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Cue-to-consequence effects in an associative account of causal attribution

Jill Ann Kuhn

CUE-TO-CONSEQUENCE EFFECTS IN AN ASSOCIATIVE ACCOUNT OF CAUSAL ATTRIBUTION

A Thesis

Presented to the

Faculty of

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In Partial Fulfillment

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ABSTRACT

This study contributes to the integration of modern conditioning theory and attribution research by investigating social analogs of cue-to-consequence effects in causal judgments. Attribution research has benefitted from distinguishing between internal and external causes and effects. The masking task used in the present study described a worker in a fictional company in which his high level of job skill (internal antecedent) or his high productivity quota (external antecedent) was paired with either his level of job satisfaction (internal consequent) or his level of productivity (external consequent). Results indicated that internal antecedents were readily associable with both internal and external outcomes, whereas an external antecedent was more associable with an external cause than an internal cause. Furthermore, external outcomes were readily associable with both internal and external causes whereas an internal consequent is more associable with an internal cause. These findings may, in part, be explained by cue-to-consequence consistency and inconsistency, and are compatible with the fundamental attribution error and correspondent bias.

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INTRODUCTION

Interest in the rules for determining cause and effect relationships have been far reaching and cross over into numerous disciplines including social psychology (Kelley, 1973; Jones and Davis, 1969), learning theory (Rudy & Wagner, 1975; Rescorla, 1968; Kamin, 1968; Shanks & Dickinson, 1987; Wasserman, 1990) and mathematical psychology (e.g., Medcof, 1990). As early as the 18th century British Associationists were interested in cause and effect. David Hume, utilizing a highly deterministic associative process to explain causal judgments, outlined a number of rules for causal association. Numerous philosophers and scientists have drawn from his original ideas in the development of modern day attribution theory.

Kelley's (1973) ideas of cause and effect are consistent with the old model of classical conditioning and are important in the understanding of human causal judgments. However, contemporary learning theory may offer a more thorough approach. The field of contemporary learning theory has synthesized the most recent findings in associative learning (Rescorla, 1968) and this synthesis needs to be taken into consideration when examining cause and effect relationships.

Drawing from Garcia and Koelling's (1966) findings that some stimuli are more associable with some signals than with others (cue-to-consequence), I examined the possibility that there exists a "socio-logical" constraint in the associability of particular causes and particular events. As part of a larger program of research, the present study utilizes contemporary learning theory to advance predictions concerning the proposition that certain causes are more readily connected to certain effects than to others. For example, internal causes should be more readily connected to internal effects than to external effects. Furthermore, external causes should be more readily connected to external effects than to internal effects. In other words, cue-to-consequence consistency will promote stronger associations, and therefore stronger causal judgments, than cue-to-consequence inconsistency.

Social Psychology

During the last 20 years research into cause and effect by attribution theorists has been profuse, encompassing over 4,000 studies (Harvey & Weary, 1984). The examination of perceived causes for a particular person's behavior is identified as "attribution theory." Simply put, attribution theory attempts to explain the inference of causal relationships as a process. In this process people attempt to determine the causes of other people's behaviors and gain understanding of their traits and dispositions. As early as

the 1700's ideas were being generated about the psychology of causation. Historical approaches to causality have been used in constructing and testing present day theories. These historical approaches have been influenced by a powerful philosophical tradition. For example, Einhorn and Hogarth (1986) have discussed how, "workers in attribution theory have tended to follow Kelley (1967) in emphasizing Mill's (1972) criteria for concomitant variation and the method of differences" (p. 3). Michotte (1946), in his explanation of how people perceive cause, drew extensively from Hume's (1886/1964) ideas which have been adopted by even more recent investigations into attribution.

A pivotal figure in the present day understanding of causality is David Hume. He utilized a highly deterministic associative process to explain causal judgments. In "A Treatise of Human Nature" (1964/1739) he made a number of observations regarding causal relationships that have been combined into three main rules. First, he suggested that causes precede effects. His second rule is described as spatiotemporal contiguity, in which there must be close temporal and spatial contiguity between causes and effects. Lastly, he emphasized consistency in the cause and effect relationship (i.e causes and effects occurring together and not alone). Additionally, Hume added a fourth rule which later became seminal in Kelley's development of the covariation principle. His fourth rule can be described as

the same cause always produces the same effect and the same effect does not occur except with the original cause. Finally, Hume hypothesized two more rules of causality; similarity (if several different objects produce the same effect, it must be by means of some quality common among them) and difference (the difference in the effects of two similar objects must stem from the ways in which they differ). These two ideas were later adopted by Kelley (1972, 1973) in the formulation of the discounting principle which will be discussed below.

Heider (1944, 1958) suggested that people search for explanations in other people's behavior in the world around us in order to reduce or avoid stress. Furthermore, he suggested that people become alarmed when they cannot accurately guess what will happen next. Hence, we use the "attribution process" to predict others' motives which we think make their behavior more predictable and hence less stressful to us as observers.

Heider was interested in knowing how ordinary people or "naive psychologists" as he called them, understood the relationships between causes and events. He emphasized the human motive to stabilize the perceived environment by appropriate cause-effect assignments. Similar to Heider's idea that searching for causes reduces stress, critical realists (e.g., Harre, 1972) posit that looking for causes is biologically adaptive and therefore may be a part of the

human biological makeup. Hence, it may be possible that humans are biologically prepared to associate certain causes and certain effects more readily than others. Furthermore, Hansen (1980) suggested that a perceivers' information search is guided by their naive causal hypotheses and that they arrive at multiple explanations as to the cause of an event. In an attempt to advance their "naively generated hypotheses" (p. 1), perceiver's utilize a principle called cognitive economy in which perceiver's attempt to confirm rather than disconfirm their original idea. They use information that allows for the simple process of covariation rather than a more complex analysis of augmentation and discounting.

Thibaut and Riecken (1955), drawing from Heider (1944) and Michotte's (1946) ideas, demonstrated that certain information about behavior and the circumstances of its occurrence are used by the observer to infer its cause. Using Heider's (1944) ideas as a foundation, Jones and Davis (1969) developed a theory of correspondent inference which focuses on the relationship between the effects of an action and the dispositions revealed by those effects. This theory states that if the environment is not seen as a sufficient explanation for the person's behavior, the observer will then attribute the behavior to something inside the person (i.e., characteristics, motives, or dispositions).

Attribution is affected by information about the action

just observed and is used to presume the intent of that action. Kelley proposed the covariation principle after examining Heider's (1944) suggestion that people might use a variant of Mill's method of differences when choosing a cause from a large array of potential causes. The covariation principle of attribution states that we look for causes and effects that covary. That is, the effect is attributed to that cause which is present when the effect is present and is absent when the effect is absent (Kelley & Michela, 1980). This is similar to early Pavlovian conditioning models which discuss the importance of contiguity of events. That is, whenever there is a cause that is present there is an effect and when the cause is absent so is the effect (recall Hume's second and third rule).

In some situations the available information is not utilized, instead, a simpler strategy for making an attribution is employed. For example, in a situation where there are multiple potential causes the observer ignores the available information that could be utilized to determine a cause and instead relies on long held beliefs. That is, rather than taking into account the immediate information available in making an attribution, observers will engage in "cognitive misering" (i.e. a shortcut) and rely on their long held beliefs. With causes there are expectations about effects and with effects there are certain assumptions about

causes. As a result of these beliefs, explanations are often given for events without the complex level of analysis implied by the first class of antecedents, i.e. information. In other words observers do not utilize the available information but instead rely on long held beliefs.

There are expectations about actors in which the good behavior of a liked person and the bad behavior of a disliked person is attributed to dispositional or internal traits whereas the good behavior of a disliked person and the bad behavior of a liked person is attributed to situational or external factors. In short, people utilize the simplest strategy for making an attribution. Rather than spending the time analyzing the information available, people often will use their long held beliefs in arriving at a conclusion. So, if Jay is running across the street and an observer is trying to determine why, she is going to rely on her beliefs about why people run across streets and not evaluate the information at hand in this particular instance. If her experience is typical she may assume Jay is running for a bus stop because he is late, rather than attributing his exertion to an internal cause, such as voices in Jay's head.

As posited above, attributions following from the covariation principle require multiple observations. For instance, when multiple observations are not possible, Kelley (1972, 1973) proposed two other principles, the

discounting principle and augmenting principle, governing casual attributions. According to Kelley (1973) causes can be inhibitory (discounted) or facilitative (augmented) and similar to other theories (e.g., Duvall & Wicklund, 1973; Jones & Nisbett, 1969) they can also be internal (personal dispositions) or external (situational). The discounting principle suggests that, "The role of a given cause in producing a given effect is discounted if other plausible causes are also present" (p. 113).

A converse of the discounting principle is the augmenting principle which Kelley (1973) states is utilized in single observation situations by observers. The augmenting principle suggests that, "the presence of the external cause serves to heighten the impression that an internal cause is present and a potent force." (p. 113). Kelley (1973) goes on to say, "if for a given effect, both a plausible inhibitory cause and a plausible facilitative cause are present, the role of the facilitative cause in producing the effect will be judged greater than if it alone were present as a plausible cause for the effect" (p. 114). For example, if a company is failing to meet its productivity goal and Doug is a worker in this company and subsequently Todd is hired and the company begins meeting its goal, Todd's effectiveness as a predictor in meeting the company goal is going to be increased regardless of his new employee status. That is, Todd's effectiveness is going to

be seen as associated with the goal and his causal status will be augmented.

Kelley (1973) also outlined three major tools people utilize in the making of an attribution; consensus, consistency, and distinctiveness. In using consensus information we examine how other people react to the same stimulus. If a group of people are watching a Three Stooges movie we can gauge one of the viewer's (Joe) response to the other people in the audience. It gives us a level of confidence in our judgment as to why Joe is laughing if other people are also laughing. Second, consistency refers to the extent the person we are observing reacts to the stimulus in the same way on other occasions. We ask ourselves does Joe always laugh when the Three Stooges are on? If Joe is consistent in his behavior he reacts in the same way each time. Thirdly, the extent to which a person reacts in the same manner to a different stimulus as the one we are presently observing provides distinctiveness information. We ask ourselves whether Joe laughs at all comedy situations or does he laugh at only the Three Stooges?

