This is to certify that the

thesis entitled

STRENGTH OF PRODUCT ATTRIBUTIONS AND OPERATION OF THE DISCOUNTING PRINCIPLE FOR SINGLE VERSUS MULTIPLE EXPERIENCES WITH A PRODUCT

presented by

JAMES CLAYTON ANDERSON

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Psychology

Frederic Wickert/NWS
Major professor

Date 8/10/78

O-7639

STRENGTH OF PRODUCT ATTRIBUTIONS AND OPERATION OF THE DISCOUNTING PRINCIPLE FOR SINGLE VERSUS MULTIPLE EXPERIENCES WITH A PRODUCT

By

James Clayton Anderson

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

1978

ABSTRACT

STRENGTH OF PRODUCT ATTRIBUTIONS AND OPERATION OF THE DISCOUNTING PRINCIPLE FOR SINGLE VERSUS MULTIPLE EXPERIENCES WITH A PRODUCT

By

James Clayton Anderson

Attribution theory seeks to predict and explain how people arrive at explanations for events which occur in their environment. A theoretical framework by Kelley (1973) employed in the research deals with two basic attributional cases: one in which the attributor has information from multiple experiences with a person or an object, and the other case in which the attributor has information from only a single experience. Kelley posits that attributors employ a covariance principle in the multiple experience case whereas the discounting principle and causal schemata are utilized in the single experience case. The present research investigated differences in the strength and confidence of attributions made about an object in the two basic cases, and secondly, investigated the use of discounting by attributors in the multiple experience case. The attributional object employed was canned slice peaches in light syrup.

In the present experiment, subjects' attributions were investigated in a completely crossed design in which the independent variables were quality of experience (positive or negative), possible situational explanation (present or

interaction, subjects in the negative experience condition who had prior experience with the peaches rated them as significantly less sour than subjects who had no prior experience. Given a positive experience, the prior experience factor had no effect. Cell means and standard deviations suggested that some subjects may have discounted the negative experience while others did not. A path analysis revealed that the independent variables impacted the dependent attribute measures through the attribute of sweetness.

A significant effect was also found for quality of experience at each level of prior experience.

So, partial support was found for discounting in the multiple experience case. Lack of results with regard to interactions involving the possible situational explanation was likely due to an ineffective manipulation. While subjects attended to the message, it was not employed in a situational manner. An explanation for lack of results for the confidence ratings was that subjects possessed such a well developed causal schema about the salient attributes of canned peaches and their ability to evaluate them, that this schema overshadowed the manipulations.

The research provided a theoretical underpinning for the observation that consumers who have a negative experience with a product with which they have had previous positive experiences will be more likely to purchase the product again than will consumers whose first experience is negative.

absent), and prior experience (several or none). It was hypothesized that there would be an effect for quality of experience, a possible situational explanation x quality of experience interaction, prior experience x quality of experience interaction, and a three-way interaction among these factors.

One hundred twenty-eight students enrolled in introductory courses in industrial and consumer psychology participated as subjects. For the prior experience factor, subjects in the prior experience condition had three experiences with the product on consecutive days prior to their fourth experience where the other two factors were varied. For the quality of experience manipulation, subjects in the negative experience condition received peaches to which a citric acid solution was added. Subjects in the positive experience condition received untreated or good peaches. Half of the subjects received a possible situational explanation for why the peaches may not have been as tasty as others while the other half received no explanation.

Subjects gave ratings of sweetness, overall taste, own purchase probability, others' purchase probability, own preference, and others' preference. In addition, subjects gave confidence ratings for each dependent measure.

Separate multivariate analyses of variance revealed a significant prior experience x quality of experience interaction for the attribute ratings, and no significant findings with regard to confidence ratings. For the

ACKNOWLEDGMENTS

I would like to express my gratitude to those who have helped me in this research. While I could attempt individual expressions of gratitude to those below, I know in each case that the words would fall short of the thoughts and feelings behind them. So, in their place I will use a series of simple and deeply felt thank yous.

First, I would like to thank my committee members: Fred Wickert, Bill Crano, Gil Harrell, Jack Hunter, and Neal Schmitt.

I would like to thank my research assistants: Steve Burnstein, Jessica Fleisig, Lynn Garfield, Ken Kurtz, Margo Rosenthal, and Marsha Tomczyk.

I would like to thank Lynn Honaker for her typing and general support.

Finally, while not directly involved in this research, I would like to thank my parents for their support throughout my graduate studies.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Attribution theory seeks to predict and explain how people arrive at explanations for events which occur in their environment. An event may be causally explained in several ways. A person can assign a quality or characteristic to him/herself, or to another person as a causal explanation for some particular behavior. As an example, a batter may attribute striking out to his own inability to hit a curveball, or alternately, he may attribute striking out to the pitcher possessing an exceptional curveball. A person can ascribe qualities or characteristics to an object which serve as a causal explanation for his/her response or reaction to the object. Continuing with the baseball example, the batter may explain his striking out by ascribing the characteristic "has a foreign substance on it" to the baseball. Alternately, a person may assign causality to some particular circumstances which were present in the situation when the effect to be explained occurred. So, the batter may attribute striking out to being momentarily blinded by the sun, or to a distraction in the stands.

A theoretical framework which encompasses the above attributions has been put forth in several papers by Kelley (1967, 1972a, 1972b, 1973). Kelley's statements of

attribution theory deal with two basic attributional cases: one in which the attributor (that is, the person making the attribution) has information from multiple observations or experiences with a person or an object, and the other case in which the attributor has information from only a single observation or experience. The present research is concerned with attributions to objects rather than persons, and the theoretical statements and empirical research will be limited largely to this perspective.

In the multiple experience case Kelley posits that a person utilizes a covariance principle (Kelley, 1972; 1973) to arrive at an attribution. The covariance principle is that "an effect is attributed to the one of its possible causes with which, over time, it covaries" (Kelley, 1972a, p.3). The attributor applies three covariance criteria of distinctiveness, consensus, and consistency to his/her experiences with a given object to decide on an appropriate explanation. Distinctiveness refers the extent to which a particular reaction or response is uniquely associated with a given object as opposed to other similar objects. Consensus is the extent to which other persons experience the same reaction or response to the object, and consistency is the extent to which the attributor's response to the object remains the same or nearly so over time. After examining the experiences with the object with regard to these criteria, an appropriate attribution is made to the person him/herself, the object, or the situation (or possibly some combination of the three).

To illustrate how different information patterns result in attributions to an object, the person, or to the situation; consider the event, "George enjoyed the science-fiction movie." Suppose that we learn that George rarely likes any science-fiction movie he sees. Thus, his response to the particular movie is highly distinctive. In addition, we learn that several friends who accompanied George to the movie also enjoyed it. There is high consensus about the movie. Finally, suppose we learn that George enjoyed the movie as much when he saw it at home on cable television as when he saw it at the theater. His response to the movie would be seen as highly consistent. From this pattern of distinctiveness, consensus, and consistency information, an appropriate explanation of the event would be an object attribution such as, "The movie is an exceptional science-fiction picture."

Instead of this pattern, suppose we learn that George likes almost every science-fiction movie he sees, and that none of his friends who accompanied him enjoyed the movie. Now we have low distinctiveness and low consensus information. As before, let's assume that George enjoyed the movie both times he saw it. So, again there is high consistency. With this pattern of information, an appropriate explanation would be a person attribution such as, "George is a science-fiction movie buff.

