilizing a set of instructions should have little impact. This limitation is particularly relevant to tests of the actor-observer proposition. The sense impression nature of the stimuli account for one of the basic sources of divergent perceptions of actors and observers. Sense impression information is provided to the actor by the environment, while to the observer the behaviour of the actor engulfs the field (Jones & Nisbett, 1971). The questionnaire format cannot capture the strength of this difference (Ruble, 1973). It is therefore possible that the relative saliency of the outcome cues was enhanced by the questionnaire format. It is further possible that attribution research utilizing the questionnaire format actually understates the potency of the divergent perceptions between actors and observers.

(3) The Social Psychology of the Experiment. Appropriate recognition must be made to the fact that all subjects participating in these two studies were undergraduate students at Carleton University. No subject playing the role of "active-teacher" had any previous teaching

experience. These "active-teacher" subjects in all probability differ markedly from professional teachers.

The professional teacher has experienced an apprenticeship period, an ego-strengthening and ego-investing period during which the "role" of teacher is acquired.

Consequently, their attributions for a particular student's performance may be different from a subject in this experiment who "plays the role of a teacher", but lacks the previous initiation period.

Other than the experimenter's personal observation, that a few "active-teacher" subjects appeared to fulfil their role with apparent professional expertise, there is no empirical evidence to substantiate the belief that active-teacher subjects perceived themselves as "teachers". Despite the fact that ratings of the active-teacher were high, particularly in the H-H condition, it cannot be claimed that undergraduate psychology students see themselves as teachers.

Laboratory experiments are full of artifacts (e.g. demand characteristics, social desirability) which make their results difficult to interpret. Social desirability cannot be overlooked as a possible determining influence on the attributions made by subjects in this experiment.

For example, in this experiment, the socially desirable response for a teacher faced with an indication of poor student performance would be to assign responsibility to themselves. The hypothesis for the active-teacher L-L condition, on the contrary, states that responsibility will be assigned to the student. This hypothesis is based upon the teacher's self-acceptance of an adequate personal performance level. When confronted with a personal poor performance coupled with poor student performance, what then is the appropriate attribution for the teacher to make - self or other? Predictably it should be self, but the results of the study do not support this hypothesis. Although teachers readily admit to their own poor performance, they are unwilling to accept complete responsibility for the consistently poor performance of a student. All non-teacher attributions were made to the student.

(4) Alternative Designs. The attempt to test the hypotheses of these experiments utilizing a traditional laboratory procedure, in retrospect, may have been inappropriate. Aside from the reservations held about the sample utilized, the testing of the hypotheses in a laboratory setting may have restricted the nuances

associated with making attributions of responsibility in a natural classroom. That is, a more appropriate test of the hypotheses may have been a longitudinal study conducted with professional teachers in real classrooms. Another alternative is to design a series of role-playing studies, as outlined by Mixon (1972). Active role players may be utilized to study performance and role/rule governed behaviour in almost any situational context. This then avoids engaging in deception, which is morally objectionable (for some) and lends clearer interpretation to the experimental results. The ambiguous results which occurred in this experiment may in fact be an accurate reflection of the attributions teachers make in assigning responsibility for student performance. Teachers' attributions may be ambiguous; responsibility for a student's performance may be seen to be a function of a number of different factors.

A Serendipitous Finding:

Examination of the results for the performance, ability, and effort ratings indicate a contradiction to the "contrast effect" found in the literature dealing

with the gain and loss of esteem in an interpersonal attraction situation. For example, Aronson and Linder (1965) found that "a gain in esteem resulted in greater attraction for the evaluator, by the recipient, than constant high esteem. Similarly, a loss in esteem produced less liking for the evaluator than invariable low esteem" (Segall & Aronson, 1967, p.179).

Accepting the assumption that a gain in esteem can be the L-H condition, and a loss in esteem to the H-L condition, an examination of the performance, ability, and effort ratings for the various experimental conditions can be made. The result of this examination reveals that scores for the second rating of performance, ability, and effort in the L-H condition are lower than for the H-H condition. Similarly, second rating performance, ability, and effort scores in the H-L condition were higher than in the L-L condition. These results are clearly contradictory to those predicted by the contrast theory. These results of the present study appear to support a primacy effect such as discussed by Asch, (1946), Luchins, (1957), Anderson and Barrios, (1961), and Anderson (1965).

Responsibility Attribution and Education

The teacher's perception of causation can have important effects in the classroom. The findings of this study have implications both for educational research and practices in the classroom.

The Teacher's Attributions of Responsibility

Clark (1965) places the blame for failure of adequately educating minority group students upon the teachers and educators. He believes for example, that the Negro child does not learn because his teacher does not expect him to learn. The pathology is in the teachers, not the students. He believes that teachers must be motivated to set high standards, provide good instruction for their pupils, and give emotional nurturance and support to their pupils.

It is often the case that failure of a student is responded to in such a manner that the student's feelings of inadequacy is increased. Katz (1967) believes that many teachers inadvertently express negative reinforcement in terms of disapproval or rejection of these students and these teachers are especially prevalent in low socioeconomic status areas (eg. high

Negro population). The effect on the Negro child may be a strengthening of his tendency toward indiscriminate self-criticism of his own efforts.

Students are often extremely dependent on information of others in making attributions about their performance. The attributional cues given the student may inflict biased self-evaluations upon him. The information provided may overstate his responsibility for poor outcomes and understate his responsibility for good outcomes. This in turn, influences his academic achievement.

Teacher Training

Teachers' impressions of students are directly influenced by actual performance. The characteristic ego-protective biases of teachers allow them to take credit and to displace blame. More time should be spent in examining and pointing out these biases to teachers. It is probable that teachers who are aware of the biases and ego-protective attributions that exist (especially in teachers' perceptions of minority group children) can better foster positive self-evaluation and feelings of competency in all students than can teachers who lack this knowledge.

Attribution of Causal Loci and Social Problems

Psychologically oriented research often displays a "person-centred" concern and causal attribution bias when applied to social problems (Caplan & Nelson, 1973). Explanations are often in terms of the personal characteristics of those experiencing the problem, with a disregard for the possible influence of external forces. For example, nonachieving lower income children are readily identifiable and accessible as a research population. Consequently, there is much person-centered research data for this group, mostly suggesting that it is the child who fails, rather than the school and the educational system. As a result, considerable evidence is available to "justify" initiating a Head Start programme. "Person-blame interpretations are in everyone's interest except those subjected to analysis"... however "for most persons (including psychologists and other social scientists) who subscribe to person-blame interpretations of social problems, the functions that such explanations serve are indeed unintended and probably even unsuspected as yet" (Caplan & Nelson, 1973, p.210).

In summary then, attribution theory is important as a general conception of the way people think about and analyze cause-effect data. The naive analysis of action (Heider, 1958) permits man to give meaning to action, to influence the actions of both himself and others, and even to predict future actions. The interpretation rests on the fact implicit in naive psychology that can and try are the conditions of action. Although it is acknowledged that the conclusions based upon the naive analysis of action do not always fit objective reality, it does appear to be the fact that they apply to a large number of cases involving action. Furthermore, it permits statements about the attribution of action, the cognition of its components, and the prediction of behaviour.

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APPENDIX 1

TABLES

TABLE 1

Summary of the Student's Performance
in all Experimental Conditions

Experimental Condition	Lesson				Review
	1	2	3	4	
H-H	6	5	6	6	6
L-H	1	3	5	6	6
H-L	6	5	3	1	6
L-L	1	2	1	1	6

TABLE 2

The Multivariate Analysis of Variance
for the Interaction Effect of Experimental
Manipulation of Subject's Performance By
Teacher's Role.

