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ATTITUDINAL AND NORMATIVE VARIABLES AS PREDICTORS OF MEXICAN AGRICULTURAL STUDENTS' SPECIFIC INTENTIONS AND BEHAVIOR: A TEST OF THE REASONED ACTION THEORY

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ABSTRACT

ATTITUDINAL AND NORMATIVE VARIABLES AS PREDICTORS OF MEXICAN AGRICULTURAL STUDENTS' SPECIFIC INTENTIONS AND BEHAVIOR: A TEST OF THE REASONED ACTION THEORY

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Theoretical and methodological concerns underlining current attitudinal research in agricultural education led to the selection of the Reasoned Action Theory or Fishbein Model as a theoretical framework and alternative methodology for the study of attitudes and their relation to behavior.

The model was applied at a Mexican agricultural college where a behavioral domain contextually related to agricultural education (agricultural students' participation behavior in summer field work projects) was selected.

Because the potential viability of the model as a diagnostic tool for developing sound behavioral change strategies was dependent on the validity of the causal relationships specified by the model, testing its predictive validity became the focus of this study. This was synonymous with assessing the tenability of the theoretical model, which posited the following causal hypotheses: (1) That the immediate determinant of behavior is intention; (2) that intention is determined by attitudinal and normative variables; (3) that the attitudinal variable is determined by behavioral beliefs and outcome evaluations; and (4) that the normative variable is determined by subjective norms and motivation to comply.

Variables involved in the model were measured and first analyzed through simple descriptive statistics. Correlational and multiple regression analysis techniques were then utilized to empirically test the relationships hypothesized by the model. Empirical testing of causal relationships also hypothesized by the model was further undertaken through the use of path analysis.

Results obtained in this study indicated that, for this application of the model: (1) behavior was moderately predicted by intention; (2) only the normative variable contributed to the prediction of intention; (3) the attitudinal variable did not contribute to the prediction of intention (attitudes were not causally related to intentions); (4) the attitudinal variable was moderately predicted by behavioral beliefs and outcome evaluations; (5) the normative variable was not predicted by subjective norms and motivation to comply taken together; and (6) when omitting the motivation to comply subcomponent the normative variable was moderately predicted by subjective norms.

The Fishbein model was determined of moderate utility as a framework for the prediction of intentions and behavior from attitudinal and normative variables. Also, it was determined moderately useful as a tool for developing sound behavioral change strategies to increase student participation in summer field work projects.

Modified applications of the Fishbein Model, integrating other variables hypothesized as enhancing its predictive power were recommended for future research applications of this model.

To my parents and husband

for their unconditional support

in all my academic pursuits.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

During the past decade, research efforts in agricultural education regarding attitude assessment have clearly increased. Nineteen studies published in the Journal of Agricultural Education between 1982 and 1990 primarily involved the measurement of attitudes of various subgroups of the agricultural education population. [See Boone and Newcomb (1990), Roegge and Russell (1990), Cano (1990), Adelaine and Foster (1989), Smith and Collins (1988), Kortlik (1987), Arrington (1986), Deeds and Barrick (1986), Miller and Short (1986), Jones and Williams (1986), Kortlik and Lelle (1986), Reneau and Roider (1986), Arrington (1985), Harris and Newcomb (1985), Miller and Krill (1985), Wiggins and Trede (1985), Dillon (1984), Herren and Cole (1984), and Benson (1982).] Furthermore, 32 out of a total of 45 agricultural education doctoral dissertations dealing with attitude-related measures were identified by Bin Yahya and Moore (1984) in the 1983 Dissertation Abstracts International alone. Attitudinal measures in all of these studies involved a wide range of target objects.

This evidence of the growing research interest in attitudinal measurement makes it apparent that the knowledge base generated from the study of attitudes in agricultural education must have important implications in this field. These implications have commonly been drawn from traditionally held attitude-utility notions such as those proposed by Petty and Caccipo (1981), who explained that attitudes in people "serve as convenient summaries of our beliefs" and "presumably help others to predict the kinds of behaviors we're likely to engage in" (p. 8).

The presumption of an existing relation between attitude and behavior has been investigated by attitude research reviewers such as Wicker (1969), Calder and Ross (1973), Deutcher (1973), McGuire (1975), Kreitler and Kreitler (1976), Schuman and Johnson (1976), Eagly and Himmelfarb (1978), Ajzen and Fishbein (1980), McPhee and Cushman (1980), and Canary and Siebold (1984). It is within the historical evolution of the conceptualization of the term "attitude" that the attitude-behavior relationship first became intuitively hypothesized. According to Cushman and McPhee (1980), a link between attitude and behavior resulted from early conceptually blurred notions of attitude that promoted a schizophrenia of definitions of attitudes by the mid 1930's and later caused the attitude construct to become imbued with a behavioral connotation.

Operationalizing the study of attitudes under a general assumption of attitude-behavior correspondence provides grounds for easily inferable behavioral predictions. This assumption further simplifies researchers' task of drawing from their findings practical implications that are ultimately translated into policy recommendations aimed at clearly defined program improvements.

Anchoring agricultural education attitudinal research in this rationale has allowed for the flourishing of studies seeking to assess the attitudes of people involved in agricultural education through various means of attitudinal measurement. In agricultural education it is important to know, for example, the attitudes of high school students toward agriscience programs. Agricultural educators can then presume that these measured attitudes (negative or positive) will help them predict these students' likely behavior (doing or not doing things regarding agriscience education). Based on knowledge of these students' attitudes and predictions of their behaviors, agricultural educators can further derive extensive implications, such as how to change attitudes to obtain desirable behavior (e.g., enrollment in agriscience courses) or on how to change the attributes of the students' attitude

targets (e.g., perceived characteristics of agriscience programs) to increase students' positive attitudes and thus positive behaviors towards the target.

Theoretical constructs like these regarding attitudes and behaviors are generally not overtly discussed in published agricultural education attitudinal studies. Rather, these constructs appear to be implicitly accepted as the theory base for conventional attitude research in this field.

Most attitudinal research in agricultural education has been carried out through exploratory, descriptive and correlational approaches. Mannebach, McKenna and Pfau (1984) and Bowen et. al. (1990) found an overwhelming predominance of descriptive research in agricultural education. This finding suggests the existence of a research paradigm which perhaps explains why attitude research has focused on describing populations on the basis of similarities and differences observed in respondents' measured attitudes, and on exploring and measuring the degree of relationship between assessed attitudes and demographic variables. Although this kind of research has merit because it reflects a concern for supporting an original assumption—that attitudes reflect life experiences (Davidson and Thomson, 1980 p. 46), it continues to be carried out under traditional assumptions of general attitude-behavior consistency, an assumption that has long been closely scrutinized and strongly challenged by attitude theorists.

A 1990 study report by Guerrero and Sutphin on research priorities in agricultural education indicated that the great majority of research topics identified within the profession were not theoretically, conceptually, and psychologically based. The evidence of ever-increasing interest in attitudes as a topic of research in agricultural education, however, seems to contradict Guerrero and Sutphin's findings of low interest in theoretical, conceptual and psychologically based topics. But this contradiction is apparent only because, despite the great interest in attitudinal

research in agricultural education, this research reflects a void in the treatment of attitude as a theoretically, conceptually and psychologically based concept. This does not come as a surprise when far more basic problems of conceptual ambiguity and lack of common definitional basis have been identified in many attitude-related studies published in agricultural education (Bin Yahya and Moore, 1984).

Simultaneous consideration of the forecasted increase in the rate at which researchers in agricultural education will be undertaking attitude-related studies and the problems with analytical procedures associated with current attitude research (Bin Yahya and Moore, 1984) suggested a search for alternative theories and methodologies that more clearly conceptualize and investigate attitude as a social-psychological phenomenon and its theorized linkages with behavior.

Current trends towards a more global, international perspective in agricultural education in the United States will undoubtedly permeate researchers' interest in carrying out studies abroad, and comparative studies are bound to characterize this research. Awareness of these trends and concerns clearly underscores the need to overcome existing "isolation from the works in other academic disciplines" (Matthews and Campbell, 1983) in order to identify contemporary attitudinal research approaches that are founded on strong theoretical and methodological propositions. Moreover, as researchers prepare to carry out research endeavors abroad, this may question whether prospective theories and methodologies are sufficient for comparative research of an international nature.

Awareness of these issues raised questions leading to the development of this study, which combined a search for theory and methodology providing empirical evidence on the attitude-behavior relationship with an opportunity to test the predictive utility of this theory and methodology in an international agricultural education setting.

The final presentation of this study thus evolved from the application and evaluation of the Reasoned Action Theory, a theoretical model identified from the field of social psychology, which offers a methodological alternative to the study of attitudes and their relation to behavior. This theory was tested in a Mexican agricultural college where a behavioral domain contextually relevant to agricultural education (agricultural students' participation behavior in summer field work projects) was selected for this research endeavor.

1.1 Nature of the Problem

Agricultural Education research most often approaches the study of attitudes from an implicit assumption that attitudes in general correlate directly with behavior, "when this relation has long been proven elusive" (King, 1975, p. 237). In agricultural education, an unexplored alternative to the study of attitudes as they relate to behavior is the use of a theoretical approach. This study tested the utility of a prominent social psychology theoretical model in an international situation. This model, which involves attitudinal measures, conceptualizes the attitude-behavior relationship differently than in current agricultural education attitudinal research. Its impressive success in providing a useful framework for predicting intentions and behavior from attitudinal and normative variables in a variety of situations—including family planning, voting behavior, occupational choice, and marketing research—made it worthy of consideration as a potential theoretical framework for the study of attitudes and behavior in an international agricultural education setting.

1.2 Purpose of the Study

The central purpose of this study was to test the *predictive utility* of the Reasoned Action Theory (also known as Fishbein and Ajzen's model or Fishbein's model) in an

international agricultural education setting. Testing the model's predictive utility is synonymous with assessing the tenability of this theoretical model which posits the following hypotheses: (1) that the immediate determinant of behavior is intention; (2) that intention is determined by weighted attitudinal and normative variables; (3) that the attitudinal variable is determined by behavioral beliefs and outcome evaluations; and (4) that the normative variable is determined by subjective norms and motivation to comply.

1.3 Research Questions

To accomplish the purpose of this study, the following research questions were formulated:

1. What were the behavioral beliefs, outcome evaluations, normative beliefs, motivation to comply, attitudes, subjective norms, intentions, and behavior of agricultural students regarding participation in summer field work projects at Chapingo University?
2. What were the correlations between the various components of the Reasoned Action Model tested in an international agricultural education setting?
3. Were the causal relationships hypothesized between the components of the Reasoned Action Model supported in the applied model?

1.4 Hypotheses

The second research question of this study required the measurement of correlations between the components of the Reasoned Action Model and implied the testing of the following hypotheses, which were operationalized as follows:

H1: An agricultural student's positive intention to participate in summer field work projects is positively correlated with his/her actual participation behavior in DETCU's summer field work projects.

H2: A positive multiple correlation is observed between (a) an agricultural student's positive intention to participate in DETCU's summer field work projects, (b) the agricultural student's positive global attitude toward participating in DETCU's summer field work projects, and (c) his/her positive global subjective norm with respect to participating in DETCU's summer field work projects.

H3: An agricultural student's positive global attitude toward participating in DETCU's summer field work projects is positively correlated with his/her estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in DETCU's summer field work projects.

H4: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects is positively correlated with his/her estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects.

The third research question required the measurement of the causal paths hypothesized to exist between the components of the Reasoned Action Model. To determine whether these causal relationships are supported in the applied model several hypotheses were operationalized as follows:

H5: An agricultural student's positive intention to participate in DETCU's summer field work projects has a direct and positive effect on his/her actual participation behavior in DETCU's summer field work projects.

H6: An agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H7: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H8: An agricultural student's positive estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in DETCU's summer field work projects has a direct and positive effect on his/her global attitude toward the act of participating in DETCU's summer field work projects.

H9: An agricultural student's positive estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects has a direct and positive effect on his/her global subjective norm with respect to participating in DETCU's summer field work projects.

1.5 Delimitations

Because this study primarily involved the empirical testing of hypotheses derived from a theoretical model of behavioral prediction, it was limited to the following conditions:

1. This study was limited to testing the predictive utility of Fishbein's Reasoned Action Model for a behavioral domain particular to agricultural students at

Chapingo University in Mexico. The behavioral domain was defined as student participation in summer field work projects. It did not include the study of any other field work-related actions or behavior.

2. Subject participation was limited to selected undergraduate agricultural students enrolled at the University of Chapingo in 1991.

3. The study was limited to testing Fishbein's Reasoned Action Model and did not involve attitudinal change measurements.

1.6 Assumptions

Several assumptions were made in undertaking this study:

1. Factors considered in the theory as being further removed from the behavior— such as a person's demographics, personality traits, or global attitudes towards the target of the behavior— are assumed to have no direct impact on behavioral performance. According to the Reasoned Action Theory, variables of this kind will be related to behavior if, and only if, they influence the beliefs that underlie the behavior's attitudinal or normative determinants (Ajzen and Fishbein, 1980, pp. 82–86).

2. The respondents were able to express themselves freely when answering an open-ended questionnaire eliciting their beliefs and personal referents regarding participation in summer field work projects.

3. No radical changes in the respondents' salient or modal beliefs and personal referents occurred between the time the instrument was developed and pilot tested and the time it was used for data collection.

4. A one-or-two week interval between measurements of behavioral intention and actual behavior was considered reasonable for accurate behavioral prediction (Ajzen and Fishbein, 1980, p. 52).

1.7 Importance of the Study

The number of published research studies on the attitude concept in this field clearly reflects the interest within agricultural education. Attitude has become part of agricultural educators' lexicon and, with it, the long-held assumption that measuring attitudes permits a reliable assessment of people's behavior to be inferred. This research assumption, coupled with the use of traditional measures of attitudes toward objects instead of the use of attitudinal measures toward performance of a specifically targeted behavior, further hinders researchers from making accurate inferences regarding attitude and behavior.

This study gains significance from testing the Fishbein's model, which proposes a theory based approach to attitudinal measurements and behavioral predictions. Furthermore, this study serves as a gauge of the potential viability of this model as a diagnostic tool for predicting behavior as well as developing behavioral change strategies to accomplish targeted program or policy outcomes in agricultural education.

1.8 Definition of Terms

Agricultural education That which provides students with scientific and technological knowledge that enables them to understand and analyze agricultural problems at the regional and national levels, and generate and propose alternatives to solve those problems through experimentation and research with

the purpose of contributing to the welfare and development of the great majority of the Mexican population living in rural areas (Mata, 1981a, p. 173).

Attitude A person's evaluation of any psychological object (Ajzen and Fishbein, 1980, p. 26).

Attitude toward the behavior A person's judgment that performing the behavior is good or bad; that he is in favor or against performing the behavior (Ajzen and Fishbein, 1980, p. 56).

Behavioral beliefs The beliefs that underlie a person's attitude toward the behavior (Ajzen and Fishbein, 1980, p. 7).

Behavioral intentions A measure of the likelihood that a person will engage in a given behavior (Ajzen and Fishbein 1980, p. 42).

Belief The subjective probability of a relation between the object of the belief and some other object, value, concept, or attribute (Fishbein and Ajzen 1975, p. 131).

DETCU (Departamento de Trabajos de Campo Universitarios) Field Work Department at Chapingo University that coordinates summer field work activities involving volunteer agricultural students (Mata, 1981b p. 57).

Normative beliefs The beliefs that underlie a person's subjective norms (Ajzen and Fishbein, 1980 p. 7).

Salient beliefs The number of beliefs about any given object a person can attend at any given moment (Ajzen and Fishbein 1980, p. 63).

Subjective norms A person's perception that important others desire his/her performance or non-performance of a specific behavior (Ajzen and Fishbein 1980, p. 57).

Summer field work projects Field activities carried out in Mexican rural communities by volunteer agricultural students who are organized into interdisciplinary work teams for periods that extend from 10 to 30 days during the summer vacation. These activities are intended to enable the students first to become aware of and understand the problems of poor farmers and subsequently to analyze, discuss, and generate alternatives to solve one or several of these problems. These actions to promote rural development are defined interactively between farmers and project participants and involve activities such as experimentation, research, education, and organization (Mata, 1981b p. 57).

1.9 Study Overview

Chapter 1 contains an introduction to this study and brief descriptions of the study's purpose; its research questions, limitations, assumptions, hypotheses, and importance; and definitions of the terms most often used in this study. Chapter 2 reviews literature relevant to this study. Chapter 3 systematically describes the methodology and procedures, based on the theoretical propositions of Fishbein's Reasoned Action Model. Chapter 4 is devoted to presenting data collection and statistical analysis results. Chapter 5 presents a final summary along with the conclusions and recommendations of this study.

CHAPTER 2

REVIEW OF LITERATURE AND RELATED RESEARCH

The literature reviewed for this study has been outlined by sections that present sequentially the various issues relevant to this study. The first section presents several conceptualizations of the term "attitude." The sections that follow deal with definitional variations of attitude, attitude-behavior consistency, predictive validity of attitude measurements, the significance of attitude research in agricultural education, the characteristics of attitudinal research in agricultural education, contemporary research on the attitude-behavior relationship and Fishbein's Model, an overview of the Reasoned Action Model, related empirical research providing supporting evidence for the predictive utility of the model, a summary of research outlining concerns and limitations of the model, and a discussion of issues in cross-cultural theory testing and international applications of the model. To conclude this chapter a presentation of literature linking several concepts which led to the selection of both research site and behavioral domain, was deemed necessary to provide an overview on the context and relevance of this study.

2.1 Conceptualizations of the Term "Attitude"

"Attitude," a term once equated with social psychology (Thomas and Znaniecki, 1918), had established more than half a century ago a strong reputation as "the most distinctive and indispensable concept in contemporary American psychology" (G. Allport, 1935). This term has given rise to major conceptual and theoretical

controversies and has expanded its influence beyond the boundaries of social psychology into many other theory and research areas. Definitions of the term are as many and as varied as the researchers and theorists dealing with it. A chronological presentation of definitions of attitude, though not exhaustive, will provide an idea of the variety of perspectives on the attitude concept by many prominent authors.

"An attitude is the sum total of man's inclinations and feeling, prejudices or biases, preconceived notions, ideas, fears, threats, and convictions about any specific topic."

—Thurstone and Cave (1929, p. 6)

"A mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related."

—G. Allport (1935, p. 798)

"An enduring organization of motivational, emotional, perceptual and cognitive process with respect to some aspect of the individual's world."

—Krech and Crutchfield (1948, p. 35)

"An enduring learned predisposition to behave in a consistent way toward a given class of objects."

—English and English (1958, p. 50)

"An emotional tendency, organized through experience to react positively or negatively toward a psychological object."

—Reemer, Gage and Rummel (1965, p. 308)

"Attitudes refer to the stands the individual upholds and cherishes about objects, issues, persons, groups, or institutions."

—Sherif, Sherif and Nebergall (1965, p. 4)

"A state of readiness, a tendency to act or react in a certain manner when confronted with certain stimuli."

—Oppenheim (1966, p. 105)

"A relatively enduring system of affective evaluative reactions based upon and reflecting the evaluative concepts or beliefs which have been learned about the characteristics of a social object or class of social objects."

—Shaw and Wright (1967, p. 10)

"A relatively enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner."

—Rokeach (1968, p. 112)

"An attitude is an idea charged with emotion which predisposes a class of actions to a particular class of social situations."

—Triandis (1971a, p. 2)

McGuire (1969) indicated that considerable dialogue had continued for several decades on the precise definition of attitudes. Several authors, however, had agreed on various characteristics of the concept. The major ones are:

1. Attitudes are based upon evaluative concepts regarding characteristics of a referent object and give rise to motivated behavior (Anderson and Fishbein, 1965; Doob, 1947; Osgood, Suci and Tannenbaum, 1957).

2. Attitudes are construed as varying in quality and intensity (or strength) on a continuum from positive through neutral to negative (Krech, Crutchfield and Ballachey, 1962; McGrath, 1964; Newcomb, Turner and Converse, 1965).

3. Attitudes are learned, rather than being innate or a result of constitutional development and maturation (Sherif and Sherif, 1956; McGrath, 1964; Rokeach, 1968).

4. Attitudes have specific social referents or specific classes thereof (Sherif and Sherif, 1956; Newcomb, Turner and Converse, 1965; Summers, 1970).

5. Attitudes possess varying degrees of interrelatedness to one another (Krech, Crutchfield and Ballachey, 1962; McGrath, 1964).

6. Attitudes are relatively stable and enduring (Newcomb, Turner and Converse, 1965; Sherif and Sherif, 1956; Summers 1970; Rokeach, 1968).

7. Attitudes are inferred constructs that can be derived from what people say, their stated values and preferences (Rokeach, 1968; Summers, 1970).

8. Finally, a prominent characteristic attributed to attitudes is that they can be measured (Oppenheim, 1966; Shaw and Wright, 1967; Bohrnstedt, 1970; Summers, 1970; Henerson, Morris and Fitzt Gibbon, 1978; Aiken, 1980; Horne, 1980).

2.2 Definitional Variations

The consensus of several authors on various characteristics of attitudes did not, however, expand to their theoretical conceptions of the structure of attitudes. Some had traditionally perceived the attitude structure as having three components: a cognitive component, an affective component and a conative component (Katz and Stotland, 1959; Krech, Crutchfield and Ballachey, 1962; Secord and Backman, 1964; Newcomb, Turner and Converse, 1965; and Brown, 1965). These social psychologists found it useful to regard an attitude as an organization of belief, emotional and action-tendency components. Other researchers, however, limited the theoretical construct of attitude to an affective component, which, they argued, is based upon cognitive process and is an antecedent of behavior (Osgood, Suci and Tannenbaum, 1957; Rhine, 1958; Harvey, Hunt and Schroder, 1961; Anderson and Fishbein, 1965; and Shaw and Wright, 1967). Shaw and Wright (1967) clearly stated this difference in views:

> The difference between the view we are expressing and the more traditional view has to do with the relations among the conceptual, affective, and action components identified by former analyses. Whereas many former theorists have treated these components as different elements of the same system, which they called attitude, we're treating them as separate (albeit closely related) systems or elements, only one of which is labeled attitude (p. 11).

Shaw and Wright further argued that their view was theoretically sound on the basis that their view of attitude more nearly coincided with the definition of attitude that is implicit in most, if not all, procedures for measuring attitudes.

Two other issues identified by Shaw and Wright as causing definitional variability of the term "attitude" and consequently causing disagreement among attitude researchers and theorists were: the degree to which attitudes may be considered to have a specific referent, and the tendency to generalize the construct to include any predisposition to respond. Shaw and Wright found and supported the view of many

theorists that attitudes have a specific referent or a specific class of referents, opposing in this manner Eysenck's (1947) and Rokeach's (1960) tendency to make attitudes a generalized and pervasive disposition of the person. Shaw and Wright also disagreed with the tendency to generalize the construct to include any predisposition to respond and agreed that the term involved only predispositions to respond to social aspects of the environment (i.e., interactions with persons and person-produced objects, events and situations) (p. 2).

Despite the seeming confusion over the conceptualization of the term "attitude," Petty and Cacioppo (1981) reported "widespread agreement among social psychologists that the term attitude should be used to refer to a general and enduring positive or negative feeling about some person, object or issue" (p. 7). Similarly, Ajzen (1988) defined attitude as "a disposition to respond favorably or unfavorably to an object, person, institution or event" (p. 4). Regarding the term "attitude," Ajzen also found a major point of agreement among contemporary social psychologists. He reported that "social psychologists seem to agree that the characteristic attribute of attitude is its evaluative nature." Ajzen further found this view strengthened by the fact that "standard attitude scaling techniques result in a score that locates an individual on an evaluative dimension vis a vis the attitude object." This is the same logic that Shaw and Wright had followed earlier to similarly equate the term "attitude" with the affective component. In fact, this component is what has been traditionally measured by classical scaling procedures such as those proposed by Guttman, 1944; Likert, 1932; Osgood, Suci and Tannenbaum, 1957.

2.3 Attitude-Behavior Consistency

Whether early theorists believed that obtaining a measure of attitude required measuring all three components—cognitive, affective and conative—or just one—

affective—they in general assumed a degree of consistency among the three. Several theorists supported this notion of consistency particularly as it referred to the attitude-behavior relationship. It is thought that Heider (1944, 1958) was the first social psychologist to propose a theoretical model that advanced the notion that people's beliefs and attitudes tended toward a state of balance or consistency. Festinger (1957), based on Heider's balance theory, developed the theory of cognitive dissonance, which also suggested that people are motivated to maintain consistency among their beliefs, feelings, and actions. Ajzen (1988) stated many theorists' proposition that "consistency fulfills important needs in a person's life" (p. 28). He also stated that other theorists viewed consistency as inherent in human beings. Included among those authors is McGuire (1960a, 1960b), who authored the model of logical consistency and suggested that people were inherently consistent in their responses because of the way they processed information and made decisions. Rosenberg (1956), who developed the theory of affective-cognitive consistency, also assumed that people need consistency.

Though empirical evidence appeared to support the presence of consistency in human affairs, early empirical research by authors such as LaPiere (1934), Minard (1952), Kutner, Wilkins and Yarrow (1952), DeFleur and Westie (1958 and 1963), Vroom (1964), Greenwald (1965), Deutscher (1966, 1973a and 1973b), Ehrlich (1969), and Wicker (1969) provided little evidence in support of behavioral consistency, rejected the natural necessity of attitude-behavior consistency, showed the frequently limited value of attitude measures in predicting action, and ultimately questioned the utility of the attitude construct in general.

Because the value of attitude measures in predicting action or behavior is an important issue for this study, it is briefly discussed in the next section.

2.4 Predictive Validity of Attitude Measurements

The attitude-behavior inconsistency problem brought as a consequence concern about the predictive validity of attitude measurements. Ajzen and Fishbein's (1977) review of attitude-behavior research involving general attitude assessment and prediction of one or more specific acts directed at the attitude object revealed that out of 54 studies attempting to predict specific actions, 25 obtained insignificant results and the remainder rarely showed correlations in excess of .40 (p. 39).

According to Canary and Siebold (1984), disillusionment with the low or insignificant validity of attitude measurements for predicting behaviors brought about the development of two areas of interest among authors of the attitude literature: "on one hand an interest more narrowly concerned with explaining the basis of attitude-behavior relationships (and attitude-behavior inconsistency in particular)" and on the other hand, "broader and more diverse efforts at understanding and predicting many types of behavior and studying attitudes as but one contributory force" (p. 2). Canary and Siebold further reported that research on the first area has generally focused on factors that mediate attitude-behavior consistency. As a result of this kind of research effort, Canary and Siebold added, other research interests developed. Among those, they distinguished the following ones:

1. The need for more careful conceptualization and measurement of attitudes.

2. More careful conceptualization and measurement of behavior.

3. Greater attention to the theoretical factors encompassing and moderating attitude-behavior correspondence.

4. Closer scrutiny of a host of other psychosocial factors affecting attitude-behavior consistency.

5. Better conceptualization of the nature of attitude-behavior consistency and methodological issues surrounding it.

6. More sophisticated studies of attitude-behavior relationships.

Canary and Siebold's observations of these extensive research efforts strengthened their positivistic statement that these efforts have regenerated the former attitude-behavior consistency view to the extent that it has now yielded "the conclusion by reviewers that consistency between attitudes and behaviors can be strong under specifiable circumstances" (p. 3).