Finally, let us assume that we know that George rarely likes any other science fiction movie he sees, and that none of his friends enjoyed the movie. Here we have an

information pattern of high distinctiveness and low consensus. Further, assume that George did not enjoy the movie the second time he saw it, indicating low consistency. From this pattern of information, an appropriate explanation would be a situational attribution such as, "The movie gave George a much-needed break to relax from studying for final exams." The information patterns with the resultant attributions are summarized in Figure 1.

Information Pattern			
Distinctiveness	Consensus	Consistency	Attribution
High	High	High	Object
Low	Low	High	Person
High	Low	Low	Situation

Figure 1 Information Patterns for the Three Basic Attributions

Kelley (1967) has proposed an analysis of variance analog for the way in which individuals analyze their state of information regarding an object. The distinctiveness criterion corresponds to the numerator or between condition term in the F-ratio while the consensus and consistency criteria correspond to the denominator or within condition term. This implicit analysis of variance determines the stability of an object attribution, or confidence in the validity of the

attribution. To the extent that an object is distinctive from other objects (thus, large between object variance) and/or reactions to it are of high consensus and consistency (small variance within people, or small variance over time), attributions to the object will be stable. Kelley makes clear that this attributional analysis is subjective in nature due to perceptual and cognitive error.

In the second attributional case where an individual has just a single experience with an object Kelley (1972b, 1973) puts forth two concepts to account for the attribution process: the discounting principle and causal schemata (singular: schema). The discounting principle is simply stated as, "The role of a given cause in producing a given effect is discounted if other plausible causes are also present" (Kelley, 1973, p.113). For example, the role of a favorable attitude toward a product in producing an individual's endorsement of it would be discounted if it was thought that the individual had received money for the endorsement.

A causal schema is a conception about the way in which two or more possible causes operate in relation to a particular kind of effect. A causal schema is learned from past experience with similar cause--effect patterns. Kelley believes that causal schemata are employed in the more common, informal attribution situations. Continuing with his analysis of variance analog Kelley (1972b, p.152) states, "Given information about a certain effect and two or more possible causes, the individual tends to assimilate it to a specific assumed analysis of variance pattern, and from

that to make a causal attribution." To the extent that a relevant causal schema is well developed, it can be argued that a causal inference will be made in the single experience situation with as much stability and confidence as in the multiple experience case. While Kelley (1972b) presents a number of causal schemata, for the present purposes, only the multiple sufficient causes schema and its counterpart, the multiple necessary causes schema, need be discussed.

In the multiple sufficient causes schema the presence of either one or both of two possible causes is adequate to produce a given effect. An example of this schema is a brand endorsement by a "person-in-the-street", presented in Figure 2. Here it can be seen that the presence of either a monetary payment or a favorable brand attitude would be adequate to induce a brand endorsement, and that the presence of both possible causes would likewise produce an endorsement. So for the multiple sufficient causes schema, given knowledge of the presence of an effect and one possible cause, an individual would be uncertain as to the presence or absence of a second possible cause. The discounting principle is proposed to operate for this schema.

In the multiple necessary causes schema the presence of both causal factors is required to produce a given effect. This schema is illustrated in Figure 2 as a brand endorsement by John Wayne. Since John Wayne is known to be steadfastly honest and very wealthy, the presence of a monetary payment alone would not be adequate to produce his endorsement of a brand. Alternately, the presence of a favorable

Multiple Sufficient Causes Schema

for "person-in-the-street":

Monetary Payment (or perhaps desire to be on television)		Favorable Brand Attitude: Absent	Favorable Brand Attitude: Present
	Present	Brand Endorsement	Brand Endorsement
	Absent		Brand Endorsement

Multiple Necessary Causes Schema

for John Wayne:

Monetary Payment		Favorable Brand Attitude: Absent	Favorable Brand Attitude: Present
	Present		Brand Endorsement
	Absent		

Figure 2 Multiple Sufficient and Multiple Necessary Causal Schemata

attitude alone would not be adequate to induce an endorsement since it is known that actors of John Wayne's caliber are highly paid for product endorsements. Rather, a favorable attitude toward the brand and a large monetary payment would be necessary to induce John Wayne to give a brand endorsement. For this schema, given knowledge of the absence of an effect, an individual would be uncertain if either cause were singly present. Naturally, these schemata can be generalized to cases of more than two possible causes, and to cases of perceived degrees of presence for causes and effects.

Fishbein and Ajzen (1972) in their review of the attribution literature observed that "few of the recently published studies seem to be direct extensions or tests of the underlying theory" (p.502). Kiesler and Munson (1975) in a later review reiterate Fishbein and Ajzen's comment. My research addressed a basic question in attribution theory and secondly, explored a basic extension to the theory. Specifically, a comparison was made between the multiple experience case and the single experience case with regard to the strength and certainty of attributions made about an object. Is there a difference in the strength and confidence of attributions made in the two basic cases? Secondly, the use of discounting by attributors in the multiple experience case was investigated. Before specific research hypotheses are presented, related research will be reviewed.

McArthur (1972) investigated how information data patterns which varied on the criteria of distinctiveness, consensus,

and consistency affected causal attributions. She presented subjects with statements about the occurrence of some response by another person ("John laughs at the comedian.") followed by three statements which provided information about high or low degrees of consensus (Almost everyone[Hardly anyone] who hears the comedian laughs at him."), distinctiveness ("John does not [also] laugh[es] at almost every other comedian."), and consistency ("In the past John has almost always [never] laughed at the same comedian."). For each set of statements, the subject was asked to decide what probably caused the event to occur from four alternative causes; something about the person, the stimulus, the particular circumstances (situation), or some combination of the three causes. McArthur found that the frequency of person attributions was greater for low than for high consensus information, for low than for high distinctiveness information, and for high than for low consistency information. The frequency of stimulus attributions (of which some were objects) was greater for high than for low consensus information, for high than for low distinctiveness information, and for high than for low consistency information. Thus, McArthur's data support the predictions for person attributions and for stimulus attributions which can be derived from Kelley's theory. McArthur further found that the frequency of circumstance (situational) attributions was greater for high than for low distinctiveness information, and for low than for high consistency. Consistency information had the most impact on circumstance attributions followed by

distinctiveness and consensus information respectively.

Orvis, Cunningham, and Kelley (1975) provide further insight into the causal attributions which are made on the basis of information patterns that vary on the attributional criteria. In addition to the complete information patterns such as those used by McArthur (1972), these researchers presented subjects with incomplete patterns with information on one or two criteria unknown. Half of the subjects were asked to decide on causal attributions from several presented factors (following McArthur, 1972), and the remaining half were asked to judge the value (from high to low on 7 point scales) of the unknown information. Results relevant to the present study were that high distinctiveness and high consistency information yielded a significantly greater frequency of stimulus attributions than other attributions ($p < .001$), and that high distinctiveness and low consistency information yielded a significantly greater frequency of circumstance or situational attributions than other attributions (again, $p < .001$). Orvis et al. also conclude from their data that consistency information has more effect on attributions than does consensus or distinctiveness information primarily because of its strong impact on situational attributions.

Ruble and Feldman (1976) have found some evidence of a presentation order bias against consensus information. However, this finding does not impact the present research for the following reasons. Subjects in the present research

received information from direct experience with the object, and consensus information was not known. Finally, Ruble and Feldman (1976) also found consistency information to be most determinant of situational attributions, regardless of order.