Tests of Significance Using Wilks Lambda Criterion and
Canonical Correlations

Test of Roots	F	DFHYP	DFERR	P LESS THAN	R
(a) 1 Through 3	.717	21.000	304.925	.815	.29
(b) 2 Through 3	.630	12.000	213.000	.816	.20
(c) 3 Through 3	.613	5.000	107.000	.679	.16

Univariate F tests

Dependent Variables	F(3,112)	MS	P less than	S.D.F.C.*
R2PERF	.953	.460	.419	.670
R2ABL	.600	.282	.620	-.093
R2EFF	1.185	.871	.319	-.034
R2PERFCONF	.804	2.926	.497	-.770
R2ABLCONF	.261	.949	.855	.064
R2EFFCONF	.607	1.978	.616	.187
R2TEACHEVL	.903	.311	.444	.747

* Standardized discriminant function coefficients

TABLE 3

The Multivariate Analysis of Variance
for the Effect of Teacher's Role

8 Tests of Significance Using Wilks Lambda Criterion and
Canonical Correlations

Test of Roots	F	DFHYP	DFERR	P LESS THAN	R
(a) 1 Through 1	1.852	7.000	106.000	.084	.330

Univariate F tests

Dependent Variables	F(1,112)	MS	P less than	S.D.F.C.*
R2PERF	1.460	.704	.227	.398
R2ABL	.719	.337	.403	.332
R2EFF	.958	.704	.331	-.543
R2PERFCONF	1.402	5.104	.237	.149
R2ABLCONF	.194	.704	.665	-.341
R2ABLEFF	6.624	21.600	.011	.842
R2TEACHEVL	.774	.267	.385	.244

* Standardized discriminant function coefficients

TABLE 4

The Multivariate Analysis of Variance
for the Effect of Experimental Manipulation
of Student's Performance

Tests of Significance Using Wilks Lambda Criterion and
Canonical Correlations

Tests of Roots		F	DFHYP	DFERR	P LESS THAN	R
(a)	1 Through 3	12.588	21.000	304.95	.001	.8
(b)	2 Through 3	2.509	12.000	213.00	.004	.4
(c)	3 Through 3	.509	5.000	107.00	.710	.1

Univariate F tests

Dependent Variables	F(3,112)	MS	P less than	S.D.F.C.*
(d) R2PERFORMANCE	106.063	51.137	.001	.740 .61
(e) R2ABILITY	51.727	24.293	.001	.294 -.43
(f) R2EFFORT	28.406	20.882	.001	.135 -.09
(g) R2PERFCONFIDENCE	.624	2.271	.605	-.150 .76
(h) R2ABLCONFIDENCE	4.038	14.682	.009	-.041 -.43
(i) R2EFFCONFIDENCE	8.715	28.416	.001	.325 -.37
(j) R2TEACHEVL	7.141	2.461	.001	.241 -.62

Discriminant Scores

Contrast	1	2
1	+ .017	-.108
2	-.078	+.846
3	-2.565	-.386

Correlations Between Variables and Composite Scores

Dependent Variable	1	2
R2PERF	.880	.404
R2ABL	.617	-.183
R2EFF	.456	-.113
R2PERFCONF	.049	.174
R2ABLCONF	.161	-.229
R2EFFCONF	.238	-.270
R2TEACHEVL	.174	-.523

* Standardized discriminant function coefficients

TABLE 5

Mean Ratings of Performance, Ability, and Effort of Active-teachers and Active-Observers in Each Outcome Condition for Experiment 1.*1

Role	Performance		Ability		Effort	
	<u>R1</u>	<u>R2</u>	<u>R1</u>	<u>R2</u>	<u>R1</u>	<u>R2</u>
	Active-teachers					
H-H	4.66	5.00	4.13	4.46	3.80	4.06
H-L	4.93	2.93	4.13	3.33	4.13	3.20
L-H	1.33	3.93	2.00	4.13	2.13	4.06
L-L	1.20	2.00	1.93	2.26	1.80	1.66

Active-observers

H-H	4.26	4.60	3.93	4.46	3.80	4.66
H-L	4.20	2.33	4.00	2.73	4.00	2.86
L-H	1.60	3.80	1.80	3.80	2.20	3.93
L-L	1.33	1.60	1.80	1.93	1.93	2.43

*Rated on a five point scale
1. R represents the first or second rating

TABLE 6

The Multivariate Analysis of Variance,
Experiment 2, for the Interaction
Effect of Experimental Manipulation
of Subject's Performance by Teacher's
Role.

Tests of Significance Using Wilks Lambda Criterion and Canonical
Correlations

Test of Roots	F	DFHYP	DFERR	P LESS THAN	R
1 Through 3	1.585	21.000	75.208	.077	.7
2 Through 3	.50	12.000	53.000	.900	.3
3 Through 3	.321	5.000	27.000	.896	.2

Univariate F tests

Dependent Variables	F(3,32)	MS	P less than	S.D.F.C.*
R2PERF	.078	.046	.971	.221
R2ABL	.382	.412	.770	-.155
R2EFF	3.365	1.746	.030	-.701
R2PERFCONF	6.283	11.112	.002	.673
R2ABLCONF	1.815	6.150	.163	.233
R2EFFCONF	1.592	8.846	.210	.457
R2TEACHEVL	.640	.300	.598	.098

* Standardized discriminant function coefficients

TABLE 7

The Multivariate Analysis of Variance
for the Effect of Sex of Subject,
Experiment 2.

Tests of Significance Using Wilks Lambda Criterion and Canonical Correlations					
Test of Roots	F	DFHYP	DFERR	P LESS THAN	R
1 Through 1	.636	7.000	26.000	.724	.382

Univariate F tests

Dependent Variables	F(1,32)	MS	P less than	S.D.F.C.*
R2PERF	.191	.112	.668	-.196
R2ABL	.104	.112	.748	.063
R2EFF	2.916	1.512	.094	1.051
R2PERFCONF	1.194	2.112	.282	.447
R2ARLCONF	.015	.050	.900	.031
R2EFFCONF	.110	.613	.741	-.355
R2TEACHEVL	.000	.000	.996	-.460

* Standardized discriminant function coefficient

TABLE 8

The Multivariate Analysis of Variance
for the Effect of Experimental Manipulation
of Student's Performance Experiment 2.