Attribution theory offers a number of explanations about how people determine why other people behave in a particular manner. The primary focus, though, has concentrated on examining the causes or antecedents of behaviors with a limited examination of outcomes or effects

for behavior (Buss, 1978). Therefore, using a more complete analysis, this study will look at both causes and effects.

Learning Theory

Classical conditioning theory has traditionally been understood as the acquired capability of a conditioned stimulus (CS) to elicit a response (conditioned response = CR) to another biologically significant stimulus (unconditioned stimulus = US) simply because of their pairing. For example, if a tone (CS) is paired with food (US) an animal will eventually salivate (CR) to the tone (CS). This outdated conceptualization posed by Pavlov and other early learning theorists (e.g. Hull, 1943; Spence, 1956) fails to adequately define the situations that produce learning or describe the extent of that learning (Rescorla, 1988).

An examination of contemporary classical conditioning literature indicates a lively interest in the impact of context on conditioning. The issues raised by contextual variation fall within a general class of problems termed stimulus selection. Rudy and Wagner (1975) describe the stimulus selection problem as "one of specifying the rules whereby a relationship will or will not appear to be learned about depending upon the context of environmental events in which it is embedded" (p. 270). For example, if the CS is a compound of two stimuli, and one of them is more salient than the other, it will most likely be the one conditioned.

The less salient CS will be overshadowed. That is, if two stimuli which are effective in producing conditioning when alone are presented together as a compound, one of the stimuli, as a result of certain unconditioned properties of the stimuli, may completely dominate the other.

More than 20 years ago the stimulus selection problem was investigated by Rescorla (1968). He showed that although two stimuli, light (A) and tone (X), shared the same contiguity, they differed in the amount of information that they gave about the experimentally administered shock. He showed that stimulus X in an AX compound would support less conditioned responding if stimulus A had been associated with reinforcement (+) prior to AX+ training than if stimulus A had no training prior to the association of AX with reinforcement. Rescorla determined that it was the contingency between the CS and US which allows for conditioning to occur. He defined it as, "the relative probability of occurrence of the US in the presence of the CS as contrasted with its probability in the absence of the CS". (p. 1.) Specifically, conditioning relies on the information that the CS provides about the US and not on the contiguity. The idea of contingency takes into consideration what events are not paired rather than just the events that are paired. Recall, that in Kelley's attribution theory the "covariation principle" is a contiguity mechanism.

Kamin (1968) reached the same conclusion as Rescorla by examining another area of conditioning known as the "blocking effect." The group that received training of the light/shock association blocked the learning of the tone/shock association during the second phase (light + tone) of training. Kamin's blocking effect also demonstrates that although the stimuli were contiguous, informational level was important. That is, it was not simply the fact that two stimuli were paired together but rather something about the actual cause that yielded information about the effect. Had it only been a matter of contiguity the tone would have become well conditioned in both groups. That is, regardless of subjects previous experience with the light, the tone should have come to elicit conditioned responding. This demonstrates that the effectiveness of a US for producing associative learning depends on the relationship between the compound CS and the expected outcome (Kamin, 1969; Rescorla, 1968; Wagner, 1969; Rescorla & Wagner, 1972; Wagner & Rescorla, 1972). Hence, it can be said that attribution theories, in social psychology, have fallen prey to the limitations noted above when examining cause-effect relations from an associative learning perspective. It is suggested that the advances made in contemporary learning theory can also be applied to the understanding of human social causal judgments which presently is limited in scope.

Cue-to-Consequence

In addition to the examination of temporal and logical relations among events, an important aspect of learning is the actual properties of the events themselves. Organisms have a representation of how events are ordered and their properties. To suggest, as classical conditioning would, that organisms have no preconception about the world is erroneous. Animals do not enter a conditioning paradigm free from previous experience or free of biological relevance.

It has become evident that some events are more associable with some signals than with others. Garcia and Koelling (1966) showed in their groundbreaking work evidence for a concept we now call "cue-to-consequence". An internal distress was easier to associate with a gustatory cue (taste) than an auditory-visual stimulus, whereas a peripherally administered pain was more readily associable with the auditory-visual stimulus. Garcia and Koelling suggested that, "natural selection may have favored mechanisms which associate gustatory and olfactory cues with internal discomfort since the chemical receptors sample the materials soon to be incorporated into the internal environment" (p. 124). Gemberling and Domjan (1982) have demonstrated the same phenomenon in one day old rats. Furthermore, Kucharski and Spear (1984) have provided evidence for a socio-biological constraint in a similar

series of studies with rats under 2 weeks of age in which they showed that rats have an inability or a severe deficiency in associating an odor and a footshock. These findings provide impetus for the search for biological constraints in human learning.

At this point it can be suggested that there perhaps exist socio-logical constraints in humans' causal judgments based on multiple observations of socio-logical antecedent and consequent events. We may have a learned tendency to make certain associations over others. That is, as the result of experience, certain stimuli are more associable than others.

Social Learning Theory

Although in the past human and infrahuman studies were conducted side by side, about 20 years ago they were separated and categorized into completely different areas of study (Gluck & Bower, 1988). In spite of this, Lovibond (1988) has suggested that there is a substantial analogy between animal and human associative learning and that the study of human cognitive processes can be aided by the study of animal learning.

The most recent approaches to the study of human attributions or causal judgments have employed a contemporary learning perspective and suggest that there may be some communality between human and animal learning. Alloy and Tabachanik (1984) proposed a theoretical framework

in which there can be an understanding of both animal and human covariation assessment. Furthermore, Algom and Bizman (1983) suggested that attribution can be examined in terms of a conditioning interpretation. Shanks and Dickinson (1987) echoing the sentiments of David Hume, stated that, "a causal judgment is seen as reflecting no more than the strength of the relevant association between the mental representations of the cause and effect, with the principles governing such attributions being those of associative learning" (p. 230). They contend that attributions follow from the perceived associative strengths between stimuli and that we should return to examining causal judgments the way we have historically so we can discover phenomena that other disciplines, such as cognitive psychology, have failed to discover.

In fact, many researchers have already taken various social phenomenon and examined them from a conditioning perspective; attraction (e.g. Cramer, Weiss, Steigleder, and Balling, 1985), sex roles (Cramer, Lutz, Bartell, Dragna & Helzer, 1989), emotions (e.g. Lanzetta & Orr, 1980, 1981), attribution (e.g., Cramer, Helzer, & Mone, 1986), and attitudes (e.g., Weiss, Buchanan, Altstatt, & Lombardo, 1971).

Heider (1944) claimed that people examining the environment for perceived causes are "naive psychologists". Similarly, Rescorla (1988) suggested that the "CS/US

relations required for conditioning are very similar to those that a rational scientist would demand to conclude that the CS is the cause of the US" (p. 336). So, it can be suggested that just as a scientist would examine the relations demonstrated before concluding a cause, so does the person on the street examine rules whereby a relationship can be determined.

In trying to determine which of the cues was most relevant, or what stimuli were most likely to be associated with a particular effect Wasserman (1990) studied a phenomenon he labeled the "competition principle". Subjects were asked to determine the strength of three foods (peanuts, shrimp, and strawberries) in causing a hypothetical patient's allergic reaction. Food combinations were varied along with the presence or absence of an allergic reaction. He found that if a subject can predict that the shrimp causes the allergic reaction and peanuts do not then shrimp is given higher causal authority. That is, shrimps and peanuts have differing associative strengths. But, if a subject can't discriminate whether it is the shrimp or the peanuts that are causing the allergic reaction both are given causal priority. That is, they both have the same associative strength. So, when subjects are trying to determine the effect from multiple causes they use information about the differential predictiveness of each of the stimuli.

Similarly, demonstrating how the blocking design (Kamin, 1969) can be utilized, Shanks and Dickinson (1987) explored cue competition in human causal judgments. They hypothesized that a blocking like effect would occur in causality judgments when the number of pairings of the causal background, a minefield, with the outcome, tanks exploding, was increased. Their results demonstrated a definite blocking effect in that subjects' causal judgments for the blocking condition were below those for the control group.

As demonstrated in the previous studies subjects use information about the differential associative strength of stimuli in making a causal judgment (Shanks and Dickinson, 1987; Wasserman, 1990). In addition, to a rule governed system for making causal judgments in the context of causal events, biological constraints and relevance may necessitate the selection of certain stimuli over others. In fact, numerous attribution situations that presently are difficult to explain may be understood in contemporary learning terms. Utilizing a social-learning approach, the consequence is the behavior or effect awaiting a causal attribution while the CSs are the numerous possible causes which could bring about the effect. Therefore, it may be possible to address social casual judgments in terms of the stimulus selection problem. Given a particular situation or context what rule or rules do observers use when attributing a cause to an event. That

is, by what rules does a person attribute a particular cause to a particular effect based upon the social context in which these two stimuli are embedded?

STATEMENT OF THE PROBLEM

Theories explaining social casual judgments, particularly the theories developed by Jones and Davis (1969) and Kelley (1973), rely heavily on historically based conditioning principles (i.e., simple contiguity and the covariation principle). As a result, much of the theorizing in attribution research done by social psychologists has not taken advantage of contemporary conditioning theory and research results. The purpose of the present study is to contribute to the integration of conditioning and social attribution research by investigating the possibility of cue-to-consequence effects in social causal judgments. I propose to investigate the possibility that some social stimuli in the role of antecedents and others in the role of consequences are not equally associable.