Turning from the multiple experience case to the single experience case, a study by Jones, Davis, and Gergen (1961) demonstrates the discounting principle and the multiple sufficient causes schema. In this study subjects listened to a tape-recorded job interview between a psychologist and a student. While subjects were aware that the student would be instructed to play the role of a job candidate for either a submariner or astronaut position, they were unaware that the recordings were made from carefully constructed scripts. The psychologist began each interview with a clear role description of behaviors desirable in a submariner (other-directed behaviors) or an astronaut (inner-directed behaviors). Then to a series of clearly relevant job choice items, the student either gave answers concordant with the earlier role description (in-role-behavior) or answers which were discordant (out-of-role behavior). Subjects were asked to rate what they thought the student was "really like", and to indicate how confident they were of their ratings on a 5-point confidence scale. So, subjects were basically asked to make an attribution of the student's behavior to an internal cause (a personality disposition) or to an external cause (role-constrained behavior). In the case of the students who enacted in-role behavior, the external cause

is known to be present and facilitative of the given behavior. Subjects would be uncertain as to the presence of a personality disposition, and the theory would predict that subjects would discount it as a possible cause. In the case of the student who enacted out-of-role behavior, the external cause is again known to be present, but inhibitive of the given behavior. When behavior occurs in spite of the presence of an inhibitory cause (role demands), the theory would predict that subjects would be more certain of a personality disposition (than if the external inhibitory cause were absent). This is known as the augmentation principle (a reverse of the discounting principle) and can be stated as follows: "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" (Kelley, 1972a, p.12). Jones et al.'s results support these predictions. The students who displayed out-of-role behaviors were rated as significantly more revealing of their actual dispositions than students who displayed in-role behaviors. In addition, subjects were significantly more confident in assigning trait dispositions to the students who displayed out-of-role than in-role behavior.

Recent research by Skaklee (1976) suggests a modification in the discounting principle. She proposed and found empirical support for a principle of minimum causation. "Once an event is sufficiently explained, other possible

factors are superfluous" (Shaklee, 1976, p.4764-B). The relevance of this finding is that to the extent that there is a sufficient situational explanation for a given effect, attributors should not seek out or utilize other possible causal explanations (e.g., an object attribution).

Several studies by Irwin and Smith (1956, 1957; Irwin, Smith, and Mayfield, 1956) provide some evidence as to which of the two attributional instances, single versus multiple experiences, would lead to stronger and more confident attributions. Two basic procedures were employed. In the first procedure, subjects were asked to decide if the average of a pack of cards was greater than or less than zero. For each card shown, the subject gave his/her judgment and a confidence rating for the judgment. The results were that subjects were more confident in their judgments after the 20th card than the 10th card; and for sets of cards with larger absolute means (high distinctiveness), and smaller standard deviations (high consistency). In a variant of the above procedure, subjects were asked to decide which of two packs of cards had the higher mean. Subjects were shown a card from each pack, and gave a judgment with a confidence rating. Again, the subjects had greater confidence about their judgments after the 20th pair of cards than the 10th pair; and for pairs of packs which had larger mean differences (high distinctiveness) and small standard deviations (high consistency).

From these results that subjects were more confidant after more experience, it might be argued that multiple

experiences would lead to stronger and more confident attributions about an object. However, upon further thought it can be effectively argued that the above research did not yield an adequate test because the task was biased against causal schemata. The tasks employed were such that subjects had no prior experience with them and could not have possessed a relevant, well developed schema. In fact, it was a condition of the research that subjects have no training in statistics to aid them in revising their judgments!

The present research provided a more adequate test of the multiple versus single experience hypothesis in that the experience with an object that was employed was one where participants possess causal schemata. The object employed was a new product from a well established product category; canned peaches. Thus, the present research investigated differences in the strength and confidence of attributions made by participants who had several experiences with the new product, and by participants who had only a single experience with the new product but could draw upon a relevant causal schema.

While there is no research which directly bears upon discounting by attributors in the multiple experience case, research by Beckman (1970) suggests that discounting would be utilized in the multiple experience case. Beckman employed a participant condition where subjects instructed two fictitious students on some mathematical concepts and symbols for four trials. One student always performed well

(high-high) while the second student's performance either deteriorated (high-low), improved (low-high), or remained poor (low-low). Following feedback from four sets of problems that the student "solved", subjects were asked to make attributions about the student's performance. Subjects in the high-low condition attributed the student's performance to situational factors with greater frequency than any other causal factor.

Beckman's research suggests that when participants in the present study had several positive experiences with a new product followed by a negative experience, they would attribute the negative experience or change to some situational factor. Further, if a possible situational explanation for the negative experience were presented to participants, discounting would be predicted with participants making more confident situational attributions with resultant less harsh evaluation of the product itself. The prediction that participants who possessed a possible situational explanation would be less likely to make an object attribution (negative product evaluation) than participants without an explanation is also supported by the principle of minimum causation. To test these hypotheses, a quality of experience factor (positive or negative) was crossed with a possible situational explanation factor (present or absent). This is the familiar multiple sufficient causes schema. These two factors were then crossed with prior experience factor (several or none) to provide a design in which both research questions could be addressed. Those were:

Which attributional case, single or multiple experiences, leads to more extreme and confident attributions, and do attributors employ the discounting principle in the multiple experience case?

Specifically, from the theoretical statements and research presented, the following research hypotheses were made:

First Hypothesis: The quality of experience factor has a significant effect on the extremity of attribute ratings for the new product, and on the probability of purchase. Subjects in the negative experience condition will be harsher in their evaluations and have a lower probability of purchase.

Second Hypothesis: There is a significant interaction between the possible situational explanation factor and the quality of experience factor with regard to extremity and confidence of attribute ratings, and purchase probability. Subjects in the negative experience condition who are given a possible situational explanation will be less harsh and confident in their ratings with a resultant higher purchase probability than subjects who receive no explanation. In the positive experience condition the possible situational explanation factor should have no significant effect.

Third Hypothesis: There is a significant interaction between the number of prior experiences factor and the quality of experience factor with regard to extremity and confidence of attribute ratings, and purchase probability. Subjects in the negative experience condition who have been given several prior experiences will be less harsh and

confident in their ratings with a resultant higher purchase probability than subjects who have no prior experience. The prior experience factor should have no significant effect for subjects in the positive experience condition.

Fourth Hypothesis: There is a significant three-way interaction with regard to extremity and confidence of attribute ratings, and purchase probability. Discounting by subjects who are given a possible situational explanation (possible situation explanation x quality of experience interaction) will be significantly greater for subjects who have prior experience than for subjects with no experience.

METHOD

Subjects

One hundred twenty-eight students enrolled in introductory courses in industrial and consumer psychology at Michigan State University participated as subjects, and received extra-credit points for participation.

Procedure

The attributional object which was used in the research was Avondale canned peach slices in light syrup. Subjects were told that a private company was sponsoring new product research for a line of canned fruit in light syrup, and that they would be trying the new sliced peaches in light syrup. Using peaches in light syrup as opposed to the more common heavy syrup, and the positioning of them as a new product was done to give a distinctive nature to the attributional object.