Tests of Significance Using Wilks Lambda Criterion and Canonical
Correlations

Test of Roots	F	DFHYP	DFERR	P LESS THAN	R
1 Through 3	2.784	21.000	75.208	.001	.873
2 Through 3	.505	12.000	53.000	.902	.417
3 Through 3	.140	5.000	27.000	.980	.159

Univariate F tests

Dependent Variables	F(3,32)	MS	P less than	S.D.F.C.
R2PERF	16.078	9.446	.001	.747
R2ABL	5.776	6.246	.003	-.085
R2EFF	15.510	8.046	.001	.417
R2CONFFERF	1.194	2.112	.328	-.087
R2CONFABL	3.941	13.350	.017	.697
R2CONF EFF	1.052	5.846	.384	-.286
R2TEACHEVL	3.307	1.550	.032	.238

* Standardized discriminant function coefficient

Discriminant Scores

Contrast	1
1	+ .182
2	+ .291
3	-2.474

Correlations Between Variables and Composite Scores

Dependent Variable	1
R2PERF	.685
R2ABL	.398
R2EFFORT	.664
R2CONFFERF	.154
R2CONFABL	.337
R2CONF EFF	.170
R2TEACHEVL	.301

TABLE 9

Mean Ratings of Performance, Ability, and Effort
with the Sex Factor Combined, For each Experimental
Manipulation in Experiment 2.*1

Experimental Manipulation	Performance		Ability		Effort	
	<u>R1</u>	<u>R2</u>	<u>R1</u>	<u>R2</u>	<u>R1</u>	<u>R2</u>
H-H	4.30	4.50	4.50	4.60	4.40	4.30
H-L	4.00	2.20	3.70	2.80	3.90	2.40
L-H	2.00	3.50	2.10	3.90	2.50	4.10
L-L	1.80	2.20	2.20	2.70	2.30	2.40

*Rated on a five point scale

1. R represents the first or second rating

TABLE 10

Summary of Analyses of Variance for
Self-Esteem and Competency Measures
Respectively, Experiment 1.

Self-Esteem

FACTOR(S)	DF	SS	FRAT	FPROB
Performance	3	5.851	2.19	.091
Teacher	1	.085	.10 ^{ac}	.756
Performance Teacher	3	2.040	.76	.519
Within Cells	112	99.603		
Total	119	107.58		

Competency

FACTOR(S)	DF	SS	FRAT	FPROB
Performance	3	2.722	.96	.418
Teacher	1	.102	.11	.743
Performance Teacher	3	1.272	.45	.724
Within Cells	112	106.40		
Total	119	110.50		

TABLE 11

Summary of Analyses of Variance for
Self-Esteem and Competency Measures
Respectively, Experiment 2.

<u>Self-Esteem</u>				
FACTOR(S)	DF	SS	FRAT	FPROB
Performance	3	3.966	2.42	.083
Sex	1	1.024	1.88	.177
Performance Sex	3	3.266	2.00	.133
Within Cells	32	17.448		
Total	39	25.704		

<u>Competency</u>				
FACTOR(S)	DF	SS	FRAT	FPROB
Performance	3	4.568	1.23	.313
Sex	1	.756	.61	.445
Performance Sex	3	2.418	.65	.590
Within Cells	32	39.500		
Total	39	47.244		

TABLE 12

Proportion and number of subjects for Experiments I and 2, in each outcome condition naming a particular category as a causal factor determining the student's performance.

EXPERIMENTAL CONDITION	(1)					(2)					(3)					(4)					(5)				
	STUDENT ABILITY					STUDENT MOTIVATION					TEACHER					SITUATION					OTHER				
I	(a) ACTIVE-TEACHER	33.5%	(5)			13.3%	(2)				0.0%	(0)				6.7%	(1)				46.7%	(7)			
HIGH-HIGH	(b) ACTIVE-OBSERVER	46.7%	(7)			6.7%	(1)				13.2%	(2)				20.0%	(3)				13.3%	(2)			
	(c) PASSIVE-OBSERVER	20.0%	(2)			60.0%	(6)				0.0%	(0)				10.0%	(1)				10.0%	(1)			
II	(a) ACTIVE-TEACHER	13.3%	(2)			6.7%	(1)				53.3%	(8)				6.7%	(1)				20.0%	(3)			
LOW-HIGH	(b) ACTIVE-OBSERVER	20.0%	(3)			26.7%	(4)				20.0%	(3)				6.7%	(1)				33.3%	(4)			
	(c) PASSIVE-OBSERVER	40.0%	(4)			20.0%	(2)				10.0%	(1)				10.0%	(1)				20.0%	(2)			
III	(a) ACTIVE-TEACHER	20.0%	(3)			13.3%	(2)				26.7%	(4)				13.3%	(2)				33.3%	(4)			
HIGH-LOW	(b) ACTIVE-OBSERVER	6.7%	(1)			20.0%	(3)				46.7%	(7)				20.0%	(3)				6.7%	(1)			
	(c) PASSIVE-OBSERVER	20.0%	(2)			20.0%	(2)				0.0%	(0)				10.0%	(1)				50.0%	(5)			
IV	(a) ACTIVE-TEACHER	26.7%	(4)			33.3%	(5)				40.0%	(6)				0.0%	(0)				0.0%	(0)			
LOW-LOW	(b) ACTIVE-OBSERVER	6.7%	(1)			20.0%	(3)				46.7%	(7)				20.0%	(3)				6.7%	(1)			
	(c) PASSIVE-OBSERVER	20.0%	(2)			20.0%	(2)				20.0%	(2)				20.0%	(2)				20.0%	(2)			

TABLE 13

The Proportion of Subjects in Each
Experimental Group Making Teacher
Attributions.

	Active-Teacher	Active-Observer	Passive-Observer
H-H	0/15	2/15	0/10
L-H	8/15	3/15	1/10
H-L	4/15	7/15	0/10
L-L	6/15	7/15	2/10

TABLE 14

Results of a Test of Proportions for
Each Experimental Group Comparing
Teacher to Non-Teacher Attribution
for the Open-Ended Data.

	Active-Teacher	Active-Observer	Passive-Observer
H-H	$Z=-2.18^*$	$Z=-.780$	$Z=-1.56$
L-H	$Z=1.71^*$	$Z=-.156$	$Z=-.781$
H-L	$Z=-1.56$	$Z=1.71^*$	$Z=-1.56$
L-L	$Z=.968$	$Z=1.71^*$	$Z=0.00$

*Z value significant at .05 level.

TABLE 15

Number of Subjects in Each Experimental Group
Making Student or Other/Situation Attributions
(Results of a Binomial Test given in Brackets).

	<u>Active-Teacher</u>		<u>Active-Observer</u>		<u>Passive-Observer</u>	
	Student Attributions	Other Attributions	Student Attributions	Other Attributions	Student Attributions	Other Attributions
H-H	8 ($p < .194$)	4	11 ($p < .059$)	4	8 ($p < .055$)	2
L-H	4 ($p < .500$)	3	9 ($p < .033$)	2	6 ($p < .254$)	3
H-L	10 ($p < .046$)	3	4 ($p < .274$)	7	4 ($p < .377$)	6
L-L	9 ($p < .002$)	0	4 ($p < .500$)	3	4 ($p < .500$)	4

TABLE 16

Number of Subjects in Each
Experimental Condition Making
Qualified Open-Ended Attributions
for Student's Performance

	Active-Teacher	Active-Observer	Passive-Observer
H-H	7/15 (46.6%)	9/15 (60.0%)	5/10 (50.0%)
L-H	4/15 (26.6%)	5/15 (33.3%)	4/10 (40.0%)
H-L	6/15 (40.0%)	8/15 (53.3%)	6/10 (60.0%)
L-L	3/15 (20.0%)	9/15 (60.0%)	8/10 (80.0%)
X	20/60 (33.3%)	31/60 (51.6%)	23/40 (57.5%)

TABLE 17

Kendall Coefficients of Concordance (W),
Rank-ordering of causal categories from
Structured Questions and Sums of Ranks (Rj)