At this time there is no biologically based theory for determining which social stimuli may be more associable (see Garcia, McGowan, & Green, 1972). At this initial exploratory stage my purpose is to investigate possibilities for unequal associability among social stimuli based on socio-logical constraints on relationships. That is, some social stimuli in the form of causes and others in the form of effects may be logically easier to associate than others.

Hansen (1980) alludes to the possibility of a sociological constraint when he discusses the role of "common sense" in attribution judgments. For example, laughter is presumed to be caused by something about the stimulus person rather than something outside of the person. Hence, there exists certain constraints in the making of social causal judgments in that certain connections are more commonsensical than others.

Cue-to-consequence consistency will promote associations and therefore produced stronger causal attributions than cue-to-consequence inconsistency. Specifically, I am investigating the possibility that an internal antecedent paired with an internal consequent will result in stronger cause-effect judgments than an internal antecedent paired with an external consequent. Secondly, I am predicting that an external antecedent paired with an external consequent will result in stronger cause-effect judgments than an external antecedent paired with an internal consequent. I am also investigating the possibility that an internal antecedent paired with an internal consequent will result in stronger cause-effect judgments than an external antecedent paired with an internal consequent. And finally I am predicting that an internal antecedent paired with an external consequent will result in stronger cause-effect judgments than an external antecedent paired with an external consequent.

Subjects, playing the role of a supervisor were asked to evaluate a worker in a fictional company. The worker, Joe, was described as either having a high level of job skill (internal cause) or having to meet a high quota standard (external cause). Subjects were given information about Joe's job satisfaction (internal effect) or Joe's level of productivity (external effect). I predicted that pairing Joe's job skill with Joe's level of job satisfaction will result in stronger causal attributions to the skill stimulus than when job satisfaction is paired with Joe's level of productivity. I further predict that pairing Joe's high quota standard with Joe's level of productivity will result in stronger causal attributions to Joe's high quota standard than pairing Joe's high quota standard to Joe's job satisfaction. I am also predicting that pairing Joe's level of job skill with Joe's level of job satisfaction will result in stronger causal attributions to the skill stimulus than when job satisfaction is paired with Joe's quota standard. Finally, I am predicting that pairing Joe's quota standard with Joe's level of productivity will result in stronger causal attributions to the quota stimulus than when level of productivity is paired with Joe's level of job skill.

GENERAL METHOD

Subjects

Subjects were 41 males and 49 females who were randomly assigned to one of four experimental conditions. Subjects were recruited from undergraduate courses at California State University, San Bernardino. All subjects were treated in accordance with the Ethical Principles of the American Psychological Association. Four female and two male experimenters, all members of the Social Learning Research Group, conducted the experiment.

Experimental Design

In classical conditioning a discriminable antecedent stimulus is paired with a discriminable consequent stimulus. In this study the antecedent stimulus had 2 levels: 1. a worker named Joe with a high level of job skill (internal cause) and 2. a worker name Joe laboring under a high production quota standard (external cause). The consequent stimulus also had 2 levels: 1. the worker who is satisfied with his job (internal effect) and 2. the worker meeting his productivity goal (external effect). The antecedent and consequent stimuli were paired 12 times. Trial 1 was a tutored practice trial in which the experimenter explained the progression of the stimuli and trial 2 was an untutored

practice trial. Hence, the experimental design can be described as a 2 X 2 X 10 mixed design with the last variable being a repeated factor. The subjects' strength of causal judgments constituted the primary dependent variable. A secondary variable included subjects' confidence estimates in their causal judgments.

Masking Task

The learning experiment was masked by describing it as a study investigating a computerized employee evaluation system. This procedure allowed for repeatedly pairing an employee with information about his level of job satisfaction or company productivity. The instructions indicated that, "In this study we are interested in testing a computerized employee evaluation system. Your cooperation is necessary for testing the usefulness of this automated program. In order to carefully test the effectiveness of the system, it will be necessary for you to assume the role of a supervisor in a large company." Further instructions indicated that, "Joe is a college student who is available for part-time employment. It is important to evaluate him carefully because he will be considered for full-time employment upon graduation." (see Appendix A for instructions particular to each group.)

Apparatus and Materials

Previous research (Shanks & Dickinson, 1987) indicated that a computer presentation of stimuli is an effective way

to study the learning of causal relationships. Hence, the subject module was an IBM 360 PC. The computer program, Micro Experimental Language (MEL) version 120, controlled the presentation of the instructions, the antecedent and consequent stimuli, and worker evaluation items and manipulanda.

The subject module included a key pad numbered 0 to 100 which allowed the subject to respond to a three item employee evaluation scale (EES) designed to measure the worker's effectiveness following presentation of the antecedent and consequent stimuli. Depending on experimental group assignment subjects were asked to rate the effectiveness of the antecedent stimulus in causing the consequent stimulus and their confidence in making the rating. The two questions were anchored with the phrases; totally ineffective and totally effective and no confidence and complete confidence, respectively. In addition, all subjects were asked to indicate Joe's chances for becoming a permanent employee. The question was anchored with the phrase no chance and very good chance, and was included in order to sustain the masking task logic. All subjects were asked to answer the three questions on a scale of 0 to 100 (including 0 or 100).

Procedure

Upon entering the lab subjects were asked to read and sign a consent form (See Appendix B). After the subject

consented to participate the experimenter seated the subject in front of the module and started the MEL program. Subjects received instructions consistent with one of four treatment conditions. Following the instructions the antecedent stimulus appeared for 5 seconds on the left side of the computer monitor. After 5 seconds had elapsed the consequent stimulus then appeared on the right side of the computer monitor. After both the antecedent and consequent stimulus had been visible for an additional 10 seconds the entire computer monitor went blank, and item one from the EES appeared for 17 seconds. This procedure is analogous to delay conditioning in Pavlovian learning. Subjects were asked to respond to item one using a 0 - 100 point scale. Regardless of the speed in which subjects entered their response the screen remained illuminated for a full 17 seconds. Following the 17 second time period the screen went blank and item two appeared for 17 seconds. This sequence was repeated for item three. Following question three the program recycled to the antecedent stimulus, with the cycle repeating 10 times. After the subjects completed 10 cycles they were debriefed (See Appendix C) and were provided the opportunity to have any questions answered.

Group 1. The purpose of Group 1 was to pair an internal antecedent stimulus with an internal consequent (Stimulus materials for all 4 groups are presented in Appendix D). Subjects were 10 males and 12 females (N = 22)

who were exposed to a worker named Joe who had a high level of job skill and to Joe's reported level of job satisfaction 10 times representing monthly evaluation periods. Following each antecedent and consequent stimulus presentation subjects were asked, "Given all the information you have received, on the scale below indicate the extent to which Joe's high level of job skill was effective in causing his level of job satisfaction", "How confident are you about your rating of Joe's high level of job skill as being effective in causing his level of job satisfaction?", and "On the scale below indicate Joe's chances for becoming a permanent employee."

Group 2. The purpose of Group 2 was to pair an internal antecedent stimulus with an external consequent. This group of subjects was comprised of 9 males and 13 females ($N = 22$). They differed from Group 1 in the consequent stimulus they received; Joe's level of productivity. Following each antecedent and consequent stimulus presentation Group 2 subjects were asked, "Given all the information you have received, on the scale below indicate the extent to which Joe's high level of job skill was effective in causing his level of productivity," and "How confident are you about your rating of Joe's high level of job skill as being effective in causing his level of productivity?" Question three was identical to the one used in Group 1.

Group 3. The purpose of Group 3 was to pair an external antecedent stimulus with an external consequent. Subjects in this group were comprised of 10 males and 16 females (N = 26) and differed from Group 2 in that their antecedent stimulus was Joe having to meet a high quota standard. Following each antecedent and consequent stimulus presentation the subjects in Group 3 were asked, "Given all the information you have received, on the scale below indicate the extent to which Joe's high quota standard was effective in causing his level of productivity," and "How confident are you about your rating of Joe's high quota standard being effective in causing his level of productivity?" Question three was identical to the one used in Group 1.

Group 4. The purpose of Group 4 was to pair an external antecedent stimulus with an internal consequent. Group 4 subjects were 8 males and 12 females (N = 20) and differed from Group 3 in the consequent stimulus they received; a worker who is satisfied with his job. Following each antecedent and consequent stimulus presentation Group 4 subjects were asked, "Given all the information you have received, on the scale below indicate the extent to which Joe's high quota standard was effective in causing his level of job satisfaction," and "How confident are you about your rating of Joe's high quota standard as being effective in causing his level of job satisfaction?" Question three was

identical to the one used in Group 1.

RESULTS

Each subject provided 2 types of information, 1) estimates of the antecedent stimulus' causal strength and 2) confidence in his/her causal judgments. Both dependent variables were rated on a 0-100 point scale. All analyses reported below were performed on those data for the 10 measured trials.