In the prior experience conditions, subjects had three experiences with the product on consecutive days prior to their fourth experience where the other two factors were varied. On their first experience with the product, subjects were told that in new product research it is necessary to identify the characteristics or qualities of a product which are important to consumers. Subjects were asked to

think of qualities or characteristics of canned sliced peaches which were important to them. They were then asked to list the opposite of the characteristic next to it. Subjects then tasted the peaches (3 slices), and repeated the procedure to elicit any attributes they may have overlooked. From this exposure, bi-polar attributes of canned sliced peaches which were salient to the subject sample were elicited. These attributes were used to rate the product on the fourth and final experience, or the only experience for the no prior experience condition.

On their second experience with the product, subjects rated ten possible brand names (e.g., Meadow Grove) and eight possible slogans (e.g., "The perfect treat, light and sweet.") for the new product on a five point like very much--dislike very much scale, and tasted the peaches again. On their third experience, subjects rated eight possible marketing strategies (e.g., a cottage cheese promotional tie-in) on a five point very effective--very ineffective scale, and again tasted the peaches. The tasks were chosen to be plausible but not too involving for the subjects, and served only as a means for subjects to get experience with the product. Copies of the three tasks are presented in Appendix A.

In the fourth experience for subjects in the prior experience condition and the only experience for subjects in the no prior experience condition, half of the subjects in each condition received peaches which were positive (consistent with experience) and half received peaches which

were negative (inconsistent with past experience). Twenty-three milliliters of a 39 percent citric acid solution were added per 29 ounce can of peaches in the negative experience condition to give the peaches an unpleasant, sour taste. Research by Peretz (1974) has shown that adding citric acid is an effective means for varying the liking of canned peaches. The level employed in the present research was one which exceeded by 5 grams the level at which there was unanimous agreement by the author and six research assistants that the peaches were bad tasting. Subjects in the positive experience condition received unadulterated peaches.

For the possible situational explanation manipulation, half of the subjects received a possible situational explanation for why the peaches may not have been as tasty as others while the other half of the subjects received no explanation. The possible situational explanation appeared on a separate mimeographed paper and had the appearance of being rather hastily done. The explanation used was as follows:

> These peaches may not be as tasty as others we've had because the lot which was used may have been picked too early. However, if the company decides to go into test market, they're going to have inspectors go to the groves to insure the ripeness and quality of the fruit, even though it may cost the company a little more.

Subjects in all conditions then rated the product on the elicited bi-polar attributes, and gave an overall taste rating. The five bi-polar attributes and overall taste scale employed were: firm texture--mushy texture, heavy syrup--light syrup, good "peach" color--discolored, sweet--sour ripe--not ripe, and overall tasty--overall not tasty. The

direction of scale polarities was randomly assigned for each attribute, and the scale order was randomly determined with the overall taste rating appearing last. A confidence rating was obtained for each of the above ratings on a confident--not confident scale. Seven point scales with anchors of extremely, moderately, somewhat, and neither were used. The rating scales were preceded by the following instructional statement: "Assuming that the company decides to go to test market, how do you think the product would be perceived (rated on the following characteristics)? In addition, please indicate on the provided scale how confident you are of each rating." A rating of purchase probability (own purchase probability) was obtained on a seven point probable--improbable scale, and was preceded by the following instructional statement: "Assuming that the company decided to bring this product on the market and that you needed to purchase a can of sliced peaches, what would be the probability that you would purchase this brand?" A confidence rating was then obtained for the probability ratings. In addition, subjects were asked 1) what percentage of other people who tried the new peaches would purchase them (others' purchase probability), 2) their preference on a five point preference scale for the new peaches in light syrup as opposed to peaches in heavy syrup (own preference), and 3) what percentage of other people who had tried the new peaches would prefer them to peaches in heavy syrup (others' preference). The measures of the subject's own preference

and his/her estimate of other people's preference were included to be parallel measures of the subject's own purchase probability and his/her estimate of other people's purchase probability. Confidence ratings were also obtained for each of these three measures. Demographic variables of sex, age, on- or off-campus residence, and frequency of food shopping were obtained for use as possible covariates.

A copy of the research instrument appears in Appendix B. Following its completion, subjects answered open-ended questions about what led to their purchase probability judgment, what led to their judgment of others' purchase probability, and their thoughts as to what accounted for the way the peaches tasted.

Design

Three factors, each with two levels, were manipulated in the present research. These were: number of prior (positive) experiences with the product, three or none; quality of experience with the product, positive or negative; and possible situational explanation, present or absent. The three factors are fixed, and completely crossed to provide a 2x2x2 factorial design. This design is presented in Figure 3.

Sixteen subjects were randomly assigned to each of the eight conditions, and were considered a random factor. A statistical power analysis (Cohen, 1977) of this design for this number of subjects revealed a power of approximately .80 to detect a main effect or interaction effect of approximately 6% of the variance, a medium-sized effect.