1			2			3		
ACTIVE-TEACHERS			ACTIVE-OBSERVERS			PASSIVE-OBSERVERS		
CONDITION	RANKING	Rj	CONDITION	RANKING	Rj	CONDITION	RANKING	Rj
(a) H-H W=.255*	1. ABILITY 2. MOTIVATION 3. TEACHER 4. SITUATION 5. OTHER	31 43 44 44 63	(a) H-H W=.134	1. TEACHER 2. ABILITY 3. MOTIVATION 4. SITUATION 5. OTHER	34 38 49 49 55	(a) H-H W=.532*	1. ABILITY 2. MOTIVATION 3. TEACHER 4. SITUATION 5. OTHER	21 21 22 41 45
(b) L-H W=.404*	1. ABILITY 2. TEACHER 3. MOTIVATION 4. SITUATION 5. OTHER	28 33 36 56 72	(b) L-H W=.661*	1. ABILITY 2. TEACHER 3. MOTIVATION 4. SITUATION 5. OTHER	29 36 41 54 65	(b) L-H W=.066	1. MOTIVATION 2. SITUATION 3. ABILITY 4. OTHER 5. TEACHER	25 27 30 34 34
(c) H-L W=.557*	1. SITUATION 2. MOTIVATION 3. ABILITY 4. TEACHER 5. OTHER	29 36 41 44 75	(c) H-L W=.420*	1. SITUATION 2. MOTIVATION 3. ABILITY 4. TEACHER 5. OTHER	34 38 39 42 72	(c) H-L W=.397*	1. MOTIVATION 2. SITUATION 3. TEACHER 4. ABILITY 5. OTHER	20 23 29 34 44
(d) L-L W=.527*	1. ABILITY 2. SITUATION 3. MOTIVATION 4. TEACHER 5. OTHER	31 33 43 44 74	(d) L-L W=.588*	1. SITUATION 2. TEACHER 3. ABILITY 4. MOTIVATION 5. OTHER	23 37 42 51 72	(d) L-L W=.482*	1. MOTIVATION 2. TEACHER 3. ABILITY 4. SITUATION 5. OTHER	20 21 27 36 46

TABLE 18

Summary of Analysis of Variance for
Student-Teacher Difference Scores based
on Structured Question Scores, Experiment 1.

FACTOR(S)	DF	SS	MS	FRAT	FPROB
Performance	3	71.00	23.700	11.632	.001
Teacher	1	.833	.833	.409	.531
Performance Teacher	3	13.667	4.556	2.236	.087
Within Cells	112	228.199	2.037		
Total	119	313.699			

TABLE 19

Summary of Analysis of Variance for
Student-Teacher Difference Scores based
on Structured Question Scores, Experiment 1.
(Expanded Analysis)

FACTOR(s)			DF	SS	MS	FRAT	FPROB
First			1	13.333	13.333	6.54	.011
	Second		1	48.133	48.133	23.62	.000
First	Second		1	9.633	9.633	4.73	.030
		Teacher	1	.833	.833	.41	.531
First		Teacher	1	4.033	3.033	1.28	.159
	Second	Teacher	1	7.500	7.500	3.68	.054
First	Second	Teacher	1	2.133	2.133	1.05	.309
	Within	Cells	112	228.20	2.037		
	Total		119	313.80	2.637		

TABLE 20

Mean difference scores for each experimental group, based on data from the Structured Question¹, and summary of t tests (one-tailed) based on above-mentioned scores², given in brackets.

	Performance Level				DF
	H-H	L-H	H-L	L-L	
Active-teacher	1.300 (3.33*)	-.567 (-1.34)	-.300 (-.79)	-.500 (-1.02)	14
Active-observer	1.000 (2.56*)	.400 (.95)	-1.067 (3.55*)	-1.067 (-2.75*)	14
Passive-observer	.550 (1.41)	.100 (.22)	-.250 (-.53)	-.650 (-1.88)	9

1. A positive mean difference score indicates a student attribution, negative mean difference score indicates a teacher attribution.
2. These significance tests are based on whether the mean difference score is significantly different from zero.

* Significant at .01 level, one-tailed test.

TABLE 21

RESPONSE FREQUENCIES RELATING TO
QUESTIONS REGARDING THE USE OF
CLOSED-CIRCUIT TELEVISION AS AN
INSTRUCTION MEDIUM. - EXPERIMENT 1

QUESTION 1		(1)	(2)	ROLE (3)	(4)	(5)
		H-H	L-H	H-L	L-L	TOTAL
ACTIVE OBS	YES	4	1	1	0	6
	NO	3	8	11	12	34
	QUALIFIED	8	6	3	3	20
ACTIVE-TEACHER	YES	3	3	0	1	7
	NO	6	5	14	13	38
	QUALIFIED	6	7	1	1	15
QUESTION 2						
ACTIVE OBS	YES	0	0	0	0	0
	NO	5	7	9	7	28
	QUALIFIED	10	8	6	8	32
ACTIVE-TEACHER	YES	1	1	1	1	4
	NO	4	8	7	7	26
	QUALIFIED	10	6	7	7	30
QUESTION 3						
ACTIVE OBS	YES	0	0	0	1	1
	NO	5	7	9	7	28
	QUALIFIED	10	8	6	7	31
ACTIVE-TEACHER	YES	1	1	0	1	3
	NO	4	7	7	7	25
	QUALIFIED	10	7	8	7	32

TABLE 22

RESPONSE FREQUENCIES RELATING TO
QUESTIONS REGARDING THE USE OF
CLOSED-CIRCUIT TELEVISION AS AN
INSTRUCTION MEDIUM - EXPERIMENT 2.

		ROLE				
QUESTION 1		(1) H-H	(2) L-H	(3) H-L	(4) L-L	(5) TOTAL
MALES	YES	4	0	1	0	5
	NO	1	2	3	3	9
	QUALIFIED	0	2	1	2	6
FEMALES	YES	1	0	0	0	1
	NO	0	3	5	3	11
	QUALIFIED	4	2	0	2	8
QUESTION 2	YES	2	0	0	1	3
	NO	2	1	5	0	8
MALES	QUALIFIED	1	4	0	4	9
	YES	0	0	0	0	0
FEMALES	NO	1	3	4	1	9
	QUALIFIED	4	2	1	4	11
QUESTION 3	YES	2	0	0	1	3
	NO	2	1	5	0	8
MALES	QUALIFIED	1	4	0	4	9
	YES	1	0	0	0	1
FEMALES	NO	0	3	4	1	8
	QUALIFIED	4	2	1	4	11

APPENDIX 2

LESSON PLANS, PROBLEMS, ANSWERS, AND THE EXPERIMENTAL QUESTIONNAIRES.

Introduction

The lesson plans provided should serve as a guideline in the preparation of your own lecture material. However, you may incorporate any of the ideas, examples etc. into your plan.

The lesson topics will be distributions, central tendencies, variability, and skewness. These present four rather distinct topic areas. Remember, you will have 7-8 minutes to prepare each of the four 5-minute lessons. The problems are of average difficulty, and therefore an adequate performance by the student can be expected to be eighty percent (80%) or better, and a poor performance to be twenty percent (20%) or less.

LessonFrequency DistributionsAid: Blackboard

When dealing with large sets of numbers, a good over-all picture and sufficient information can often be conveyed by grouping the data into a number of classes. For example, we might have the results of a 14 item test for a class of 20 people. This measure provides any of 15 scores ranging from 0-14 (Write on board). We might have obtained the following scores (Write on board)

5	14	4	9
4	10	13	10
8	9	4	6
7	7	11	1
6	12	14	8

These data are ungrouped data and tell us little of the overall picture: we might find it useful to group the data in tabular form in terms of a frequency distribution or simply distribution.