US (Consequent Stimulus) Strength Curve

Five different graphs were utilized in the presentation of the consequent stimulus (a worker's job satisfaction or productivity). All subject's received 2 presentations of each of the 5 graph levels in random order. Although intensity of a unconditioned stimulus generally is not varied within a condition in traditional learning studies it is necessary to vary it in a social learning experiment. Identical graph levels would be redundant and would not provide the subject with a realistic representation of a worker's productivity or job satisfaction. That is, it is highly unlikely that a worker would have an identical level of productivity or an identical level of job satisfaction for 10 measured periods. Subjects did indeed respond to the consequent stimulus with progressively stronger causal judgments as a function of high levels of production and job

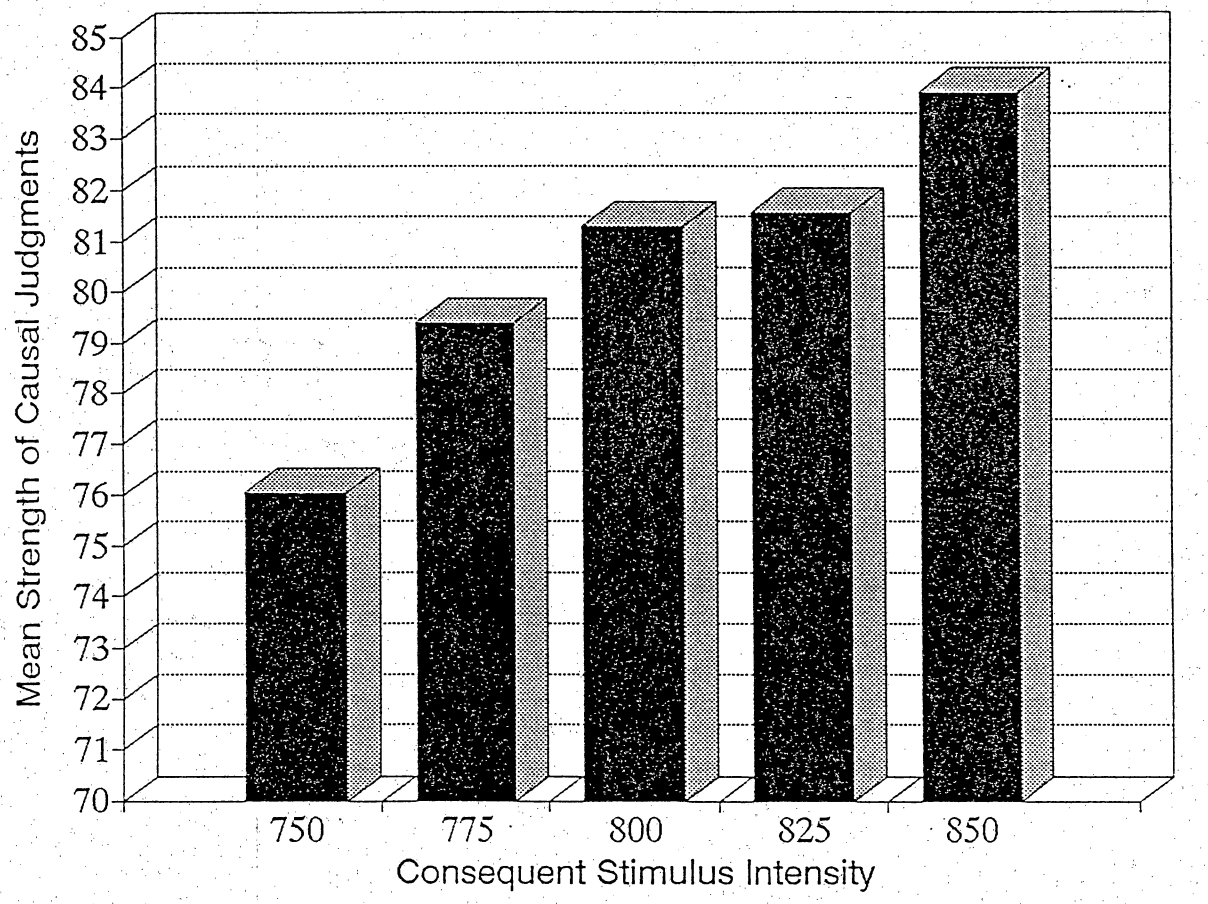
satisfaction (see Figure 1). This result indicates that subjects did indeed pay close attention to the stimuli presented using the MEL Program.

Confidence Rating

A method utilized by Shanks and Dickinson (1987) to determine subjects' confidence ratings in their causal judgments was employed in the present study. They suggested that a subject's confidence in their judgment must be consistent regardless of experimental group assignment otherwise their causal judgments may be a by-product of the causal task and not of their actual judgment. In other words subjects' causal judgments would be confounded with their confidence in making the judgment. To test subjects' confidence ratings their 10 ratings were reduced to blocks of 5 trials. A 4 X 5 (Groups X Trials) repeated measures ANOVA was employed to test the subjects' confidence ratings and neither the Groups effect nor the interaction were found to be statistically reliable. These results demonstrate that subjects were confident in their judgments regardless of experimental treatment. A trials effect, however, was significant, $F(4,344) = 7.85$, $p < .05$, indicating that the subjects' confidence in their causal attributions increased with repeated exposure to the stimuli.

Figure 1

Mean Strength of Causal Judgments as a Function of the Consequent Stimuli



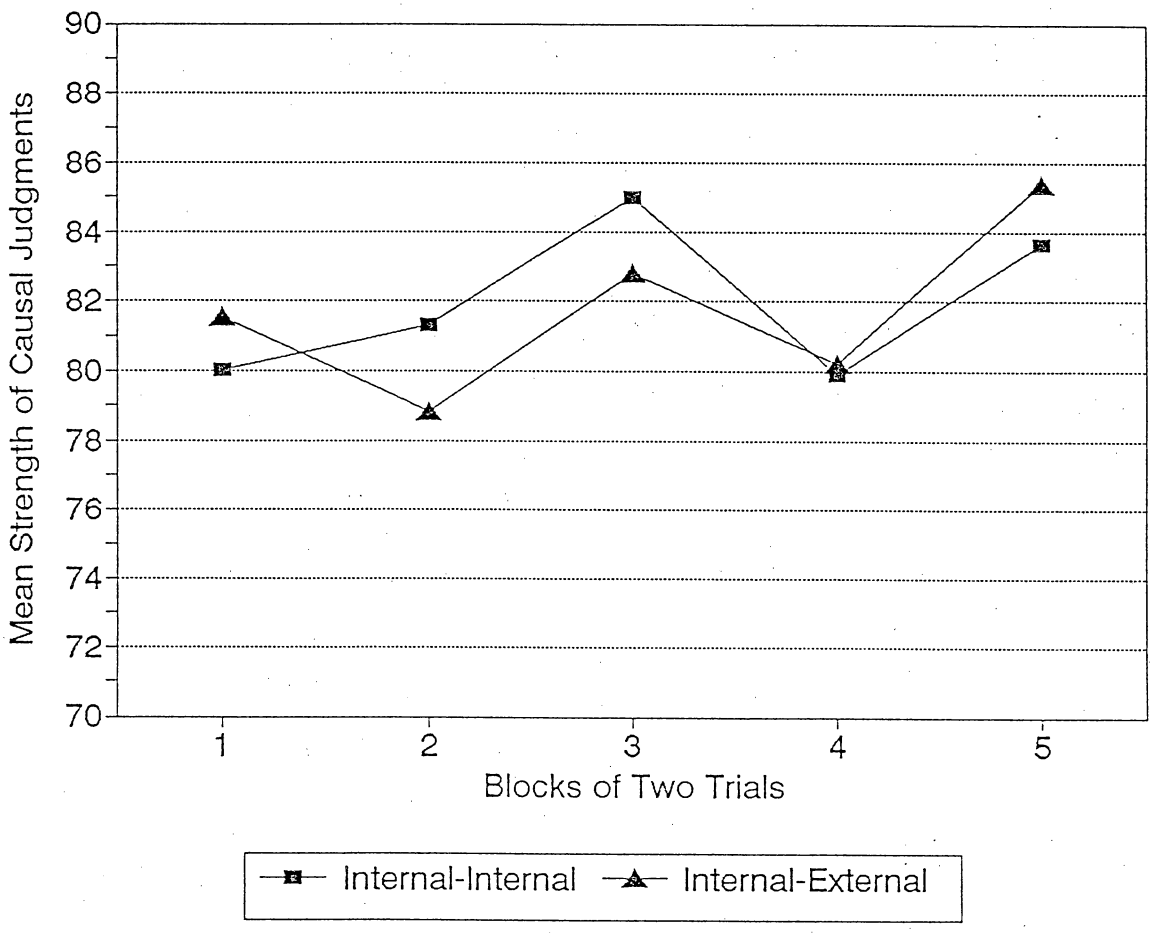
Causal Judgments

Recall that the antecedent stimulus had two levels: 1) a worker with a high level of job skill (internal cause) and 2) a worker laboring under a high production quota (external cause). Also recall that the consequent stimulus had two levels: 1) a worker who is satisfied with his job (internal effect) and 2) a worker meeting his productivity goal (external effect). The hypotheses can be tested in two ways, A) by holding the antecedent stimulus constant and comparing attributions for different consequences or B) by holding the consequent stimulus constant and comparing attributions for different antecedents. In either case causal judgments are expected to be strong for consistent as opposed to inconsistent antecedent-consequent pairings.

CS (Antecedent Stimuli) Held Constant. Consistent with the data reduction strategy used for the confidence measure the 10 ratings were reduced to blocks of 5 trials. In the first analysis high level of job skill (internal cause) was held constant while job satisfaction (internal effect) and worker's level of productivity (external effect) were compared (see Figure 2). A 2 X 5 (Groups X Trials) repeated measures ANOVA was performed on the subjects' causal judgments. Neither the Groups effect nor the interaction were statistically reliable. However, the ANOVA revealed a significant trials effect, F (4,168) = 6.38, $p < .05$; that is, subjects' causal attribution strength increased over

Figure 2

Comparison of Internal and External Consequents with the Internal Antecedent Stimulus Held Constant