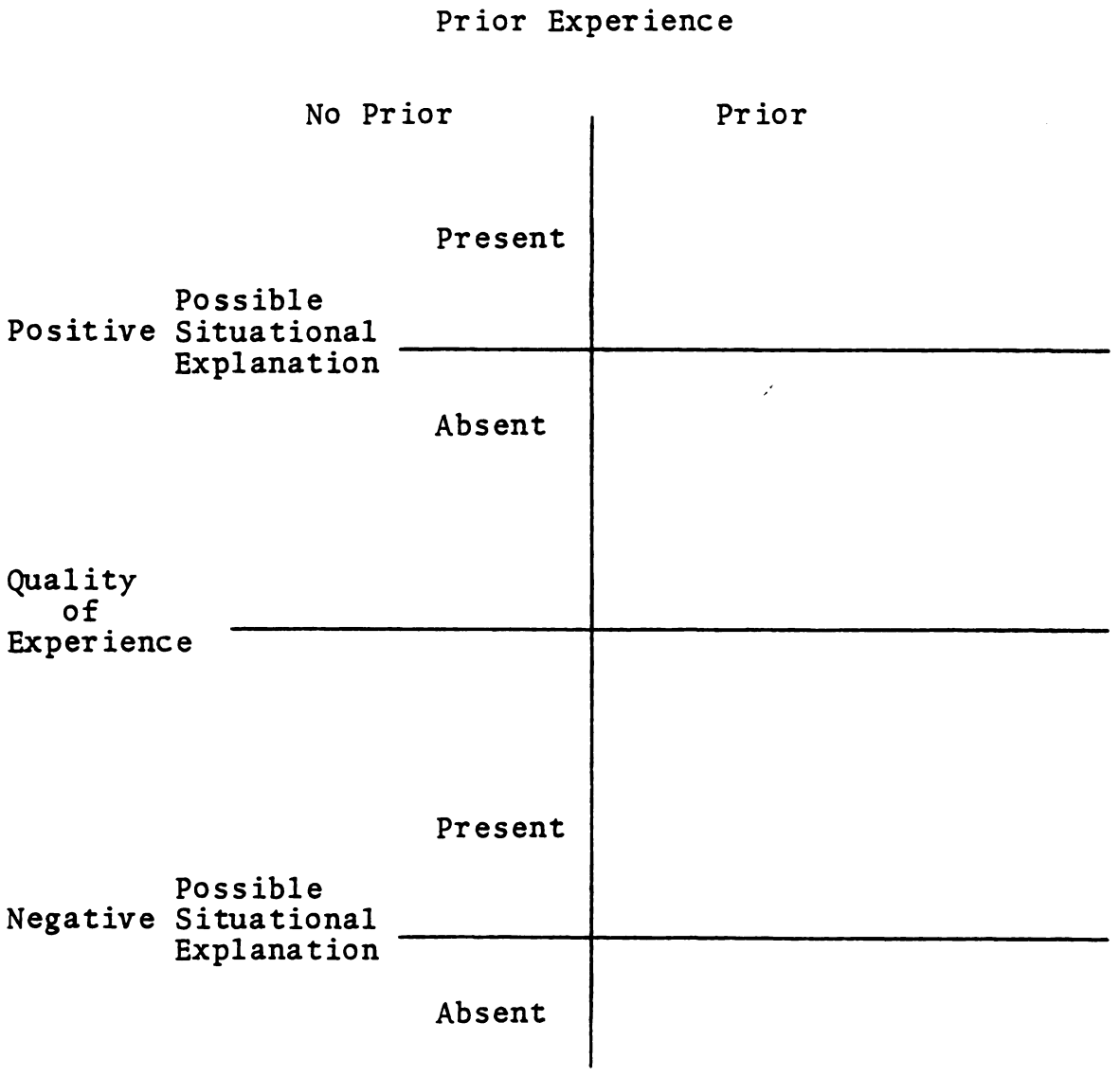

Figure 3 Design for the Research

Analyses

A modified version (Scheifley and Schmidt, 1973) of MULTIVARIANCE (Finn, 1972) was utilized to perform a preliminary multivariate analysis of covariance to determine if any of the demographic variables warranted inclusion as covariates. Following this, two separate multivariate analyses of variance were carried out. One analysis was performed on the dependent measures of sweetness, overall taste, probability of purchase, and preference, and the second analysis was performed on the confidence ratings for these dependent measures. A univariate analysis of variance was also carried out on the dependent measure of ripeness. This was done as a partial manipulation check on the possible situational explanation factor in that subjects who received the explanation should rate the peaches as significantly less ripe than the subjects who received no explanation.

A two stage significance-testing approach recommended by Hummel and Sligo (1971) was employed. If the overall multivariate null hypothesis was rejected, the univariate F's were interpreted to determine which dependent measures were significantly affected. Appropriate simple main effects were computed for significant interactions.

A path analysis (Heise, 1975) was also performed. Independent variables and interactions which were significant as well as nonsignificant independent variables involved in significant interactions were dummy coded and treated as exogenous variables. The dependent measures of sweetness,

overall taste, own purchase probability, others' purchase probability, own preference, and others' preference served as endogenous variables. The PATHPAC program by Hunter and Hunter (1977) was utilized for the analysis. With this program, causal influence indicators are specified which correspond to hypothesized causal relationships within a model. From these indicators path coefficients are obtained using ordinary least-squares estimation. Stated differently, path coefficients are beta weights derived from a set of multiple regressions on the posited relationships within a model. The path coefficients are used to generate a correlation matrix which, in turn, is subtracted from the observed correlation matrix to provide a residual matrix from which the goodness of fit of a proposed model can be judged.

RESULTS

Preliminary Analyses

Correlational analysis indicated that while the dependent measure of Own Preference was related to the measure of Own Purchase Probability ($r=.41$, $p<.01$), the measures were not parallel. The correlation of Own Purchase Probability with Overall Taste ($r=.71$) was significantly greater than the correlation of Own Preference with Overall Taste ($r=.35$; $t_{diff.}=4.42$, $p<.01$), and the correlation of Own Purchase Probability with Sweetness ($r=.60$) was significantly greater than the correlation of Own Preference with Sweetness ($r=.28$; $t_{diff.}=3.48$, $p<.01$). In addition, it was found that the correlation of Own Purchase Probability with Others' Purchase Probability ($r=.62$) was significantly different from the correlation of Own Preference with Others' Preference ($r=.25$; difference$=.37$, $p<.01$). Since the analyses indicated that the measures should not be combined to form a two item cluster as originally was hoped, Own Preference was treated as a separate measure, and a separate analysis of variance was performed on it. This analysis revealed that the independent variables had no significant effect on Own Preference, either as main effects or interactions.

An analysis of variance was also performed on the dependent measure of Ripeness as a partial check for the possible

situational explanation manipulation. This analysis revealed a significant main effect for the possible situational explanation factor, F (1,120) = 20.37, $p<.0001$. Subjects who received the explanation rated the peaches as significantly less ripe. Smaller main effects were found for quality of experience, F (1,120) = 7.10, $p<.0088$, and prior experience, F (1,120) = 4.50, $p<.0361$ with subjects who received the negative experience, and subjects who had prior experience rating the peaches as significantly less ripe. The possible situational explanation factor accounted for the most variance in Ripeness ratings (approximately 14%) with quality of experience (approximately 4%) and prior experience (approximately 3%) accounting for much less. So, the results suggest that the subjects attended to the ripeness aspect of the explanation.

The results of a multivariate analysis of covariance indicated that none of the demographic variables warranted inclusion in the analyses of variance as covariates.

Multivariate Analyses of Variance

The results of the multivariate analysis of variance for the dependent measure set of Sweetness, Overall Taste, and Own Purchase Probability will be presented first. The multivariate null hypothesis for the prior experience X quality of experience X possible situational explanation interaction was not rejected, F (3,118) = .68, $p<.5677$.

The multivariate null hypothesis for the prior experience X quality of experience interaction was rejected,

F (3,118) = 3.61, $p<.0155$. An examination of the univariate F's revealed that the interaction was significant only for the dependent measure of Sweetness, F (1,120) = 4.92, $p<.0284$. The cell means for the attribute of sweetness and the simple main effects for the interaction are presented in Table 1.

It can be seen for Table 1 that when given a negative experience, subjects who had prior (positive) experience rated the peaches as significantly less sour than did subjects who had no prior experience. Given a positive experience, there is no significant difference between the no prior and prior experience conditions. In the negative experience condition, subjects in the prior experience condition have a larger standard deviation (s = 2.24) than subjects in the no prior experience condition (s = 1.58). This finding, along with the pattern of means, is consistent with an explanation that some subjects in the negative experience--prior experience condition discounted the negative experience (and gave a sweetness rating consistent with prior experience) while other subjects did not (and gave a corresponding low sweetness rating). At the positive experience condition the difference in standard deviations can be explained by sampling error variance in the sweetness of peaches over four experiences. There is also a significant effect for quality of experience at each level of prior experience. Subjects in the negative experience condition rated the peaches as significantly less sweet.

The multivariate prior experience X possible situational

Table 1 The Attribute of Sweetness as a Function of Prior Experience and Quality of Experience

---

Table 1a. Mean sweetness, 1=extremely sour, 7=extremely sweet. Cell standard deviations in parentheses.

		Prior Experience	
		No Prior	Prior
Quality of Experience	Positive	5.50 (.92)	5.16 (1.48)
	Negative	3.03 (1.58)	3.97 (2.24)

Table 1b. Simple main effects.

No Prior vs. Prior at Positive, $F_{(1,120)} = .71$, $p > .25$

No Prior vs. Prior at Negative, $F_{(1,120)} = 5.27$, $p < .025$

Positive vs. Negative at No Prior, $F_{(1,120)} = 36.56$, $p < .001$

Positive vs. Negative at Prior, $F_{(1,120)} = 8.46$, $p < .005$

---

explanation interaction was not significant, F (3,118) = 1.88, p <.1367. A significant interaction was not predicted.