Apart from this area of research, these authors identified a second area that scrutinizes more closely the circumstances under which consistency between attitude and behavior can be found. This second area of attitudinal research is the one Canary and Siebold characterized before as "broader and more complex efforts at understanding and predicting many types of behavior and studying attitudes as but one contributory force" (p. 2). In this area, Canary and Siebold identified Fishbein and Ajzen's (1975) behavioral intentions model, which they qualified as "the best known model" (p. 4) for understanding attitude-behavior relationships.

Up to this point, this review has attempted to present succinctly the theoretical and definitional entanglement of the attitude concept, and has also presented the contemporary view of attitude held by social psychologists.

Questions that warrant attention at this time for the purposes of this research are:

1. How significant has the study of attitudes in agricultural education been?

2. How can the study of attitudes in agricultural education be characterized?

3. Has the contemporary view of attitude influenced agricultural education's approach to attitude research?

This review will now turn to literature relevant to these questions.

2.5 Significance of Attitude Research in Agricultural Education

Since 1984, evidence of increased interest in attitude-related research among agricultural educators has been reported. Bin Yayha and Moore (1984) found that in the 1983 Dissertation Abstracts International alone, 32 out of a total of 45 doctoral dissertations in agricultural education dealt with the measurement of attitude-related variables. In their report, Bin Yahya and Moore expressed concern for the quality of attitude-related measures used in agricultural education research:

> Given the high percentage of attitude-related studies in agricultural education and their associated problems of conceptual ambiguity, the lack of common definitional bases, and the great reliance on apparently questionable measuring scales with respect to construct validity, researchers in the profession need to seek techniques that will improve the validity and increase the reliability of their data (p. 1).

A review of research studies published in the Journal of Agricultural Education during 1982–1990 identified 19 studies involving attitude measurement, which suggests that interest in the study of attitudes continues. Furthermore, an issue of greater specificity within attitude research in agricultural education, such as the relationship between practical experience and attitude change, has been undertaken as a topic of doctoral dissertations in recent years by Colley (1985), Deeds (1985), and Nortman (1989). In India, Shanga and Khurana (1985) similarly measured attitudinal change of agricultural students regarding practical field training. Doctoral dissertation research by Smith (1981), Lyons (1982), Smith (1985), Siefferman (1986), Khalatbari (1986), Yothapriom (1987), Suyuthie (1988), Suriyawongse (1988), and Irwin (1988) have also primarily involved assessments of elementary, high school, vocational, agricultural, and college teachers' attitudes towards several target objects. This account of attitude and attitude-related research in agricultural education is not exhaustive, but it is sufficient to underscore its relative significance.

2.6 Characteristics of Attitudinal Research in Agricultural Education

No articles or other publications characterizing attitudinal research in agricultural education were found; therefore, a brief analysis of 19 studies published in the Journal of Agricultural Education was undertaken to identify the basic characteristics shared by these studies.

In general, these studies:

1. Are self-identified as descriptive and correlational studies.
2. Involve correlations of respondents' demographic characteristics and other variables with measured attitude intensity.
3. Measure attitude intensity differences and similarities between and within subgroups identified from specific populations.
4. Use the term "attitude" loosely, and sometimes interchangeably with other terms, such as "opinion."

Among these studies, two had particularly important characteristics aside from those mentioned above.

The first was a study by Miller and Short (1986). It was one of two studies among all those reviewed that actually included a working definition of "attitude." "An attitude is a predisposition to behave in a certain manner" (Kerlinger, 1973). From this definition, Miller and Short inferred for their study, "Attitudes of Ohio Vocational Agriculture Teachers Toward Summer Programs" that "attitudes toward summer programs would provide a window through which to view the potential behavior of teachers" (p. 19).

The second study, by Jones and Williams (1986), measured the correlation between attitude and self-reported behavior toward cognitive skill development

through the combined implementation of an attitude-use questionnaire and the Certainty Method of Response Technique to improve attitude measurement. Jones and Williams reported consistency between their respondents' attitudes and self-reported behavior at a .10 alpha level. However, they disappointedly stated that the average attitude score and the average use score were "lower than might have been expected" (p. 29).

Two observations can be drawn from these studies:

1. The first study openly expressed the concept-implied direct relation between attitude and behavior—a strong speculation no longer warranted in current attitude-behavior research.

2. The second study, which can be judged as a plausible attempt at exploring respondents' attitude-use consistency through the use of improved measurement techniques, does not rely on a theoretical framework to explain the moderate consistency reported.

Some of the characteristics identified above together with the two observations made from the studies just discussed, add more issues of concern to those already expressed in Yayha and Moore's (1984) previous quote—namely, problems of conceptual ambiguity, lack of common definitional bases, and great reliance on apparently questionable measuring scales surrounding current attitudinal research in agricultural education.

Lastly, within the scope of the literature reviewed, a negative response to the third question regarding the implications of the contemporary view of attitude for agricultural education research can be readily inferred from the studies reviewed, which did not implicitly or explicitly reveal a contemporary view of attitude and of the attitude-behavior relationship in their approach to the study of attitudes.

The current status of attitudinal research in agricultural education can be summed up as an activity that is often undertaken by agricultural education researchers, though this type of research appears: (1) to have overlooked the evolution of the attitude construct, and (2) continues to be guided by the general assumption embedded in early assumptions of attitude—namely, that of a general attitude-behavior consistency. This has resulted in attitude measurement research that cannot claim predictions nor strong attitude-behavior correlations per se, but is limited to infer (from the working definition of "attitude") a predisposition to act and, on that basis, draft extensive recommendations to improve or promote the behavioral response that is expected from or should correspond to a person's positively measured attitudes. Moreover, much of this research also reflects a limited understanding of attitude and attitude theory and a greater concern for correlational measures, typically between various factors, demographic characteristics of the respondents, and the intensity of their attitudes. This research approach is an appropriate strategy for describing and uncovering relationships between external variables and attitudes, but unfortunately it does not carry further repercussions of a theoretical significance regarding people's expressed attitudes and their intended or actual behavior.

2.7 Contemporary Attitude-Behavior Research and Fishbein's Model

The current status of the research approach in agricultural education to the study of attitudes and the lack of studies within this field addressing the attitude-behavior relationship from a theoretical standpoint suggested the literature search focus on the study of this relationship. This search was most extraordinarily facilitated by a 1984 volume by Canary and Siebold. These authors, in their compilation and annotation of more than 600 references, attempted to "offer a collection of contemporary writings that shed light on attitude-behavior relationships as they are

broadly as well as traditionally viewed." This collection, made up of relevant literature from many academic disciplines, indeed represents the authors' purpose to "affirm the multidisciplinary nature of scholarly work on persons' attitudes and actions" (p. 1).

In their efforts to present a contemporary review of attitude-behavior research, Canary and Siebold identified two approaches underlying the diverse attitude-behavior literature. The first one, which they called mainstream research, focused specifically on factors mediating attitude-behavior consistency. The second one, including much work outside of social psychology, was research concerned with identifying and explaining the determinants of action, in which attitudes usually appeared as but one of a set of psychological, social, and situational influences on behavior. From these two bodies of literature targeting two different problems—namely, identifying the specific relationship(s) between attitude and behavior vs. identifying the determinants of behavior—Canary and Siebold considered research from the second area as carrying broader consequences for understanding attitude-behavior relationships. Within this second area, they identified models such as Fishbein and Ajzen's behavioral intention model, in which behavioral intentions are conceived as jointly determined by an actor's attitude toward the act (not the traditional attitude toward object) and subjective norms, or perceived social pressures to perform the behavior or not. They also identified Triandis' (1980) theory of social behavior, which specifies habit, facilitating conditions, and social factors in addition to attitude, affect, and beliefs as determinants of behavioral intentions and behaviors. Other models outside the field of psychology, which in most cases take the attitude-behavior relationship as only one facet of a larger interest in the determinants of action, were also considered by these authors.

The specific interest and extended discussion of Fishbein and Ajzen's model, identified in Canary and Siebold's annotated bibliography as "perhaps the best known" (p. 4), guided the attention of this review towards Canary and Siebold's

treatment of this theory. To begin with, these authors identified Fishbein's model as falling within one of two views dominating contemporary understanding of attitude structure and processes. According to Canary and Siebold, this view, sometimes called the expectancy approach, expectancy-value, instrumental approach, or subjective expected utility, stands in clear opposition to the other major view. Known as the tripartite view, it holds that an attitude is composed of three elements that play coexistive and/or substitutive roles in determining behavior. The opposition stems from empirically supported arguments that attitudes are not structured in this manner, but rather in a sequence wherein intentions to act moderate the attitude-behavior relationship. The current trend, which is based on existing evidence that supports this contention and casts doubt on the tripartite approach, is "to conceive of a sequential view of attitudes-intentions and behaviors" (p. 9) as the expectancy approach proposes. Because the Fishbein model represents the "trend" conception of attitude structure and process and because much has been written about it, Canary and Siebold also offered a brief evaluation of this theoretical model. Regarding the performance of Fishbein's model these authors stated that in studies that tested the model's assumptions or compared it to alternative explanations, the model had been impressive. They also stated, however, that to no one's surprise given the amount of attention it had earned, the model had also been criticized.

Continued applications of Fishbein's model to predict and explain several socially relevant behaviors in varied fields reinforced the potential usefulness of this model for analyzing the beliefs, attitudes, subjective norms, intentions, and behavior of agricultural students regarding their participation in summer field work projects at Chapingo University in Mexico.

An overview of this model is now in order.

2.8 Fishbein's Reasoned Action Model: A Conceptual Overview

The model—also known as the behavioral intentions model, the Reasoned Action Theory, Fishbein and Ajzen's model, or simply as Fishbein's model, has been the focus of much field and laboratory work over the past 23 years. It was introduced by Fishbein in 1967 (see Fishbein 1967a, 1967b, and 1967c) and later refined, developed and tested by Fishbein with the assistance of colleagues such as Jaccard (see Fishbein and Jaccard, 1973) and Ajzen (see Fishbein and Ajzen, 1975). An extensive number of studies using and testing the model have also followed. This model can best be presented by simultaneously borrowing Bowman and Fishbein's (1978) conceptual overview of the model while contextualizing it to the topic of interest for this study. According to Bowman and Fishbein, a basic proposition of the Fishbein approach is that actual behavior is determined by behavioral intention. In this study, this would mean that the actual participation behavior of agricultural undergraduates in DETCU's summer field work projects is determined by their intention to participate. The model also proposes that this intention is a better predictor of actual behavior than is a general positive or negative feeling about (i.e., an attitude toward) DETCU's summer field work projects, and, furthermore, that an individual's behavioral intention—or in the current case, an agricultural student's participation intention—is in turn a result of the following components: the attitude toward a specific action, such as participation in DETCU's summer field work projects, and the conception of what most people important to the student think he/she should do in regards to participating. This can be symbolically represented as follows:

$$\mathrm{PB} \sim \mathrm{PI} = (\mathrm{A_{act}})w_1 + (\mathrm{SN})w_2 \tag{2.1}$$

where:

PB = the behavior in question (e.g., agricultural undergraduates' participation behavior in DETCU's summer field work projects).

PI = the behavioral intention or, in this case, participation intention (e.g., the intention of agricultural undergraduates to participate in DETCU's summer field work projects).

A_{act} = the attitude toward performing the action or behavior (e.g., agricultural undergraduates' attitude toward participating in DETCU's summer field work projects).

SN = subjective norm, i.e., the individual's perception that most people who are important to him/her think he/she should or should not engage in the behavior in question (e.g., a perception that most of these important people think he/she should participate in DETCU's Summer Field Work Projects).

The weights w_1 and w_2 are theoretical weighting parameters reflecting the relative importance of A_{act} and SN as determinants of PI. These weights are expected to vary across individuals and across behaviors. (The actual values of the weights for any given behavior are determined through multiple regression).

The attitude toward an action (A_{act}), or the attitudinal component of behavioral intentions, is a function of two subcomponents: the perceived consequences of performing the behavior and the evaluations of these perceived consequences.

These are symbolically represented as follows:

$$A_{act} = \sum_{i=1}^{n} B_i e_i \tag{2.2}$$

where:

A_{act} = the attitude toward performing the action or behavior.

B_i = the belief that performing the behavior will lead to consequence i.

e_i = the evaluation of consequence i (n is the number of salient beliefs held about performing the behavior).

The subjective norm, SN, or normative component of the theory, is proposed to be determined by perceptions of what specific others say should be done and the willingness of the individual to accept the advice and viewpoint of others. Thus,

$$SN = \sum_{i=1}^{n}(NB_i)(Mc_i) \tag{2.3}$$

where:

NB_i = the normative belief about referent i, i.e., the individual's belief that person or group i thinks he/she should perform the behavior (e.g., participating in DETCU's summer field work projects).

Mc_i = the individual willingness to comply with the normative prescriptions of referent i; n is the number of relevant referents.

Given significant weights, w_1 and w_2, for A_{act} and SN in predicting behavioral intentions, their subcomponents—namely, B_i, e_i, NB_i and Mc_i—can be invaluable in understanding agricultural undergraduates' decision-making process regarding participation. Specifically, they can be used to pinpoint precise differences between those agricultural undergraduates who intend to participate and those who do not intend to participate in DETCU's summer field work projects.

According to equation 2.1, the immediate determinant of participation behavior (PB) is the intention to perform that behavior, with the attitude toward the act (A_{act}) and the subjective norm (SN) being the essential variables underlying the intention to participate. Other variables, such as the agricultural undergraduate's attitude toward

DETCU's summer field work projects and his/her demographic characteristics, can be related to behavioral intention only to the extent that their influence is exerted through a component, A_{act} and/or SN, with a significant weight in equation 2.1. In turn, A_{act} and SN will be related to actual behavior only through their relationship to intention. This implies that partialing A_{act} and SN should reduce any relationship between PI and any external variable to non-significance. Furthermore, partialing PI should remove the relationship (a) between PB and the components A_{act} and SN and (b) between PB and any external variable. The model as presented here is theorized to sufficiently capture the important features of the decision-making process of agricultural undergraduates regarding participation without the addition of any external variables.

In summary, the application of the Fishbein model for understanding the role of attitudinal and normative variables as predictors of agricultural students' participation behavior in summer field work projects requires the prior demonstration of the following theoretical relationships presumed to exist:

$$PB \sim PI$$

$$PI = (A_{act})w_1 + (SN)w_2$$

$$A_{act} = \sum_{i=1}^{n} B_i e_i$$

$$SN = \sum_{i=1}^{n} (NB_i)(Mc_i)$$

Further treatment of the model's factors and assumptions within a theoretical framework follows.

2.9 Theoretical Framework of the Model

Two important assumptions underlie the theory on which the Reasoned Action Model is based. The first is that human beings are usually quite rational and make systematic use of the information available to them. The second is that most actions of social relevance are under volitional control. Based on the second assumption, the model views a person's intention to perform (or not to perform) a behavior as the immediate determinant of the action. Furthermore, according to the model, a person's intention is a function of two basic determinants, one personal in nature and the other reflecting social influence. The first one, termed "attitude toward the behavior," involves the person's beliefs that the behavior leads to certain outcomes and his/her evaluations of these outcomes. The second determinant of intention, termed "subjective norm," involves the person's beliefs that specific individuals or groups think he/she should or should not perform the behavior and his/her motivation to comply with those referents. These two factors, according to the theory, are of different relative importance, and this importance is further assumed to depend in part on the intention under investigation.

To this level, the theory proposes that it is possible to predict a person's intention by measuring his/her attitude toward performing the behavior, his/her subjective norm, and their relative weights, but because the theory's goal is not limited to behavioral prediction but also includes the understanding of an individual's behavior, it goes further to explain why people hold certain attitudes and subjective norms.

According to the theory, attitudes are a function of beliefs. The beliefs that underlie a person's attitude toward the behavior are termed "behavioral beliefs." Subjective norms are also a function of beliefs, but beliefs of a different kind—namely, the person's beliefs that specific individuals or groups think he/she should or should not perform the behavior. These beliefs underlying a person's subjective norm are

termed "normative beliefs." The figures below depict the theoretical framework of the model. The first figure illustrates how Fishbein's Reasoned Action Model theorizes the relationships among the factors just described.

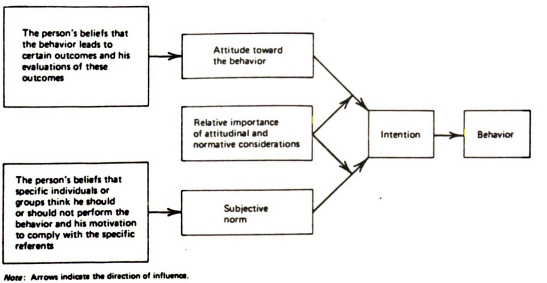


Figure 2.1: Relations among beliefs, attitude, subjective norm, intention and behavior. [From Ajzen and Fishbein (1980) p. 8]

The second is a version of the applied model for the purposes of this research.

As it may be observed, and as Fishbein and Ajzen argued (1980), the model establishes a causal chain linking beliefs to behavior. The authors explain this as follows: "On the basis of different experiences people may form different beliefs about the consequences of performing a behavior and different normative beliefs. These beliefs in turn determine attitude and subjective norm, which then determine intention and the corresponding behavior" (p. 91). They further added that tracing a behavior's determinants back to the underlying beliefs can lead to greater understanding of the behavior.

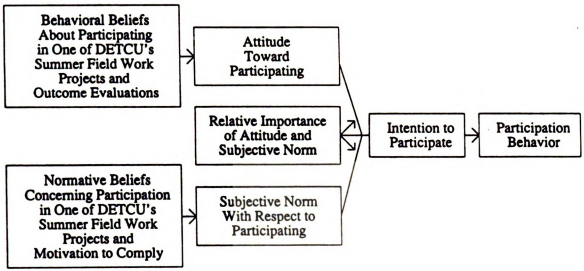


Figure 2.2: Relations among beliefs, attitude, subjective norm, intention, and participation behavior of agricultural students in summer field work projects at Mexico's Chapingo University.

In the treatment of this model's theory, Ajzen and Madden (1986) underscored three prerequisites (previously identified by Ajzen 1982; and Ajzen and Fishbein 1977) conditioning the model's predictability of strong associations between intention and behavior. The first requires that the measure of intention correspond in its level of generality to the behavioral criterion (e.g., in predicting attendance at mass every Sunday, the intention assessed should be specifically that of attending mass every Sunday). The second requires that the intention does not change in the interval between the time at which it was assessed and the time at which the behavior is observed. The longer the time interval, the more likely is the occurrence of unforeseen events that may change the intention. And the third, mentioned before, requires that the behavior under consideration be under volitional control. (A behavior is

considered to be completely under a person's control if the person can decide at will to perform it or not to perform it.)

Ajzen and Fishbein pointed out two other important features as characterizing the Reasoned Action Model:

1. The model makes reference to a person's attitude toward the behavior it is trying to predict (e.g., attitude towards the act of attending church) in contrast to traditional measures of attitude which generally deal with attitudes toward objects (e.g., attitude towards church).

2. The model does not make reference to various factors that social and behavioral scientists have invoked to explain behavior (e.g., personality characteristics, demographic variables, social role, status, etc.). These factors, though recognized as potentially important, do not constitute an integral part of the theory but are instead considered external variables. These external variables are viewed effecting behavior only to the extent that they influence the determinants of that behavior.

In concluding this overview of the Reasoned Action Model and its theoretical framework, it can be asserted, as Fishbein and Ajzen have, that the model "identifies a small set of concepts which are assumed to account for the relations (or lack of relations) between any external variable and any kind of behavior that is under an individual's volitional control" (1980, p. 9).

2.10 Hypotheses Linking Beliefs to Behavior

Fishbein and Ajzen (1980) stated that the theoretical relationships in the Fishbein model are to be considered "an empirical question" (p. 80). The authors further

elaborated several points regarding the need for empirical verification of the hypotheses underling the model's theory. Their points are:

1. The argument that behavior is ultimately determined by beliefs should not be taken to mean that there is a direct link between beliefs and behavior.

2. Beliefs influence attitudes and subjective norms; these two components influence intentions; and intentions influence behavior. Although the authors postulate relations between these variables, the variables are neither identical nor interchangeable.

3. From a theoretical point of view, the authors expect certain relations to hold, but for a variety of reasons they may not obtain in practice.

4. The relation between the attitudinal and normative components on the one hand and intentions on the other is also an empirical question, partly because correspondence is a prerequisite for a strong empirical relation and also because the weights of the two components have to be considered. For these reasons, it is necessary to demonstrate that intentions can be predicted from attitudes and subjective norms and not simply assume that a strong relationship exists.

5. Even when intention is viewed as the immediate determinant of behavior, the strength of the obtained intention-behavior relation depends on the correspondence and on the intention's stability.

These authors further concluded that the Reasoned Action Theory consisted essentially of a series of hypotheses linking beliefs to behavior, with each hypothesis requiring empirical verifications, adding that if a measure of intention were found to be unrelated to the behavioral criterion, it would be foolish to try to understand the behavior by investigating the determinants of the intention. In summing up this

discussion, the authors made it clear that "it is inappropriate to use beliefs in an attempt to directly predict intentions or behavior," and, similarly, "inappropriate to go directly from attitudes and subjective norms to behavior," concluding that "such attempts are meaningful only when the intervening relations have first been empirically demonstrated" (p. 81).

The relationships hypothesized in the Reasoned Action Theory are generally operationalized and tested through the use of linear and multiple regression analyses. Four hypotheses describe the relationships or linkages among the variables involved in this theory:

H1: A person's positive behavioral intention is positively correlated with his/her behavior.

H2: A positive multiple correlation is observed between (a) a person's positive intention, (b) his/her positive attitude toward performing the act, and (c) his/her positive subjective norm with respect to performing the behavior.

H3: A person's positive global attitude toward performing the act is positively correlated with his/her estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) toward performing the behavior.

H4: A person's positive global subjective norm with respect to performing the behavior is positively correlated with his/her estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning performing the behavior.

The use of correlation and regression techniques is appropriate when testing hypothesized relationships among variables. The authors of the Reasoned Action Theory go further to postulate causal linkages (see Ajzen and Fishbein, 1980, p. 91) between these variables. Most research reporting successful model applications,

however, have focused on testing hypotheses concerning the specified relationships within the model. Because one fundamental concern underlying the model's usefulness as a diagnostic tool is the hypothesized causal relationships among the model's constructs, a separate discussion of this issue follows a review of studies reporting strong relationships among the components of the model.

2.11 Empirical Research Supporting the Model

A great number of studies have applied and/or tested the Reasoned Action Model's ability to predict and understand various socially relevant behaviors. These studies, in general, have provided empirical support for the relations specified in Figure 2.1 and have also strengthened the model's tenability. A review of results of published research undertaken in applied settings follows below.

For clarity, studies will be presented chronologically, from the earliest to the latest identified from relevant literature. Study results will be limited to those that specifically address the attitude-behavior relationship as theorized in Fishbein's model.

Soon after the model was developed, Ajzen and Fishbein (1970) tested it by utilizing a prisoner's dilemma game and varying motivational orientations. In a laboratory setting, 96 college students were randomly assigned to one of three motivational orientation conditions in the game and measurements prescribed by the model were taken. The authors found a strong attitude-behavior correlation.

Winters (1971) tested Fishbein's model in the prediction of purchasing behavior with respect to ecologically significant products. In a field setting, 82 consumers responded to measures of the Fishbein model. Winters reported a .31 to .34 relationship, which is considered to be moderate (Davis, 1976).

Jaccard and Davidson (1972) applied the model to predict birth control behavior. In a field setting, 73 female students completed a questionnaire containing Fishbein measures. The researchers reported a multiple correlation of .835 between the model's components and behavioral intention, which was considered to be a very strong attitude-behavior relation.

Fishbein and Jaccard (1973) predicted the intentions of college women to use contraceptives. In a field setting, college women were asked to indicate intentions, attitudes, normative beliefs and motivations to comply with regard to several birth control behaviors. A strong attitude-behavior relationship was found.

Ajzen and Fishbein (1974) applied the model to a group task, communication, and compliance. In a laboratory situation 144 undergraduates were divided into groups of three to achieve a task. Intentions about their part, communication and compliance were correlated and regressed. A strong attitude-behavior relationship was reported.

Ryan (1974) applied the model in a marketing situation. In a laboratory setting 105 subjects completed measures of attitudes toward the act and subjective norm and participated in an artificial purchase situation. Multiple correlations predicting intentions ranged from .648 to .734. A strong attitude-behavior link was also found.

Jaccard and Davidson (1975) used the model in the area of family planning and contraceptive use. In a field setting, 270 women were randomly selected and randomly assigned into one of six groups to assess by the Fishbein model their intention to have a child in next two years, intention to have a two-child family, and intention to use birth control pills. A multiple regression coefficient of $R = .730$ to .842 was reported. The attitude-behavior relationship was found to be very strong, and the model was considered to be very successful in predicting behavioral intentions.

King (1975) tested the model in predicting church attendance. The field study involved 94 students, who completed typical Fishbein scales that were correlated with

actual church attendance. Several regression analyses were performed. The attitude-behavior relation was found to be very strong, evidenced by a correlation coefficient of $r = .760$.

Werner, Middlestadt, and Crawford (1975) applied the model to predicting behavioral intentions to have a third child. In a field setting, 59 mothers responded to measures of perceived consequences (evaluation and strength), normative beliefs (strength and motivation to comply), intentions to have a third child, and attitudes toward contraception and family planning. Researchers reported a strong attitude-behavior relation.

Davidson and Jaccard (1976) applied the Reasoned Action Model to predict intention to have a child. The field study involved a stratified random sample of 270 women, who completed measures of intentions, beliefs, evaluations, norms, and compliance regarding childbearing within two years. The model's components strongly predicted intentions ($R = .804$).

Pomazal and Jaccard (1976) tested Fishbein's model in predicting blood donation. In a field setting, 270 subjects completed standard model measures one week prior to a blood drive. In the week following the drive, actual behavior—assessed with self-reports—was checked against drive records. The model prediction of intentions was strong ($R = .60$).