For example (Write on board)

<u>Scores of tests</u>	<u>Frequency</u>
0-2	1
3-5	4
6-8	6
9-11	5
12-14	4

The construction of a numerical distribution consists essentially of three steps:

1. choosing the classes into which the data are to be grouped
2. sort the data into the appropriate classes
3. count the number of items in each class

The most difficult step is the first one and we shall concentrate on it.

The two things to consider in the first step are those of determining the number of classes into which to group the data, and the range of values (Write these two ideas on the board) that is, "From where to where" each class is to go. Both these choices are arbitrary, but it depends on the nature of the data and the purpose it will serve. The following rules are generally observed;

1. We seldom use fewer than 6 or more than 15 classes.
2. We always choose classes which will accomodate all the data.

Thus we must be sure to accomodate both the smallest and the largest values, and that none of the values can fall into possible gaps between successive classes.

3. We must always make sure that each item goes into only one class i.e. avoid overlap.
4. Whenever possible we must make the class intervals of equal length, that is, we make them cover equal ranges of values.

The numbers shown in the right-hand column of the above table are called class frequencies: they give the number of items falling into each class. Also, the smallest and the largest values that can go into any given class are referred to as its class limits;

thus the class limits of the above table are 0 and 2, 3 and 5, etc. More specifically, 0,3,6,...12 etc. are referred to as the lower class limits, while 2,5,8,...14 are referred to as the upper class limits of the respective classes.

LessonGraphical presentation of dataShapes of distributions

Remember in the last lesson we presented the results for a test of 14 items for 20 people. This we presented as:

<u>Score</u>	<u>Frequency</u>
0-2	1
3-5	4
6-8	6
9-11	5
12-14	4

In graphic form these data might be presented as frequency polygon or a histogram (Write names on board). These can be drawn as follows:

Frequency polygon

The vertical axis (ordinate) represents the frequency, while the horizontal axis (abscissa) is represented by the possible scores:

Histogram

In the histogram, the width of each bar is equal to the size of the class interval, and the height of each bar is equal to the frequency of that class.

Thus, in the frequency polygon we have connected the points, whereas in the histogram we have a horizontal line at each point to correspond to the interval taken by each score.

Shapes of distributions

Simply by inspection we can determine some of the characteristics of the over-all collection of scores. Relatively few people have extremely high scores, and even fewer had lower scores. Most were in the middle range. The distribution above might best be represented as flat.

Negative Skew
Distribution D

Positive Skew
Distribution E

Thus, we might have obtained results giving us a bell-shaped or normal distribution. Or, we may have had a peaked distribution, indicating people were more alike in the measurement obtained.

If the distribution has a peak that is displaced at one or other ends of the measurement scale, and a tail that is strung-out in the opposite direction, this pattern is called skewness. It is described in terms of the stringing out of the tail of the curve. In distribution D, the tail points toward the lower scores; it is called a negative skew. Distribution E shows just the opposite. Here the tail points toward the higher scores; it has a positive skew.

Lesson

Measures of Central Tendency

Once having established a distribution curve, we may be interested in how the scores tend to cluster in that particular distribution. One series of indexes tells us about the central tendency of the scores in a distribution. Central tendency is what we are referring to when talking about an average score. Three indexes are the mode, the median, and the mean.

Mode

The mode is the most frequent in a distribution.

Once the scores are grouped the mode is determined by inspection. It is simply the score that has been tallied the most or the score under the peak of the distribution. It is possible, however, to have a distribution in which every score occurs an equal number of times. In such a case there is no mode. It may also be the case that a distribution has two or more scores that are of the highest yet equal frequency. Such a distribution is bimodal, trimodal, or generally, multimodal. All modes are then reported.

Median

The midpoint or midscore in a distribution.

Once scores are ordered by magnitude or are grouped, the median is defined as that point above which and below which one-half of the scores fall.

If we have an odd number of items, there is always a middle term whose value is the median, e.g. 5, 10, 2, 7, 8, becomes 2, 5, 7, 8, 10 and 7 is the median.

Generally, if there are n items, and n is odd, the median is the value of the $\frac{n+1}{2}$ of the largest item.

e.g. $n=25$, $\frac{25+1}{2}=13$

If we have an even number of items, there is never a middle item, and the median is defined as the mean of the values of the two middle items. e.g. Median of 3, 6, 8, 10, 13, 15 is $\frac{8+10}{2}=9$. It is important to remember the formula $\frac{n+1}{2}$ is not a formula for the median itself, it merely tells us the position of the median, that is, the number of items we must count until we reach the number whose value is the median.

Mean

The mean is the sum of scores in a distribution divided by the number of scores.

The mean is the most sensitive index of central tendency. For example, the mean of the scores 4, 8, 5, 7, 11, 14, 9, 1, and 3 is $\frac{61}{9} = 6.77$.

A commonly used symbol to denote the mean is $\bar{X}$, where the bar over the X distinguishes the mean from a value indicating a particular individual's score.

LessonSome comparisons of the mean, mode, and median

The mode and median are not necessarily balance points as is the mean, e.g.

To change the mode (10), we would have to reduce the number of scores in a category having the most frequent occurrence, or else, add sufficient scores in another category to create a new mode.

To change the median (10), we would have to add or shift scores so as to change the half-above, half-below divisions of the distribution. In both cases there are many scores that could be changed without any effect upon either the mode or the median.

If the mean is the most sensitive measure, why consider using the mode or median as the measure of central tendency?

Mode: easiest to obtain

Median: if the scores are ranked, median is easier to find than the mean.

Because it is a balance point, the mean may be pulled away from what appears to be the point where the scores cluster in the distribution. This is so when there are extremely high and extremely low scores in a distribution.

e.g.

1.

2.

3.

The location of extreme scores in 1 and 2 show how the mean is pulled toward the extremity.

In such cases, the median is usually more representative of the central tendency of the distribution, or average score, so to speak.

Problems

If hospital bills are grouped into a frequency table with the classes \$50.00-\$99.99, \$100.00-\$149.99, \$150.00-\$199.99, \$200.00-\$249.99, \$250.00-\$299.99, and \$300.00 or more, decide for each of the following quantities whether it can be determined on the basis of this distribution:

1. How many of the bills amounted to less than \$150.00?
2. How many of the bills amounted to \$150.00 or less?
3. How many of the bills amounted to \$200.00 or more?
4. How many of the bills amounted to more than \$200.00?
5. How many of the bills amounted \$500.00 or more?
6. How many of the bills amounted to less than \$175.00?

3

OF/DE

3

Problems

1.

This kind of graph is called a histogram, in which the width of each bar is equal to the size of the _____ . The height of each bar is equal to the _____ of that class.

2.

This graph is called a frequency polygon. Straight lines have been drawn between the dots making the set of frequencies clearly visible. Each dot has been placed directly over the _____ of its _____ .

3. Draw and label a distribution curve to indicate fewer individual differences were discriminated by the measuring instrument.

4. Draw and label a distribution curve to indicate people on a test tended to answer most of the questions on the test correctly.

5. Draw and label a distribution curve to indicate people tended to answer most of the questions on a test incorrectly.

6. Draw and label a distribution curve indicating the measuring instrument failed to discriminate fewer differences.

Problems

1. The following are the average number of inches of rainfall a month on the Costa del Sol, Spain:

8.5, 7.0, 6.0, 6.0, 4.0, 1.0, 0.5, 0.5, 1.5, 3.5, 6.5, 7.5

Calculate the mean number of inches of rainfall per month.

2. What is the median of the following fourteen temperatures (Fahrenheit)?

432, 440, 412, 405, 427, 415, 409, 415, 409, 422, 417, 437, 411, and 411.