The multivariate null hypothesis for the quality of experience X possible situational explanation interaction was not rejected, F (3,118) = .68, p<.5644. So, the second hypothesis did not receive empirical support.

The multivariate main effect for the possible situational explanation factor was not significant, F (3,118) = .66, p< .5811. A significant main effect was not hypothesized.

No significant main effects or interactions were found for the analysis of variance of the confidence ratings for Sweetness, Overall Taste, and Own Purchase Probability. The cell means and standard deviations for the confidence ratings are presented in Table 2. Table 2 shows that the cell means are uniformly high. The flatness of the mean confidence ratings across cells explains the lack of significant effects.

Path Analysis

Prior experience, quality of experience, and the prior experience X quality of experience interaction were dummy coded and employed as exogenous variables in the path analysis. The correlation matrix which was input to PATHPAC appears in Table 3a. Several models were estimated, and the one which provided the best fit of the data is presented in Figure 4 with the residual matrix shown in Table 3b.

The exogenous variables impact the endogeneous variables through the dependent measure of sweetness. Sweetness and

Table 2 Confidence in Attribute Ratings

		No Prior Experience		Prior Experience		
		X	SD		X	SD
Positive Experience	C Sweetness	6.1888	.834	C Sweetness	6.063	.854
	C Overall Taste	6.1888	.981	C Overall Taste	6.688	.479
	C Own Purchase Probability	6.1888	.911	C Own Purchase Probability	6.1888	1.109
	Possible Situational Explanation					
	No Explanation					
	C Sweetness	6.188	.911	C Sweetness	6.063	.680
	C Overall Taste	6.063	.998	C Overall Taste	6.438	.629
	C Own Purchase Probability	5.938	.929	C Own Purchase Probability	5.938	.772
Negative Experience	C Sweetness	5.500	1.673	C Sweetness	6.313	1.138
	C Overall Taste	6.125	.885	C Overall Taste	6.375	1.008
	C Own Purchase Probability	5.938	1.237	C Own Purchase Probability	6.063	1.124
	Possible Situational Explanation					
	No Explanation					
	C Sweetness	6.750	.447	C Sweetness	6.625	.885
	C Overall Taste	6.563	.727	C Overall Taste	6.563	.629
	C Own Purchase Probability	6.000	1.461	C Own Purchase Probability	6.188	.834

Note: 1 = extremely not confident, 7 = extremely confident.

Table 3 Correlation Matrix for Path Analysis, and Residual Matrix of Observed Minus Predicted Correlations

---

Table 3a. Input Correlation Matrix

	P.E.	Q.E.	P.E.xQ.E.	S.	O.T.	Ow.Pu.	Ot.Pu.	Ow.Pr.	Ot.Pr.
Prior Experience	1.00	.00	.00	.08	.11	.08	.05	.01	.15
Quality of Experience	.00	1.00	.00	.49	.07	.13	.10	.11	.07
P.E. X Q.E.	.00	.00	1.00	-.17	.08	.01	-.08	-.01	.03
Sweetness	.08	.49	-.17	1.00	.47	.57	.43	.29	.18
Overall Taste	.11	.07	.08	.47	1.00	.71	.55	.34	.19
Own Purchase Probability	.08	.13	.01	.57	.71	1.00	.59	.42	.29
Others' Purchase Probability	.05	.10	-.08	.43	.55	.59	1.00	.37	.50
Own Preference	.01	.11	-.01	.29	.34	.42	.37	1.00	.24
Others' Preference	.15	.07	.03	.18	.19	.29	.50	.24	1.00

Table 3b. Residual Matrix of Observed Minus Predicted Correlations

	P.E.	Q.E.	P.E.xQ.E.	S.	O.T.	Ow.Pu.	Ot.Pu.	Ow.Pr.	Ot.Pr.
Prior Experience	.00	.00	.00	.00	.07	.03	.02	-.02	.13
Quality of Experience	.00	.00	.00	.00	-.16	-.15	-.06	-.01	-.02
P.E. X Q.E.	.00	.00	.00	.00	.15	.10	.02	.03	.05
Sweetness	.00	.00	.00	.00	.00	.00	.09	.05	.00
Overall Taste	.07	-.16	.15	.00	.00	.00	.13	.04	-.03
Own Purchase Probability	.03	-.15	.10	.00	.00	.00	.00	.00	-.02
Others' Purchase Probability	.02	-.06	.02	.09	.13	.00	.00	.12	.01
Own Preference	-.02	-.01	.03	.05	.04	.00	.12	.00	.06
Others' Preference	.13	-.02	.05	.00	-.03	-.02	.01	.06	.00