Bearden and Woodside (1977) applied the model to consumerism. Two surveys involved 172 males' and 184 females' behavioral intentions regarding brands of beer and soft drinks. In this field study, the attitude relation found was very strong. The coefficient of determination for attitudes and norms predicting intentions were very high ($R^2 = .43$ to $.70$).

Pomazal and Brown (1977) tested the adequacy of Fishbein's model for the prediction of the intention to smoke marijuana. In a field setting, 101 students

responded to standard model measures. The model predicted well ($R = .78$) and reported a very strong attitude-behavior relation.

Bowman and Fishbein (1978) tested the Fishbein model in predicting voter intentions and behavior with regard to a nuclear power referendum. Prior to a nuclear referendum, 88 Oregon voters responded to items measuring vote intentions according to Fishbein procedures. Attitude toward voting was very highly correlated with both vote intention ($r = .91$) and actual behavior ($r = .84$). A very strong attitude-behavior relation was found.

Vinokur-Kaplan (1978) tested the model in predicting the act of having or not having another child. In this field study, 141 couples were interviewed to obtain predictor measures and responses to intention scales. Behavior was measured one year later. The attitude-behavior relationship found was reported as strong.

Smetana and Adler (1979) applied the model to abortion decision making. The study obtained measures of beliefs about consequences and normative expectations, and intentions obtained from subjects waiting for pregnancy test results. Subsequent behavior was measured among pregnant subjects. The effect of the normative component in the model was greater than the effect of the attitudinal component ($\beta = .46$ vs. .27, respectively). The authors found a strong attitude-behavior relation.

Cook, Lounsbury, and Fontenelle (1980) tested the model's ability to predict college students' use of marijuana, amphetamines, tranquilizers, and beer. In a field setting, 349 students were surveyed to obtain measures of drug use, attitudes toward drug use, and subjective norms. A strong relation was obtained for the Fishbein predictors, and the attitude-behavior relation resulted strong.

Fishbein and Ajzen (1980) used the model to predict consumer behavior. Their field study involved 37 college students, who completed intention, attitude, and subjective norm questionnaires regarding five brands in each of three product

classes. The average multiple correlation between attitudes and subjective norms with intentions was .63; attitudes obtained .56 and norms obtained .10 regression weights. The attitude-behavior relation reported was strong.

Fishbein, Ajzen, and Hinkle (1980) predicted voter choice in the 1976 presidential election by applying Fishbein's model. This field study involved 76 voters from an Illinois county, who responded to intention, attitude, normative, and behavior measures regarding the 1976 presidential election. The correlation reported between differential intention and voting choice was .80. A very strong attitude-behavior relation was stated by the researchers.

Fishbein, Bowman, Thomas, Jaccard, and Ajzen (1980), using the Fishbein model, assessed voting attitudes, norms, and behaviors in the British 1974 national and the 1976 Oregon referendum elections. Both studies were concerned with predicting voting behavior as obtained from intention component scores and behavior; correlations and regression weights were obtained. Very strong attitude-behavior relations were found in both studies. In the British election study, intentions correlated .84 with behavior, and in the Oregon election intentions correlated .89 with behavior.

Fishbein, Jaccard, Davidson, Ajzen, and Loken (1980) applied the model to family planning. This field study involved an unspecified number of college women, who completed belief, normative, intention, and attitude scales regarding birth control. The authors reported an $R = .89$ for the prediction of intention, and a very strong attitude-behavior relation.

Smetana and Adler (1980) used Fishbein's model to assess behavioral intentions of having an abortion or having a baby. In a field setting, 136 women completed questionnaires while waiting for pregnancy test results. Results reported that

intention was highly related to behavior (R^2 = .96), also a very strong attitude-behavior relationship.

Sperber, Fishbein, and Ajzen (1980) applied the model to predict women's intentions regarding choosing a career vs. fulfilling a housewife role. In this field study, 111 high school girls completed intention, belief, attitude, and subjective norm scales. Attitudes towards pursuing a career correlated .83 with intention (β = .67); subjective norms correlated .64 with intention (β = .29). A very strong relation between attitudes and behavior was reported.

Manstead, Proffitt, and Smart (1983) tested the Reasoned Action Model for predicting and understanding mothers' infant-feeding intentions and behavior. The study involved 123 primiparous and 127 multiparous mothers responding to a questionnaire containing measurement scales for behavioral beliefs, evaluation, normative beliefs, motivation to comply, and intention. A multiple correlation of .78 was reported, indicating a strong attitude-behavior relation.

Prestholdt and Fisher (1983) applied Fishbein's model to understanding and predicting students' decisions to either stay in or drop out of high school. A representative sample of 10 high schools was selected from five school districts. A group of 1,732 students completed questionnaires measuring students' behavioral and normative beliefs. Study results indicated that both the attitude and the normative component are related to the student's intention. Together they provided a fairly accurate (R = .60) prediction of the student's intention. Attitude was weighted more heavily than subjective norm: the beta weights were .60 and .32, respectively. A strong attitude-behavior relation was found.

Crawley (1988) explored the utility of the Reasoned Action Model for understanding and predicting science teaching behavior. Sixty-seven elementary and secondary school teachers responded to questionnaires measuring attitudes toward the

behavior (including behavioral belief strength and outcome evaluation) and subjective norm (including normative belief strength and motivation to comply). Attitude toward the behavior was found to be significantly related to intention.

Montano, Williams, Carline, Wright, and Phillips (1988) applied Fishbein's model to understand better the process of choosing a medical career. To carry this out, the authors studied fourth-year medical students' decisions to pursue or not to pursue careers in family practice. Fishbein's model provided a method for examining how students' values, expectations regarding family practice, and perceptions of social support influenced their decisions to pursue family practice careers.

Ray (1989) collected data from 377 students in grades 3 to 8 to identify the determinants of their intentions to perform laboratory and non-laboratory science activities. The Fishbein model was used as the basis for the study. The hypotheses generated from the model were confirmed: attitude toward the behavior and subjective norm explained significant amounts of variance in behavioral intention for both laboratory and non-laboratory behaviors. Attitude toward behavior had a greater relative weight than subjective norm for both laboratory and non-laboratory activities. The correlations between adjacent constructs in the theoretical model were significant in all cases.

Other successful applications of the Reasoned Action Model have also been reported by several other authors studying behaviors such as seat belt use (Budd, North, and Spencer, 1984), eating in fast food restaurants (Bringberg and Durand, 1983), conserving energy in the home (Seligman, Hall, and Finegan, 1983), seeking dental care (Hoogstraten, de Haan, and ter Horst, 1985), using credit union services (Gur-Arie, Durand, and Bearden, 1979), jogging (Riddle, 1980) and consumer complaining (Bearden and Crockett, 1981). The multiple correlations found in these studies were roughly in the range of .60 to .90.

No studies were found that tested or applied the Fishbein Reasoned Action Model to analyze specific behaviors within the context of agricultural education.

2.12 Causal Relationships of the Model

As reviewed above, most research reporting successful model applications has tested hypotheses concerning the specified relationships within the model. Research testing hypotheses concerning the causal linkages established in the model, however, has been very scarce. Minard and Page (1984) reported that the large body of literature providing evidence relevant to the causal relationships underlying the Fishbein model is limited in several respects:

> First, research examining the entire set of model constructs with appropriate measures has yet to appear. Many studies, for example, have not considered behavior in examining the model's causal system while investigations that include behavior have omitted other model constructs. Second, the majority of attention has been focused on the attitudinal portion of the model. Relatively little emphasis has been given to the normative chain of the model, despite the fact that this model component has been and remains the most problematic. Third, tests of hypothesized relationships within the normative component have usually occurred within situations that may have biased the results. Fourth, recent advancements in the analytical techniques for causal modeling have not been reflected in the analyses undertaken in many investigations. Finally, a causal network assumed by the model has rarely been tested against competing causal configurations. Thus, while a study may provide reasonable support for the model, the question concerning whether alternative causal systems would receive even stronger support is rarely addressed (p. 137).

Liska (1984) is another author involved in research that critically examines the causal structure of the model. This author recognizes the strong influence the model has had on the direction of attitude-behavior research over the past decade but strongly addresses what he terms as "theoretical problems and issues generated by the parsimonious causal structure of the model" (p. 62).

Specifying the recursive-chain or causal structure underlying the components of the model leads to the following hypotheses for testing the causal paths of the model:

H5: A person's positive behavioral intention has a positive and direct effect on his/her behavior.

H6: A person's positive attitude toward performing the act has a positive and direct effect on the person's behavioral intention.

H7: A person's positive subjective norm with respect to performing the behavior has a positive and direct effect on the person's behavioral intention.

H8: A person's positive estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) toward performing the behavior has a positive and direct effect on his/her global attitude toward performing the act.

H9: A person's positive estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning performing the behavior has a positive and direct effect on his/her global subjective norm with respect to performing the behavior.

Minard and Page (1984) strongly underscored the importance of testing hypotheses stating the causal relationships specified within the model. They stated that "the hypothesized causal relationships among these constructs of the model constitute a fundamental concern underlying the model's usefulness as a diagnostic tool" because "the confirmation of these relationships would lend support to using the model as a framework for devising sound behavioral change strategies" (p. 137).

A further look at related research publications in the following sections provides a more thorough presentation of issues surrounding the Fishbein model.

2.13 Concerns and Limitations of the Model

Much of the appeal of Fishbein's Reasoned Action Model is due to its empirical success. The attention it has drawn among researchers has also given rise, however,

to basic concerns about its theoretical and methodological sufficiency, and has also generated considerable research interest regarding a number of limiting conditions identified in several studies, some of which have utilized the model beyond the intended conditions of its framework. These issues merit a brief discussion because they may be useful in understanding and interpreting possible findings in this study.

2.13.1 Basic Concerns

Several researchers have voiced two major concerns about the model. O'Keefe (1990) best summarized them as follows: "Although research has produced encouraging results for the Reasoned Action Theory, it has also given rise to two main questions about the theory's treatment of the determinants of intention. One concerns the relationship of the attitudinal and normative components; the other concerns the sufficiency of the two-component model" (p. 84). The first concern involves findings of significant positive intercorrelations between the two components of the model. These were reported by Bearden and Crockett, 1981; Miniard and Cohen, 1981; Ryan, 1982; Sheperd and D.J. O'Keefe, 1984; and Warshaw, 1980. These findings brought up for discussion among attitude-behavior researchers the idea that those two components may not actually be conceptually or empirically different. Experimental manipulation of the model components, however, has provided researchers empirical evidence that those two components are indeed different and that each exerts distinct influences on intention (see Fishbein and Ajzen 1981b). Researchers have not yet been able to settle this issue conclusively.

The second major issue of concern deals with the two-component model sufficiency. As it may be recalled, the theory proposes that attitudes (A_{act}) and subjective norms (SN) are the only significant influences on intention, and that any other factors might be related to intention indirectly through A_{act} and SN, but not directly. Authors have

suggested adding other components to the model—for example, personal norms and moral obligations were at one point added by the theory authors (Ajzen and Fishbein, 1969 and 1970). These components have also been suggested by Prestholdt, Lane, and Mathews (1987), and by Zuckerman and Reis (1978). Other components—such as social structure (Davis, 1985, and Liska, 1984), the degree of perceived control over the behavior (Ajzen and Madden, 1986), and beliefs about others' behaviors (Grube, Morgan, and McGree 1986) have also been suggested along the way. Addition of these components, however, has not consistently improved significantly the predictability of intention. The only variable added to the model that has been found to exert influence directly on intention is prior behavior. Empirical research has reported the effect of the variable identified as prior performance of the behavior in question to be an effect not mediated by either of the model's two components. In studies by Bentler and Speckart (1979 and 1981), Budd et al. (1984), Crosby and Muehling (1983), and Fredricks and Dossett (1983), findings suggested that people who performed the action under investigation in the past are more likely to intend to perform that action in the future. Further clarification of the role of prior behavior in influencing intention is being sought through research. Its inclusion as a new component of the model has not yet been warranted.

Research on the determinants of each component has been systematically conducted. Determinants of the attitudinal component have not been the focus of much discussion. Controversy has been stronger concerning research studies analyzing the theory's claims regarding the determinants of the normative component, also known as subjective norm. This component is determined by two other subcomponents, known respectively as normative beliefs (NB) and motivation to comply (Mc). According to O'Keefe (1990), one issue is the level of specificity at which the motivation to comply (Mc) component is assessed. The theory prescribes that Mc questions are to be phrased as general questions about the respondent's desire to

comply with a particular referent's belief. However, other researchers have suggested that asking act-specific Mc questions or, alternatively, Mc questions of intermediate specificity, would lead to a better understanding of the influence of particular referents on the specific intention to be predicted. A second issue is the scoring procedures to be used. O'Keefe identified studies in which the bipolar and unipolar scales utilized for each determinant (NB and Mc) yielded different correlations between $\sum_{i=1}^{n}(NB_i)(Mc_i)$ and SN. Other concerns related to the normative component have also been identified. O'Keefe (1990) best summarized several of those in the following statement:

> There are yet other complexities and confusions surrounding the normative component. For example, $\sum_{i=1}^{n} NB_i$ has sometimes been found to be a better predictor of SN than $\sum_{i=1}^{n}(NB_i)(Mc_i)$ (that is, deleting the motivation to comply element improves the prediction of SN; Budd et. al., 1984; Kantola, Syme, and Campbell 1982; Miniard and Page, 1984) and correspondingly a number of studies have found that intentions are more predictable from A_{act} and $\sum_{i=1}^{n} NB_i$ than they are from A_{act} and $\sum_{i=1}^{n}(NB_i)(Mc_i)$ even with varied scoring procedures and different levels of Mc specificity (Budd and Spencer, 1984b; Chassin et al., 1981; DeVries and Ajzen, 1971; McCarty, 1981; Saltzer, 1981; Schlagel, Crawford and Sanborn, 1977) (Page 87).

Concerns with the normative component of the model have in the past been acknowledged by Ajzen and Fishbein (1980) and summarized by O'Keefe (1990) as suggesting that "perhaps the Reasoned Action Theory does not adequately capture the role of normative influences" (p. 87). Alternative means of assessing the normative component have been pursued through research although not much has yet been accomplished.

As researchers have studied the intention-behavior relationship depicted in the model, they have identified reasonably strong relationships in several behavioral domains. O'Keefe states, however, that "the central question that has been raised concerning the Reasoned Action Theory's depiction of the intention-behavior relationship concerns whether intention is sufficient to predict behavior" (p. 87). Intention alone, as a variable predictive of behavior, has been thought of as a better predictor of central behavior than of peripheral behavior because, according to Ryan

(1976), greater centrality implies better developed intentions. The hypothesis that intentions do not completely mediate the effects of all other variables on behavior has prompted researchers such as Bentler and Speckart (1979), Fredericks and Dossett (1983), and Wittenbraken, Gibbs, and Kahle (1983), to conduct studies of this issue. They have reported that taking prior behavior into account improves the prediction of behavior. These studies provide the basis for further research on factors in addition to intention that enhance behavioral prediction.

Supporting evidence of factors the theory outlines as influencing the intention-behavior relationship has been reported. The main factors influencing strong intention-behavior correlations are: correspondence among measures of intention and behavior, stability of the intention within the period of time during which both intention and behavior are measured, and volitional control over the behavior. These factors are necessary preconditions in the model for obtaining strong behavioral predictions. These factors become limitations of the model when attempts are made to study behavioral domains that do not fit the boundary conditions defined within the model's framework.

2.13.2 Limitations of the Model

In conducting two meta-analyses to investigate the effectiveness of Fishbein's model, Sheppard, Hartwick, and Warshaw (1988) found strong overall evidence for its predictive utility. They also found, however, that researchers are generally interested in the understanding and prediction of situations that do not fit neatly within the model's framework. They added that "the model is frequently applied to situations in which (1) the target behavior is not completely under the subjects' volitional control; (2) the situation involves a choice problem not explicitly addressed in the model; and/or (3) subjects' intentions are assessed when it is impossible for them to have all

of the necessary information to form a completely confident intention" (p. 325). The meta-analyses were undertaken to assess the effects of falling within one or more of the three limiting conditions on the use of attitudes and subjective norms to predict intentions, and the use of intentions to predict behavior. The following is a summary of the issues and findings of these meta-analyses. A total of 87 studies testing the Reasoned Action Model involving varied behavioral domains were utilized in these analyses.

Goal Vs. Behavior

Fishbein and Ajzen have explicitly acknowledged their model's limitation in distinguishing between a goal intention and a behavioral intention. The model deals with only those behaviors that are under a person's volitional control. Therefore, actions that are at least in part determined by factors beyond an individual's voluntary control fall outside the boundary conditions established for the model. Fishbein and Ajzen (1975) initially claimed that only a few actions fall outside of this boundary condition. Ajzen recently acknowledged, however, that "some behaviors are more likely to present problems of control than others, but we can never be absolutely certain that we will be in a position to carry out our intentions. Viewed in this light it becomes clear that strictly speaking every intention is a goal whose attainment is subject to some degree of uncertainty" (Ajzen, 1985, p. 24).

Two potential problems exist when the model is applied to study goals for which attainment involves a degree of uncertainty. The first one concerns the strength of the intention-performance relation, because a variety of factors in addition to one's intentions determine whether goals are achieved. As a consequence, the accuracy of predicting goal attainment from individuals' intentions should be much lower than that achieved when using intentions to predict volitional behavior. The

second potential problem of using the model in goal situations concerns how people determine their goal intentions. Specifically, there seems to be no provision in the model for considering either the probability of failing to achieve one's goals or the consequences of such failure. Fishbein and Ajzen acknowledged that individuals take such considerations into account, but only in extreme cases. "People do not intend to perform behaviors that they realize are beyond their ability" (Fishbein and Ajzen, 1975, p. 372). How individuals incorporate such considerations into goal intentions in less extreme cases is lacking in the model.

Intentions Vs. Estimates

Frequently, researchers are interested in predicting subjects' intentions and behaviors when the subjects' knowledge about and control of events is imperfect. In doing so, researchers utilizing the Fishbein and Ajzen model have failed to distinguish between individuals' intentions to perform some behavior or achieve the goal, and their subjective estimates of whether they actually will perform the behavior or achieve the goal. There clearly are times when what one intends to do and what one actually expects to do are quite different. The distinction between estimation and intention has dramatic implications for the prediction of intention from attitudes and subjective norms and for the intention-performance relation. A measure of estimation will likely provide the better prediction of performance in cases where researchers step outside the bounds claimed for the Fishbein and Ajzen model (i.e., in the prediction of goals and in choice situations). When considering the prediction of intentions vs. estimates, attitudes and subjective norms likely provide a more accurate prediction of an intention measure than an estimation measure. Individuals' estimates of whether they will perform some activity are likely to include consideration of all factors of which they are aware that could influence their performance of the activity.

Consequently, the prediction of such estimates, utilizing attitudes and subjective norms alone, is likely to be attenuated.

As already mentioned, the purpose of including the findings of these meta-analyses was to provide a comprehensive view of the constraints of the model and the adverse effects on its predictive utility when utilized beyond its specifications, not to undermine the merit of the work of the authors of the theory. To conclude, using the words of Sheppard, Hartwick, and Warshaw (1988), the advent of Fishbein and Ajzen's Reasoned Action Model in 1975 "placed a compelling structure on the field of attitudes, which was in relative disarray before their work" (p. 340). This model continues to generate important empirical and theoretical work in this field, and appropriate modifications to account for situations limiting its predictive utility should be investigated further.

2.14 Cross-Cultural Testing of Social Psychology Theories

A lively debate exists regarding the value of cross-cultural research in the field of social psychology. David M. Messic (1988) suggested that cross-cultural research can play two distinct roles: "The first one of these roles involves the assessment of the generality of empirical phenomena and the second involves the use of culture as a theoretical variable" (p. 42). Davidson and Thomson (1980) stated the same idea when describing two idealized objectives that motivate the attitude researcher to obtain data from more than one culture. They presented it as follows:

> The first objective is to establish boundary conditions for attitudinal models and theories. In the most obvious case, a researcher would test an attitudinal model that previously had been validated for one cultural group in at least one other culture. The second motivation for doing comparative research is to study the effects of cultural and ecological factors on attitudes and behavior. In studies of this type, the researcher gathers data from more than one culture to obtain variance on at least one of the variables (e.g. climate) in the model or hypothesis. Although this is the most easily conceptualized form of transcultural studies, it introduces sampling (cultures, not individuals, are the sampling units)

> and equivalence of measurement problems (both functional and score equivalence are required) that are more difficult to solve than the problem encountered in research that tests the generality of psychological theories (p. 26).

While Davidson and Thomson (1980) found that testing the universality of a psychological model or theory is "methodologically, the most defensible comparative strategy" (p. 32), Messic (1988) concluded that "using cross-cultural research to delimit the generality of an empirical relationship in a theoretically informative way is an inadvisable research strategy" (p. 43). In explaining the rationale he used for his conclusion, he added that if the phenomenon occurred in a different culture, one would be pleased at the robustness of the effect, but one would have to conclude, at least with the phenomenon at hand, that culture was unimportant. If it were the case that the result did not duplicate, then the negative results could have a variety of possible causes; "thus the outcome of a cross-cultural replication," he concluded, "is likely either to show that culture is unimportant for the phenomenon or to produce an uninterpretable result" (p. 43).

Davidson and Thomson (1980) were more optimistic about testing the universality of a psychological theory across cultures. They found that this approach offers two important advantages:

> ... both arise from the fact that within each culture the researcher is looking at the relations between a number of variables. First, only the functional equivalence of measure is required. Second, cultural differences can often be meaningfully interpreted because they tend to appear as a difference in one relation in the presence of cultural similarities in other relations. On the basis of a general pattern of similarity, one can begin to investigate specific cultural differences in the relations between variables. As Campbell (1964) observed, differences between cultural groups are only interpretable against a background of considerable similarity. In the absence of demonstrations of similarity it is impossible to distinguish cultural differences from a large number of alternative explanations that could plausibly account for the difference (p. 33).

An application of this approach in attitudinal research was made by Davidson, Jaccard, Triandis, Morales, and Diaz Guerrero (1976). They tested a model developed

by Triandis in 1971 (see Triandis 1971b) to predict behavior from attitudinal and belief variables in Mexico and the United States. The predictive utility of the model was found to be similar for each cultural group. Once this cross-cultural similarity was established, it was possible to investigate between-group differences. In this regard, it was found that the relative influence of the components in predicting intentions varied as a function of the cultural group studied.

Arguments in favor of and against conducting cross-cultural research are well balanced and it is difficult to resolve the importance of cross-cultural theory testing. Of particular concern for this study is the identification of cross-cultural research on the relation between beliefs, attitudes, and behavior, which, according to Davidson and Thomson (1980, p. 61), has been minimal.

The kind of cross-cultural research that Messic, Davidson, and Thomson were referring to implied the simultaneous testing of a theory in two cultures from which one of three possible outcomes could be expected: (1) no difference in the model's predictive utility in the two cultures, therefore no cultural differences; (2) significant differences but theoretically uninterpretable because of the difficulty to assess culture as a variable; and (3) interpretable results under conditions of similar predictive utility of the model in both cultures, useful to investigate between-group differences explainable by cultural variables.

A review of the literature of cross-cultural applications of the Fishbein model revealed no instances in which the model was applied simultaneously in two cultures to test its predictive utility in both of them. Furthermore, culture as a variable is not taken into consideration in any of the existing cross-cultural studies using Fishbein's model. Cross-cultural applications of the Fishbein model have been conceptualized differently than the approach most often used in cross-cultural theory-testing research involving two-culture comparisons.

2.15 Attitudinal Model Comparisons and Fishbein Model Cross-Cultural Testing

An earlier study by Jaccard and Davidson (1975), which compared the predictive utility of the Trandis and Fishbein models on family planning intentions, reported highly accurate predictions by both models. The authors also noted that, in some instances, the Fishbein model made more accurate predictions of some variables than the Triandis model. (See Sociometry, Vol 38, No. 4, p. 501.)

Other comparisons have also been made involving the Fishbein model. Also classified as a summation model, the Fishbein model was compared to Osgood, Suci, and Tannenbaum's 1957 congruity principle and Anderson's 1965 averaging model. Research in the United States has demonstrated the superiority of both the averaging model and the summation model over the congruity principle for predicting attitudes (Anderson, 1971; and Anderson and Fishbein, 1965). The adequacy of these three models for predicting attitudes has further been compared in a number of cross-cultural investigations (see Tanaka, 1972; Triandis and Fishbein, 1963; and Triandis, Tanaka, and Shanmugam, 1966). In most comparisons of the models presented in these studies, the summation principle provided the more accurate predictions. In other cross-cultural studies testing summation models such as Fishbein's and Triandis', it has been noted that "for the populations and topics reviewed, there appear to be no culturally determined boundary conditions modifying the models of attitude formation" (Davidson and Thomson, 1980, p. 57).

Culture as a variable affecting the performance of the Fishbein model has not been mentioned in any cross-cultural applications of the model in countries such as England (Norwich and Jaeger, 1989; and Hewstone and Young, 1988), Canada (Valois, Desharnais, and Godin, 1988), West Germany (Bossong and Johann, 1981), Holland (Meertens and Stallen, 1981), Austria (Thomas, Swaton, Fishbein, and Otway, 1980),

Spain (Echabe, Rovira, and Garate, 1988), Argentina (Fishbein, 1990), and Australia (Kantola, Syme, and Campbell, 1982; and Carpenter and Fleishman, 1987). This fact may be related to substantive findings identified in the literature by Davidson and Thomson, suggesting that "basic cognitive processes, such as information processing and cue utilization, are relatively invariant across cultures" (p. 62).

Whether culture affects the universality of any social psychological theory in general (or that of the Reasoned Action Theory in particular) remains a controversial question challenging current research practices in social psychology, where, according to Sharon and Yehuda (1988), replication research is rarely carried out today and a finding is assumed to have general validity (p. 99).

In arguing in favor of conducting replications of studies in various cultures, these authors explained their view as follows:

> Only if studies are replicated under different conditions, such as different populations, different situations, and of course, different cultures, may one come to general and universal conclusions regarding a social psychological variable or phenomenon. Just as one should not construct social psychological theories based upon studies using $n = 1$ subjects, likewise one cannot confirm them on the basis of a single study in which the number of investigated situations is 1. This is specially true when the generalization beyond the population studied is to a different cultural group (p. 107).

Evidence of the outstanding performance of the Reasoned Action Model as a theoretical framework used in many disciplines in the study of varied behavioral domains includes successful model applications in cross-cultural situations. In assessing the predictive utility of this model under the cross-cultural conditions selected for this study, and in keeping with Messic's counsel (1988, p. 43) no hypothesizing regarding cultural effects on theory performance will be attempted because of the methodological difficulties in their quantification and because of the researcher's limitations in making assertions in a theoretically informative way.