3. The mode for the data in question 2 is _____?

4. In the series of numbers 2, 5, 7, 9, 11, 17, 20, 25 the median is _____?

5. For a series of observations 10, 9, 8, 8, 7, 7, 7, 6, 6, 5, 4, the arithmetic mean is _____?

6. The mode for the data in question 5 is _____?

Problems

1. The median, the mode and the mean are all measures of _____.
2. The _____ is the most sensitive measure of central tendency.
3. The most practical argument favoring the _____ is that it is the easiest to obtain.
4. The _____ tends to be biased by extreme scores.
5. In the case where the mean is biased by extreme scores, the _____ is usually more representative of the central tendency of the distribution.
6. The formula $\frac{n+1}{2}$ is used _____.

Review Problem

1. Draw and label a distribution curve to indicate fewer individual differences are discriminated by the measuring instrument.
2. In the series of numbers 39, 55, 46, 38, 41, 40, 33, 49, 42, 37, 49, 44, 51, 48, 44, the mean is _____?
3. The median of the series of numbers in question 2 is _____?
4. The mode for the series of observations 11, 9, 4, 5, 7, 4, 9, 5, 9, 9, and 10 is _____?
5. The _____ is the most sensitive measure of central tendency.
6. The formula $\frac{n+1}{2}$ is used to _____.
7. By grouping data into a tabular form we obtain a _____.

Answers

1. yes

2. no

3. yes

4. no

5. no

6. no

Answers

1. ... class interval frequency

2. ... midpoint class interval

Answers

1. 4.3 inches
2. 415
3. 409, 411, 415
4. 10
5. 7
6. 7

Answers

1. central tendency
2. mean
3. mode
4. mean
5. median
6. to find the location of the median

Answers

1.

2. 43.7

3. 44

4. 9

5. mean

6. to find the location of the median

7. frequency distribution

193.

How would you rate the student's ability?

poor excellent

How confident are you in this rating?

not very
confident

very
confident

194.

How would you rate the student's effort?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

195.

How would you evaluate the teacher's presentation to the student?

poor.

excellent

Questionnaire 2
Teacher Questionnaire

On the following scales, try to answer the question by putting an X in the interval.

How would you rate the student in terms of his performance?

How confident are you in the above rating?

197.

How would you rate the student's ability?

poor

excellent

How confident are you in the above rating?

not very
confident

very
confident

198.

How would you rate the student's effort?

poor

excellent

How confident are you in the above rating?

not very
confident

very
confident

How would you evaluate your presentation to
the student?

Questionnaire A
Observer Teacher Questionnaire

Why did the student perform as he did?

Please comment on the use of closed-circuit television as the means of instruction in this experiment.

Rank order the following items with regard to possible reasons for the student's performance. Place the most important reason first, and the least important last:

student's ability, teacher's presentation,
student's motivation, the use of television as
an instruction medium, other (give reason)

1. _____

2. _____

3. _____

4. _____

5. _____

Do you agree with the use of closed-circuit television as a medium of instruction for university students? For students in general? Why or why not?

On the following scales, try to answer the question by putting an X in the appropriate interval.

How would you rate the student in terms of his performance?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

205.

How would you rate the student's effort?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

excellent

How confident are you in this rating?

very
confident

207.

How would you evaluate the teacher's overall
performance?

poor excellent

Questionnaire B
Teacher Questionnaire

Why did the student perform as he did?

Please comment on the use of closed-circuit television as the means of instruction in this experiment.

Rank order the following items with regard to possible reasons for the student's performance. Place the most important reason first, and the least important last:

student's ability, teacher's presentation,
student's motivation, the use of television
as an instruction medium, other (give reason)

1. _____

2. _____

3. _____

4. _____

5. _____

211.

Do you agree with the use of closed-circuit television as a medium of instruction for university students? For students in general? Why or why not?

poor excellent

not very confident very confident

213.

How would you rate the student's ability?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

How would you rate the student's effort?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

How would you evaluate the overall performance
of your presentation?

poor

excellent

6

APPENDIX 3

SOCIAL EVALUATION SCALE

Choose a person of the same sex you would like
having as a companion on a trip and rate that person
on the following bipolar items by placing a checkmark
in the appropriate interval.

worthless	_____	valuable
lenient	_____	severe
good	_____	bad
successful	_____	unsuccessful
cowardly	_____	brave
admirable	_____	deplorable
weak	_____	strong
fast	_____	slow
competent	_____	incompetent
violent	_____	moderate
laborious	_____	effortless

Choose a professor and rate that person on the following bipolar items by placing a checkmark in the appropriate interval.

brave		cowardly
bad		good
moderate		violent
effortless		laborious
severe		lenient
successful		unsuccessful
strong		weak
deplorable		admirable
competent		incompetent
fast		slow
valuable		worthless

Rate yourself on the following bipolar items by placing a checkmark in the appropriate interval.

2

competent		incompetent
strong		weak
moderate		violent
unsuccessful		successful
slow		fast
brave		cowardly
severe		lenient
bad		good
valuable		worthless
admirable		deplorable
effortless		laborious

3

Choose a friend and rate that person on the following bipolar items by placing a checkmark in the appropriate interval.

strong		weak
bad		good
slow		fast
admirable		deplorable
effortless		laborious
unsuccessful		successful
valuable		worthless
violent		moderate
competent		incompetent
cowardly		brave
lenient		severe

APPENDIX 4
INSTRUCTIONS FOR EXPERIMENT 2

ON THE FOLLOWING PAGES YOU WILL BE PROVIDED WITH INFORMATION CONCERNING THE INTERACTION BETWEEN A STUDENT AND A TEACHER. ALSO PRESENT IN THE SITUATION WAS AN OBSERVER-TEACHER WHO MONITORED THE TEACHER'S PERFORMANCE AND THAT OF THE STUDENT. YOU ARE TO TAKE THE ROLE OF THE OBSERVER-TEACHER. THAT IS, YOU MUST PLACE YOURSELF IN THE POSITION OF THE OBSERVER AND INTERPRET THE INFORMATION AS YOU BELIEVE THE OBSERVER-TEACHER WOULD HAVE INTERPRETED IT.

YOU HAVE BEEN PROVIDED WITH A COPY OF THE INSTRUCTIONS AND PROCEDURE FROM THE EXPERIMENT. THERE ARE ALSO THE RESULTS OF A PARTICULAR SUBJECT. FOLLOW THE TEXT CLOSELY AS IT IS PLAYED ON THE TAPE-RECORDER. AT THE APPROPRIATE INTERVALS, YOU WILL BE GIVEN AMPLE TIME TO COMPLETE A NUMBER OF SHORT QUESTIONS.

DO YOU HAVE ANY QUESTIONS ABOUT THE PROCEDURE?
REMEMBER, YOU ARE TO PLAY THE PART OF THE OBSERVER-TEACHER.

THE SUBJECTS ARE SCHEDULED TO ARRIVE SUCCESSIVELY, SEPARATED BY A FEW MINUTES.

WHEN THE FIRST SUBJECT ARRIVES, THE EXPERIMENTER EXPLAINS THAT:

"The purpose of the study in which you are participating today is to learn about the teacher's role in the teacher-learning process and how it is affected by TV instructions.

As so often occurs, especially in practice teaching, there is both a teacher and observer-teacher present in the classroom.