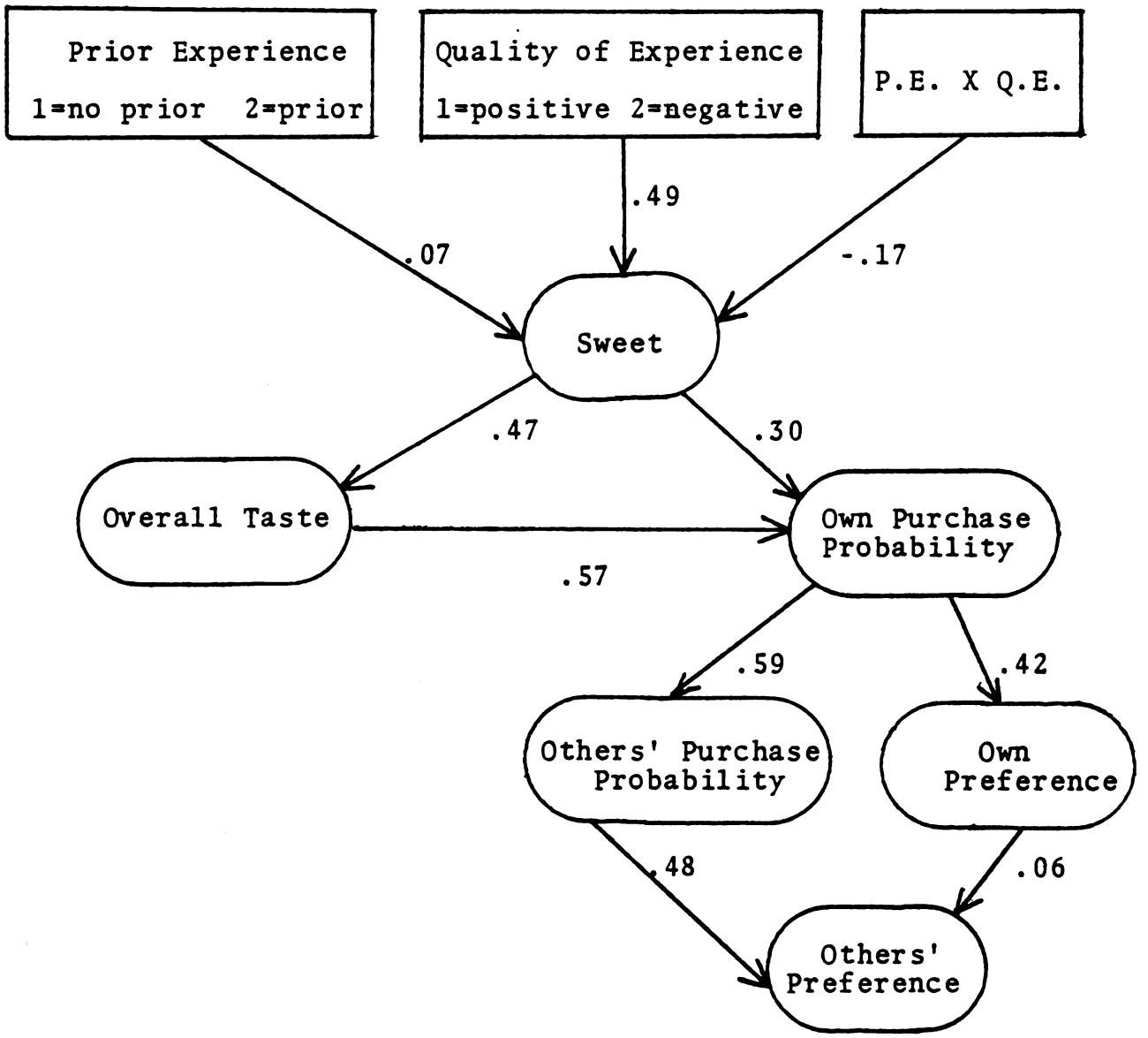

Figure 4 Path Model

Overall Taste, in turn, impact Own Purchase Probability which predicts both Others' Purchase Probability and Own Preference. Others' Purchase Probability and to a lesser extent Own Preference account for Others' Preference. It was expected that Preference would be causally prior to Purchase Probability (either Own or Other). The position of Own Preference in the obtained model suggests that the Preference item may not have accurately measured the underlying construct.

DISCUSSION

The prediction of a prior experience X quality of experience interaction was supported by the data. Given a negative exposure, subjects who had prior experience with the peaches rated them as significantly less sour than subjects who had no prior experience. Given a positive exposure, the prior experience factor had no significant effect on subjects' ratings. An examination of the means in Table 1 alone might suggest an averaging of experience for subjects in the negative experience--prior experience condition. However, the standard deviations indicate that some subjects discounted the negative experience while others did not. So, partial support was found for discounting in the multiple experience case.

The quality of experience X possible situational explanation interaction, and the prior experience X quality of experience X possible situational explanation interaction were not supported by the data. The significance of these interactions was dependent on the effectiveness of the possible situational explanation. The pattern of results for Ripeness indicate that while subjects attended to the message, it was not employed in a situational manner. The large main effect of the explanation on Ripeness supports this. Two possible explanations can be offered. Subjects may have doubted the

the situational nature of the problem, suspecting that the problem would be recurrent, or they simply may not have grasped the situational nature of the explanation.

An unexpected finding was the flatness across cells of mean confidence ratings. Regardless of condition, subjects were highly confident in all their ratings. A possible after-the-fact attributional explanation would be that the subjects possessed such a well developed causal schema about the salient attributes of a "good" canned peach and their ability to evaluate them, that this schema overshadowed the experimental manipulations. However, the attributional object was chosen to be one for which subjects possessed a well-developed conception. An alternate explanation may be that because there were no personal consequences to subjects for their ratings, they may have been more liberal in their confidence estimates.

The path analysis revealed that quality of experience and the prior experience X quality of experience interaction impacted the dependent measures through the attribute of sweetness. Sweetness directly impacted Overall Taste, and both directly and indirectly impacted Own Purchase Probability. So, an individual's purchase probability was significantly predicted by his/her evaluation of sweetness. The path model also indicates that individuals used their own purchase probability to estimate others' purchase probability. This finding is consistent with the egocentric or false consensus bias discussed by Ross (1977). This bias is one where individuals view their own judgments as relatively common, and that

most other individuals would behave as they would. The position of Own Preference in the path model, and its small relationship with Others' Preference would suggest that the preference measure employed in this research did not capture the underlying construct of preference. Theoretically one would expect preference to causally preceed purchase probability.

The present research demonstrated discounting as a more general attribution phenomenon, consistent with the principle of minimum causation. A segment of subjects with prior experience, when given an inconsistent negative experience, tended to discount it in light of the prior positive experiences; subjects who had no prior experience to draw upon were more harsh in their evaluation of the product.

Within attribution theory, more thought should be given to how multiple experiences are translated into causal schema, and the conditions for employing a causal schema as opposed to actively seeking further experience. Further empirical work is needed to define these processes. Following from this, research is needed to address the questions of when a decision is made to employ a causal schema or seek further experience, what are the differences in causal explanations rendered, and how do they differ in validity?

With regard to consumer behavior, two implications come to mind. The finding of significant interaction of prior experience and quality of experience for the sweetness attribute (which significantly impacted purchase probability)

provides a theoretical underpinning for the observation that consumers who have a negative experience with a product with which they have had previous positive experiences will be more likely to purchase the product again than will consumers whose first experience with the product is negative. In addition, if an effective situational explanation were present, consumers with prior positive experience would be more likely to actively seek out and use that explanation to reduce the incongruency. Consumers with no past experience, however, would have no such motivation.

A marketing implication of this research would be to have multiple-unit new trial promotions so that if a single negative experience occurred it would be more likely attributed to situational factors than to the product itself. Where multiple-unit new trials are not possible, more explicit preparation instructions/serving suggestions could be included with the product to facilitate a positive first experience.

APPENDICES

APPENDIX A

In new product research it is necessary to identify the characteristics or qualities of a product which are important to consumers. Today we would like you to think of characteristics or attributes of canned sliced peaches which are important to you. For example, carbonation (carbonated-flat) might be an important attribute for a soft drink. On the lines below, please list the attributes of canned sliced peaches which are important to you.

_____

_____

_____

_____

_____

_____

_____

_____

Student number_____
(for identification purposes only,
your responses will be strictly confidential)

New Product Research

Rate each of these potential brand names according to the scale below by placing the number which corresponds most closely to your opinion in the space beside the name.

1. Like very much
2. Like somewhat
3. No opinion
4. Dislike somewhat
5. Dislike very much

Name Brands

_____ 1. Flavor Valley Peaches

_____ 2. Sweet Breeze Peaches

_____ 3. Orange Lake Peaches

_____ 4. Gold "n" Ripe Peaches

_____ 5. Sun Ripe Peaches

_____ 6. Mell-o-Sweet Peaches

_____ 7. Tasty De-Lite Peaches

_____ 8. Orchard Fresh Peaches

_____ 9. Meadow Grove Peaches

_____10. Tropical Treat Peaches

Rate these slogans using the same scale.

_____ 1. "So fresh they belong at the produce counter".

_____ 2. "Now there's good taste without the extra calories".

_____ 3. "The perfect treat, light and sweet".

_____ 4. "Light in taste, light in price".

_____ 5. "When you want that something sweet, here's a healthy treat".

_____ 6. "So light and fresh you can eat "em" anytime".

_____ 7. "Preserved in light syrup to give that better than fresh picked taste".

_____ 8. "Now there's that light fresh taste anytime of year".

Student number_____

New Product Research

Rate each of these possible marketing strategies as to how effective you think they will be in helping product sales by using the scale below, and placing the number which corresponds most closely to your opinion in the space beside the strategies.