To conclude this chapter, a presentation of literature linking several concepts that led to the selection of both research site and behavioral domain was deemed necessary to provide an overview of the context and relevance of these elements in the conceptualization of this study.

2.16 Research Site and Behavioral Domain Selection

Selecting a research site and a behavioral domain for testing the model involved several criteria. The first was the selection of a behavior within the context of agricultural education of relative significance for those manifesting the behavior. Of equal weight was selecting a behavior thought to have educational value and to carry educational policy implications of some importance. The third criterion was that it be a behavior strictly under volitional control. The final criterion was that the behavior be observable in a cross-cultural context. The participation behavior of agricultural students in summer field work projects at Chapingo University in Mexico was identified as a behavioral domain meeting these requirements.

Student participation in field work projects has not been the object of study or formal research at Chapingo University. However, the concept of field work and the practice of providing students with the opportunity to participate in field work experiences have been strongly advocated for more than two decades at Chapingo University. In general, field work has been seen as an educational strategy that links theory to practice and one that enhances students' agricultural training. A further review of the conceptualization of this activity provides a richer understanding of the goals and purposes of this strategy. Mata (1981c) better described this educational strategy as follows:

> With the university field work projects it is intended to go beyond the simple integration of the theory-practice binomial, because it is an attempt to accumulate experience that will provide the means for transforming the objectives and methodologies of traditional education into a new

> conception of agricultural education. That is to say, that we are searching for an education based on the real problems confronted by poor farmers and agricultural laborers of our rural areas. An education that will develop in the student a critical social conscience motivating him/her to promote solutions to the complex problems the majority of the farmers of our country are faced with (p. 48).

Field work activities at Chapingo can be traced back to 1970. Through a long history of experiences, these activities later became institutionalized through the creation of the Department of Field Work at Chapingo (Trabajo Colectivo DETCU, 1981, pp. 42–47). The pioneering efforts at Chapingo University in implementing this educational strategy since 1970 have generated considerable dialogue among its advocates. In a 1986 forum organized at Chapingo to discuss the outcomes of this educational activity and to review related institutional policies, Conrado Marquez (1986) identified the development in participating students of varied positive attitudes corresponding with the spirit and educational objectives of Chapingo University (p. 4).

Efforts at Chapingo geared towards either enhancing or transforming students' higher education through the implementation of this educational strategy are by no means the first ones known. Similar activities were well underway in Ethiopia's University, Heile Selassie I in 1964. Also known as study-service, these activities quickly spread around the world in countries such as Pakistan, the Philippines, Indonesia, Nepal, the United States of America, the United Kingdom, Nigeria, Thailand, Iran, Sri Lanka, and India. According to Fussell and Quarmby (1974), these study-service activities or schemes were "characterized by their ability to: (1) provide a worthwhile educational experience for those who participate in them; (2) provide this experience by involving participants in practical activities that help meet the basic needs of other people (e.g., through agricultural extension, health care and education, social welfare work); and (3) encourage and help education systems to continually adapt themselves to the needs of society" (p. 8).

Goodlad (1982), in his introductory statement to his book on study-service also provides an overall view of the implications of this educational project:

> Study-service is the term applied by UNESCO to work in which students combine study leading to the award of an academic qualification with some form of direct practical service to the community. Students in study service schemes do not compete with paid professionals; rather, they do work which could not otherwise have been done. Such activity is a challenge to the traditional notion that the service rendered to society by educating institutions is indirect rather than direct. Indeed questions about study service turn out to be fundamental questions about what higher education is for, how it should be carried out, how it should be assessed, and how its overall costs and benefits can be evaluated (p. 1).

A convergence of conceptualizations of what is termed field work projects at Chapingo University and study-service in other sources of literature can be readily identified. Different modalities of implementation have allowed for a wide range of field work or study-service schemes to develop throughout the world. In Mexico, the pioneering work at Chapingo in implementing and institutionalizing this educational project has influenced similar work in other institutions of higher education across the country. Efforts to implement this strategy have been further prompted by current Mexican government policies aiming at revitalizing and modernizing both Mexican agriculture and higher education. Since 1965, serious chronic agricultural crises and food shortages have been undoubtedly associated with both a stagnated national agriculture and a higher agricultural education characterized by professionals in the field as 'problematic' (Mata, 1990). Efforts to modernize agriculture are directed to promote "principles of self-determination among small farmers regarding their production programs, their forms of organization for work, and their level of commitment for agricultural promotion." (Poder Ejecutivo Federal, 1989) Agricultural modernization policies also conceptualize "equitable schemes of association among subsistence, small and commercial farmers to promote equitable capital flow, land use efficiency and usage of better techniques to increase agricultural yields" (Poder Ejecutivo Federal, 1989). Furthermore, the efforts for modernizing

higher education more closely resemble the means and goals envisioned at Chapingo, where field work activities have long been advocated as a non-traditional educational strategy potentially capable of precipitating a paradigm shift in the higher agricultural education system. The official statement issued by Mexico's Public Education Department regarding the aims of modernizing education read: "The modernization of education consists basically in bringing about major structural changes including the expansion and diversification of educational services through non-traditional strategies and the integration of production processes with the overall economic development." In modernizing higher education, it is further intended to "diversify student training to form professionals with flexible characteristics and positive attitudes towards work and production; to promote self-learning and self-actualization in students; to encourage students' scientific pursuits; a spirit of social solidarity and of greater involvement in generating solutions to problems affecting society" (SEP, 1989).

The development of positive attitudes in students as a result of their agricultural education indicated by Marquez (1986) and in the statement above (SEP, 1989) hints at an important function that higher agricultural education in Mexico is expected to play. The Mexican Association of Higher Agricultural Education (1989), in stating some of the functions of higher agricultural education, first described the outcome profile of an agronomist and later expanded on the roles of this type of education:

> An agronomist, then, can be conceptualized as an individual whose training would allow him to find solution to technical, ecological, and socio-economic problems faced by animal and crop production. This through his application of scientific methods with creativity, critical sense and a spirit of service. Therefore, the agricultural profession must have a formative content (attitudes) and an informative content. Regarding the formative content, agronomists must receive an education that is: (a) scientific; (b) creative; (c) critical; (d) responsible; and (e) committed to improving the quality of life of the rural population, to optimizing and conserving non-renewable resources, and to increasing agricultural production (Asociacion Mexicana de Educacion Agricola Superior pp. 20–21).

The formative function of higher agricultural education at Chapingo University is partly fulfilled through the implementation of field work activities. As already mentioned, these have been institutionalized through the creation of the Field Work Department (DETCU). This department defines field work as "a part of the academic work that should contribute to the development of a new breed of professionals in agronomy—one able to understand the reality of rural life and able to unite efforts with subsistence farmers in order to transform their reality" (proyecto DASAYA, ENA-UACH, 1975). If field work activities are to play a dual role, fulfilling a formative function in students' education as well as a transformative function in modernizing agricultural education at Chapingo University, attention must be paid to student involvement in field work. Many of the academic endeavors and much of the discussion regarding field work and field work projects as a vehicle for the fulfillment of educational functions at Chapingo have been centered around differing philosophical views on program implementation among staff members and program administrators in the field work department and in the university in general. Financial constraints and severe organizational problems have long been obstacles in the implementation of these activities and are commonly discussed issues of concern, but student participation, a pivotal factor in the accomplishment of the expected outcomes of this strategy, has not been brought up for study. Researching students' participation behavior in summer field work projects using the reasoned action theoretical framework provided the basis for an assessment of the utility of the model as a potentially useful tool for analyzing the role that attitudinal and normative variables play in the prediction of these students' behavioral intentions and participation behavior, and for laying a foundation for presenting an introductory analysis of factors regulating student involvement in such an important educational project. The Reasoned Action Theory or Fishbein Model, may ultimately prove to be a valuable diagnostic tool for developing sound behavioral change strategies to

improve student participation in summer field work projects at Mexico's Chapingo University.

CHAPTER 3

METHODOLOGY AND PROCEDURES

The theory underlying Fishbein's Reasoned Action Model proposes a specific methodology and procedures for the development of the research instrument. It also suggests the use of specific statistical analyses involving the variables identified and measured with the constructed instrument to accomplish the purposes of this study. These methods and procedures are outlined in this chapter.

The Reasoned Action Model argues that a person's attitude toward a behavior is determined by his salient beliefs that performing the behavior leads to certain outcomes, and by his evaluations of those outcomes. It also states that a person's subjective norm is determined by his beliefs that specific salient referents think he should (or should not) perform a given behavior, and by his motivations to comply with those referents. These two components simultaneously are considered to be a function of the weighted sum of the appropriate beliefs. Furthermore, this theory greatly emphasizes that only salient beliefs serve as determinants of attitudes and subjective norms. These salient beliefs can be identified, in turn, by following the specific procedures proposed by the model's theory and described in the following section.

3.1 Modal Behavioral and Normative Beliefs Eliciting Procedures

In identifying the set of beliefs that are salient in a given population, Ajzen and Fishbein (1980) discussed a procedure to elicit modal salient beliefs:

> The modal salient beliefs can be ascertained by eliciting beliefs from a representative sample of the population; the beliefs most frequently elicited by this sample constitute the modal set for the population in question...We would ask the sample of respondents to list the advantages, disadvantages, or anything else they associate with performing the behavior under investigation. Once the respondents have listed their beliefs, we have to make decisions concerning the number and kind of beliefs to be included in the modal set. The first step is analogous to a content analysis of the various beliefs emitted by different individuals. It involves organizing the responses by grouping together beliefs that refer to similar outcomes and counting the frequency with which each outcome in a group was elicited (p. 68).

The final decision to be made concerns which of these beliefs to include in the modal salient set. The authors' best recommendation is to choose those beliefs that account for a certain percentage of all beliefs emitted. After final selection of modal salient beliefs, the authors suggest constructing a questionnaire based on the set of beliefs identified.

The steps described above were implemented during a 10-day visit to the research site in Mexico in March of 1991. Authorization to implement this study had been arranged for during a prior visit to this university (in December of 1990).

The modal set of salient behavioral beliefs of agricultural students at Chapingo University regarding participation in DETCU's summer field work projects was elicited from a sample of the population totalling 142 undergraduates. This sample represented 5 percent of the total undergraduate population (2,857). A sampling procedure known as quota sampling was used. Kerlinger (1986) described quota sampling as a procedure "in which knowledge of strata of the population—sex, race, region, and so on—is used to select sample members that are representative, typical, and suitable for certain research purposes" (p. 120). According to Kerlinger, this procedure derives its name from the practice of assigning quotas, or proportions of kinds of people, to interviewers, and it is one frequently used in public opinion polls. Most studies utilizing the Fishbein methodology for instrument development

invariably used the accidental sampling technique, which, according to Kerlinger, is a more popular sampling technique but also weaker than the one chosen for this study.

Information on student enrollment by major obtained from the university administration aided in identifying "major" as the selection criterion for defining sampling quotas from this population.

An open-ended questionnaire (see Appendix A, Spanish version) first asked the respondents to list the advantages, disadvantages, or anything else they associated with participating in summer field work projects. Then they were asked to list people or groups that would approve or disapprove of their participation. Once the respondents had listed their salient behavioral beliefs and salient referents, the behavioral beliefs were subjected to content analysis. This involved organizing the responses by grouping together beliefs that referred to similar outcomes and counting the frequency with which each outcome in a group was elicited. Following content analysis, the final selection of modal behavioral beliefs was limited to those beliefs that accounted for 75% of all beliefs emitted. This practice was recommended by Fishbein and Ajzen (1980) as "perhaps the least arbitrary decision rule in choosing which beliefs to include in the modal salient set" (p. 70).

To obtain a list of salient referents (or normative beliefs) for the construction of normative beliefs statements, a list of the total salient referents, with frequency of mention in descending order, was developed. The most frequently mentioned individuals or groups were selected. The final compilation and selection of modal behavioral and normative beliefs (salient referents) is presented in Appendices B and C. Once this phase was completed, the research instrument was constructed.

3.2 Instrument Development

The research instrument was designed to obtain measures of the constructs contained in the Reasoned Action Theory. All items used a closed, semantic differential format. The first page provided instructions concerning use of the seven-point bipolar scales. The following pages contained the questionnaire, which was composed of seven sections. Each section measured one of the constructs of the theory: (1) behavioral intentions; (2) a global measure of attitude toward the behavior; (3) a global measure of subjective norms; (4) behavioral beliefs; (5) outcome evaluations; (6) normative beliefs; and (7) motivation to comply.

The first section contained a single statement measuring students' behavioral intentions. Students responded to the statement "I intend to participate in one of DETCU's summer field work projects" by means of a 7-point extremely likely-extremely unlikely scale.

The second section consisted of a set of three evaluative semantic differential scales used to obtain a global measure of students' attitudes toward the behavior. Students completed the statement "My participation in one of DETCU's summer field work projects would be" by selecting responses from three scales: good-bad, wise-foolish, harmful-beneficial. The sum over these three scales served as the global measure of attitude.

The third section, like the first one, contained a single statement to obtain a global measure of students' subjective norms. The statement "Most people who are important to me think I should participate in one of DETCU's summer field work projects" was rated on a 7-point extremely likely-extremely unlikely scale.

Section four was used to assess the students' belief strength of 20 behavioral beliefs. These were expressed in the form of statements of possible outcomes or consequences of their participation in one of DETCU's summer field work projects. Thus, students

were asked to indicate the probability of each of the consequences happening if they were to participate. The first statement appearing in section four, "My participation in one of DETCU's summer field work projects would allow me to relate the theory I learn in the classroom to the practice in the field", was rated by the students on a scale ranging from extremely likely to extremely unlikely. The other 19 statements were also rated this way.

Students' evaluations of the outcomes associated with their participation were measured in section five. Statements from section four were shortened to express specifically participation outcomes. Thus, the first statement to be completed in section five (corresponding to the first one in section four) read as: "Relating the theory I learn in the classroom to the practice in the field is...." Students completed this statement rated by choosing a response on a seven point scale ranging from extremely good to extremely bad. The same procedure was followed in rating the other 19 statements in this section.

The measure of belief strength with respect to each outcome was later multiplied by the corresponding evaluation, and the sum over the 20 products served as a belief-based measure of students' estimated attitude toward participation in DETCU's summer field work programs.

Students' normative beliefs were assessed in section six. This section involved statements concerning the expectations that important others (friends, professors, producers, classmates and parents) have related to the students' participation in DETCU's summer activities. Students were asked to evaluate the first statement, "Some of my friends think I should participate in one of DETCU's summer field work projects," using a 7-point scale ranging from extremely likely to extremely unlikely. Four other statements in this section were also evaluated in this manner.

The final section measured students' motivation to comply with the expectations of those salient referents mentioned in section 6. Thus, the first statement in section seven (reworded from the first one in section six) read: "Generally speaking, I want to do what some of my friends think I should do." This was rated by the students on a 7-point extremely likely-extremely unlikely scale. Four other statements in this section were evaluated in this way.

Each normative belief was later multiplied by its corresponding motivation to comply with the referent, and the sum of the products constituted the belief-based measure of students' estimated subjective norm regarding their participation in DETCU's summer field work projects.

Following Ajzen and Fishbein's (1980) procedures for developing the instrument required paying careful attention to keeping the measurement of each of these components in correspondence to the behavioral criterion selected for this study in terms of its action, target, context, and time elements. Attention to this particular concern is essential to ensure the proper application and evaluation of the Reasoned Action Theory.

3.3 Instrument Validity, Clarity and Reliability

The developed instrument was subjected to several procedures for determining its validity, clarity, and reliability.

Procedures to determine instrument validity—that is, "the degree to which an instrument measures the true score it was designed to measure" (Fishbein and Ajzen, 1975, p. 108)—followed those recommended by Ray (1989) in a similar study using the Fishbein model. In this study, validity was assured via careful adherence to the Reasoned Action Theory and the instrument construction procedures proposed by the theory's authors. A panel of evaluators at Michigan State University was asked

to assess the extent to which the procedures proposed by the Reasoned Action Theory were followed in constructing the instrument. Panel members also judged item clarity and the correspondence of the item scales with behavioral criteria. Members of the guidance committee for this study were asked to serve as the panel members. They received an English copy of the survey instrument, an evaluation form, and other materials, including diagrams of the original and contextualized Fishbein model; Ajzen and Fishbein's (1980) Appendix A, titled "Steps in the construction of a standard questionnaire"; a copy of the instrument utilized to elicit salient behavioral outcomes and referents of the population studied, and tables identifying modal salient beliefs. These resources were provided to assist the panel members in their task of assessing the instrument content validity. A Spanish version of the survey instrument was included in the package given to a panel member proficient in both English and Spanish. Prior to his evaluation, the Spanish instrument version underwent a process calling for translation from English to Spanish and a back-translation from Spanish to English in compliance with proper instrument translation procedures. The survey instrument was later edited to reflect the improvements suggested by the panel members.

To further determine the instrument's content validity, a group of 20 students at Chapingo University were involved in a pretest exercise. These students were chosen because they were part of the population targeted for this study whose names had not appeared on the final sample lists. During this pretest, students were asked to assess the clarity of the items in the Spanish version of the instrument. As a result, further improvements were made in the Spanish version of the instrument before it was administered (Copies of the final version of the instrument in English and Spanish are found in Appendix D). By implementing these procedures Borg and Gall's (1979) and Tuckman's (1972) requisites for instrument pretesting were thus met.

"Reliability refers to the degree to which a measure is free of variable error" (Fishbein and Ajzen, 1975, p. 107). Osgood, Suci, and Tannenbaum (1957) have reported high reliabilities for single seven-point bipolar scales in the semantic differential. Fishbein and Ajzen (1975) indicated that "responses to probabilistic scales of the semantic-differential type such as probable-improbable, likely-unlikely, tend to yield highly reliable measures of the strength of beliefs or intentions" (p. 108). As an example they cited Davidson (1973), who reported test-retest reliabilities greater than .95 for the likely-unlikely scale. Fishbein and Ajzen further added that "it is possible to locate subjects on evaluative and probabilistic dimensions with a high degree of reliability" and that "the question of reliability, therefore, does not pose a major problem for the measurement of beliefs, attitude, and intentions when appropriate instruments are employed" (p. 108). Based on this assumption of high reliability, the overwhelming majority of studies on the Fishbein model published in reputable journals of the behavioral sciences—such as the Journal of Experimental Social Psychology, the Journal of Personality and Social Psychology, the Journal of Social Psychology, the Journal of Applied Social Psychology, and the Journal of Marketing Research—rarely discuss instrument reliability.

A test-retest reliability analysis for this instrument, although scheduled as part of the study had to be dropped. Time limitations and circumstances imposed on the study participants, such as finals week and end of the semester deadlines, as well as time-spans for model component measurements (as dictated by the theory), prevented the implementation of the test-retest procedure to assess scale reliabilities. An alternative procedure for reliability analysis known as Cronbach's alpha coefficient was used to assess the reliability of three variables in the model that were measured in the instrument through multiple semantic differential seven-point bipolar scales. These reliability tests were performed using a computer program known as the Statistical Package for the Social Sciences, SPSS/PC+. Cronbach's alpha reliabilities

for these variables ranged form .84 to .65. High reliability for the measurement of three remaining variables in the model that were measured using single semantic differential seven-point bipolar scales was assumed on the basis of previous research findings by Osgood, Suci, and Tannenbaum (1975), Davidson (1973), and Fishbein and Ajzen (1975).

3.4 Population and Sampling Procedures

The population selected for studying the role of attitudinal and normative variables as predictors of agricultural students' intentions and behavior regarding participation in DETCU's summer field work projects consisted of Chapingo University agricultural undergraduates who were freshmen, sophomores and juniors enrolled for the 1991 school year. Chapingo University serves agricultural students at the high school and undergraduate level. Its 1991 enrollment was 5,490 students. Except for senior undergraduates, all other students at Chapingo were eligible to participate in summer field work projects. For the purposes of this study, only agricultural undergraduates were considered because they were assumed to have more established attitudes regarding field work projects than high school students because they had been students at the university much longer than the high school students and therefore had been exposed to information about field work projects longer. From a final population of 2,117 a total sample of 323 students was drawn using the stratified random sampling technique. This technique, according to Borg and Gall (1979), "assures the research worker that the sample will be representative of the population in terms of certain critical factors that have been used as a basis for stratification" (p. 187). The number of students enrolled per major, the relevance of major to field work practices, and year in school were the combined critical factors used for stratification. With assistance provided by a faculty member from the statistics

department at Michigan State University a computer program for random number selection was used. Numbers were assigned to each student name on the strata listings and selected random numbers were matched with corresponding numbers and names. A coding system was then devised consisting of eight (alpha and numerical) characters to identify each selected participant.

3.5 Data Collection Procedures

In the first stage of data collection, covering a period of one week (June 12-June 18), packets containing a cover letter and the measurement instrument were delivered to the selected respondents. The cover letter (Appendix E, Spanish version) explained the purpose of the study, assured confidentiality of response and stated the voluntary nature of participation. The list of names and corresponding codes of selected participants was carefully matched with participants' coded questionnaires to monitor responses and conduct follow-up activities. Respondents were personally contacted during class breaks and through other means and were briefed about the study. They were encouraged to fill out their questionnaires and to return them to an assigned class member previously identified, to the researcher or to the clerical staff of the Field Work Department. During the first stage 157 completed questionnaires were returned, for an encouraging 49 percent response rate.

The second stage was initiated during the second week of data collection (June 19–June 25). In the second stage, those who had not yet responded received a second identical packet with a thank you/remainder note. This added 35 percent more to the response rate (114 more respondents), for a total response rate of 84 percent.

A more intensive version of the technique known as double dipping nonrespondents was undertaken during the last three days of school at Chapingo University (June 26-28) to handle non-response error. The original technique (see Miller and Smith,

1983) recommends drawing a random sample of 10 to 20 percent from the non-respondents, who are then interviewed by phone or face to face to obtain data using the questionnaire as an interview schedule. This procedure was modified to identify and contact as many non-respondents as possible. Out of 52 non-respondents in the total sample, 34 were identified as no longer accessible. The remaining 18 non-respondents were personally visited and data were obtained as recommended by the double dipping technique. These data were later statistically compared with the data from the respondents. A T-test (Appendix F) to compare the attitudinal variable means for both groups indicated no significant differences between these means, so data from both groups were pooled, allowing generalizations from the sample to the population. A final total of 289 respondents (89.4 percent) participated in the study.

Data on actual behavior (for those students who stated in their questionnaires that they intended to participate in summer field work projects) was obtained from the university Field Work Department, which coordinates these projects at Chapingo University. The names of students participating in the projects were entered into a database together with the names of study participants. A computer program was used to sort and match names to find out if those students who stated that they intended to participate in DETCU's summer field work projects actually followed through with their intentions.

3.6 Data Analysis Procedures

Important analyses involving the variables specified in the model are correlational in nature. Correlation coefficients (r), a means for describing the strength of the relationships, or the degree of linear relationship, ranging from -1 to $+1$, among these variables were calculated using a statistical package known as SPSS/PC+. In assessing the significance of the results of these analyses, statistical significance was

set at a .05 alpha level. Guidelines to define the appropriateness of the level of correlations found in this application of the Fishbein model follow those suggested in Ajzen and Fishbein (1980):

> Although it is an arbitrary decision to term a correlation weak or strong, some general guidelines can be suggested. In the social sciences, correlations around .30 have been considered satisfactory and, consistent with this practice, we would suggest that correlations below this level are usually of little practical value even if they are statistically significant. Correlations in the range of .30 to .50 may be considered of moderate magnitude, while correlations exceeding .50 indicate relatively strong relationships between two variables (p. 99).

Further empirical testing of the theory required the calculation of an index of the degree to which one variable (intention) can be predicted from a simultaneous consideration of two other variables (attitude toward the behavior and subjective norm). Such an index is provided by calculations of the multiple correlation coefficient (R) which can range from zero (no predictability) to 1.0 (perfect predictability). The authors of the theory further expound on the usefulness of this statistical analysis:

> The multiple correlation indicates the degree of correlation between two or more predictor variables and a given criterion measure. In computing this index, we also obtain a weight for each of the predictor variables which represents the independent contribution of that variable in the prediction of the criterion. When testing our theory, then, weights are obtained for the attitude toward the behavior and the subjective norm. These weights *(w)* can be taken as indicants of the relative importance of each component in the prediction of intention (Ajzen and Fishbein, p. 99).

In a summary of the analyses results, the relationships among the variables that make up the Reasoned Action Theory are reported in Chapter 4 in the form of a diagram such as the one in Figure 2.1 in Chapter 2. On the left side, this diagram shows a coefficient value of the relation between an estimate of attitude, based on behavioral beliefs and outcome evaluations, and a global measure of attitude toward the behavior. Similarly, it presents, the correlation coefficient value between an estimate of subjective norm, based on normative beliefs and motivation to comply, and a global measure of subjective norm. The global measures of attitude and subjective

norm are then used, following the direction of the flow chart, to predict the intention. The chart also depicts individual coefficients of the relation of each of these two variables with the intention, along with the multiple correlation and the relative weight of each component. At the right end, the diagram illustrates the last two components of the model, the strength of the relation between intention and behavior, by means of a correlation coefficient value. The major findings of relationships among the variables specified in model are summarized in this diagram.

The final and most crucial theory testing procedure was carried out through the application of a statistical technique known as path analysis, which, according to Kerlinger and Pedahzur (1973), "is a method of analysis designed to shed light on the tenability of a theoretical model" (p. 307). Blau and Duncan (1967) explained the purpose of using path analysis. "Path analysis is not a method for discovering causal laws but a procedure for giving a quantitative interpretation to the manifestations of a known or assumed causal system as it operates in the population" (p. 172).

Wright (1934) explained this similarly:

> "...the method of path coefficients is not intended to accomplish the impossible task of deducting causal relations from the values of the correlation coefficients. It is intended to combine the quantitative information given by the correlations which such qualitative information as may be at hand on causal relations to give a quantitative interpretation" (p. 193).

In other words, according to Kerlinger and Pedhazur (1973): "Path analysis is useful in theory testing rather than in generating it. In fact, one of the virtues of the method is that, in order to apply it, the researcher is required to make explicit the theoretical framework within which he operates" (p. 305). In path analysis, "numerical estimates of the causal relationships between two variables are represented by path coefficients" (Bohrnstedt and Knoke, 1988, p. 441). Wright defined a path coefficient as:

> the fraction of the standard deviation of the dependent variable (with the appropriate sign) for which the designated factor is directly responsible, in the sense of the fraction which would be found if this factor varies to the same extent as in the observed data while all others (including the residual factors...) are constant. In other words, a path coefficient indicates the direct effect of a variable taken as a cause of a variable taken as effect (p. 310).