As you can see, there is both a television camera and monitor. This will allow both the student and the teacher to monitor each other through our closed circuit television system. Note also the switch on the student's desk which he will turn on at the beginning of each problem session. This switch turns on a light bulb in the teacher's room and indicates the student is working on the problems. Should the light be turned off, this will indicate the student has given up working on the problems.

Now, if you will follow me, I'll show you where the observer-teacher will be located. You can wait there until the next subject arrives and we continue with the experiment."

THE SUBJECT IS SHOWN THE ROOM WITH THE ONE WAY MIRROR, LOOKING INTO THE TEACHING ROOM, AND ASKED TO WAIT THERE UNTIL THE NEXT SUBJECT ARRIVES. THE EXPERIMENTER LEAVES THE SUBJECT AND AWAITS THE ARRIVAL OF THE SECOND SUBJECT. WHEN THE SECOND SUBJECT ARRIVES, THE EXPERIMENTER REPEATS:

"The purpose of this study in which you are participating today is to learn about the teacher's role in the teacher-learning process and how it is affected by T.V. instructions.

As so often occurs, especially in practice teaching, there is both a teacher and observer-teacher present in the classroom. This is essentially the situation we will have here today.

As you can see, there is both a television camera and monitor. This will allow both the student and the teacher to monitor each other through our closed circuit television system. Note also the switch on the student's desk which he will turn on at the beginning of each problem

session. This switch turns on a light bulb in the teacher's room and indicates the student is working on the problems. Should the light be turned off, this will indicate the student has given up working on the problems.

Now, if you will follow me, I'll show you where the observer-teacher will be located, and introduce you to one of the other subjects."

THE SECOND SUBJECT IS THEN BROUGHT INTO THE OBSERVATION ROOM AND BRIEFLY INTRODUCED TO THE FIRST SUBJECT. THE EXPERIMENTER THEN SAYS:

"As I previously mentioned to both of you, there are two teaching roles in this experiment, a teacher and an observer-teacher. We will decide by tossing a coin which one of you will be the teacher and which the observer-teacher."

THE EXPERIMENTER LEAVES THE SUBJECT TO BE THE OBSERVER-TEACHER IN THE OBSERVATION ROOM AND INSTRUCTS HIM TO

"Just watch the proceedings and I will return in several minutes with some further instructions for you."

THE EXPERIMENTER THEN TAKES THE TEACHER INTO THE TEACHING ROOM ON THE OTHER SIDE OF THE ONE WAY MIRROR. HE SHOWS HIM THE TELEVISION CAMERA AND THE MONITOR. HE THEN SEATS HIM AT THE TABLE IN FRONT OF THE BLACKBOARD AND ADDRESSES HIMSELF AS FOLLOWS TO THE TEACHER:

"Your task will be to teach the student certain statistical concepts concerning such ideas as frequency distribution and measures of central tendency.

As you have already seen, the student will be watching you on his television monitor. For awhile at the beginning you will be able to watch the student on the monitor over there beside the camera. However, for some people we leave the monitor on during the lessons and for others we turn it off. In your case the monitor will be turned off before you begin the lessons and not turned on again until you have completed all your lessons.

Here is the material which I would like you to present to the student. You will have approximately 20 minutes to present this material to the student. These 20 minutes will be broken into four 5 minute periods. At the end of each period the student will do a set of problems. There will be six problems in each set. Thus you will have an opportunity to evaluate his work through the problems that he will be doing. This opportunity will occur after each of the five minute periods. After you have scored the student's performance, please place the score in the appropriate place on the diagram on the board. Note that at the end of the four lessons the student will be given a review set of problems.

Problem set order	Score
First	
Second	
Third	
Fourth	
Review	

I will bring the problems to the student in order that you have an opportunity to prepare the next lesson.

Now, please take the next few minutes to read over the background material and problems for the first lesson. You may wish to make your own notes on the paper provided. Any questions?

THE EXPERIMENTER THEN LEAVES THE ROOM SAYING, "I'm just going to give the other subjects their instructions."

THE EXPERIMENTER THEN RETURNS TO THE OBSERVER-TEACHER AND SAYS,

"As you have heard, the teacher will be instructing the student about certain statistical concepts such as frequency distribution and measures of central tendency, and evaluating his progress through a number of different problems sets. The scores for each of these problem sets will be recorded on the board, so you too will have an opportunity to observe them. I would like you to follow closely both the teacher's and student's performance. Here are the lesson plans, the problems and the answers to the problems. Any questions?"

THE EXPERIMENTER RETURNS TO THE TEACHER'S ROOM AND TELLS THE TEACHER, "I'm going to get the student, settle him in his room, and explain to him his part in the study. You can watch while I give the student his instructions, then continue with your lesson plans. I'll return shortly."

THE EXPERIMENTER THEN TURNS ON THE MONITOR AND LEAVES. THE EXPERIMENTER USHERS THE THIRD SUBJECT INTO THE THIRD ROOM AND EXPLAINS TO HIM HIS ROLE AS FOLLOWS,

"Your job today is really quite simple. We're going to have someone try to teach you something over TV instead of in a classroom. On your monitor you will see your teacher who will be giving you four brief lessons concerning certain statistical concepts such as frequency distribution and measures of central tendency. After each lesson you will have a few problems to do. Note the switch on your desk. You must turn this on at the beginning of each problem session and turn the switch off if you stop working on the problems. So it is important that you listen closely and do your very best. Do you have any questions?"

THE EXPERIMENTER THEN RETURNS TO THE TEACHER'S ROOM, SHUTS OFF THE MONITOR AND PREPARES THE TELEVISION CAMERA.

THE TEACHER GIVES HIS LESSON (SEE APPENDIX FOR LESSONS AND PROBLEM SETS. EACH LESSON IS FOLLOWED BY THE PROBLEM SET FOR THAT LESSON. NOTE ALSO THAT THERE IS A FINAL REVIEW PROBLEM SET), AFTER WHICH THE EXPERIMENTER TAKES THE FIRST PROBLEM SET TO THE PUPIL. AS HE LEAVES, HE SAYS TO THE TEACHER,

"Plan what you are doing to say next." THE EXPERIMENTER RETURNS AFTER THE STUDENT HAS COMPLETED THE PROBLEMS AND ALLOWS THE TEACHER TO CORRECT THEM. THE TEACHER THEN RECORDS THE MARK ON THE BOARD, FOR EXAMPLE, AS FOLLOWS:

Problem set order	Score
First	1/6

GIVEN THE ABOVE INFORMATION, PLEASE COMPLETE THE FOLLOWING QUESTIONS

OBSERVER-TEACHER QUESTIONNAIRE

On the following scales, try to answer the question by putting an x in the appropriate interval.

How would you rate the student in terms of his performance?

poor

excellent

How confident are you in this rating?

not very confident

very confident

How would you rate the student's ability?

poor

excellent

How confident are you in this rating?

not very confident

very confident

How would you rate the student's effort? .

poor

excellent

How confident are you in this rating?

not very confident

very confident

231.

How would you evaluate the teacher's performance?

poor

excellent

THE EXPERIMENTER THEN RETURNS THE PAPER TO THE STUDENT AND WHEN HE RETURNS HE TELLS THE TEACHER A NEW PRESENTATION PERIOD IS BEGINNING. THE SAME PROCEDURE IS USED FOR ALL THE LESSONS.

THE FOLLOWING SUMMARIZES THE STUDENT'S PERFORMANCE ON ALL THE LESSONS:

Problem set order	Score
First	1/6
Second	3/6
Third	5/6
Fourth	6/6
Review	6/7

KEEPING THE ABOVE INFORMATION IN MIND, PLEASE COMPLETE THE QUESTIONS WHICH APPEAR ON THE FOLLOWING PAGES.