1. Very effective
2. Fairly effective
3. No opinion
4. Fairly ineffective
5. Very ineffective

Strategies

_____1. Money-off coupons in daily newspaper.

_____2. Recipes serving suggestions on side of can.

_____3. Money-back guarantee.

_____4. Contest—"In twenty-five words or less why _____peaches in light syrup are the best".

_____5. Cottage cheese—promotional tie-in.

_____6. Prominent front-of-aisle displays in addition to shelf locations.

_____7. Have a Jo Ann Worley type spokesperson to associate with the brand name.

_____8. A catchy jingle.

Student number_____

APPENDIX B

Student Number_____
(for identification purposes only your responses will be strictly confidential)

NEW PRODUCT RESEARCH

Assuming that the company decides to go to test market, how do you think the product would be perceived (rated on the following characteristics)? In addition please indicate on the provided scale how confident you are of each rating.

	Extremely	Moderately	Somewhat	Neither	Somewhat	Moderately	Extremely	
Firm Texture	____	____	____	____	____	____	____	Mushy Texture
Confident	____	____	____	____	____	____	____	Not Confident
Heavy Syrup	____	____	____	____	____	____	____	Light Syrup
Confident	____	____	____	____	____	____	____	Not Confident
Discolored	____	____	____	____	____	____	____	Good "peach" Color
Confident	____	____	____	____	____	____	____	Not Confident
Sweet	____	____	____	____	____	____	____	Sour
Confident	____	____	____	____	____	____	____	Not Confident
Not ripe	____	____	____	____	____	____	____	Ripe
Confident	____	____	____	____	____	____	____	Not Confident
Overall Tasty	____	____	____	____	____	____	____	Overall Not tasty
Confident	____	____	____	____	____	____	____	Not Confident

Assuming that the company decided to bring this product on the market and that you needed to purchase a can of sliced peaches, what would be the probability that you would purchase this brand? In addition please indicate on the provided scale how confident you are of your probability rating.

	Extremely	Moderately	Somewhat	Neither	Somewhat	Moderately	Extremely	
Probable	_____	_____	_____	_____	_____	_____	_____	Improbable
Confident	_____	_____	_____	_____	_____	_____	_____	Not Confident

Assuming that the company decided to bring this product on the market, what percentage of other people who have tried these peaches do you think would purchase this brand?

_____%

Please indicate how confident you are of the above percentage.

	Extremely	Moderately	Somewhat	Neither	Somewhat	Moderately	Extremely	
Confident	_____	_____	_____	_____	_____	_____	_____	Not Confident

Do you prefer these new peaches in light syrup to peaches in heavy syrup?

	Definitely Prefer	Somewhat Prefer	No Preference	Somewhat Prefer	Definitely Prefer	
Light Syrup	_____	_____	_____	_____	_____	Heavy Syrup

Please Indicate how confident you are of the above rating.

	Extremely	Moderately	Somewhat	Neither	Somewhat	Moderately	Extremely	
Confident	_____	_____	_____	_____	_____	_____	_____	Not Confident

What percentage of other people who have tried these peaches do you think would prefer them to peaches in heavy syrup?

_____%

Please indicate how confident you are of the above percentage.

	Extremely	Moderately	Somewhat	Neither	Somewhat	Moderately	Extremely	
Confident	_____	_____	_____	_____	_____	_____	_____	Not Confident

Demographics

Sex: Male _____ Female _____

Age: _____

Do you live:

on campus _____ off campus _____

How often do you usually go food shopping?

_____ more than twice a week

_____ twice a week

_____ once a week

_____ once every two weeks

_____ once a month

_____ less than once a month

_____ less than once every six months

LIST OF REFERENCES

LIST OF REFERENCES

Beckman, L. Effects of students' performance on teachers' and observers' attributions of causality. Journal of Educational Psychology, 1970, 61(1), 76-82.

Cohen, J. Statistical power analysis for the behavioral sciences. New York: Academic Press, 1977.

Finn, J.D. MULTIVARIANCE: Univariate and multivariate analysis of variance, covariance, and regression. Ann Arbor: National Educational Resources, Inc., 1972.

Fishbein, M., & Ajzen, I. Attitudes and opinions. Annual Review of Psychology, 1972, 23, 487-544.

Heise, D.R. Causal analysis. New York: Wiley & Sons, 1975.

Hummel, T.J., & Sligo, J.R. Empirical comparison of univariate and multivariate analysis of variance procedures. Psychological Bulletin, 1971, 76(1), 49-57.

Irwin, F.W., & Smith, W.A.S. Further tests of theories of decision in an "expanded judgment" situation. Journal of Experimental Psychology, 1956, 52(6), 345-348.

Irwin, F.W., & Smith, W.A.S. Value, cost, and information as determiners of decision. Journal of Experimental Psychology, 1957, 54(3), 229-232.

Irwin, F.W., Smith, W.A.S., & Mayfield, J.F. Tests of two theories of decision in an "expanded judgment" situation. Journal of Experimental Psychology, 1956, 51(4), 261-268.

Jones, E.E., Davis, K.E. & Gergen, K.J. Role playing variations and their informational value for person perception. Journal of Abnormal and Social Psychology, 1961, 63(2), 302-310.

Kelley, H.H. Attribution in social interaction. in E.E. Jones, D.E. Kanouse, R.E. Nisbett, S. Valins, & B. Weiner (Eds.), Attribution: Perceiving the causes of behavior. Morristown (NJ): General Learning Press, 1972a.

Kelley, H.H. Attribution theory in social psychology. in D. Levine (Ed.), Nebraska Symposium on Motivation, (Vol. 15). Lincoln: University of Nebraska Press, 1967.

Kelley, H.H. Causal schemata and the attribution process. in E.E. Jones, D.E. Kanouse, R.E. Nisbett, S. Valins, & B. Weiner (Eds.), Attribution: Perceiving the causes of behavior. Morristown (NJ): General Learning Press, 1972b.

Kelley, H.H. The process of causal attribution. American Psychologist, 1973, 28(2), 107-128.

Kiesler, C.A., & Munson, P.A. Attitudes and opinions. Annual Review of Psychology, 1975, 26, 415-455.

McArthur, L.A. The how and what of why: Some determinants and consequences of causal attribution. Journal of Personality and Social Psychology, 1972, 22(2), 171-193.

Orvis, B.R., Cunningham, J.D., & Kelley, H.H. A closer examination of causal inference: The roles of consensus, distinctiveness, and consistency information. Journal of Personality and Social Psychology, 1975, 32(4), 605-616.

Peretz, M.D. Studies on the measurement of attitude intensity. Unpublished master's thesis, Michigan State University, 1974.

Ross, L. The intuitive psychologist and his shortcomings: Distortions in the attribution process. in L. Berkowitz (Ed.), Advances in Experimental Social Psychology, (Vol. 10). New York: Academic Press, 1977.

Ruble, D.N., & Feldman, N.S. Order of consensus, distinctiveness, and consistency information and causal attributions. Journal of Personality and Social Psychology, 1976, 34(5), 930-937.

Scheifley, V.M., & Schmidt, W.H. Jeremy D. Finn's MULTIVARIANCE - multivariate analysis of variance, covariance, and regression - modified and adapted for use on the CDC 6500. Occasional Paper No. 22, Office of Research Consultation, School for Advanced Studies, College of Education, Michigan State University, 1973.

Shaklee, H.L. Limited minds and multiple causes: Discounting in multicausal attribution (Doctoral dissertation, University of Oregon, 1976). Dissertation Abstracts International, 1977, 37(9), 4764B.