Two kinds of criteria are used to determine whether a pattern of correlations for a set of observations is consistent with a specific theoretical formulation. These are statistical significance and meaningfulness. Some researchers prefer to adopt the criterion of meaningfulness and delete all the paths that are not meaningful. Because conventional guidelines for determining meaningfulness don't exist, a decision was made to treat path coefficients of .10 or smaller as not meaningful. Using path coefficients, a correlation matrix (R) is first reproduced for all the variables in the system. Deletion of non-meaningful paths is the second step in the process. Then the extent to which the original R matrix can be approximated is determined. Kerlinger and Pedahzur (1973) provided the following guidelines to perform this final step:

> In this case, too, there are no set rules for assessing goodness of fit. Once again the researcher has to make a judgment. Broadly speaking, if the discrepancies between the original and the reproduced correlations are small, say, <.05, and the number of such discrepancies in the matrix is relatively small, the researcher may conclude that the more parsimonious model which generated the new R matrix is a tenable one (p. 318).

In reporting other important results of this study, additional statistical techniques such as descriptive statistics, linear, logistic, multiple regression analysis and T-tests were also implemented.

3.7 Summary

Methods and procedures for testing Fishbein and Ajzen's theory or model were patterned after those prescribed by these authors. Procedures leading to final data collection were carried out in two separate phases. Phase one involved the

design of an open-ended questionnaire administered to agricultural undergraduates at Chapingo by use of a quota sampling technique. Content analysis of data was then undertaken in compliance with theory methodology to produce the research instrument. During phase two, an instrument consisting of seven sections totalling 55 semantic differential seven-point bipolar scales was developed. Instrument content validity was checked by members of the guidance committee for this study. A pilot test, involving 20 Chapingo University undergraduates was also executed to assess instrument clarity. Instrument revisions were made as suggested during validity and clarity assessments. Reliability tests were executed for three variables measured in the model through multiple semantic differential seven-point bipolar scales. Based on reviewed literature, high reliability assumptions were adopted for semantic differential single seven-point bipolar scales used to measure three other variables in the model. Through stratified random sampling, 323 agricultural undergraduates were selected as study participants. Two separate mailings, coupled with the use of a double dipping non-respondents technique to handle non-response error, rendered nearly a 90 percent response from those students sampled. Finally, student behavioral data was obtained from official school records. Gathered data were later analyzed using primarily linear, logistic, multiple regression and path analysis techniques. Descriptive statistics and T-test techniques were also utilized for further analyses.

CHAPTER 4

RESULTS

The purpose of this study was to test the predictive utility of the Reasoned Action Theory in an international agricultural education setting. To accomplish this purpose, three specific objectives were set forth. The first was to determine agricultural students' behavioral belief strength, outcome evaluations, normative beliefs, motivation to comply, attitude toward the behavior, subjective norms, intentions, and behavior regarding participation in summer field work projects at Chapingo University. These were the variables identified in the Reasoned Action Theory. When operationalized into a model, this theory becomes known as Fishbein's Model or Fishbein and Ajzen's Model. Operationalizing a theory into a model is consistent with Cushman and McPhee's 1980 definition of a model as "an applied or situated theory" (p. 16). Because this theory or model "consists essentially of a series of hypotheses linking beliefs to behavior, with each hypothesis requiring empirical verification" (Ajzen and Fishbein, 1980, p. 80), the empirical demonstration of the presumed relationships among the variables in the model became the second objective of this study. More specifically stated, the second objective was to determine the correlations between adjacent components of the Reasoned Action Model when tested in an international agricultural education setting. To finally determine the predictive utility or tenability of this applied theory, a third study objective was set, which involved a test of the validity of the causal relationships hypothesized in the model. Results obtained through several statistical analyses are presented in three sections. These correspond to the objectives stated above.

4.1 Applied Model Outcomes

Variables involved in the applied model were operationalized and measured using semantic differential seven-point bipolar scales as described in chapter 3. Eight separate variables were measured. These were defined as respondents': (1) behavioral beliefs, (2) outcome evaluations, (3) normative beliefs, (4) motivation to comply, (5) global attitude toward the behavior, (6) global subjective norms, (7) behavioral intentions, and (8) behavior. These variables appear in the model either as individual components or subcomponents standing in different relations with one another.

4.1.1 Behavioral Beliefs

Twenty behavioral beliefs (B_i) linking consequences to the act of participating in summer field work projects were assessed on seven-point bipolar likely-unlikely scales. In these scales, respondents assessed the likelihood or probability that several consequences linked to this participation behavior would occur. This was the strength with which respondents held these beliefs, termed "belief strength" in Table 4.1.

This table depicts mean values and standard deviations of the strength with which respondents held behavioral beliefs regarding participation. An interpretation of these means was aided by the following guidelines:

Range of mean	Interpretation of mean responses
$B_i \geq 1.5$	highly certain
$1.5 > B_i > -1.5$	uncertain
$-1.5 \geq B_i$	highly uncertain

These guidelines were developed based on values used in semantic differential seven-point scales of the type:

Table 4.1: Means and Standard Deviations of Respondents' Behavioral Belief Strength.

Behavioral Beliefs	Belief Strength	
Participating in Summer Field Work Projects	*Mean*	*SD*
Allows me to relate the theory I learn in the classroom to the practice in the field.	*1.96	.87
Allows me to understand more closely the problems of Mexican agriculture.	*2.08	.81
Allows me to come in direct contact with producers.	*2.31	.73
Is discouraging because of the lack of support university officials demonstrate by rejecting project proposals and curtailing economic resources needed to carry out the service projects.	1.03	1.42
Gives me needed practical experience.	*1.64	.87
Allows me to provide technical assistance to poor farmers to help solve some of their problems.	*1.84	.91
Gives me an opportunity to observe and learn different agricultural production techniques.	1.38	1.07
Interferes with working on my thesis.	−.26	1.99
Takes time away from more important activities for me.	.32	1.68
Causes me to miss out on my summer vacation.	.63	1.90
Is an opportunity to see other parts of the country.	*2.10	.99
Is frustrating because of organizational problems at DETCU that sometimes cause failure to accomplish the objectives set for the service projects.	1.16	1.42
Causes me to spend less vacation time with my family.	*1.62	1.39
Overlaps with the field study trip planned in my department.	.30	2.37
Allows me to gain new knowledge on various agriculture-related subjects.	*2.00	.86
Takes time away from my other academic duties during the planning phase of the project.	.45	1.46
Causes me to miss out on opportunities to get a remunerative job.	−.42	1.65
Complements my agricultural training.	*1.98	.84
Allows me to make contacts for future employment possibilities.	1.30	1.12
Is difficult for me because I don't have time to do it.	.43	1.80

*High certainty of occurrence of this participation outcome

extremely likely	+3
quite likely	+2
slightly likely	+1
neither (likely nor unlikely)	0
slightly unlikely	−1
quite unlikely	−2
extremely unlikely	−3

As Table 4.1 shows, respondents were highly certain of the occurrence of nine consequences (marked with an asterisk) associated with their participation in summer field work projects. These consequences, with the exception of one, also exhibited small standard deviations denoting a narrow variance of individual response scores. The occurrence of the remaining behavioral beliefs associated with participation was, overall, rated by respondents as uncertain. Standard deviations were notably large for these consequences, indicating a wide range of variance of individual response scores.

4.1.2 Outcome Evaluations

Students' evaluations (e_i) regarding 20 possible outcomes associated with their participation in summer field work projects were assessed on seven-point bipolar good-bad scales. On these scales, respondents indicated the extent to which they qualified a participation-related consequence as good or bad. Table 4.2 shows the means and standard deviations of respondents' outcome evaluations.

Interpretation of outcome evaluation means was based on these guidelines:

Range of mean	Interpretation of mean response
$e_i \geq 1.5$	good outcome
$1.5 > e_i > -1.5$	neither good nor bad
$-1.5 \geq e_i$	bad outcome

These guidelines were developed based on values used in semantic differential seven-point bipolar scales of the type:

Table 4.2: Means and Standard Deviations of Respondents' Outcome Evaluations.

Behavioral Beliefs	Outcome Evaluations	
Participating in Summer Field Work Projects	*Mean*	*SD*
Allows me to relate the theory I learn in the classroom to the practice in the field.	*2.42	.60
Allows me to understand more closely the problems of Mexican agriculture.	*2.40	.62
Allows me to come in direct contact with producers.	*2.35	.58
Is discouraging because of the lack of support university officials demonstrate by rejecting project proposals and curtailing economic resources needed to carry out the service projects.	−1.67	1.16
Gives me needed practical experience.	*2.43	.59
Allows me to provide technical assistance to poor farmers to help solve some of their problems.	*2.38	.60
Gives me an opportunity to observe and learn different agricultural production techniques.	*2.26	.59
Interferes with working on my thesis.	−1.55	1.15
Takes time away from more important activities for me.	−.49	1.32
Causes me to miss out on my summer vacation.	−.40	1.09
Is an opportunity to see other parts of the country.	*2.08	.70
Is frustrating because of organizational problems at DETCU that sometimes cause failure to accomplish the objectives set for the service projects.	−1.70	1.11
Causes me to spend less vacation time with my family.	−.80	1.06
Overlaps with the field study trip planned in my department.	−1.39	1.22
Allows me to gain new knowledge on various agriculture-related subjects.	*2.25	.63
Takes time away from my other academic duties during the planning phase of the project.	.11	1.51
Causes me to miss out on opportunities to get a remunerative job.	−.91	1.01
Complements my agricultural training.	*2.35	.55
Allows me to make contacts for future employment possibilities.	*1.99	.73
Is difficult for me because I don't have time to do it.	−1.34	1.09

*Good participation outcome

extremely good	+3
quite good	+2
slightly good	+1
neither good nor bad	0
slightly bad	−1
quite bad	−2
extremely bad	−3

Table 4.2 shows that respondents evaluated 10 of the 20 outcomes (marked with an asterisk) as being good outcomes or consequences of project participation (mean values of 1.5 and above). Standard deviation values for these positively rated outcomes were small, indicating a narrow variance of individual response scores. Seven participation outcomes obtained mean values ranging from .11 to −1.34. These were interpreted as neither good nor bad. The three remaining outcomes obtained mean values of −1.55 and below. These were interpreted from respondents' evaluations as bad consequences or outcomes of project participation. Standard deviations for outcomes in these two final categories were larger relative to those obtained for those positively rated outcomes. This indicated a wider spread of individual response scores about their means.

4.1.3 Normative Beliefs

Five normative beliefs (NB) involving statements concerning the expectations important others placed on the respondents regarding their participation in DETCU's summer projects were assessed on seven-point bipolar likely-unlikely scales. On these scales, respondents were asked to evaluate the probability (or likelihood) of participation expectations that important others placed on them. Table 4.3 shows the means and standard deviations obtained for each normative belief.

Interpretation of normative beliefs means was based on these guidelines:

Table 4.3: Means and Standard Deviations of Respondents' Normative Beliefs

Normative Beliefs	*Mean*	*SD*
Some of my friends think I should participate in one of DETCU's summer field work projects.	.55	1.51
Some of my professors think I should participate in one of DETCU's summer field work projects.	.43	1.55
The producers think I should participate in one of DETCU's summer field work projects.	.65	1.51
Some of my classmates think I should participate in one of DETCU's summer field work projects.	.58	1.47
My parents think I should participate in one of DETCU's summer field work projects.	.27	1.54

Range of mean	Interpretation of mean responses
$NB \geq 1.5$	highly certain
$1.5 > NB > -1.5$	uncertain
$-1.5 \geq NB$	highly uncertain

These guidelines were developed based on values used in semantic differential seven-point scales of the type:

extremely likely	+3
quite likely	+2
slightly likely	+1
neither (likely nor unlikely)	0
slightly unlikely	−1
quite unlikely	−2
extremely unlikely	−3

Table 4.3 shows that respondents were uncertain about the expectations that all of their salient referents (important others) had regarding their participation in summer field work projects. Mean values ranged from .65 to .27, and standard deviations reflected a wide range of variance of individual response scores.

4.1.4 Motivation to Comply

Five statements involving measurement of respondent's motivation to comply (Mc) with the expectations of their salient referents to participate in DETCU's summer field work projects were assessed by respondents on seven-point bipolar likely-unlikely scales. On these scales, respondents were asked to indicate their willingness or motivation to comply with the participation expectations that they believed important others had of them. Table 4.4 shows the means and standard deviations of respondents' motivation to comply.

Table 4.4: Means and Standard Deviations of Respondents' Motivation to Comply.

Motivation to Comply		
Generally speaking, I want to do what...	*Mean*	*SD*
Some of my friends think I should do.	−.93	1.66
Some of my professors think I should do.	−.28	1.70
The producers think I should do.	.06	1.66
Some of my classmates think I should do.	−.85	1.58
My parents think I should do.	.28	1.69

Interpretation of motivation to comply means was based on these guidelines:

Range of mean	Interpretation of mean responses
$Mc \geq 1.5$	highly motivated to comply
$1.5 > Mc > -1.5$	neither motivated nor unmotivated
$-1.5 \geq Mc$	highly unmotivated to comply

These guidelines were developed based on values used in semantic differential seven-point scales of the type:

extremely likely	+3
quite likely	+2
slightly likely	+1
neither (likely nor unlikely)	0
slightly unlikely	−1
quite unlikely	−2
extremely unlikely	−3

Table 4.4 shows that respondents were uncertain about their motivation to comply with the expectations that all of their salient referents (important others) had regarding their participation in summer field work projects. Mean values ranged from .06 to −.93, and standard deviations reflected a wide range of variance of individual response scores.

4.1.5 Global Attitude Toward the Behavior

A set of three evaluative semantic differential seven-point bipolar scales were used to obtain a global measurement of respondents' attitudes toward the behavior in question (A_{act}). The statement "My participation in one of DETCU's summer field work projects would be" was completed by respondents on three scales with good-bad, wise-foolish, harmful-beneficial end points. Table 4.5 shows the mean and standard deviation of respondents' global attitude toward participation in DETCU's summer field work projects.

Table 4.5: Mean and Standard Deviation of Respondents' Global Attitude Toward Participation in DETCU's Summer Field Work Projects.

Respondents' Global Attitude Toward the Behavior (A_{act})	
Mean	*SD*
1.59	.64

Interpretation of respondents' global attitude toward the behavior was based on these guidelines:

Range of mean	Interpretation of mean responses
$A_{act} \geq 1.5$	highly positive attitude
$1.5 > A_{act} > -1.5$	neither positive nor negative
$-1.5 \geq A_{act}$	highly negative attitude

These guidelines were developed based on values used in three semantic differential seven-point bipolar scales. These scales were similar to those described before and had values that ranged from +3 to −3.

Table 4.5 shows that respondents had a highly positive attitude toward participating in DETCU's summer field work projects.

4.1.6 Global Subjective Norms

A single semantic differential seven-point bipolar scale was used to obtain a global measurement of respondents' subjective norms (SN) regarding their participation in one of DETCU's summer field work projects. The statement "Most people who are important to me think I should participate in one of DETCU's summer field work projects" was rated by respondents on a single scale with extremely likely–extremely unlikely end points.

Table 4.6 shows the mean and standard deviation of respondent's global subjective norms regarding their participation in DETCU's summer field work projects.

Interpretation of respondents' global subjective norms was based on these guidelines:

Range of mean	Interpretation of mean responses
$SN \geq 1.5$	highly certain
$1.5 > SN > -1.5$	uncertain
$-1.5 \geq SN$	highly uncertain

Table 4.6: Mean and Standard Deviation of Respondents' Global Subjective Norms Regarding Participation in DETCU's Summer Field Work Projects.

Respondents' Global Subjective Norms Regarding Participation (SN)	
Mean	*SD*
.64	1.57

These guidelines were developed based on values used on a single semantic differential seven-point bipolar scale. This scale was similar to those described before and had values that ranged from +3 to −3.

Table 4.6 shows that respondents were uncertain about the expectations that most people important to them had regarding their participation in DETCU's summer field work projects. The standard deviation shown reflects a wide spread of single response scores about the mean.

4.1.7 Behavioral Intentions

A single semantic differential seven-point bipolar scale was used to obtain a measurement of respondent's behavioral intentions. Behavioral intentions are defined here as respondents' intentions to participate in one of DETCU's summer field work projects (PI). The statement "I intend to participate in one of DETCU's summer field work projects" was rated by respondents on a single scale with extremely likely–extremely unlikely end points.

Table 4.7 shows the frequency distribution of respondents' intentions to participate in DETCU's summer field work projects.

Table 4.7 shows that only 24 students (8.3 percent of the respondents) indicated that their participation intentions were extremely likely. Forty-three of them (14.9 percent of the respondents) assessed their participation intentions as quite likely.

Table 4.7: Frequency Distribution of Respondents' Intentions to Participate in DETCU's Summer Field Work Projects

Behavioral Intentions		
I intend to participate in one of DETCU's summer field work projects	*Freq.*	*%*
extremely likely	24	8.3
quite likely	43	14.9
slightly likely	57	19.7
neither likely nor unlikely	36	12.5
slightly unlikely	11	3.8
quite unlikely	53	18.3
extremely unlikely	65	22.5
Total	289	100

Spanning three categories, a large number of students assessed their participation intentions as being either slightly likely, neither likely nor unlikely, and as slightly unlikely. Grouping these three categories allows one to interpret the participation intentions of 104 respondents, or 37 percent, as uncertain. Downward on this table, the number of respondents stating quite unlikely and extremely unlikely participation intentions increases. On the latter category, 53, or 18.3 percent, of the students responded. On the former category, 65, or 22.5 percent of the respondents indicated extremely unlikely participation intentions.

To further describe the results obtained from the analysis of this variable, the mean and standard deviation of respondents' participation intentions are shown on Table 4.8

Interpretation of respondents' participation intentions was based on these guidelines:

Table 4.8: Mean and Standard Deviation of Respondents' Intentions to Participate in Summer Field Work Projects.

Respondents' Intentions to Participate in Summer Field Work Projects (PI)	
Mean	*SD*
−.33	2.05

Range of mean	Interpretation of mean responses
$SN \geq 1.5$	highly certain
$1.5 > SN > -1.5$	uncertain
$-1.5 \geq SN$	highly uncertain

Table 4.8 shows that respondents were uncertain regarding their intentions to participate in DETCU's summer field work projects. The resulting standard deviation also reflects a wide spread of single response scores about the mean.

4.1.8 Behavior

Respondents' actual participation behavior (PB) was measured by operationalizing students' participation behavior as a dichotomous variable. In creating this variable and adding it to each case in a data file used for statistical analyses, the statement "Student participated in DETCU's summer field work projects: yes/no" was entered. University lists containing the names of students that were registered as participants of DETCU's summer field work projects were used to sort and identify the respondents' corresponding behavior.

Table 4.9 shows the distribution of respondents' participation behavior in DETCU's summer field work projects.

Table 4.9 shows, that only 36 students (12.5 percent of the respondents) actually participated in DETCU's summer field work projects. The overwhelming majority (253, or 87.5 percent of the respondents) did not participate.

Table 4.9: Dichotomous Distribution of Respondents' Participation Behavior in DETCU's Summer Field Work Projects

Participation Behavior		
Student participated in one of DETCU's summer field work projects	*Freq.*	*%*
yes	36	12.5
no	253	87.5
Total	289	100

4.2 Testing Hypotheses About Correlations

To accomplish the second objective of this study or answer the second research question, which involved determining the correlations presumed to exist in the model, the theoretical relationships in the Fishbein model were considered, as recommended by the theory's authors, "an empirical question" (Fishbein and Ajzen, 1980, p. 80) requiring the empirical verification of the hypotheses underlying the model's theory. Eight separate variables were involved in testing these hypotheses. These, again, were respondents' (1) behavioral beliefs, (2) outcome evaluations, (3) normative beliefs, (4) motivation to comply, (5) global attitude toward the behavior, (6) global subjective norms, (7) behavioral intentions, and (8) behavior. These variables appear in the model either as individual components or subcomponents standing in different relations to one another.

4.2.1 Measurement of Dependent and Independent Variables

The variables mentioned above stand in different relationships to one another other as depicted in the following equations:

$$PB \sim PI$$

$$PI = (A_{act})w_1 + (SN)w_2$$

$$A_{act} = \sum_{i=1}^{n} B_i e_i$$

$$SN = \sum_{i=1}^{n} (NB_i)(Mc_i)$$

where in the first equation, PI (the participation intention) is identified as the independent variable and PB (the actual participation behavior) is identified as the dependent variable.

In the second equation, PI (the participation intention) is identified as the dependent variable determined by the weights of the two independent variables: A_{act} (attitude toward participating) and SN (subjective norm with respect to participating.

In the third equation, A_{act} (attitude toward participating) is identified as a dependent variable, and B_i (the perceived consequences of performing the behavior), combined with e_i (the evaluations of these perceived outcomes), represent the independent variable.

In the fourth equation, SN (the subjective norm) is identified as a dependent variable, and NB (the perceptions of what specific others say should be done), combined with Mc (the willingness of the individual to accept advice and viewpoint of others), represent the independent variable.

Four hypotheses involving the variables just described were identified from the theoretical model and were contextualized to the applied model for predicting agricultural students' intentions and participation in summer field work projects at Mexico's Chapingo University. These hypotheses were stated in the null form and were all tested at a .05 level of significance.

H1: An agricultural student's positive intention to participate in summer field work projects is not positively correlated with his/her actual participation behavior in DETCU's summer field work projects.

$$PB \sim PI$$

In testing the first null hypothesis, a point biseral correlation between students' intention to participate in summer field work projects and their reported participation behavior was computed. The correlation value found was $r = .39$. A one-tailed significance test showed that the probability of observing, in this sample, a correlation coefficient of .39 or greater when the value in the population is zero was .001. Because the observed significance level was smaller than .05, the null hypothesis that there is no positive linear association between the two variables in the population was rejected. Figure 4.1 illustrates the regression line plotted for these two variables. The magnitude of this correlation, according to Davis (1971) and Ajzen and Fishbein (1980), is considered to be moderate.

H2: A positive multiple correlation is not observed between (a) an agricultural student's positive intention to participate in DETCU's summer field work projects, (b) the agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects, and (c) his/her positive global subjective norm with respect to participating in DETCU's summer field work projects.

$$PI = (A_{act})w_1 + (SN)w_2$$

The second null hypothesis was tested by calculating an index of the degree to which students' intention to participate could be predicted from a simultaneous consideration of two other variables: an attitudinal variable (attitude toward the

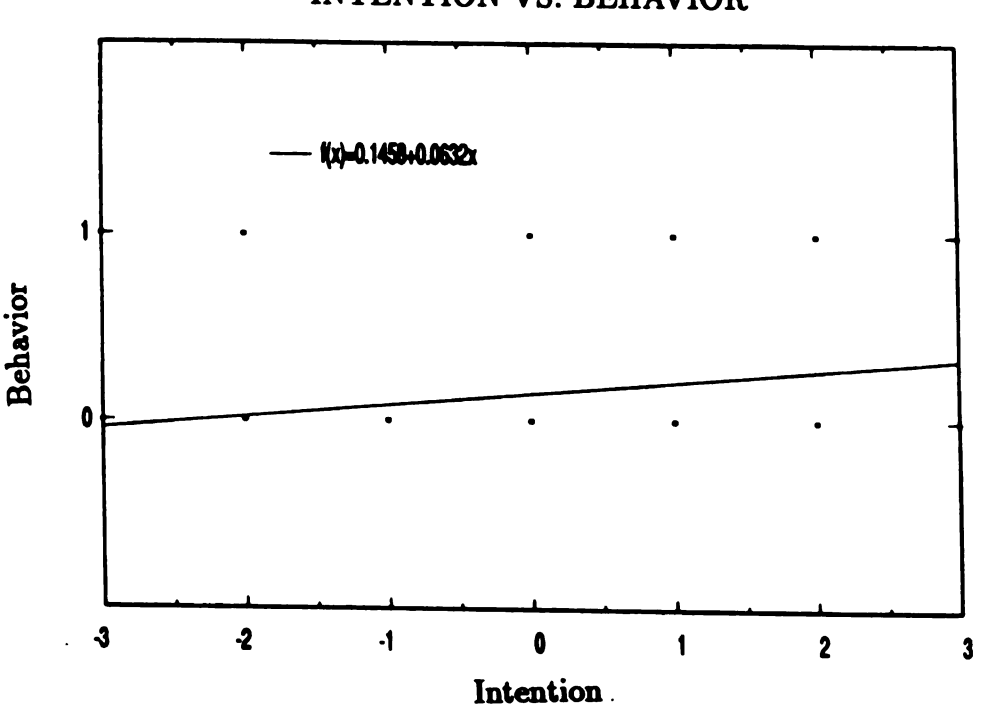


Figure 4.1: Linear regression of intention vs. behavior.

behavior A_{act}) and a normative variable (subjective norm SN). This index, provided by calculations of the multiple correlation coefficient, was $R = .33$. The observed significance level for this coefficient was smaller than .05. For this reason, the null hypothesis that there is not a multiple regression between these three variables in the population was rejected.

The obtained multiple regression index, indicating the prediction of students' participation intentions using measures of attitudes and subjective norms, can be considered of moderate magnitude.

In addition to obtaining this multiple correlation index, beta weights of .09 (for $A_{act}w_1$) and .29 (for SNw_2) were obtained. These weights, according to Ajzen and Fishbein (1980), can be taken to indicate the relative importance of each component in the prediction of intention. As it can be observed, the attitudinal variable in the prediction of intention was substantially less important than the normative variable.

Separate simple correlations between the attitudinal variable and intention and the normative variable and intention were deemed necessary to assess the relationships between the attitudinal and normative variables and the intention variable. The coefficient value for the relationship between the attitudinal variable and intention was $r = .18$; the value for the relationship between the normative variable and intention was $r = .32$. Both of these coefficients were significant at a .05 alpha level. Nevertheless, only the correlation coefficient obtained for the normative variable and intention reached a level considered of moderate magnitude. The correlation coefficient for the attitudinal variable and intention is considered of low or little practical value, even when it is statistically significant.

H3: An agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects is not positively correlated with his estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in DETCU's summer field work projects.

$$A_{act} = \sum_{i=1}^{n} B_i e_i$$

The third null hypothesis was tested by computing a measure of correlation between students' global attitude toward the act of participating in summer field work projects and their estimated attitude towards the act. A Pearson product moment correlation of $r = .34$ was obtained. In a one-tailed significance test, the probability of observing, in this sample, a correlation coefficient of .34 or greater when the value in the population is zero was .001. Because the observed significance level was smaller than .05, the null hypothesis that there is no positive linear association between the two variables in the population is rejected. Figure 4.2 illustrates the linear regression plotted for these two variables. The magnitude of this correlation, according to Davis (1971) and Ajzen and Fishbein (1980), is considered to be moderate.