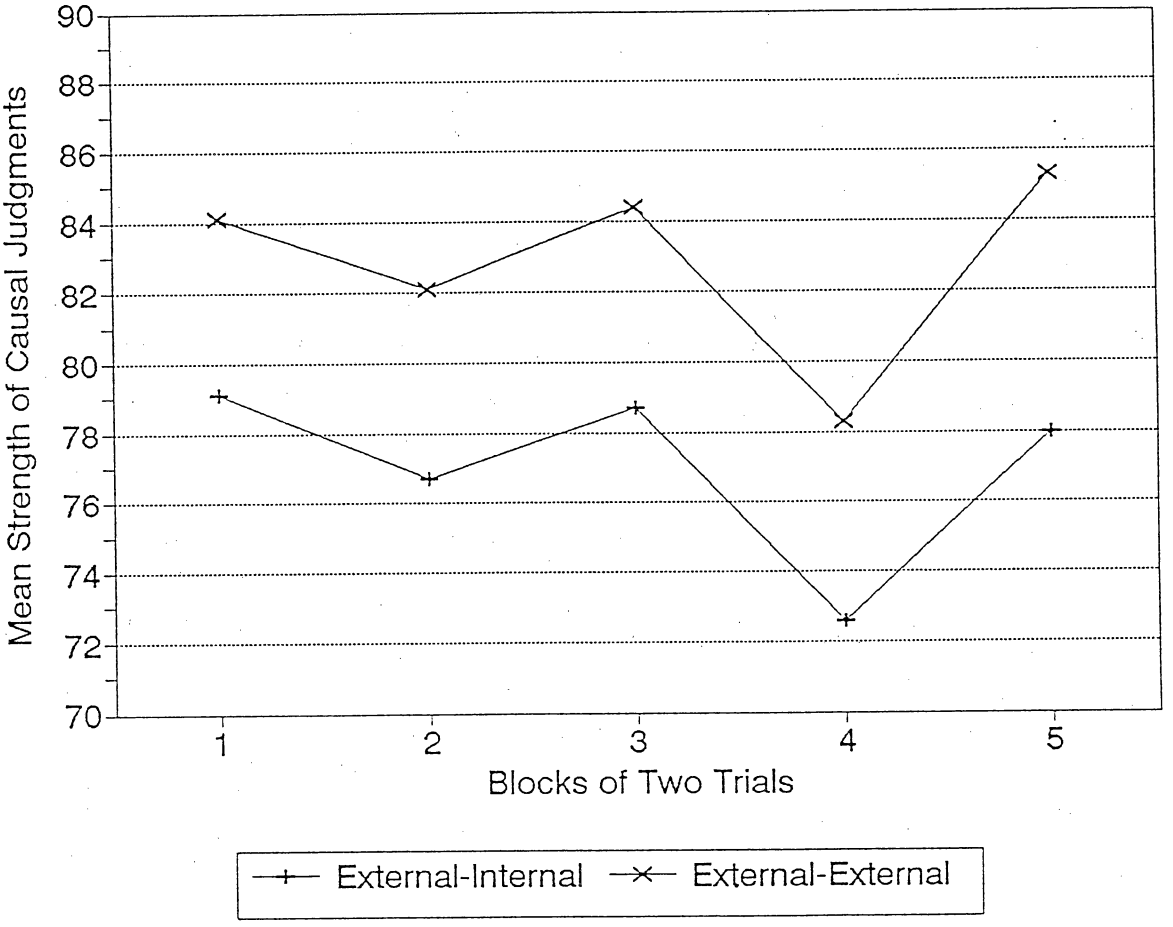
trials. Attributions of cause to a skilled worker were equal when the effect was either a high level of job satisfaction or a high level of productivity.

In the second analysis, a worker's production quota (external cause) was held constant while job satisfaction (internal effect) and worker's level of productivity (external effect) were compared (see Figure 3). A 2 X 5 (Groups X Trials) repeated measures ANOVA was performed on the subjects' causal judgments and revealed a significant Groups effect, F (1,44) = 4.16, $p < .05$; no interaction was observed. As hypothesized, when the antecedent and consequent were consistent causal attributions to the worker were higher than when they were inconsistent. It can be concluded that for an external antecedent stimulus the strength of a subject's causal judgment is higher when the antecedent is paired with an external consequent.

The ANOVA also revealed a significant trials effect, F (4,176) = 9.90, $p < .05$. That is, subjects' causal attributions changed over trials. This effect may be due to the dip in attribution strength at block 4. This effect may be due in part to the two lowest US intensity levels occuring at this block. Pairwise comparisons (one-tailed) were performed for each of the 5 blocks. No differences were observed for block 1 (M=84.10 vs M=79.13), t(220) = 1.54, $p > .05$; or block 2 (M=82.06 vs M=76.73), t(220) =

Figure 3

Comparison of Internal and External Consequents with the External Antecedent Stimulus Held Constant

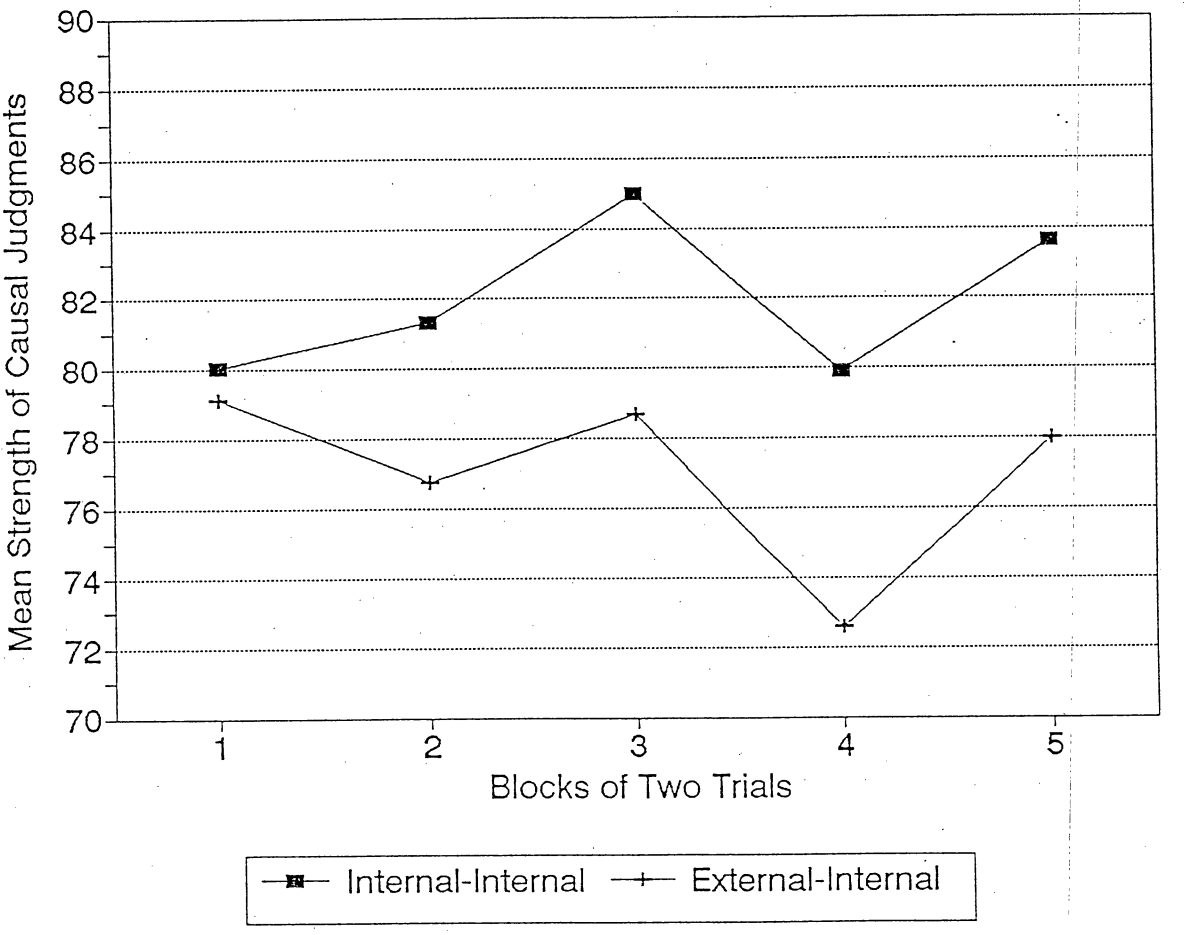


1.65, p >.05. However, differences were observed for block 3 (M=84.35 vs M=78.65), $t(220) = 1.76$, p >.05; block 4 (M=78.27 vs M=72.60), $t(220) = 2.84$, $p < .05$ and block 5 (M=85.33 vs M=78.00), $t(220) = 2.27$, $p < .05$. Consistent with learning theory stronger causal attributions were on the later trials. Using a more stringent criterion in order to control alpha at the hypothesis level a Dunn's test for multiple comparisons was performed. Group differences were only found on trial 4.

US (Consequent Stimuli) Held Constant. Consistent with the data reduction strategy used for the confidence measure the 10 ratings were reduced to blocks of 5 trials. In the third analysis job satisfaction (internal effect) was held constant while high level of job skill (internal cause) and the worker's productivity quota (external cause) were varied (see Figure 4). A 2 X 5 (Groups X Trials) repeated measures ANOVA was performed on the subjects' causal judgments and revealed a significant Groups effect, $F(1,40) = 3.37$, $p < .05$. A marginal interaction (Groups X Trials) was also observed, $F(4,160) = 2.32$, $p < .06$. As hypothesized, when the antecedent and consequent were consistent causal attributions to the worker were higher than when they were inconsistent. It can be concluded that for an internal antecedent stimulus the strength of a subject's causal judgment is higher when the antecedent is paired with an internal consequent. The ANOVA also revealed a significant

Figure 4

Comparison of Internal and External Antecedents with the Internal Consequent Stimulus Held Constant