OBSERVER-TEACHER QUESTIONNAIRE

Why did the student perform as he did?

Please comment on the use of closed-circuit
television as the means of instruction in this
experiment.

Rank order the following items with regard to possible reasons for the student's performance.

Place the most important reason first, and the least important reason last:

student's ability, teacher's presentation,
student's motivation, the use of television
✓ as an instruction medium, other (give reason)

1. _____

2. _____

3. _____

4. _____

5. _____

Do you agree with the use of closed-circuit television as a medium of instruction for university students? For students in general? Why or why not?

On the following scales, try to answer the question by putting an X in the appropriate interval.

How would you rate the student in terms of his performance:

poor

excellent .

How confident are you in this rating?

not very
confident

very
confident

238.

How would you rate the student's ability?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

239.

How would you rate the student's effort?

poor

excellent

How confident are you in this rating?

not very
confident

very
confident

240.

How would you evaluate the teacher's overall
performance?

poor

excellent

WHILE THE TEACHERS ARE COMPLETING THE QUESTIONNAIRES, THE EXPERIMENTER HAS THE STUDENT SELF-ADDRESS AN ENVELOPE IN WHICH HE WILL EVENTUALLY RECEIVE INFORMATION REGARDING THE OUTCOME OF THE STUDY. SIMILARLY, THE TEACHERS, UPON COMPLETING THEIR QUESTIONNAIRES, SELF-ADDRESS ENVELOPES. THE SUBJECTS ARE CAUTIONED NOT TO DISCUSS THE EXPERIMENT AND EACH ONE IS DISMISSED INDIVIDUALLY.

APPENDIX 5

CLOSED-CIRCUIT TELEVISION DATA

Issues Relating to the Use of Closed-Circuit Television
as an Instruction Medium

Three questions were directed to the subjects regarding the use of closed circuit television as an instruction medium (see Appendix 2, p.164). Responses to each of the questions were divided into three categories, as follows: "Yes" indicating complete agreement with such use, "No" indicating complete disagreement with such use, and "Qualified" indicating agreement or disagreement with a proviso, e.g. that the lectures be of a high quality, well taught, etc. The results for the questions are summarized in Tables 21 and 22 (Appendix 1, p.162). Assignment of the categories was completed by two independent raters with an inter-rater reliability of 97 percent (mutual agreement).

The first question required the subject to "Comment on the use of closed circuit television as a means of instruction in this experiment." For Experiment 1, examination of the total number of responses regardless of the experimental condition, resulted in no significant differences ($\chi^2=1.01$, $df=2$, n.s.) between active-teacher and observer-teacher responses (Table 21 (5), Appendix 1, p.162). Combining these two groups indicates 10.2 percent replied "Yes",

60 percent replied "No", and 29.8 percent gave a "Qualified" answer. A significantly greater percentage of all subjects therefore replied in the negative ($X^2=44.45, df=2, p<.01$). Division of the responses according to whether the final performance of the student was high or low indicated there were significantly more "No" answers for both the active-teachers ($X^2=8.10, df=1, <.01$) and active-observers ($X^2=5.52, df=1, p<.02$) in the conditions where the final performance was low.

Examination of this question in Experiment 2 indicated there were no sex differences in the manner of response ($X^2=3.15, df=2, p<.30$) so the data was combined across this variable. Fifteen percent replied "Yes", 50 percent replied "No", and 35 percent gave a "Qualified" answer. Again, these differences were statistically significant ($X^2=7.39, df=1, p<.05$) with considerably more subjects replying in the negative. However, combining the "Yes" and "Qualified" categories eradicates any difference in manner of response. There were no significant differences in manner of response between experimental roles.

The second question asked of subjects was "Do you agree with the use of closed circuit television as a medium of instruction for university students? There were no differences in Experiment 1 between active-teachers' and active-observers' mode of response ($X^2=4.14, df=2, p<.10$). The results for Experiments 1 and 2 presented in Tables 21 and 22 (Appendix 1, p.162) indicate significant differences in manner of response ($X^2=49.4, df=2, p<.001$ for Experiment 1; $X^2=12.34, df=2, p<.01$, for Experiment 2). Thus, about 50 percent of subjects indicate at least reservations in advocating the use of closed circuit television for use with university students.

The third question asked subjects; "Do you agree with the use of closed-circuit television as a medium of instruction for students in general?" Consistent with the response patterns of the previous question, there were no significant differences in Experiment 1 between the responses of active-teachers and active-observers ($X^2=1.20, df=2, p<.50$). The percentage of respondents in each category are presented in Table 21 and 22 (Appendix 1, p.162). There are significant differences in response patterns for both

Experiments 1 ($X^2=49.85, df=2, p<.001$) and Experiment 2 ($X^2=10.39, df=2, p<.01$). Only 3 or 10 percent, respectively, of the subjects are in complete favour of the use of closed-circuit television, with the majority (97 or 90 percent, Experiments 1 and 2 respectively) of students either outrightly against its use, or at least holding certain reservations about its use generally.

The uni-directional communication system in this experiment was not endorsed by the majority of subjects in both Experiment 1 (60 percent) Table 21 (Appendix 1, p. 162), Question 1, and Experiment 2 (50 percent) Table 22 (Appendix 1, p. 163) Question 1. Subjects in the experimental conditions where the student's final performance was poor (H-L, L-L) consistently made a greater number of negative responses as compared to subjects with students whose final performance was adequate (Tables 21 & 22, Appendix 1, p. 162). This is consistent with the assignment of responsibility for performance, particularly in the H-L condition. In this condition, active-teachers were more likely to place responsibility for the student's performance on situational factors.

The lack of two-way communication presents numerous problems to both the teacher and the student. Subjects mentioned a variety of reasons for the ineffectiveness of this particular communication system, which parallel those discussed by Reed (1971):

(1) The teacher has no way of judging if the pace is adequate, if greater content elaboration is needed, or whether he is "getting through".

(2) The student is denied the opportunity to ask questions, to ask for clarification or benefit from discussion.

(3) If the learning process is to proceed at a high level of efficiency, by continuously reinforcing the correct responses, educational television is not ideal. The student's response may be incorrect, and due to the slow feedback to the teacher, responses may be inadequately or inappropriately reinforced.

(4) The absence of personal contact reduces emotional support.

Even when replying to the question of closed-circuit television for university students or students in general, subjects tended to reply with a "No" or

"Qualified" answer (Tables 21 & 22, Appendix 1, p. 162).

What are the possible implications of the results for the current and future use of closed-circuit television in education? It may be the case that this method of instruction is not as effective for college students as it is for primary and secondary school students, for at least the following reasons (Reed, 1971). First, at the higher educational levels, a lack of feedback presents a greater problem for consequent lessons. Is the teacher to assume his student has mastered a theoretical concept after only a single presentation, or does he repeat his points in the following lecture? Secondly, television did not play as large a part in the environment of students currently at the college level, while growing up, as compared to lower level students. Thirdly, different age groups have different preferences for the media. Finally, college professors today are often not as receptive to the use of closed-circuit television.

However, the evidence currently available indicates that "there is no longer any reasons to raise the question whether instructional television can serve as an efficient tool of learning. This is not to say

it always does, but the evidence is now overwhelming
that it can, and under favourable circumstances, does"
(Chu & Schramm, 1967).

END

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