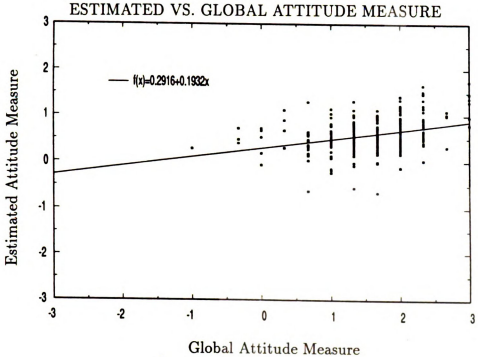


Figure 4.2: Linear regression of estimated vs. global attitude measures.

H4: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects is not positively correlated with his/her estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects.

$$SN = \sum_{i=1}^{n} (NB_i)(Mc_i)$$

In testing the fourth null hypothesis, a Pearson product correlation between students' global subjective norms toward the act of participating in one of DETCU's summer field work projects and their estimated subjective norm toward this act was computed. The correlation value was $r = -.15$. A one-tailed test was used in this procedure. According to Norusis (1988) with a one-tailed test, a null hypothesis can be rejected only if the value of the correlation coefficient is large and in the direction

specified (p. 323). Because neither of these two conditions was met by the outcomes of this correlation, the null hypothesis was not rejected. This hypothesis stated that an agricultural student's global subjective norms and his/her estimated subjective norms (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects were not positively correlated.

Figure 4.3 illustrates the linear regression plotted for these two variables.

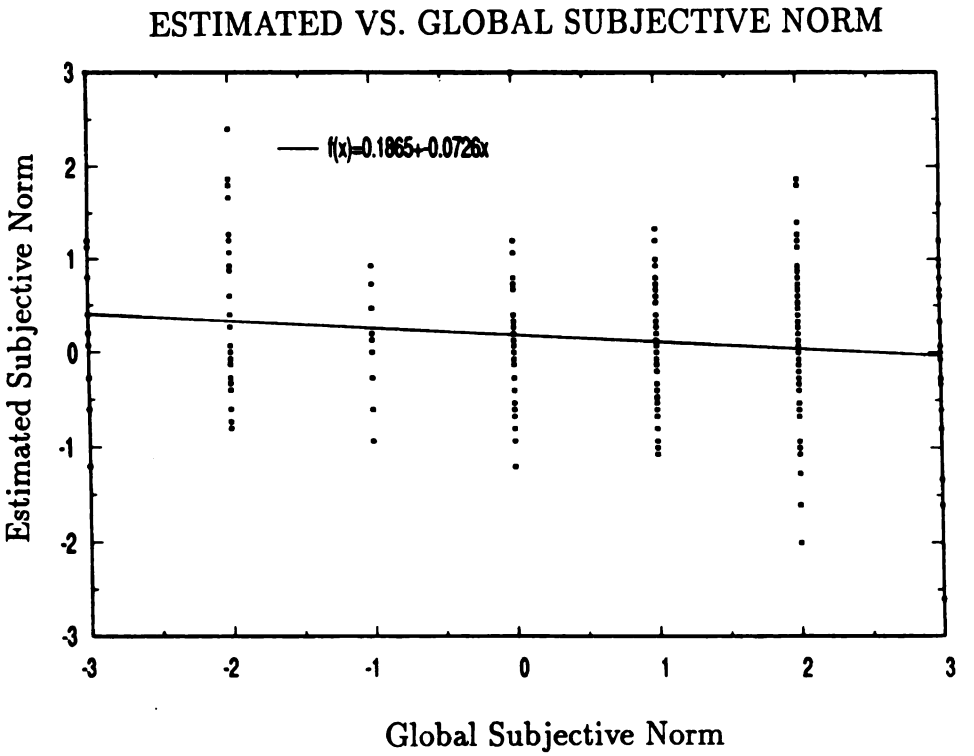


Figure 4.3: Linear regression of estimated vs. global subjective norms.

Concerns about the normative component of the model have been acknowledged by Fishbein and Ajzen (1980). Several authors have found that the removal of the motivation to comply element (Mc_i) improves the correlation between global subjective norms (SN) and estimated subjective norms $\sum_{i=1}^{n} NB_i$. (see Budd, North and Spencer, 1984; Kantola, Syme and Campbell, 1982; and Minard and Page, 1984). On this basis, a new hypothesis in the null form was specified:

H4b: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects is not positively correlated with his/her estimated subjective norm (normative beliefs only) concerning participation in DETCU's summer field work projects.

Removing the Mc component of the model and performing a Pearson product moment correlation yielded a value of $r = .57$. The magnitude of this correlation, according to Davis (1971) and Ajzen and Fishbein (1980), is considered to be strong. In a one-tailed significance test, the probability of observing, in this sample, a correlation coefficient of .57 or greater when the value in the population is zero was .001. Because the observed significance level was smaller than .05, the null hypothesis that there is not a positive linear association between the two variables in the population is rejected.

4.2.2 Summary of Correlational Findings of the Applied Model

A summary of outcomes of the tested relationships hypothesized among the variables comprising the Reasoned Action Theory is presented in Figure 4.4. This figure presents, starting on the left, the relationship between an estimate of attitude, based on behavioral beliefs and outcome evaluations, and a global measure of attitude toward the behavior. Similarly, the correlation between an estimate of subjective norm, based on normative beliefs and motivation to comply, and a global measure of subjective norm is also presented. Following the arrows to the right shows global measures of attitude and subjective norm used to predict intention. Simple correlations of the normative and subjective components with the intention and a multiple correlation together with the relative weight of each component are also shown here. Finally, the strength of the relation between intention and behavior is reported in this applied model.

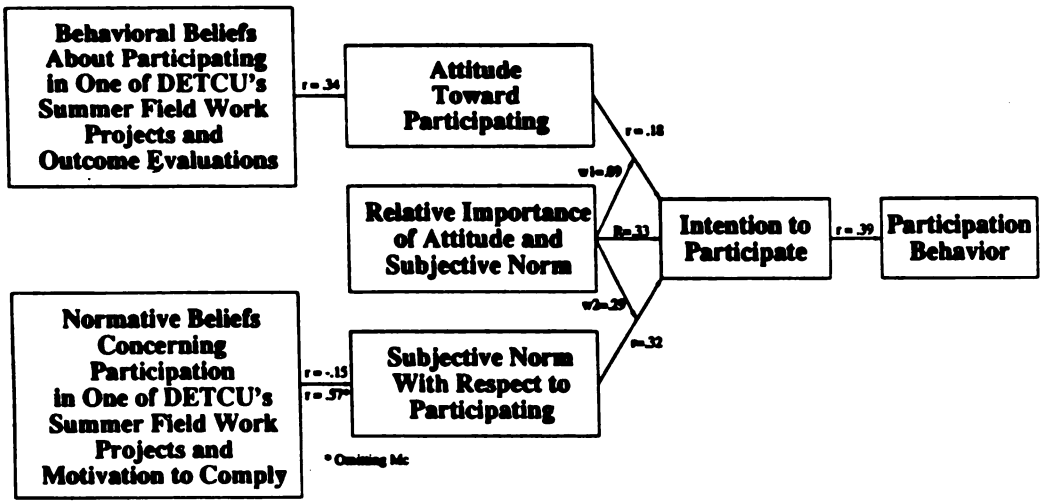


Figure 4.4: Outcome summary of relations among beliefs, attitude, subjective norm, intention, and participation behavior of agricultural students in DETCU's summer field work projects at Mexico's Chapingo University.

Depicted in the lower left corner of this diagram is the relationship observed between an estimate of subjective norm (based on normative beliefs and motivation to comply) and a global measure of subjective norm. Contrary to the relation hypothesized in the theory, a negative relationship was observed between these variables. Further analysis indicated that the removal of Mc_i resulted in a positive and strong relationship between estimated and global subjective norms, thus indicating that Mc_i does not play a role in the formation of subjective norms.

4.3 Causal Structure of the Applied Model

To finally determine the predictive utility of the Reasoned Action Theory, or model, a third study objective was set, which involved a test of the causal relationships hypothesized in the model to determine whether these causal relationships are

supported in the applied model. To accomplish this, a statistical technique known as path analysis was implemented. Kerlinger and Pedhazur (1973) described path analysis as "a method of analysis designed to shed light on the tenability of a theoretical model" (p. 307). These authors added that, to apply this method, the researcher is required to make explicit the theoretical framework within which he/she operates. They also stated that an explanatory model is not arrived at on the basis of data, but rather on the basis of knowledge, theoretical formulations, and assumptions, and logical analysis. In other words, "what determines the type of analysis to be applied to the data is the explanatory scheme of the researcher and not the other way around" (p. 307).

The main premises hypothesized in the Fishbein model and identified and tested in this quantitative research are: (1) that the immediate determinant of behavior is intention, (2) that intention is determined by attitudinal and normative variables, (3) that the attitudinal variable is determined by behavioral beliefs and outcome evaluations, and (4) that the normative variable is determined by subjective norms and motivation to comply.

The causal diagram and the structural equations representing the structure of interrelated hypotheses in this model are briefly reviewed in the next sections.

4.3.1 Fishbein's Causal Diagram

The six-variable causal system in Figure 4.5 represents the hypothesized causes of agricultural students' participation behavior in DETCU's summer field work projects. The plus signs indicate the direction of the hypothesized relationships, and the curved double-headed arrow indicates that these two antecedent variables are not causally analyzed but are correlated. In this application of the Fishbein model, it is hypothesized that: (1) participation intention is the immediate antecedent of

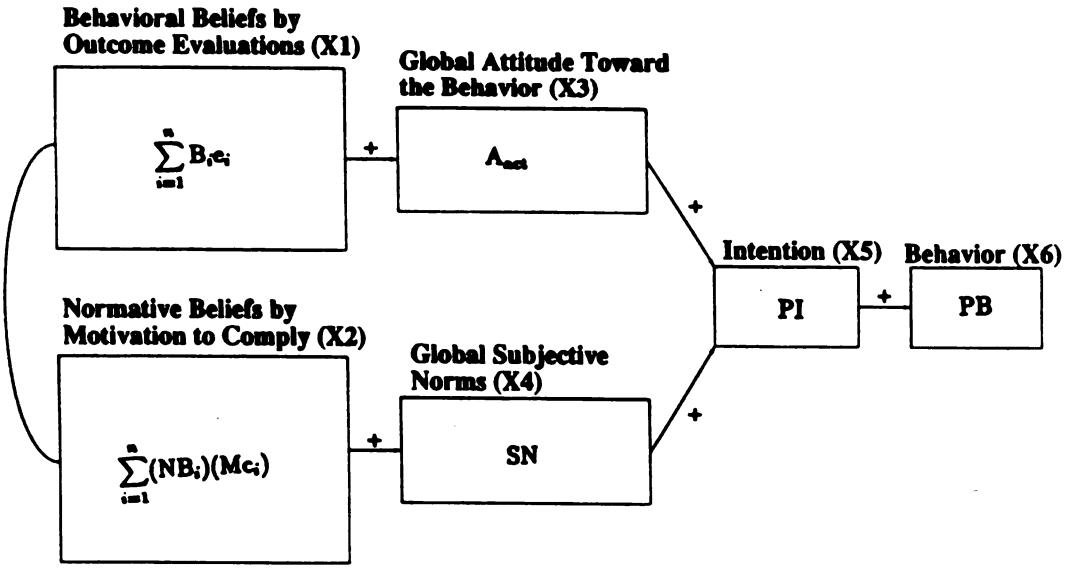


Figure 4.5: Fishbein's Causal Diagram for Agricultural Students' Participation Behavior.

participation behavior (PI $\longrightarrow$ PB); (2) participation intention is determined by the agricultural student's attitude towards the act ($A_{act} \longrightarrow$ PI) and by his/her perception of social pressures which is represented by subjective norm (SN $\longrightarrow$ PI); (3) that A_{act} and SN are, in turn, decomposed into specific cognitive and motivational constructs. A_{act} is viewed as a function of the beliefs (B_i) about the behavior's consequences weighted by the evaluation (e_i) of these consequences ($\sum_{i=1}^{n} B_i e_i \longrightarrow A_{act}$). Similarly, SN is proposed to be a function of the normative beliefs (NB_i) about referent expectation weighted by the motivation to comply (Mc_i) with these referents ($\sum_{i=1}^{n} (NB_i)(Mc_i) \longrightarrow$ SN).

4.3.2 Structural Equations

According to Borhnstedt and Knoke (1988), "path analysis begins with a set of structural equations which represent the structure of interrelated hypotheses in a theory" (p. 441). These equations bear a 1:1 relationship with a causal diagram such as the one in Figure 4.5. These six variables are designated in the diagram by $X1, X2, X3, X4, X5$, and $X6$ to simplify their expression in the model's equations. Kerlinger and Pedhazur (1973) provided a brief discussion on how variables in a causal model may be represented by equations:

> Each endogenous (dependent) variable in a causal model may be represented by an equation consisting of the variables upon which it is assumed to be dependent, and a term representing residuals, or variables not under consideration in the given model. For each independent variable in the equation there is a path coefficient indicating the amount of expected change in the dependent variable as a result of a unit change in the independent variable. Exogenous variables (assumed to be dependent on variables not included in the model) are represented by a residual term only. The letter e with an appropriate subscript is used to represent residuals (p. 310).

The equations for the applied model which express all variables in standard score form (z score), are:

$$X_1 = e_1 \tag{4.1}$$

$$X_2 = e_2 \tag{4.2}$$

$$X_3 = P_{31}X_1 + e_3 \tag{4.3}$$

$$X_4 = P_{42}X_2 + e_4 \tag{4.4}$$

$$X_5 = P_{53}X_3 + P_{54}X_4 + e_5 \tag{4.5}$$

$$X_6 = P_{65}X_5 + e_6 \tag{4.6}$$

According to Kerlinger and Pedhazur (1973), this set of equations can be referred to as a recursive system, described by Borhnstedt and Knoke (1988) as a "model in which all of the causal influences are assumed to be in one and one direction only" (p. 439). This is consistent with the causal links proposed by the Reasoned Action Theory.

In these equations, the symbol for a path coefficient is a P with two subscripts, the first indicating the effect (or the dependent variable), and the second indicating the cause (the independent variable). Residuals (e's) are also expressed in z scores in these equations. X_1 and X_2 are exogenous and are therefore represented by residuals only. X_3 is shown to depend on X_1 and e_3 (which stands for variables outside the system affecting X_3). X_4 is shown to be dependent on X_2 and e_4. X_5 is shown to depend on X_3 and X_4 plus the residual e_5, and X_6 is shown to be dependent on X_5 and e_6. The observed correlations among these variables are shown in Table 4.10.

Table 4.10: Correlation Matrix of Variables in the Applied Path Model.

	X_1	X_2	X_3	X_4	X_5	X_6
X_1	–					
X_2	.3424	–				
X_3	.3420	−.1344	–			
X_4	.2043	−.1574	.3095	–		
X_5	.2261	−.0706	.1846	.3224	–	
X_6	.0945	−.0503	.0821	.1054	.3930	–

4.4 Testing Hypotheses about Causal Paths

To test the causal relationships proposed in the Fishbein model, five hypotheses were derived from the applied model and operationalized as follows:

H5: An agricultural student's positive intention to participate in DETCU's summer field work projects has a direct and positive effect on his/her actual participation behavior in DETCU's summer field work projects.

H6: An agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H7: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H8: An agricultural student's positive estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in DETCU's summer field work projects has a direct and positive effect on his/her global attitude toward the act of participating in DETCU's summer field work projects.

H9: An agricultural student's positive estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects has a direct and positive effect on his/her global subjective norm with respect to participating in DETCU's summer field work projects.

Path coefficients were used in testing the strength of the causal relationships in these hypotheses (so as to support or reject them). The standardized regression coefficients (beta weights) for the variables in the model, estimated using the SPSS/PC+ statistical package, were taken as equivalents to the path coefficients.

Bohrnstedt and Knoke (1988) and Walsh (1990) indicated that path coefficients are equivalent to the standardized betas obtained from multiple regression equations. To calculate the path between intention and behavior, logistic regression analysis was performed. This provided a more accurate path coefficient estimation for these variables' causal relationship because behavior was measured as a nominal variable (dichotomous)—not as an interval variable as it was the case for the other variables in the model. Table 4.11 summarizes the results obtained from the regression analyses performed based on Fishbein's hypothesized causal paths.

Table 4.11: Regression Analyses for Causal Relationships Hypothesized in Fishbein's Model

Independent Variables	A_{act} X_3	SN X_4	PI X_5	PB X_6
Estimated attitude (X_1)	.3419**			
Estimated subjective norm (X_2)		−.1573		
Global attitude (X_3)			.0937	
Global subjective norm (X_4)			.2933**	
Participation intention (X_5)				.3539**
Coefficient of determination (R^2)	.1169	.0247	.1118	.1252

**Path coefficients significant at α.001

An examination of the path coefficients in Table 4.11 reveals that the direct impact of participation intention on participation behavior (P_{65}) was .3930, the same as the product moment correlation in Table 4.10. The direct path from global attitude to participation intention (P_{53}) was very small, only .0937. The much larger product moment correlation between these two variables (.1846) suggests that global attitude may have a somewhat small effect on participation intention indirectly through mediating variables not considered in the model. The direct impact of global subjective norm on participation intention (P_{54}) was .2933, fairly similar to the correlation coefficient (.3224) between these two variables. The path from estimated attitudes to global attitudes (P_{13}) was .3419, closely matching the

correlation coefficient of .3424 found for these variables. To conclude, the direct impact of estimated subjective norm on global subjective norm (P_{42}) was calculated as hypothesized by the Fishbein model. The obtained path coefficient value was $-.1573$, similar to the correlation coefficient ($-.1514$) between these two variables.

Reported findings suggest that Mc does not play a role in determining subjective norm (therefore affecting adversely the overall performance of the model). This was confirmed in this study where the consideration of Mc_i in calculating correlations and a causal path between estimated subjective norm and global subjective norm produced negative and small coefficient values (opposite to those hypothesized in the Reasoned Action Theory.) The applied model also reveled that the causal path between global attitude toward the behavior and intention was not meaningful. This path was therefore eliminated. Table 4.12 summarizes the results obtained from further regression analyses performed to reassess and confirm valid causal relationships in the applied model.

Table 4.12: Regression Analyses for Valid Causal Relationships Found in the Applied Model

Independent Variables	A_{act} X_3	SN X_4	PI X_5	PB X_6
Estimated attitude (X_1)	.3419**			
Estimated subjective norm (X_2)*		.5722**		
Global subjective norm (X_4)			.3223**	
Participation intention (X_5)				.3539**
Coefficient of determination (R^2)	.1169	.3275	.1039	.1252

*Omitting Mc_i

**Path coefficients significant at α.001

By omitting Mc_i from the estimated subjective norm variable as suggested in reviewed literature, a strong path coefficient of .5722 was revealed, congruent with an estimated correlation coefficient between these variables of .5723.

Adopting the preferred criterion of meaningfulness as the best indicator for sustaining or negating the hypotheses specifying causal relationships within the applied model, and for deleting all paths whose coefficients were not considered meaningful, path coefficients smaller than .10 were treated as not meaningful. Path coefficients P_{65}, P_{54}, and P_{13} sustain only the following hypotheses:

H5: An agricultural student's positive intention to participate in DETCU's summer field work projects has a direct and positive effect on his/her actual participation behavior in DETCU's summer field work projects.

H7: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H8: An agricultural student's positive estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in DETCU's summer field work projects has a direct and positive effect on his/her global attitude toward the act of participating in DETCU's summer field work projects.

The hypotheses that were not sustained were:

H6: An agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H9: An agricultural student's positive estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in

DETCU's summer field work projects has a direct and positive effect on his/her global subjective norm with respect to participating in DETCU's summer field work projects.

These results suggested that, for this application of the Fishbein model, (1) attitudes were not causally related to intentions, and (2) estimated subjective norm was not causally related to global subjective norms when it included a motivation to comply component. Omitting this component, a new hypothesis that can be strongly sustained as a valid causal relationship in the applied model was stated:

H10: An agricultural student's positive estimated subjective norm (normative beliefs only) concerning participation in DETCU's summer field work projects has a direct and positive effect on his global subjective norm with respect to participating in DETCU's summer field work projects.

After the deletion of paths whose coefficients were considered not meaningful, the extent to which the original R matrix could be approximated was determined. Discrepancies between the original and the reproduced correlations were small ($<.05$) and few. A more parsimonious model than the one hypothesized by Fishbein and Ajzen was tenable for this research application. This one follows:

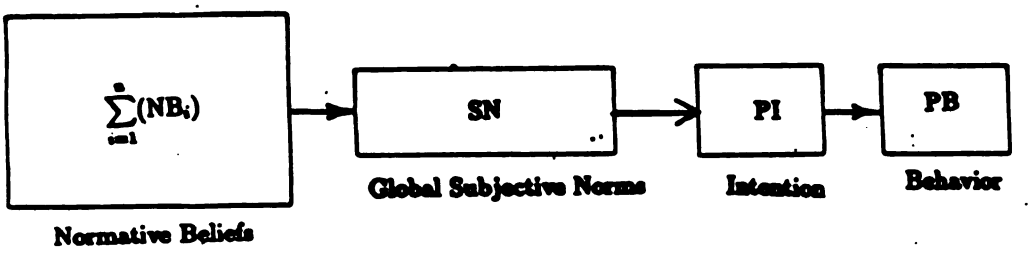


Figure 4.6: Causal Diagram for Agricultural Students' Participation Behavior in Summer Field Work Projects.

CHAPTER 5

SUMMARY, MAJOR FINDINGS, DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS FOR FUTURE RESEARCH

Five sections are presented in this chapter. The first provides a summary of the objectives, methodology and outcomes of this study. Study findings are presented in the second section and briefly discussed in the third section using additional research references reporting similar findings. Conclusions and implications drawn from this study are simultaneously presented in the fourth section. The final section outlines several recommendations for future research.

5.1 Summary

Agricultural education research efforts on attitude assessment have clearly increased during the past decade. Published studies in this field most often approach the study of attitudes from an implicit assumption that attitudes in general correlate directly with behavior. Operationalizing the study of attitudes under a general assumption of attitude-behavior correspondence provides grounds for easily inferrable behavioral prediction. This assumption further simplifies researchers' task of drawing from their findings practical implications that can be ultimately translated into policy recommendations aimed at clearly defined program improvements. The assumption of general consistency between attitude and behavior, however, has been closely scrutinized and strongly challenged by attitude theorists since 1969.

Recently identified research priorities in agricultural education indicate that the great majority of research topics identified within the profession are not theoretically, conceptually, and psychologically based (Guerrero and Suthpin, 1990). This is a puzzling finding in light of the increased trend toward attitudinal research in this field.

Assumptions about attitude-behavior consistency, coupled with low interest in theoretically based research topics, seem to confirm the suggestion that current attitudinal research in agricultural education reflects a void in the treatment of attitude as a theoretically, conceptually, and psychologically based concept. Evidence supporting this suggestion has been provided by Bin Yahya and Moore (1984), who identified basic problems of conceptual ambiguity and lack of common definitional basis in many attitudinal studies in agricultural education.

The growing interest in attitudinal research, the problems associated with it, and recent trends in agricultural education toward an international outlook on issues of the profession have raised serious concerns about the sufficiency of current theory and methodology for future international research activities involving attitudinal measurements. These concerns led to the development of this study, which combined a search for theory and methodology that provide empirical evidence on the attitude-behavior relationship with an opportunity to test the tenability of this theory and methodology in a international agricultural education setting.

This study involved the application and evaluation of the Reasoned Action Theory, a theoretical model identified from the field of social psychology that offered a methodological alternative to the study of attitudes and their relation to behavior. This theory was tested at a Mexican agricultural college, where a behavioral domain contextually relevant to agricultural education (agricultural students' participation in summer field work projects) was selected for this research endeavor. No studies

were found that tested or applied the Reasoned Action Theory or Fishbein Model to analyze the empirical relationship between attitude and behavior within the context of agricultural education.

The central purpose of this study was to test the predictive utility of the Reasoned Action Theory (also known as Fishbein and Ajzen's model or Fishbein's model) in an international agricultural education setting. Testing the model's predictive utility was synonymous with assessing the tenability of this theoretical model, which posited the following causal hypotheses: (1) that the immediate determinant of behavior is intention; (2) that intention is determined by weighted attitudinal and normative variables; (3) that the attitudinal variable is determined by behavioral beliefs and outcome evaluations; and (4) that the normative variable is determined by subjective norms and motivation to comply. To accomplish the purpose of this study, three research questions involving the variables in the model were formulated as follows:

1. What were the behavioral beliefs, outcome evaluations, normative beliefs, motivation to comply, attitudes, subjective norms, intentions, and behavior of agricultural students regarding participation in summer field work projects at Chapingo University?

2. What were the correlations between the various components of the Reasoned Action Model tested in an international agricultural education setting?

3. Were the causal relationships hypothesized between the components of the Reasoned Action Model supported in the applied model?

The second and third research questions implied the testing of correlational and causal relationships hypothesized between the components of the Reasoned Action Model. The results of this study have theoretical and practical implications for future research on attitudes and their relation to behavior in agricultural education.

Methods and procedures for testing Fishbein and Ajzen's Model were patterned after those prescribed by these authors in their book, *Understanding Attitudes and Predicting Social Behavior* (1980). Procedures leading to final data collection were carried out in two phases. Phase one involved the design of an open-ended questionnaire administered to agricultural undergraduates at Chapingo by use of a quota sampling technique. Content analysis of data was then undertaken in compliance with theory methodology to produce the research instrument. During phase two, an instrument consisting of seven sections totalling 55 semantic differential seven-point bipolar scales was developed. Instrument content validity was checked by a panel formed by members of the guidance committee for this study. A pilot test to assess instrument clarity was also executed involving 20 Chapingo University undergraduates. Instrument revisions were made as suggested during validity and clarity assessments. Reliability tests were executed for three variables measured in the model through multiple semantic differential seven-point bipolar scales. Based on reviewed literature, high reliability assumptions were adopted for semantic differential single seven-point bipolar scales used to measure three other variables in the model. Through stratified random sampling, 323 agricultural undergraduates were selected as study participants. Two mailings, coupled with the use of a double dipping non-respondents technique to handle non-response error, rendered nearly a 90 percent response from those students sampled. Finally, student behavioral data were obtained from official school records. Gathered data were later analyzed, primarily using linear, multiple regression, and path analysis techniques. Descriptive statistics and t-test techniques were also utilized for additional analyses. The SPSS/PC+ computer package was used to analyze data.

The first research question or objective of this study was to determine agricultural students' behavioral belief strength, outcome evaluations, normative beliefs, motivation to comply, attitude toward the behavior, subjective norms,

intentions, and behavior regarding participation in summer field work projects at Chapingo University. These were the variables identified in the Reasoned Action Theory.