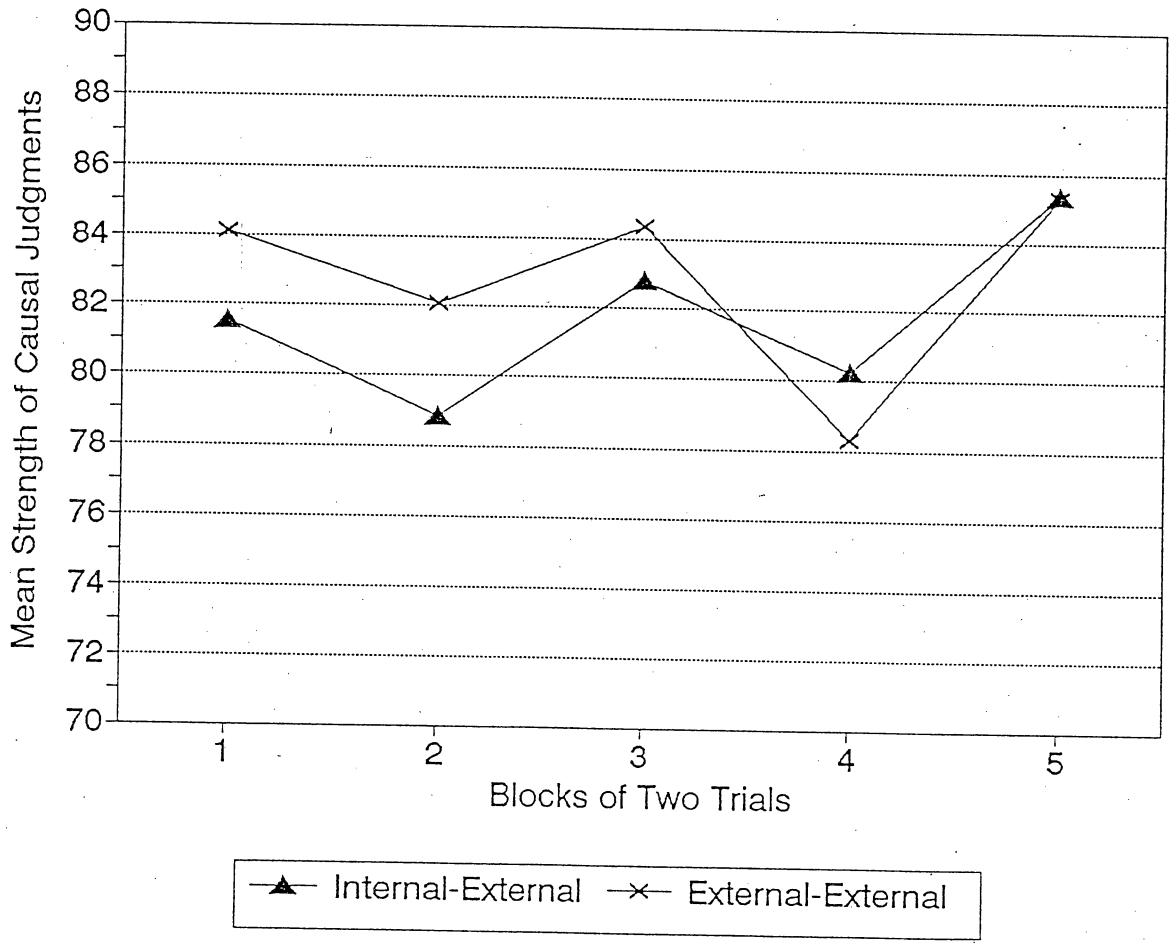


trials effect, F (4,160) = 6.82, $p < .05$; that is, subjects' causal attributions increased with repeated exposure over trials. Pairwise comparisons (one-tailed) were performed on the 5 blocks. No differences were observed in block 1 (M=80.02 vs M=79.13) = t(200) = .29, $p > .05$ or block 2 (M=81.32 vs M=76.73) = t(200) =1.50, $p > .05$. However differences were observed for block 3 (M=84.95 vs M=78.65) = t(200) = 2.06, $p < .05$, block 4 (M=79.89 vs M=72.58) = t(200) = 2.34 and block 5 (M=83.63 vs M=78.00) = t(200) = 1.84, $p > .05$. Using a more stringent criterion in order to control alpha at the hypothesis level a Dunn's test for multiple comparisons was performed. Consequently, no differences were observed.

In the fourth analysis the worker meeting his productivity goal (external effect) was held constant while high level of job skill (internal cause) and a high productivity quota (external cause) were varied (see Figure 5). A 2 X 5 (Groups X Trials) repeated measures ANOVA was performed on the subjects' causal judgments. Neither the Groups effect nor the interaction were statistically reliable. However, the ANOVA revealed a significant trials effect, $F(4,184) = 7.73$, $p < .05$; that is, subjects' causal attribution strength increased over trials (See Figure 5). Attributions of cause to a worker's productivity goal were equal when the cause was either high level of job skill or a high quota standard.

Figure 5

Comparison of Internal and External Antecedents with the External Consequent Stimulus Held Constant



DISCUSSION

The goal of the present study was to contribute to the integration of modern conditioning theory and causal attribution research by investigating cue-to-consequence effects in social causal judgments. At this time there is no biologically based theory for determining which, if any, social stimuli may be more associable (see Garcia, McGowan, & Green, 1972). However, predictions based upon a sociological analysis were advanced. Research in attribution has benefitted from distinguishing between internal and external causes. The research reported here also took advantage of these distinctions. In addition, this research attempted to identify internal and external outcomes or effects. Given these distinctions between causes and effects hypotheses analogous to ones developed by contemporary conditioning researchers were tested.

The hypotheses were tested holding the antecedent stimulus constant and comparing attributions for different consequents, and by holding the consequent stimulus constant and comparing attributions for different antecedents. Specifically, causal judgments were expected to be stronger for consistent as opposed to inconsistent antecedent-consequent pairings. Support was found for two of the

hypotheses.

The results of the present study suggest that causal attributions to an internal antecedent may not be limited to just explaining internal effects, but may include external effects as well. That is, when a worker's high level of job skill (internal antecedent) was held constant and paired with a worker's level of job satisfaction (internal consequent) or a high level of productivity (external consequent) subjects' strength of causal judgments were approximately equal. And, when a worker's high productivity level (external consequent) was held constant and paired with a worker's high level of job skill (internal antecedent) or a quota standard (external antecedent) subjects' strength of causal judgments were approximately equal. These outcomes are contrary to prediction but may be consistent with the "correspondent bias" frequently reported in the attribution literature. That is, dispositions, compared to situational stimuli, may be more readily associable with both internal and external outcomes or effects.

Consistent with predictions advanced here the external antecedent stimulus did not evidence the same degree of associability with internal and external consequences. When a worker's quota standard (external antecedent) was held constant and paired with a worker's level of job satisfaction (internal consequent) or a high level of

productivity (external consequent) subjects' gave stronger causal judgments when the antecedent and consequent were consistent. Hence, when the "cues" and "consequences" were consistent subjects' judgment of the cues causal strength was significantly higher than when the pair of stimuli included inconsistent cues and consequences.

Other evidence for the cue-to-consequence hypothesis advanced here comes from the comparisons involving different antecedent stimuli and similar consequent stimuli. Again, stronger causal attributions were made to the internal antecedent as opposed to the external antecedent when the consequence was also internal. That is, when a worker's high level of job skill (internal antecedent) was paired with job satisfaction (internal consequent) the strength of subjects' causal judgments to the skilled worker was higher than when a high level of job skill was paired with meeting a quota standard (external antecedent).

Errors in attributing cause can sometimes be made. Heider (1958) explained that a "cognitive error" occurs when an attributor depreciates the importance of situational factors and exaggerates dispositional factors in regulating behavior. More recently Ross (1977) has named this tendency the fundamental attribution error. In the present study, the fundamental attribution error may have been in evidence. For example, when the internal antecedent was paired with the internal consequent subjects' gave stronger judgments

than when the external antecedent was paired with the internal consequent. That is, consistent with the cue-to-consequence hypothesis subjects appear to have difficulty associating a dispositional cause with a situational effect. Hence, subjects in previously reported research gave more dispositional attributions than situational attributions for someone writing an essay under substantial constraints (Jones & Harris, 1967).

Limitations on Reported Effects

The consequent stimulus was portrayed in graphic form. Repeated pairings of antecedent and consequent stimuli produced stronger causal judgments to higher levels of job satisfaction and levels of production. This effect was unanticipated, but was consistent with classical conditioning manipulations of unconditioned stimulus (US) intensity. Where US intensity is compared response strength is positively related to increased levels of intensity. Although traditional learning studies do not vary the US level within a condition, it is necessary to vary the social learning analog. Without a slight variation in the consequent stimulus the presentation of information about a worker in a company would appear unrealistic. Although intensity effects were found in the present study it can be argued that being under the constraint of a social learning experiment in which US intensity levels must be varied for realism we risk changing the subject's focus from the

intended information. That is, the antecedent and consequent stimulus are the variables of interest and not the US intensity which is simply a part of the masking task.

Studies of causal attribution frequently use descriptions of social action rather than present information about social action over time. That is, subjects receive information in one short session and are then asked to make an attribution. The present study, in utilizing a learning paradigm, involved multiple presentations of the antecedent and consequent stimulus. As a result, the cue-to-consequence effects reported here may generalize only to situations where information is presented repeatedly rather than merely described. And, although more research on the boundary conditions pertinent to the results reported above is necessary, it should be noted that the results are arguably consistent with the correspondent bias and the fundamental attribution error found in studies that use the descriptive methodology.

Implications for Future Research

Future research in the area of socio-logical constraints on learning is warranted. Recall that in the present study consequents were defined as either internal or external and were paired with internal or external antecedents. Other socio-logical definitions of stimuli relevant to cue-to-consequence consistency are also possible. For example cue-to-consequence

consistency/inconsistency could be defined in terms of levels of analysis. The concept of levels of analysis pertains to the area of research in which an investigator is focusing his/her attention in terms of identifying cause and effect relations. Common levels of analysis include biological, physiological, psychological, and sociological phenomena. Theoretically, cues and consequents within a particular level of analysis, are assumed to be more associable than cues and consequences representing different levels of analysis. For example, it is easier to attribute cues and consequences within an individual level (psychological) than cues and consequences representing combinations of levels-for example, psychological cue paired with a sociological group outcome. For example, in the present study, the worker laboring under <u>his</u> productivity quota was paired with <u>his</u> level of productivity and not the <u>company's</u> level of productivity. That is, the present study examined cues and consequences at the individual, or psychological, level of analysis. However, it is feasible that a cross level of analysis from an individual cue to a social consequent can be examined. It is not expected that such as association would lead to stronger causal attributions than cue-to-consequence pairings within a particular level of analysis. Although the fundamental attribution error occurs when an internal and external antecedent are separately paired with an internal consequent

it may be possible to potentiate an external antecedent by compounding it with an internal cause when pairings with the internal consequent takes place (Ellins, Cramer, & Whitmore, 1985; Galef & Osbourne, 1978; Palmerino, Rusiniak, & Garcia, 1980).

A potentiation effect may be possible because of the pre-eminence of dispositional causes to enter into both internal and external outcome associations. For example, assume two groups of subjects are provided with information regarding an external antecedent (a professor giving instructions about an essay topic) and the essay itself. (For this analysis it is critical to assume that the essay, because it is a personal expression, is an internal consequent.) One of the two groups however is given information regarding the essay writers personal belief about the essay topic.

Consistent with previous research subjects would be expected to give stronger dispositional attributions than situational attributions for the essay. However, it is not the difference between internal and external attributions that matter here, rather how will the two groups differ regarding the strength of their attributions of cause to the professor-the external antecedent. If an internal antecedent can potentiate (i.e. facilitate different associations) an external antecedent the two groups of subjects should differ. That is, the group receiving both

internal and external antecedent information should give stronger situational attributions than subjects receiving external antecedent information alone.

The present study utilized a classical conditioning paradigm. All the information presented to the subject was on a timer. No response contingent stimuli were included. Nor could any behavior on the part of the subject advance the subject further in the evaluation cycle. They simply had to wait until the allotted time had expired before they could proceed. Future research might include an instrumental conditioning paradigm in which the opportunity to make an attribution would be contingent on the subjects' performing a simple response. Such an opportunity may have reinforcing effects. And, as subjects search for invariance the opportunity to make an attribution based on consistent antecedent and consequent pairings may be more reinforcing than making attributions for inconsistent antecedent and consequent pairings. This paradigm may be useful to examine because of its mundane realism.

The present study in utilizing cue-to-consequence research contributed to the integration of modern conditioning theory and causal attribution theory. Further inroads into constraints on the socio-logical associability of social cues and consequents has been made by distinguishing between internal and external events.

Appendix A

Instructions for Group 1

Preliminary Instructions. In this study we are interested in testing a computerized employee evaluation system. Your cooperation is necessary for testing the usefulness of this automated program. In order to carefully test the effectiveness of the system, you will need to assume the role of a supervisor in a large company. You will be given information about a part-time employee, Joe and his level of job satisfaction. After reviewing a monthly job satisfaction report it will be your responsibility as Joe's supervisor to evaluate the OVERALL relationship of Joe's level of skill to his reported LEVEL OF JOB SATISFACTION. Joe is a college student who is available only for part-time employment. It is important to evaluate him carefully because he will be considered for full-time employment upon graduation. Prior to his employment Joe filled out a Skill Inventory and the results revealed he has a VERY HIGH LEVEL OF SKILL for his job assignment.

Instructions Prior to Practice Trial. On the left side of the screen a picture representing a part-time employee, Joe, will be presented. On the right side of the screen a graph depicting Joe's level of job satisfaction will be presented. It is important to rate Joe on his OVERALL level of job satisfaction. The practice trial is now ready to begin.

Instructions Prior to Estimates of Causal Strength. Following each monthly productivity report of Joe's job satisfaction you will be asked to rate Joe on the OVERALL relationship of his level of job skill to his level of job satisfaction. Ratings are on a '0 to 100' point scale. After reading each item carefully, please respond by using the numeric key pad on the right side of the keyboard. After entering any number between '0 and 100' (including 100) please wait for the next evaluation item to appear.

Appendix A (cont'd)

Instructions for Group 2

Preliminary Instructions. In this study we are interested in testing a computerized employee evaluation system. Your cooperation is necessary for testing the usefulness of this automated program. In order to carefully test the effectiveness of the system, you will need to assume the role of a supervisor in a large company.
You will be given information about a part-time employee, Joe and his level of productivity. After reviewing a monthly job satisfaction report it will be your responsibility as Joe's supervisor to evaluate the OVERALL relationship of Joe's level of skill to his reported LEVEL OF PRODUCTIVITY. Joe is a college student who is available only for part-time employment. It is important to evaluate him carefully because he will be considered for full-time employment upon graduation. Prior to his employment Joe filled out a Skill Inventory and the results revealed he has a VERY HIGH LEVEL OF SKILL for his job assignment.

Instructions Prior to Practice Trial. On the left side of the screen a picture representing a part-time employee, Joe, will be presented. On the right side of the screen a graph depicting Joe's level of productivity will be presented. It is important to rate Joe on his OVERALL level of productivity. The practice trial is now ready to begin.

Instructions Prior to Estimates of Causal Strength. Following each monthly productivity report of Joe's productivity you will be asked to rate Joe on the OVERALL relationship of his high level of job skill to his level of productivity. Ratings are on a '0 to 100' point scale. After reading each item carefully, please respond by using the numeric key pad on the right side of the keyboard. After entering any number between '0 and 100' (including 100) please wait for the next evaluation item to appear.

Appendix A (cont'd)

Instructions for Group 3

Preliminary Instructions. In this study we are interested in testing a computerized employee evaluation system. Your cooperation is necessary for testing the usefulness of this automated program. In order to carefully test the effectiveness of the system, you will need to assume the role of a supervisor in a large company. You will be given information about a part-time employee, Joe and his level of productivity. After reviewing a monthly productivity report it will be your responsibility as Joe's supervisor to evaluate the OVERALL relationship of Joe's quota standard to his reported LEVEL OF PRODUCTIVITY. Joe is a college student who is available only for part-time employment. It is important to evaluate him carefully because he will be considered for full-time employment upon graduation. Because of Joe's job assignment he works to meet a VERY HIGH PRODUCTIVITY QUOTA.

Instructions Prior to Practice Trial. On the left side of the screen a picture representing a part-time employee, Joe, will be presented. On the right side of the screen a graph depicting Joe's level of productivity will be presented. It is important to rate Joe on his OVERALL level of productivity. The practice trial is now ready to begin.

Instructions Prior to Estimates of Causal Strength. Following each monthly report of Joe's productivity you will be asked to rate Joe on the OVERALL relationship of his quota standard to his level of productivity. Ratings are on a '0 to 100' point scale. After reading each item carefully, please respond by using the numeric key pad on the right side of the keyboard. After entering any number between '0 and 100' (including 100) please wait for the next evaluation item to appear.

Appendix A (cont'd)

Instructions for Group 4

Preliminary Instructions. In this study we are interested in testing a computerized employee evaluation system. Your cooperation is necessary for testing the usefulness of this automated program. In order to carefully test the effectiveness of the system, you will need to assume the role of a supervisor in a large company. You will be given information about a part-time employee, Joe and his level of job satisfaction. After reviewing a monthly job satisfaction report it will be your responsibility as Joe's supervisor to evaluate the OVERALL relationship of Joe's high quota standard to his reported LEVEL OF JOB SATISFACTION. Joe is a college student who is available only for part-time employment. It is important to evaluate him carefully because he will be considered for full-time employment upon graduation. Because of Joe's job assignment he works to meet a VERY HIGH PRODUCTIVITY QUOTA.

Instructions Prior to Practice Trial. On the left side of the screen a picture representing a part-time employee, Joe, will be presented. On the right side of the screen a graph depicting Joe's level of job satisfaction will be presented. It is important to rate Joe on his OVERALL level of job satisfaction. The practice trial is now ready to begin.

Instructions Prior to Estimates of Causal Strength. Following each monthly report of Joe's job satisfaction you will be asked to rate Joe on the OVERALL relationship of his high quota standard to his level of job satisfaction. Ratings are on a '0 to 100' point scale. After reading each item carefully, please respond by using the numeric key pad on the right side of the keyboard. After entering any number between '0 and 100' (including 100) please wait for the next evaluation item to appear.

APPENDIX B

CONSENT FORM

I am volunteering to participate as a subject in this study. I understand that the purpose of this study is to test the efficiency of a computerized employee evaluation system. I understand that the information will be presented to me via a computer monitor and that I will be asked to assume the role of a production supervisor in a large company. I understand that my name will NOT be included in the experiment itself and that my anonymity will be maintained at all times. I also understand that my participation in this study is voluntary and that I may refuse to answer any questions at any time. I also understand that I may withdraw from this study at any time without penalty or prejudice. I also understand that any questions I may have regarding this study will be answered.

I understand that all the information collected in this study will be treated as confidential with no details about my responses released to anyone outside the research staff without my separate and specific written consent. I understand that I may derive no specific benefit from participation in this study, except perhaps form feeling that I have contributed to the development of psychological knowledge.

I hereby allow this research group to publish the results of the study in which I am participating, with the provision that my name and/or other identifying information will be withheld. This study is being conducted by psychology students under the supervision of Dr. Robert Cramer, PS-211, extension 5576. I understand that if I have any questions or concerns about the study or the informed consent process I may also contact the Psychology Department Human Subjects Review Board at CSUSB.

Participant's Signature: _____

Participant's Name (Printed): _____

Date: _____

APPENDIX C

DEBRIEFING STATEMENT

The present study is part of a series of research projects designed to investigate human social causal judgments. Unfortunately, in order to adequately investigate this phenomenon a small deception of the subjects was necessary. Rather than directly asking questions concerning your causal judgments, we explained the study as testing the efficiency of a computerized Employee Evaluation System. The company, its employees, and the evaluation system were fictitious. We apologize for this deception, however, if we had asked directly about your causal judgments your responses may have been effected.