Assessment of agricultural students' behavioral belief strength was based on 20 behavioral beliefs linking consequences to the act of participating in summer field work projects. Respondents were highly certain of the occurrence of nine consequences (marked with an asterisk on Table 4.1). The remaining behavioral beliefs, which the participants did not hold as strongly, were rated as uncertain.

To assess outcome evaluations, respondents indicated the extent to which they qualified a participation-related consequence as good or bad. They evaluated 10 out of 20 potential outcomes of participation in summer field work projects as being good outcomes (marked with an asterisk on Table 4.2). Seven other outcomes were rated as neither good nor bad, and the three remaining participation outcomes were evaluated as bad consequences.

Assessment of normative beliefs involved statements concerning the expectations that important others had of the respondents regarding their participation in summer field work projects. When evaluating the probability or likelihood of participation expectations that five important referents had for them, respondents appeared uncertain about those participation expectations.

For the assessment of motivation to comply, respondents were asked to indicate their willingness or motivation to comply with the participation expectations they believed important others had of them. Respondents appeared equally uncertain about their motivation to comply with the participation expectations of those important others.

To assess agricultural students' attitude toward the behavior, the survey asked respondents to complete the statement "My participation in one of DETCU's summer

field work projects would be..." by selecting from three semantic differential seven-point bipolar scales. Results indicated that respondents had a highly positive attitude toward participation.

To assess the students' subjective norm, the survey asked the students to rate the statement "Most people who are important to me think I should participate in one of DETCU's summer field work projects" on a single semantic differential seven point bipolar scale. Results showed that respondents were uncertain about the expectations important others had for them.

The measurement of agricultural students' behavioral intentions—that is, their participation intentions—involved the statement "I intend to participate in one of DETCU's summer field work projects," which respondents rated on a single semantic differential seven-point bipolar scale. Results here also showed that respondents were uncertain about their participation intentions.

The participation behavior of respondents was determined with the aid of university listings containing the names of students registered as participants of DETCU's summer field work projects. Only 12.5 percent of the respondents participated in DETCU's summer field work projects. The overwhelming majority (87.5 percent) did not participate.

In answering the second research question, which involved determining the correlations presumed to exist in the model, the theoretical relationships in the Fishbein model were considered, as recommended by the theory's authors, "an empirical question" requiring testing. Four correlational hypotheses stated in the null form were tested at a .05 level of significance.

H1: An agricultural student's positive intention to participate in summer field work projects is not positively correlated with his/her actual participation in DETCU's summer field work projects was rejected.

The correlation value between students' intention to participate in summer field work projects and reported participation behavior was $r = .39$ at an observed level of significance of .001.

H2: A positive multiple correlation is not observed between (a) an agricultural student's positive intention to participate in DETCU's summer field work projects, (b) the agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects, and (c) his/her positive global subjective norm with respect to participating in DETCU's summer field work projects was rejected.

The multiple correlation coefficient for the prediction of intention from a simultaneous consideration of attitude toward the behavior and subjective norm was $R = .33$ with an observed significance level smaller than .05. Beta weights were also reported to indicate the relative importance of each variable in the prediction of intention. The weight for the attitude toward the behavior variable was .09, whereas the weight for the subjective norm variable was .29. Both weights were significant at a .05 alpha level. However, the importance of the attitudinal variable in the prediction of intention was substantially lower that that of the normative variable. Separate single correlations to assess the relationship of the attitudinal and normative variables individually with the intention variable were also obtained. The coefficient value for the attitudinal variable with intention was $r = .18$, while the value for the normative variable with intention was $r = .32$, both significant at $\alpha = .05$. Nevertheless, only the correlation between the normative variable and intention was considered of moderate magnitude. The correlation between the attitudinal variable and intention was considered of little practical value, even when found statistically significant.

H3: An agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects is not positively correlated with his/her estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in DETCU's summer field work projects was rejected.

A correlation value between global attitude and estimated attitude toward participating in summer field work projects was $r = .34$ at an observed level of significance smaller than .05.

H4: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects is not positively correlated with his/her estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects was not rejected.

The correlation value between global subjective norm and estimated subjective norm towards participating in summer field work projects was $-.15$. This coefficient value was not large and not in the direction specified. In considering other research studies reporting that the removal of Mc improved the correlation between global subjective norm and estimated subjective norm, a null hypothesis omitting Mc was tested to observe the hypothesized change in this correlation. This was stated as follows:

H4b: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects is not positively correlated with his/her estimated subjective norm (normative beliefs only) concerning participation in DETCU's summer field work projects.

This null hypothesis was not rejected. The new correlation value between subjective norms and estimated subjective norms (without the Mc component) was $r = .57$ at an observed level of significance smaller than .05. This correlation is considered of large magnitude. This result further indicated that Mc did not play a role in the formation of subjective norms.

To finally determine the predictive utility or tenability of the Reasoned Action Theory, a third research question involving a test of the causal relationships hypothesized in the model was formulated to determine whether these causal relationships are supported in the applied model.

Five research hypotheses suggesting causal relationships among the variables in the Fishbein model were tested at a .05 alpha level. These hypotheses were stated as follows:

H5: An agricultural student's positive intention to participate in DETCU's summer field work projects has a direct and positive effect on his/her actual participation behavior in DETCU's summer field work projects.

H6: An agricultural student's positive global attitude toward the act of participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H7: An agricultural student's positive global subjective norm with respect to participating in DETCU's summer field work projects has a direct and positive effect on the agricultural student's intention to participate in DETCU's summer field work projects.

H8: An agricultural student's positive estimated attitude (behavioral beliefs weighted by his/her evaluations of those beliefs) about participating in

DETCU's summer field work projects has a direct and positive effect on his/her global attitude toward the act of participating in DETCU's summer field work projects.

H9: An agricultural student's positive estimated subjective norm (normative beliefs weighted by his/her motivation to comply) concerning participation in DETCU's summer field work projects has a direct and positive effect on his/her global subjective norm with respect to participating in DETCU's summer field work projects.

In testing the strength of the causal relationships proposed in these hypotheses, to either support them or reject them, path coefficients were calculated. These path coefficients were equivalent to the standardized betas obtained from multiple regression equations. A different type of regression known as logistic regression provided a more accurate path coefficient estimation for the causal relationship between participation intention and behavior because behavior was measured as a nominal variable (dichotomous), not as an interval variable as it was the case for the other variables in the model.

Estimated path coefficients $P_{65} = .3539$, $P_{54} = .2933$, and $P_{13} = .3419$, significant at $\alpha = .05$, sustained hypotheses H5, H7, and H8, respectively. Hypotheses H6 and H9 were not sustained. A path coefficient for H6 stating a direct and positive path from global attitude to participation intention, P_{53}, was very small, only .0937 and thus not meaningful. The path coefficient estimated for H9, as hypothesized by the Fishbein model, stated a direct positive path from estimated subjective norm (normative beliefs weighted by motivation to comply) to global subjective norms and was $P_{42} = -.1573$. This path coefficient was small and opposite to the direction specified in hypothesis H9. A test of this causal path in an application of the Fishbein model by Minard and Page (1983) also obtained similar results. These authors concluded that, contrary

to Fishbein, this path was not a valid path when weighting normative beliefs by motivation to comply. They further stated that motivation to comply was not an antecedent of subjective norms. In their study, Minard and Page did find a causal direct and positive path between global subjective and estimated subjective norms when omitting motivation to comply. On this basis, a new hypothesis of the causal relationship between estimated subjective norm (omitting Mc) and global subjective norm was formulated.

H10: An agricultural student's positive estimated subjective norm (normative beliefs only) concerning participation in DETCU's summer field work projects has a direct and positive effect on his global subjective norm with respect to participating in DETCU's summer field work projects.

The new estimated path coefficient value between subjective norms and estimated subjective norms (without the Mc component) was strong ($P_{42} = .5722$) and sustained as a valid causal relationship in the applied model.

After the deletion of paths not considered meaningful in the applied Fishbein model, a more parsimonious model than the one hypothesized by Fishbein and Ajzen was constructed. In the new model: (1) participation intention was the immediate antecedent of participation behavior (PI $\longrightarrow$ PB); (2) participation intention was determined only by the agricultural students' perception of social pressures, which is represented by subjective norm (SN $\longrightarrow$ PI); (3) attitude toward the behavior A_{act} was a function of the beliefs (B_i) about the behavior's consequences weighted by the evaluation (e_i) of these consequences ($\sum_{i=1}^{n} B_i e_i \longrightarrow A_{act}$); and (4) subjective norm SN was only a function of the normative beliefs (NB_i) about referent expectations ($\sum_{i=1}^{n}(NB_i) \longrightarrow SN$).

Path coefficients for the causal relations specified in the new model were again estimated and compared to the zero-order correlations obtained for the variables

linked by direct paths in the model. Small discrepancies between estimated path coefficient values and the values for the correlation coefficients indicated that the data were consistent with the more parsimonious model. These findings thus indicated that a more parsimonious model than the one hypothesized by Fishbein and Ajzen was tenable for this research application.

5.2 Major Findings

This study involved the application and evaluation of the Reasoned Action Theory as a methodological alternative to the study of attitudes and their relation to behavior in agricultural education. The theory was tested at a Mexican agricultural college, where a behavioral domain contextually relevant to agricultural education (agricultural students' participation behavior in summer field work projects) was selected. No prior studies were found applying this theory to analyze the empirical relationship between attitude and behavior within the context of agricultural education. Preliminary analyses of the variables involved in this theory or model led to the following findings:

In terms of the agricultural students' measured behavioral beliefs and outcome evaluations regarding participation in summer field work projects, it was found that:

1. Agricultural students were highly certain of the occurrence of nine consequences, eight of which were positively evaluated as potential outcomes of their participation in summer field work projects and were related to their professional training in agriculture.

Regarding the students normative beliefs and motivation to comply it was found that:

1. Agricultural students were uncertain about the participation expectations that five important referent had of them and equally uncertain about their personal motivation to comply with those unknown participation expectations.

The assessment of agricultural students' global attitude towards the behavior, subjective norms, intention and behavior led to the following findings:

1. Agricultural students' global or general attitude toward participating in summer field work projects was highly positive.
2. Agricultural students were uncertain about their subjective norms. That is, they expressed uncertainty about the participation expectations that important others had for them.
3. Respondent expressed uncertainty about their participation intentions.
4. An overwhelming majority of the respondents did not participate in summer field work projects.

Analyses of the correlational relationships hypothesized in the model through linear multiple regression techniques provided the basis for additional findings. These are listed below:

1. All but one of the correlations and multiple correlations hypothesized in the Fishbein model were empirically verified in the applied model.
2. The correlation hypothesized between global subjective norm and estimated subjective norm was not empirically verified in the model when estimated subjective norm included the motivation to comply subcomponent.
3. A strong correlation was observed between global subjective norm and estimated subjective norm when motivation to comply was omitted from the subjective norm variable.

4. Coefficients reported for the hypothesized relationships among the variables in the model were of strong and moderate magnitude except for the correlation coefficient obtained between the attitude toward the behavior and the participation intention variables.

Final analyses to determine the tenability of the causal relationship hypothesized in the model involving path analysis techniques yielded further findings:

1. Three of the five causal paths hypothesized in the Fishbein model were empirically validated in the applied model, thus sustaining corresponding causal hypotheses.

2. The hypothesis for the causal path from global attitude to participation intention was not sustained because the estimated path coefficient was very small and determined not meaningful.

3. The hypothesis proposing a direct positive causal path from estimated subjective norm (based on normative beliefs weighted by motivation to comply) to global subjective norm was not sustained because the path coefficient obtained was small and in the opposite direction from what was predicted.

4. A strong direct positive causal path was observed from estimated subjective norm to global subjective norm when motivation to comply was omitted from the estimated subjective norm variable.

Several of these findings have been reported in similar studies applying the Fishbein model. A brief discussion of these findings is presented after referring to some of the limitations of this study.

First, because of time limitations and circumstances imposed on the study participants, such as finals week and end of the semester deadlines, as well as time

spans for model component measurement, an alternative test of reliability known as the Cronbach's Alpha Coefficient was used to assess the reliability of the scales used to measure the variables in the model instead of the planned test-retest procedure. Using the Cronbach's Alpha Test only allowed reliability assessment for scales measuring three variables in the model. Assumptions of high reliability documented in relevant literature were made for three other variables measured on single scales in the model. These were global subjective norm, intention, and behavior. High reliability assumptions (1.00) for these variables reduced measurement error to zero, causing linear correlations, and multiple and logistic regression coefficients to be slightly underestimated, making the conclusions drawn for this study more tentative.

Second, the selection of the behavior for the application of the Fishbein model in this study was based on an assessment that three prerequisites conditioning the model's predictability of strong associations between intention and behavior were met. One of them was that the behavior under consideration be under volitional control. (A behavior is under a person's control if the person can decide at will to perform it or not.) It was later found that factors existed that were beyond the control of the students and that could have prevented them from performing the behavior. This might have lowered the model's ability to predict a strong association between intention and behavior. The association observed in the applied model was only moderate.

5.3 Discussion

Several issues in the tenability of the Reasoned Action Theory surfaced in this study. This discussion is organized into short subsections addressing these issues.

5.3.1 Determinants of the Attitudinal and Normative Variables

The determinants of the attitudinal variable or global attitude toward the behavior (A_{act}) have not been the focus of much discussion in past research of the Fishbein model. These determinants, in this application, represented well the process of attitude formation proposed by the theory's authors. Controversy has been stronger in research studies analyzing the theory's claims regarding the determinants of the normative component. This component is determined by two other subcomponents—normative beliefs (NB) and motivation to comply (Mc). Through the normative belief subcomponent, a person's beliefs that specific individuals or groups think he/she should or should not perform the behavior are measured. The second subcomponent (Mc) measures the person's motivation to comply with specific referents. The inclusion of this subcomponent in the Fishbein model, according to Miniard and Cohen (1981), "is based on the premise that the expectations of particular referents will be more important than those of others." Therefore the role of Mc is "to reflect these variations in referent influence potential." (p. 318). Miniard and Cohen further added: "Despite its conceptual appeal, evidence supporting Mc's predictive utility has been limited" (p. 318). These authors confirmed a 1969 report by Ajzen and Fishbein stating a decrement in the prediction of behavioral intention (BI) when NB was weighted by Mc. Saltzer (1981) commented similarly regarding this problem:

> Actual practice has indicated that the inclusion of the motivation to comply measure often reduces the relationship of perceived normative beliefs with measures of behavioral intentions, perhaps due to a reactive measurement problem wherein respondents wish to appear autonomous and independent when deciding about potential behavior (p. 264).

This reactive measurement problem, however, seems to have been overlooked by Fishbein and Ajzen, who stated that "it is reasonable to assume that one is more highly motivated to comply with important than with unimportant others" (p. 345),

further implying that Mc is invariably positive for each important referent in the normative beliefs component.

Though the authors acknowledge the concerns about their measures of the normative component and its underlying cognitive structure, they have been consistent in defining the normative component in terms of the perceived prescriptions of relevant referents, the motivation to comply with those referents because they believe that these two variables capture the essence of perceived normative pressure.

Stronger arguments against Fishbein and Ajzen's position regarding the Mc component are further elaborated by Miniard and Cohen (1981), who presented the issue as follows:

> One of the questionable aspects of Fishbein's model has been the asserted relationship between SN and $\sum_{i=1}^{n}$ NBMc (cf. Ahtola, 1976; Lutz, 1976). Although SN has been conceptualized (Fishbein and Ajzen, 1975, p. 302) and operationalized as a perceptual construct ("Most people who are important to me think I should/should not perform behavior x"), its role in the model is to mediate the effects of not only the underlying perceptual (i.e., NB) component, but a motivational component (i.e., Mc) as well. It would seem that the two approaches to operationalizing the normative component should yield similar results only when Mc is positive for each referent. When Mc is either zero or negative (e.g., an irrelevant or negative referent, say a parent whose "advice" sometimes produces the opposite effect), the two approaches should yield inconsistent results since SN implicitly assumes one is motivated to comply with important others. It is our opinion, both the internal logic and empirical evidence underlying the adequacy of the advocated SN measure is weak (p. 319).

The results of the relationship between SN and $\sum_{i=1}^{n}$ NBMc for the applied model in this study added to the accumulated evidence against Fishbein and Ajzen's assertion that the normative beliefs and motivation to comply subcomponents capture the essence of perceived normative pressures. Or, in other words, that SN mediates the effects of both NB and Mc. The fourth hypothesis in this study, similarly stating the equivalence of SN and $\sum_{i=1}^{n}$ NBMc, was not empirically supported. This equivalence was supported only when the Mc subcomponent was omitted from the equation, thus

indicating, as other studies have, that Mc is theoretically misspecified in the Fishbein model.

5.3.2 Determinants of Intention

In the Fishbein model, an attitudinal and a normative component are specified as the determinants of intention. The theory proposes that attitudes (A_{act}) and subjective norms (SN) are the only significant influences on intention and that any other factors might be related to intention indirectly through A_{act} and SN, but not directly.

In predicting intention in the applied model from the simultaneous consideration of both the attitudinal and normative variables, barely 11 percent of the variance of intention was explained by these two variables. Furthermore, the attitudinal component did not play a role in the prediction of intention. An unexplained 89 percent of the variance of intention suggests that other variables may be specified for better prediction of intention. Many authors have suggested adding other components to the model—for example, personal norms and moral obligations were at one point added by the theory authors (Ajzen and Fishbein, 1969 and 1970). These components have also been suggested by Prestholdt, Lane, and Mathews (1987), and by Zuckerman and Reis (1978). Other components such as social structure (Davis, 1985, and Liska, 1984); the degree of perceived control over the behavior (Ajzen and Madden, 1986), and beliefs about others' behaviors (Grube, Morgan, and McGree, 1986), have in general also been suggested along the way. However, the addition of these components has not consistently improved significantly the predictability of intention. The only variable added to the model that has been found to directly influence intention is prior behavior.

Empirical research has reported the effect of the variable identified as prior performance of the behavior in question to be an effect not mediated by either of

the two components of the model. In studies by Bentler and Speckart (1979 and 1981), Budd et. al. (1984), Crosby and Muehling (1983), and Fredricks and Dossett (1983), findings have suggested that people who have performed the action under investigation in the past are more likely to intend to perform that action in the future. Further clarification of the role of prior behavior in influencing intention is being sought through research.

Research on the relative importance of the attitudinal and normative variables in predicting intention has contributed to interesting theoretical insights. For example, in a study by Ajzen and Fishbein (1970), the attitudinal component was reported to carry more weight under a competitive motivational orientation. This study also reported that the relative importance of the attitudinal and normative components was reversed under a cooperative motivational orientation. Songer-Nocks (1976) reported similar findings regarding the relative importance of these two components in the prediction of intention under cooperative and competitive conditions. These findings suggest that the role of the attitudinal and normative component in the prediction of intention in the model is contingent upon certain specifiable conditions.

5.3.3 The Intention-Behavior Relationship

O'Keefe (1990) stated that "the central question that has been raised regarding the Reasoned Action Theory's depiction of the intention-behavior relationships concerns whether intention is sufficient to predict behavior" (p. 87).

Results of the applied model in this research regarding the intention-behavior relationship indicated that only 15 percent of the variance of behavior was explained by the intention variable.

Two possible explanations for this result can be hypothesized. The first one is that the behavior predicted in this study was a peripheral behavior for the study

participants rather than a central behavior. Ryan (1976) stated that intention alone, as a variable predictive of behavior, has been thought of as being a better predictor of central behavior than of peripheral behavior because greater centrality implies better developed intentions. The second possible explanation involves the hypothesis that intentions do not completely mediate the effects of all other variables on the behavior. This hypothesis has prompted researchers such as Bentler and Speckart (1979), Fredericks and Dossett (1983), and Wittenbaken, Gibbs, and Khale (1983) to conduct studies related to this issue. They have reported that taking into account prior behavior improves the prediction of the behavior. Further research on factors in addition to intention is needed to enhance behavioral prediction.

5.3.4 Causal Structure of the Model

Path analysis results indicated in the applied model that the path hypothesized from attitude toward the behavior to intention was not a valid path because the estimated path coefficient between attitude and intention was .09, which was determined not to be meaningful. This was a surprising finding at first because the students' attitude toward participation in summer field work projects had been assessed as highly positive. Because intention was expected to mediate the effect of attitude on behavior and because it is usually considered to be logical or consistent for a person who holds a favorable attitude toward some object or behavior to perform favorable behaviors, it was expected that highly positive attitudes would strongly predict positive participation intentions. But this expectation was not theoretically warranted because, as it has been largely argued by Ajzen and Fishbein (1977), the idea that a given behavior is assumed to be consistent with a person's attitude merely rests on the basis of largely intuitive considerations. Reporting that agricultural students' highly positive attitudes towards participation in summer field work projects were

not meaningful in determining their participation intentions has important practical and theoretical implications. These are discussed separately.

Another path hypothesized in the Fishbein model that was not supported in the applied model was the path from estimated subjective norm (normative beliefs weighted by motivation to comply) and global subjective norm. This path was not sustained because of the inclusion of the motivation to comply subcomponent, which, as discussed before, lowers the predictability of the model's normative component. Considerable evidence exists that Mc does not play a role in the formation of subjective norm. The omission of Mc was confirmed as a necessary step for the estimation of a valid causal path between estimated subjective norm (including normative beliefs only) and global subjective norm. Prior to this research, Minard and Page (1984) had reported similar results regarding the validity of this causal path in the Fishbein model. They reported their finding as follows:

> Perhaps most compelling is the evidence regarding the $\sum_{i=1}^{n}$ NB $MC \longrightarrow$ SN relationship. Contrary to Fishbein's position, this path was not statistically significant. Further, while NB was significantly correlated with SN, weighting NB by Mc decreased the prediction of SN. This result indicates that Mc does not play a role in the formation of SN (p. 141).

5.4 Conclusions and Implications

Several conclusions and implications from this attitudinal study in agricultural education were drawn. It was first concluded that the use of the Reasoned Action Theory or Fishbein Model served as a useful theoretical framework for a preliminary analysis of the attitude-behavior relationship. An immediate implication derived from this conclusion is that attitudinal–behavioral research in agricultural education should be more seriously considered from a theoretical perspective rather than from a largely intuitive assumption of general attitude-behavior correspondence.

This assumption has repeatedly been found flawed in empirical studies of attitude-behavior consistency. This has been termed by DeFleur and Westie (1963) as "the fallacy of expected correspondence" (p. 27) and should strongly be questioned in agricultural education attitudinal research. It is of utmost importance to begin questioning this assumption because it has further repercussions on recommendations made from findings reported in attitudinal studies grounded on this assumption. If, for example, the assumption had been made in this study that attitudes, which were found to be highly positive, covaried with behavior, then strongly misleading participation predictions would have been intuitively concluded. Instead, through the application of a theoretical framework, it was hypothesized that the potential effects of attitudes on behavior would have been mediated through intention if attitudes were empirically related to intention. Through statistical analyses it was found, however, that attitudes were not causally related to intention and thus were farther removed from behavior.

Another important conclusion is that the use of the Fishbein Model as a theoretical framework for the analysis of attitudes and behavior in agricultural education provides a good introductory approach to understanding the theoretical evolution and psychological distinction between the concepts that have traditionally been involved in attitudinal studies. The Reasoned Action Theory, or Fishbein Model, though not free of controversy, has been openly recognized as having "placed a compelling structure on the field of attitudes which was in relative disarray before Fishbein and Ajzen's work" (Sheppard, Hartwick, and Warshaw (1988).

A final conclusion from the application of the Reasoned Action Theory or model is that it proved to be moderately useful as a diagnostic tool for developing behavioral change strategies to increase student participation. Because the normative component appeared to have greater relative importance in predicting student participation, an implication that follows is that efforts to produce behavioral change should be geared

towards increasing the students' normative considerations regarding their intention to participate in summer field work projects (an altruistic, cooperative behavior). Emphasizing the positive reinforcement from peers and important others may be most effective in predisposing agricultural students toward stronger intentions to participate in summer field work projects, intentions that would further predispose students to participate in these service projects.

5.5 Recommendations for Future Research

A limited body of knowledge related to the topic of this study was available within published attitudinal research in agricultural education. All bibliographical sources regarding the theoretical treatment of attitudes and other related concepts were identified from other fields of study. Because attitudinal research is of great importance in agricultural education, a list of recommendations for future related research is outlined below.

1. Applications of the Fishbein model within the context of agricultural education are recommended to further explore its potential utility as a viable diagnostic tool for developing behavioral change strategies.

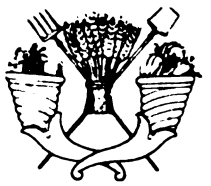
2. Modified model applications are also recommended based on research suggesting that other variables enhance the predictive power of the model.

3. Research on the causal structure of the model is strongly recommended because the value of employing the model as a diagnostic tool for developing behavioral change strategies is dependent on the validity of the causal relationships specified by the model.

APPENDICES

APPENDIX A

OPEN-ENDED QUESTIONNAIRE



" ENSEÑAR LA EXPLOTACION DE LA TIERRA, NO LA DEL HOMBRE "

UNIVERSIDAD AUTONOMA CHAPINGO

Chapingo, México.

DEPENDENCIA

NUMERO DEL OFICIO:

EXPEDIENTE:

ASUNTO: DEPARTAMENTO DE TRABAJOS DE CAMPO - UACH ENCUESTA DE PARTICIPACION UNIVERSITARIA

Especialidad_____ Grado_____ Grupo_____

INSTRUCCIONES GENERALES

El siguiente cuestionario tiene como propósito identificar las consecuencias mas importantes que los estudiantes universitarios de Chapingo frecuentemente relacionan con su participación en los campamentos de trabajos de campo (La actividad de campo desarrollada durante el periodo intra-semestral).

SUPONIENDO QUE ESTUVIERAS CONSIDERANDO PARTICIPAR EN LOS CAMPAMENTOS DE TRABAJOS DE CAMPO DURANTE EL PROXIMO MES DE JULIO.....

¿ Qué ventajas especificas crees que obtendrias del participar en los campamentos de trabajos de campo durante el próximo mes de julio? Por favor describe brevemente cada una de ellas.

1.

2.

3.

4.

5.

6.

7.

8.

9.

Especificamente, ¿ qué desventajas crees que te ocasionaria el participar en los campamentos de trabajos de campo el próximo mes de julio? Por favor describe brevemente cada una de ellas.

1.

2.

3.

4.

5

6.

7.

8.

9.

¿ Hay algunas otras consecuencias (positivas o negativas) que asociarías con tu participación en los campamentos de trabajos de campo el próximo mes de julio?
Por favor describe brevemente cada una de ellas.

1.

2.

3.

EN CUANTO A OTRAS PERSONAS RELACIONADAS CONTIGO.....