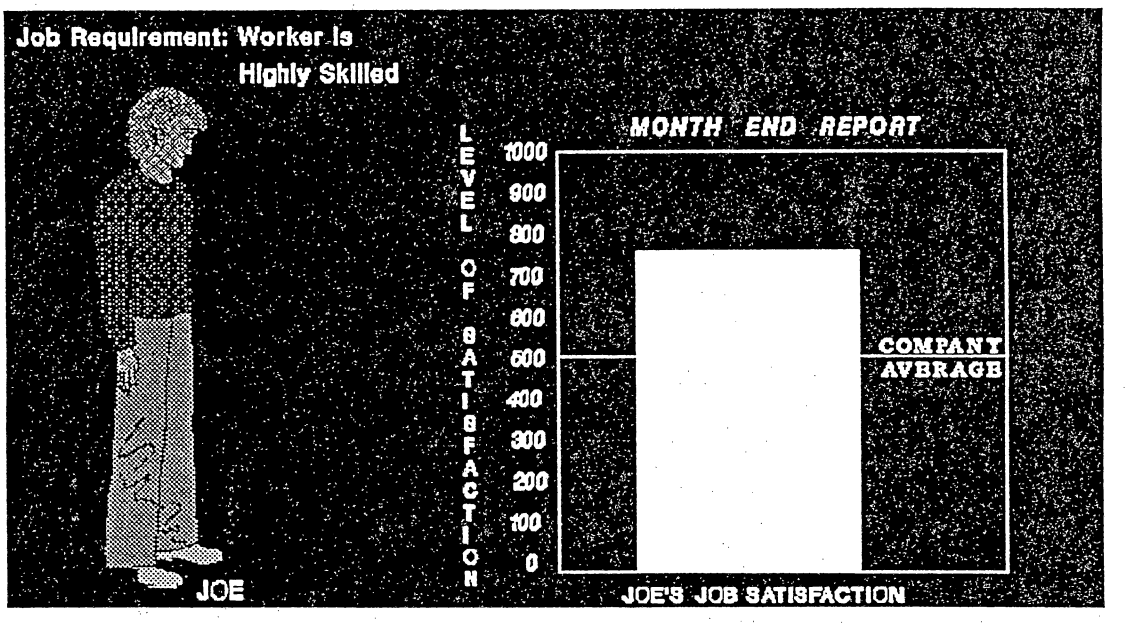
(Stop. Are there any questions?)

It is our sincere hope that the necessity for deception is understood. It is important for the completion of this study that you do not speak with other students on campus about your experience here today. If other potential subjects are aware of the purpose of the experiment, the results of the study might be compromised.

The present study conforms to the ethical principles of the American Psychological Association. We are interested in obtaining your comments regarding your participation in our experiment. This information would serve as a basis for checking and evaluating the quality and care with which our research is conducted. Please feel free to comment or ask questions. For results concerning this study contact Dr. Robert Cramer at 880-5570.

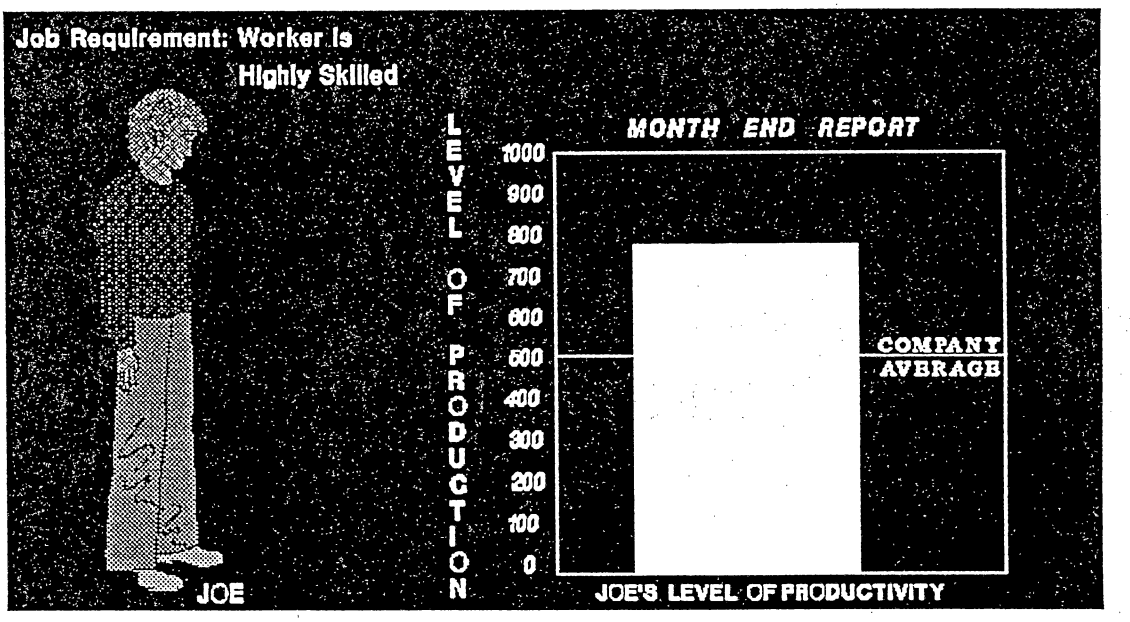
Appendix D

Group 1 (Internal Antecedent and Internal Consequent)



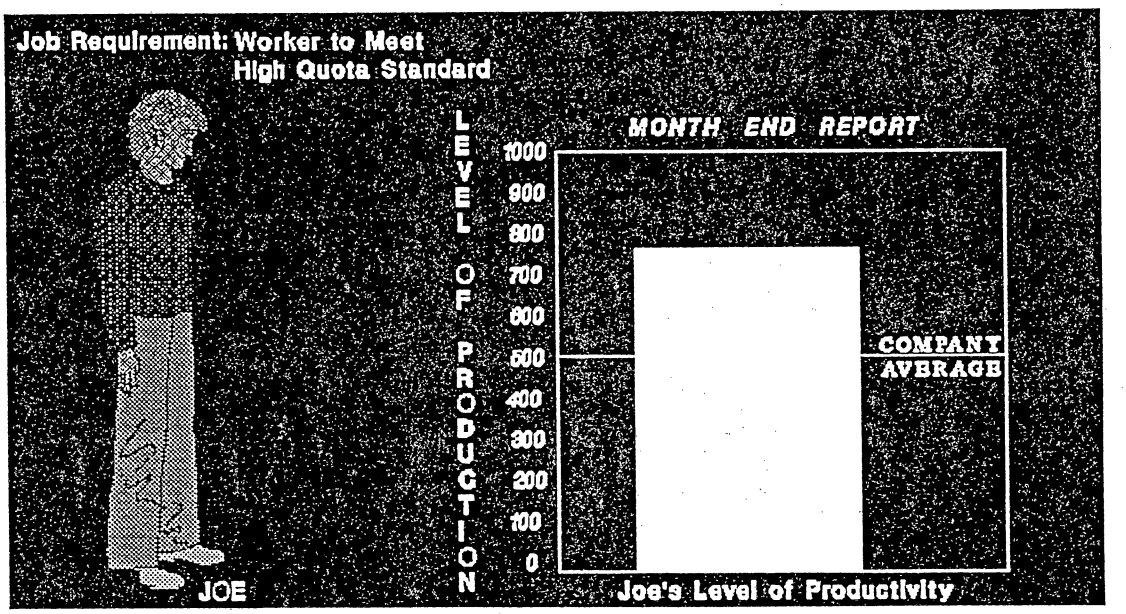
Appendix D (cont'd)

Group 2 (Internal Antecedent and External Consequent)



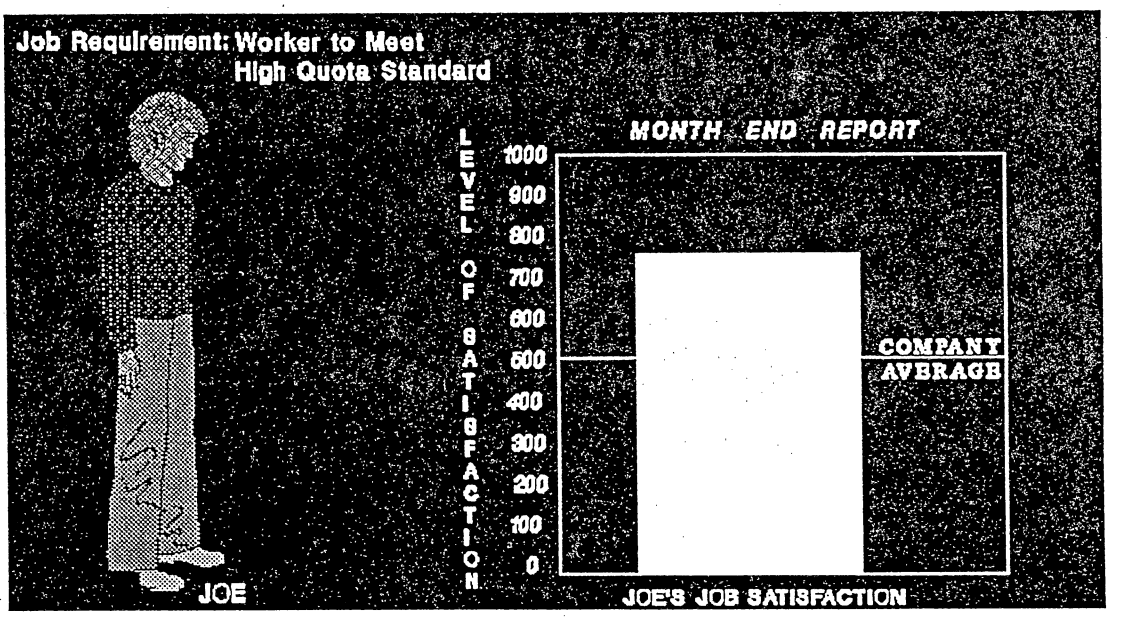
Appendix D (cont'd)

Group 3 (External Antecedent and External Consequent)



Appendix D (cont'd)

Group 4 (External Antecedent and Internal Consequent)



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