¿ Hay alguna persona o grupos que aprobarían tu participación en los campamentos de trabajos de campo el próximo mes de julio? Por favor enumeralos individualmente.

1. 4.

2. 5.

3. 6.

¿ Hay alguna persona o grupos que desaprobarían tu participación en los campamentos de trabajos de campo el próximo mes de julio? Por favor enumeralos individualmente.

1. 4.

2. 5.

3. 6.

¿ Hay algunos otros grupos ó personas que te vengan a la mente cuando piensas acerca de tu posible participación en los campamentos de trabajos de campo el próximo mes de julio?
Por favor enumeralos individualmente.

1. 3.

2. 4.

APPENDIX B

MODAL BEHAVIORAL BELIEFS

Table B.1: Modal Distribution of Respondents' Behavioral Beliefs.

No.	Participating in Summer Field Work Projects	Frequency
1.	Allows me to relate the theory I learn in the classroom to the practice in the field.	117
2.	Gives me a closer view and understanding of the problems of Mexican agriculture.	88
3.	Allows me to come in direct contact with producers.	83
4.	Is frustrating because of the lack of support university officials demonstrate by curtailing economic resources, rejecting project proposals and limiting the expenses necessary for transportation and working tools needed to carry out the service projects.	61
5.	Gives me needed practical experience.	55
6.	Is an opportunity to provide technical assistance to poor farmers and to help solve some of their problems.	55
7.	Allows me to observe and learn different agricultural production techniques.	50
8.	Interferes with working on my thesis.	44
9.	Takes time away from more important activities for me.	40
10.	Causes me to miss out on my vacation.	39
11.	Is an opportunity to visit and learn of other parts of the country.	39
12.	Is frustrating because of organizational problems at DETCU that sometimes cause failure to accomplish the objectives set for the service projects.	38
13.	Causes me to spend less vacation time with my family.	38
14.	Overlaps with the field study trip planned in my department.	36
15.	Allows me to acquire new knowledge on various agriculture-related subjects.	36
16.	Takes time away from my other academic duties during the planning phase of the project.	33
17.	Causes me to miss the opportunity to get a job and earn some money.	21
18.	Complements my agricultural training.	21
19.	Provides me with opportunities to make contacts for future employment possibilities.	20
20.	Is difficult for me because I don't have time to do it.	19

APPENDIX C

MODAL NORMATIVE BELIEFS

Table C.2: Modal Distribution of Respondents' Normative (Salient) Beliefs.

No.	Referent	Frequency
1.	Some of my Friends	50
2.	Some of my Professors	46
3.	The Producers	38
4.	Some of my Classmates	38
5.	My Parents	24

APPENDIX D

ENGLISH AND SPANISH VERSIONS OF THE INSRUMENT

GENERAL INSTRUCTIONS

In the questionnaire you are about to fill out we ask questions which make use of rating scales with seven places; you are to place an "X" in the place that best describes your opinion. For example, if you were asked to rate "The Weather in December" on such a scale, the seven places should be interpreted as follows:

The Weather in December is

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

If you think the Weather in December is extremely good, then you would place your "X" as follows:

The Weather in December is

good ___X___:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

If you think the Weather in December is quite bad, then you would place your "X" as follows:

The Weather in December is

good _____:_____:_____:_____:_____:___X___:_____ bad
extremely quite slightly neither slightly quite extremely

If you think the Weather in December is slightly good, then you would place your "X" as follows:

The Weather in December is

good _____:_____:___X___:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

If you think the Weather in December is neither good nor bad, then you would place your "X" as follows:

The Weather in December is

good _____:_____:_____:___X___:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

You will also be using a rating scale with likely-unlikely as endpoints. This scale is to be interpreted in the same way. For example, if you were asked to rate "The Weather is Cold in December"

The Weather is Cold in December

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

If you think that is extremely likely that the Weather is cold in December you would place your "X" mark as follows:

The Weather is Cold in December

likely ___X___:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

In making your ratings please remember the following points:

(1) Place your marks in the middle of the spaces, not on the boundaries:

_____:__X___:_____:_____:_____:_____X_____
this not this

(2) Be sure to answer all items--please do not omit any.
(3) Never put more than one "X" mark on a single scale.

Please carefully read the statements and mark the option which best represents your views.

THE GENERAL PURPOSE OF THIS QUESTIONNAIRE IS TO LEARN ABOUT YOUR VIEWS REGARDING THE UPCOMING SUMMER FIELD WORK PROJECTS COORDINATED BY THE FIELD WORK DEPARTMENT (DETCU) AT CHAPINGO.

SECTION I

PLEASE INDICATE THE POSSIBILITY OF THE FOLLOWING:

I intend to participate in one of DETCU's Summer Field Work Projects.

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

SECTION II

EVALUATE THE FOLLOWING STATEMENT ON EACH ONE OF THESE THREE SCALES:

My participation in one of DETCU'S Summer Field Work Projects would be:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

wise _____:_____:_____:_____:_____:_____:_____ foolish
extremely quite slightly neither slightly quite extremely

harmful _____:_____:_____:_____:_____:_____:_____ beneficial
extremely quite slightly neither slightly quite extremely

SECTION III

INDICATE IN THIS SECTION WHAT YOU THINK OTHER PEOPLE WOULD LIKE YOU TO DO REGARDING YOUR DECISION TO PARTICIPATE IN ONE OF DETCU'S SUMMER FIELD WORK PROJECTS.

Most people who are important to me would think I should participate in one of DETCU's Summer Field Work Projects:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

SECTION IV

RECENTLY, AN OPEN SURVEY WAS IMPLEMENTED AT CHAPINGO WITH THE PURPOSE OF IDENTIFYING SOME OF THE CONSEQUENCES STUDENTS BELIEVE ARE ASSOCIATED WITH THEIR PARTICIPATION IN DETCU'S SUMMER FIELD PROJECTS. A LIST OF THE 20 MOST FREQUENTLY MENTIONED BELIEFS IN THIS SURVEY IS INCLUDED IN THIS SECTION.

ASSUMING THAT YOU WERE GOING TO PARTICIPATE IN ONE OF DETCU'S PROJECTS ..... HOW LIKELY, DO YOU BELIEVE, IS IT FOR EACH OF THE FOLLOWING CONSEQUENCES TO OCCUR?

1. My participation in one of DETCU's Summer Field Work Projects would allow me to relate the theory I learn in the classroom to the practice in the field. This is:

   likely _____:_____:_____:_____:_____:_____:_____ unlikely
   extremely quite slightly neither slightly quite extremely

2. My participation in one of DETCU's Summer Field Work Projects would allow me to understand more closely the problems of Mexican agriculture. This is:

   likely _____:_____:_____:_____:_____:_____:_____ unlikely
   extremely quite slightly neither slightly quite extremely

3. My participation in one of DETCU's Summer Field Work Projects would allow me to come in direct contact with producers. This is:

   likely _____:_____:_____:_____:_____:_____:_____ unlikely
   extremely quite slightly neither slightly quite extremely

4. My participation in one of DETCU's Summer Field Work Projects would discourage me because of the lack of support university officials demonstrate (e.g., by rejecting project proposals and curtailing economic resources necessary to carry out the service projects properly). This is:

   likely _____:_____:_____:_____:_____:_____:_____ unlikely
   extremely quite slightly neither slightly quite extremely

5. My participation in one of DETCU's Summer Field Work Projects would give me needed practical experience. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

6. My participation in one of DETCU's Summer Field Work Projects would allow me to provide technical assistance to poor farmers to help solve some of their problems. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

7. My participation in one of DETCU's Summer Field Work Projects would give me an opportunity to observe and learn different agricultural production techniques. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

8. My participation in one of DETCU's Summer Field Work Projects would not allow me to work on my thesis. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

9. My participation in one of DETCU's Summer Field Work Projects would take time away from more important activities for me. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

10. My participation in one of DETCU's Summer Field Work Projects would cause me to miss out on my summer vacation. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

11. My participation in one of DETCU's Summer Field Work Projects would give me an opportunity to see other parts of the country. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

12. My participation in one of DETCU's Summer Field Work Projects would be frustrating because of organizational problems at DETCU (which sometimes result in failure to accomplish the objectives of the service projects). This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

13. My participation in one of DETCU's Summer Field Work Projects would cause me to spend less vacation time with my family. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

14. My participation in one of DETCU's Summer Field Work Projects would conflict with the field study trip planned in my department. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

15. My participation in one of DETCU's Summer Field Work Projects would allow me to gain new knowledge on various agriculture-related subjects. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

16. My participation in one of DETCU's Summer Field Work Projects would take time away from my other academic duties during the planning phase. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

17. My participation in one of DETCU's Summer Field Work Projects would cause me to miss out on opportunities to get a remunerative job. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

18. My participation in one of DETCU's Summer Field Work Projects would complement my agricultural training. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

19. My participation in one of DETCU's Summer Field Work Projects would allow me to make contacts for future employment possibilities. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

20. My participation in one of DETCU's Summer Field Work Projects would be difficult because I would not have time to do it. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

SECTION V

NOW USING THE FOLLOWING SCALES, PROCEED TO EVALUATE (AS GOOD OR BAD) EACH ONE OF THE CONSEQUENCES RELATED TO PARTICIPATION IN ONE OF DETCU'S SUMMER FIELD WORK PROJECTS

1. **Relating the theory I learn in the classroom to the practice in the field is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

2. **Understanding more closely the problems of Mexican agriculture is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

3. **Coming in direct contact with producers is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

4. **Becoming discouraged to participate in the Summer Field Work Projects because of the lack of support university officials demonstrate (e.g., by rejecting project proposals and curtailing economic resources necessary to carry out the service projects properly) is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

5. **Gaining needed practical experience is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

6. **Providing technical assistance to poor farmers to help solve some of their problems is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

7. **Observing and learning different agricultural production techniques is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

8. **Being unable to work on my thesis is:**

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

9. Using up time from more important activities (for me) than participating in one of DETCU's Summer Field Work Projects is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

10. Missing out on my summer vacation is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

11. Seeing other parts of the country is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

12. Becoming frustrated by the organizational problems at DETCU (which sometimes cause failure to accomplish the objectives of the service projects) is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

13. Spending less vacation time with my family is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

14. Conflicting schedules between the Summer Field Work Projects and the field study trip planned in my department is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

15. Learning new knowledge on various agricultural-related subjects is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

16. Using up time from my other academic duties to participate in the planning phase of one of DETCU's Summer Field Work Project is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

17. Missing out on opportunities to get a remunerative job in the Summer is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

18. Complementing my agricultural training is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

19. Making contacts for future employment possibilities is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

20. Not having time to participate in the Summer Field Work Projects is:

good _____:_____:_____:_____:_____:_____:_____ bad
extremely quite slightly neither slightly quite extremely

SECTION VI

SOME PEOPLE AROUND YOU MAY LET YOU KNOW WHAT THEY THINK YOU SHOULD DO ABOUT DECIDING ON PARTICIPATING IN ONE OF DETCU'S SUMMER FIELD WORK PROJECTS.

PLEASE EVALUATE THE FOLLOWING STATEMENTS RELATED TO THIS IDEA.

1. Some of my friends think I should participate in one of DETCU's Summer Field Work Projects. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

2. Some of my professors think I should participate in one of DETCU's Summer Field Work Projects. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

3. Some producers think I should participate in one of DETCU's Summer Field Work Projects. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

4. Some of my classmates think I should participate in one of DETCU's Summer Field Work Projects. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

5. My parents think I should participate in one of DETCU's Summer Field Work Projects. This is:

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

SECTION VII

OCCASIONALLY SOME PEOPLE AROUND YOU MAY HAVE SOME INFLUENCE IN YOUR DECISION-MAKING

PLEASE INDICATE ON THE SCALES BELOW THE POSSIBILITY THAT THE FOLLOWING PERSONS WOULD HAVE TO INFLUENCE YOUR DECISION OF PARTICIPATING IN ONE OF DETCU'S SUMMER FIELD WORK PROJECTS.

1. Generally speaking, I want to do what some of my friends think I should do.

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

2. Generally speaking, I want to do what some of my professors think I should do.

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

3. Generally speaking, I want to do what some of the producers think I should do.

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

4. Generally speaking, I want to do what some of my classmates think I should do.

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

5. Generally speaking, I want to do what my parents think I should do.

likely _____:_____:_____:_____:_____:_____:_____ unlikely
extremely quite slightly neither slightly quite extremely

ENCUESTA DE PARTICIPACION ESTUDIANTIL EN LOS CAMPAMENTOS DEL DETCU

Departamento de Trabajos de Campo Universitarios

Dirección Académica
Universidad Autónoma Chapingo
Chapingo, México

Junio 1991

INSTRUCCIONES GENERALES

En el cuestionario que estas a punto de llenar se plantean preguntas que hacen uso de escalas evaluativas con siete categorías. Por favor marca con una equis "X" el espacio de la categoría que mejor describa tu opinión. Por ejemplo, si fueras a evaluar la expresión "El Clima en Diciembre" en una escala de esta clase, las siete categorías deben de interpretarse de la siguiente manera:

El Clima en Diciembre es:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

Si piensas que el Clima en Diciembre es extremadamente bueno, entonces pondrías tu "X" como sigue:

El Clima en Diciembre es:

bueno ___X___:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

Si piensas que el Clima en Diciembre es muy malo, entonces pondrías tu "X" como sigue:

El Clima en Diciembre es:

bueno _____:_____:_____:_____:_____:___X___:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

Si piensas que el Clima en Diciembre es ligeramente bueno, entonces pondrías tu "X" como sigue:

El Clima en Diciembre es:

bueno _____:_____:___X___:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

Si piensas que el Clima en Diciembre no es ni bueno ni malo, entonces pondrías tu "X" como sigue:

El Clima en Diciembre es:

bueno _____:_____:_____:___X___:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

Tambien se usarán escalas evaluativas con las palabras "probable" e "improbable" en cada extremo. Estas deben de interpretarse de la misma manera que las anteriores. Por ejemplo si se te pidiera que evaluaras la expresión "El Clima es Frío en Diciembre" esta escala aparecería de la siguiente forma:

El Clima es Frío en Diciembre

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

Al hacer tus evaluaciones por favor recuerda lo siguiente:

1. Marca con una "X" dentro de los espacios proveídos para cada categoría y no entre las categorías.

____ :____ :__X__ :____ :____X____ :____
correcto incorrecto

2. Asegurate de evaluar cada una de las expresiones -- Por favor no omitas ninguna.

3. No marques con una "X" mas de un categoría en cada expresión.

Finalmente, lee con cuidado cada expresión y marca la categoría que mejor represente tu punto de vista correspondiente.

SECCION I

POR FAVOR INDICA LA POSIBILIDAD DE LO SIGUIENTE:

1. Tengo intención de participar en uno de los campamentos del DETCU el próximo mes de julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

SECCION II

EVALUA AHORA LA SIGUIENTE EXPRESION
EN CADA UNA DE ESTAS TRES ESCALAS

1. Mi participación en uno de los campamentos del DETCU sería algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

sabio _____:_____:_____:_____:_____:_____:_____ insensato
extremadamente muy ligeramente ni ligeramente muy extremadamente

perjudicial _____:_____:_____:_____:_____:_____:_____ benéfico
extremadamente muy ligeramente ni ligeramente muy extremadamente

SECCION III

INDICA EN ESTA SECCION LO QUE TU PIENSAS QUE A OTRAS PERSONAS LES GUSTARIA QUE HICIERAS EN CUANTO A TU DECISION DE PARTICIPAR EN UNO DE LOS CAMPAMENTOS DEL DETCO

1. La mayoría de las personas que son importantes para mí piensan que debo participar en uno de los campamentos del DETCU en julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

SECCION IV

RECIENTEMENTE SE REALIZO UNA ENCUESTA ABIERTA EN CHAPINGO CON EL PROPOSITO DE IDENTIFICAR ALGUNAS DE LAS CONSECUENCIAS QUE LOS ESTUDIANTES CREEN QUE LES TRAERIA EL PARTICIPAR EN UNO DE LOS CAMPAMENTOS DEL DETCU EN JULIO. EN ESTA SECCION SE PRESENTAN LAS VEINTE CONSECUENCIAS MAS FRECUENTEMENTE MENCIONADAS EN ESTA ENCUESTA.

Suponiendo que estuvieras considerando participar .... que probabilidad crees tu que cada una de las siguientes consecuencias tenga de ocurrir?

1. Mi participación en uno de los campamentos del DETCU en julio me permitiría relacionar la teoría que aprendo en el salón con la practica en el campo. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

2. Mi participación en uno de los campamentos del DETCU en julio me permitiría conocer mas de cerca la problematica del campo Mexicano. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

3. Mi participación en uno de los campamentos del DETCU en julio me permitiría entrar en contacto directo con los productores. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

4. Mi participación en uno de los campamentos del DETCU en julio me desanimaría debido a la falta de apoyo que algunos oficiales universitarios demuestran. (ej. Al rechazar propuestas de proyectos y al recortar los recursos económicos necesarios para realizar adecuadamente los proyectos de servicio). Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

5. Mi participación en uno de los campamentos del DETCU en julio me daría la oportunidad de obtener la experiencia practica que necesito. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

6. Mi participación en uno de los campamentos del DETCU en julio me daría la oportunidad de proveer asistencia técnica a los campesinos marginados para ayudarles a resolver algunos de sus problemas. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

7. Mi participación en uno de los campamentos del DETCU en julio me daría la oportunidad de observar y aprender diferentes tecnicas de producción agrícola. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

8. Mi participación en uno de los campamentos del DETCU en julio me impediría trabajar en mi tesis. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

9. Mi participación en uno de los campamentos del DETCU en julio me quitaría tiempo de otras actividades mas importantes. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

10. Mi participación en uno de los campamentos del DETCU en julio me causaría perder mis vacaciones de verano. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

11. Mi participación en uno de los campamentos del DETCU en julio me permitiría conocer otras partes del país. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

12. Mi participación en uno de los campamentos del DETCU en julio sería frustrante por los problemas organizacionales del DETCU que a veces ocasionan que no se cumpla con los objetivos planeados para algunos proyectos. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

13. Mi participación en uno de los campamentos del DETCU en julio me causaría pasar menos tiempo de vacaciones con mi familia. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

14. Mi participación en uno de los campamentos del DETCU en julio me causaría un translape con el viaje de estudios planeado en mi especialidad. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

15. Mi participación en uno de los campamentos del DETCU en julio me permitiría adquirir nuevos conocimientos en diversas areas relacionadas con la agricultura. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

16. Mi participación en uno de los campamentos del DETCU me involucraría en la fase de planeación del proyecto y me quitaría tiempo de mis responsabilidades académicas . Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

17. Mi participación en uno de los campamentos del DETCU en julio me causaría perder oportunidades de obtener un trabajo remunerativo. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

18. Mi participación en uno de los campamentos del DETCU en julio complementaría mi formación agronómica. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

19. Mi participación en uno de los campamentos del DETCU en julio me daría la oportunidad de hacer contactos para posibilidades de empleo en el futuro. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

20. Mi participación en uno de los campamentos del DETCU en julio seria difícil porque no tendría tiempo para hacerlo.

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

SECCION V

USANDO LAS SIGUIENTES ESCALAS POR FAVOR PROCEDE ENSEGUIDA A EVALUAR SEGUN PERCIBAS (COMO ALGO BUENO O COMO ALGO MALO) CADA UNA DE LAS CONSECUENCIAS RELACIONADAS CON LA PARTICIPACION EN LOS CAMPAMENTOS DEL DETCU EN JULIO.

1. Relacionar la teoría que aprendo en el salón con la práctica en el campo es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

2. Conocer mas de cerca la problemática del campo Mexicano es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

3. Entrar en contacto directo con los productores es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

4. El desánimo en participar en los campamentos del DETCU en julio debido a la falta de apoyo que algunos oficiales universitarios demuestran al rechazar propuestas de proyectos y a recortar los recursos económicos necesarios para realizar adecuadamente los proyectos de servicio es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

5. Ganar la experiencia practica necesaria es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

6. Proveer asistencia técnica a los campesinos marginados para ayudarles a resolver algunos de sus problemas es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

7. Observar y aprender diferentes técnicas de producción agrícola es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

8. No poder trabajar en mi tesis es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

9. Tomar tiempo de otras actividades más importantes para mi por participar en un campamento es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

10. Perder mis vacaciones de verano es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

11. Conocer otras partes del país es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

12. Frustrarme por los problemas organizacionales del DETCU que a veces ocasionan que no se cumpla con los objetivos planeados para algunos proyectos es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

13. Pasar menos tiempo de vacaciones con mi familia es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

14. El translape de los campamentos del DETCU en julio con el viaje de estudios planeado en mi especialidad es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

15. Adquirir nuevos conocimientos en diversas areas relacionadas con la agricultura es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

16. Tomar tiempo de mis responsabilidades académicas para participar en la fase de planeación de un campamento es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

17. Perderme una oportunidad de obtener un trabajo remunerativo es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

18. Complementar mi formación agronómica es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

19. Hacer contactos para posibilidades de empleo en el futuro es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

20. No tener tiempo para participar en uno de los campamentos del DETCU en julio es algo:

bueno _____:_____:_____:_____:_____:_____:_____ malo
extremadamente muy ligeramente ni ligeramente muy extremadamente

SECCION VI

ALGUNAS PERSONAS QUE TE RODEAN PODRIAN HACERTE SABER LO QUE ELLOS PIENSAN QUE TU DEBES HACER EN CUANTO A TU DECISION DE PARTICIPAR EN LOS CAMPAMENTOS DEL DETCU EN JULIO. POR FAVOR EVALUA LAS SIGUIENTES EXPRESIONES CON RELACION A ESTA IDEA.

1. Algunos de mis amigos piensan que debo participar en uno de los campamentos del DETCU en julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

2. Algunos de mis profesores piensan que debo participar en uno de los campamentos del DETCU en julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

3. Los productores piensan que debo participar en uno de los campamentos del DETCU en julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

4. Algunos de mis compañeros piensan que debo participar en uno de los campamentos del DETCU en julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

5. Mis padres piensan que debo participar en uno de los campamentos del DETCU en julio. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

SECCION IV

LA INFLUENCIA DE ALGUNAS PERSONAS QUE TE RODEAN PODRIA SER SIGNIFICATIVA EN TU TOMA DE DECISIONES. POR FAVOR INDICA LA PROBABILIDAD QUE LAS SIGUIENTES PERSONAS TENDRIAN EN INFLUENCIAR TU DECISION DE PARTICIPAR EN UNO DE LOS CAMPAMENTOS DEL DETCU EN JULIO.

1. En general, me gusta hacer lo que algunos de mis amigos piensan que debo hacer. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

2. En general, me gusta hacer lo que algunos de mis profesores piensan que debo hacer. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

3. En general, me gusta hacer lo que los campesinos piensan que debo hacer. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

4. En general, me gusta hacer lo que algunos compañeros piensan que debo hacer. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

5. En general, me gusta hacer lo que mis padres piensan que debo hacer. Esto es:

probable _____:_____:_____:_____:_____:_____:_____ improbable
extremadamente muy ligeramente ni ligeramente muy extremadamente

AL CONCLUIR CON ESTE CUESTIONARIO NO OLVIDES DE REGRESARLO EN EL SOBRE AQUI PROVEIDO A LAS OFICINAS DEL DETCU O A LA ING. CELINA GARZA WILLE.

MUCHAS GRACIAS POR TU PARTICIPACION!!!

APPENDIX E

COVER LETTER

Estimado estudiante: Junio 12, 1991

La Dirección Académica de esta universidad y el Departamento de Trabajos de Campo (DETCU) han aprobado la realización de un proyecto de investigación que será conducido por la Ing. Celina G. Wille. La Ing. Garza-Wille es una colega visitante y candidata a doctorado en el Departamento de Extensión y Educación Agrícola de la Universidad Estatal de Michigan. Esta investigación será la base para su trabajo de disertación doctoral. El enfoque de este estudio es uno de los programas del DETCU y tiene como objeto el análisis de la relación teorática Actitud-Comportamiento en el contexto de la participación estudiantil en los campamentos que el DETCU coordina para el próximo mes de julio. El estudio contempla derivar implicaciones prácticas que serán retroalimentativas para el DETCU. Hasta esta fecha, no existen estudios precedentes en esta área de investigación en Chapingo por lo que la realización de este estudio es de relevancia académica.

A través de una técnica de muestreo aleatorio estratificado, tú has sido seleccionado como participante en este estudio. La información que proveas al responder al cuestionario que has recibido junto con esta carta será de suma importancia para la realización exitosa de este estudio. Existen dos normas importantes de ética de la investigación que rigen a este proyecto. La primera es que tu participación en este estudio es considerada ser totalmente voluntaria y la segunda es que las respuestas que tu proveas serán tratadas con la más estricta confidencialidad.

Con el propósito de identificar y correlacionar tu respuesta a una de las preguntas del cuestionario acerca de tu intención en participar en uno de los campamentos del DETCU con tu acción, se ha codificado tu cuestionario con un número en la última página. Es importante asegurarte que solo la persona que está conduciendo este estudio tendrá acceso directo a la información que proporciones y que el reporte final de los resultados de este estudio no te asociará personalmente con respuestas especificas o resultados reportados.

Te tomará de 20 a 30 minutos en contestar este cuestionario. Cuando lo hayas completado, por favor regrésalo dentro del sobre membretado que se incluye y entrégalo directamente a la Ing. Garza-Wille quien estará personalmente recogiendolos. Si te es más conveniente, también puedes entregarlo a la secretaria del DETCU. La Ing. Celina Garza-Wille estará en las oficinas del DETCU durante nuestro horario regular (8:00 a.m.- 3:00 p.m.) los dias 12 al 21 de junio. Ella estará disponible para contestar preguntas que tengas con relación al estudio.

Tu disposición como participante y tu pronta respuesta a este cuestionario son invaluables ya que en general se espera que los resultados que se obtengan puedan sugerir nuevas perspectivas para la implementación de una función tan vital en Chapingo como la es el servicio universitario. Te agradecemos con anticipación tu apoyo a la realización de este proyecto de investigación.

Atentamente,

Dirección Académica-UACH

La Dirección del Departamento de Trabajos de Campo

Celina G. Wille
Departamento de Extensión y Educación Agrícola
Universidad Estatal de Michigan

Al responder a este cuestionario estas de acuerdo en participar voluntariamente.
Se tendrán copias del resumen de resultados del estudio, a tu disposición en el centro de documentación del DETCU.

APPENDIX F

T-TEST OF EARLY VS. LATE RESPONDENTS

Table F.3: T-test Comparison of Early vs. Late Respondents on Attitude Toward Participation Variables.

Item	Early Respondents $n = 271$	Late Respondents $n = 18$	T-value	Probability
Particil	1.78	1.77	.05	.96
Partici2	1.18	1.05	.56	.57
Partici3	1.81	1.83	-.07	.94

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