

THE THEORY OF PLANNED BEHAVIOR IN PREDICTING
ATTENDANCE AT ENVIRONMENTAL HORTICULTURE
EXTENSION PROGRAMS

By

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For my family

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The Florida Cooperative Extension Service has a long tradition of serving clientele via many different channels. One primary technique used by many agents is hosting workshops or demonstrations. Horticulture extension agents have a large audience and target this clientele for their major programs by using flyers, newsletter announcements, email, and phone calls. These agents have expressed a need to discover why a larger percentage of this audience is not participating. Therefore, the Theory of Planned Behavior was utilized to determine how attitudes, subjective norms and perceived behavioral control predict the intent of horticulture professionals to attend horticulture-based Extension programs. A purposive sample of 3000 professionals was surveyed. Overall, results showed that the TPB model explained 53% of the variation in behavioral intent, and all three constructs were significant predictors of intent. However, significant differences existed among attendees and non-attendees with regard to the model. Attitude was the only significant predictor of intent for non-attendees. It was

concluded that in order to boost participation of horticulture professionals at Extension programs, a specific need exists for understanding and, possibly, changing the attitudes and beliefs of non-attendees.

CHAPTER 1 INTRODUCTION

Interviews with various extension agents and specialists reveal that horticulture industry professionals in Florida are targeted for extension programs, but attendance at programs does not seem to represent this effort (L. Felter, T. Hurt, R. Schoellhorn, personal communication, 2002). Agents are interested in learning what would motivate more people to attend their programs. Therefore, the purpose of the current study was to determine why horticulture industry professionals participate in Extension programs and what would possibly motivate those who do not attend to become more active in these programs.

Client satisfaction and program accountability is a driving force behind the Extension service (Habeeb, Birkenholz, & Weston, 1987; Martin & Omer, 1987; UF/IFAS Fact Digest, 2003). Therefore, a constant need for understanding the program environment and target audience exists for Extension Agents (Martin & Omer, 1987). Literature suggests that quality programming is important to maintaining and promoting new audiences (Bowling, 2001; Israel, 2001; Norland, 1992; Summerhill & Taylor, 1992). Suggestions for improving program planning include gathering valuable information about the target audiences and their needs, having the clientele participate in the planning process, understanding the program life cycle and knowing when to end a program, and properly evaluating the programs (Bowling, 2001; Israel, 2001; Norland, 1992; Summerhill & Taylor, 1992).

Anecdotal information reveals that agents are targeting large groups of growers and nursery owners, but attendance at programs does not seem representative of this effort (L. Felter, T. Hurt, R. Schoellhorn, personal communication, 2002). Primary marketing tactics used to disseminate information about programs are flyers, newsletter announcements, emails and phone calls. Agents have expressed an interest in understanding the basic question of what factors would help increase the number of people at their programs. Even though these agents do many evaluations of their programs, they indicate that the data collected from the evaluations fails to answer that question. One reason may be instrument design (Jacob & Ferrer, 2000)). Many program evaluations indicate likes and dislikes of attendees, such as the delivery method, presenter, or location, but fail to discover a deeper understanding of what motivated the grower to actually attend (Jacob & Ferrer, 2000).

Cooperative State Research, Education, and Extension Service

The three main objectives of the U. S. Cooperative State Research, Education and Extension Service are to offer the information gathered at the land-grant universities; encourage the adoption of new techniques and ideas; and use the educational process to improve lives of clientele. In essence, the motto encompasses all that the Extension service does: “Help people help themselves” (Habeb, Birkenholz, & Weston, 1987; N. Place, personal communication, 2001).

The Florida Cooperative Extension Service (FCES) is one of three branches in the University of Florida’s Institute of Food and Agricultural Sciences (UF/IFAS), which was established in April 1964 when The University of Florida’s College of Agriculture, School of Forestry, Agriculture programs Experiment Stations and the Cooperative

Extension Service were combined. FCES is a partnership between UF/IFAS, the United States Department of Agriculture, and county governments in Florida. Each of Florida's 67 counties is home to an Extension office and many agents. In addition, IFAS incorporates 17 on-campus academic departments, 14 Research and Education Centers (REC), 7 research and demonstration sites and 5 locations with Degree Program Partnerships.

The Extension service utilizes three conceptual models when delivering educational information. Agents attempt to balance technology transfer, problem solving, and knowledge change when developing and delivering educational programs. The goal of these programs is to elicit a behavioral change in the target group (Habeeb, Birkenholz, & Weston, 1987). Therefore, Extension agents are continually searching for the most effective way to meet the needs of their audience (Martin & Omer, 1987). Many different types and sizes of Extension programs exist in the various areas of agriculture, such as pest management, water conservation, horticulture, forestry, child development, business, marketing and many more. Delivery methods range from workshops and demonstrations to one-on-one sessions and web-based activities. Program development is defined as the activities involved in building, creating, planning or developing an educational program (Taylor, 1994). Furthermore, the Extension service has a variety of categories for their programs, including routine program, maintenance program, impact program, and major program designations.

Extension program development is challenging to the agent and specialists involved, requiring large amounts of time and personal commitment that directly affects the success or failure of their programs (Israel, 2001; Place, 2001). Research has

indicated that the extension service is a major supplier of farmer education about new technology and farming practices (Ford, 1995). Many studies have been conducted that explain the importance of the Extension service to its clientele. The audience of each of these programs range from the general public to specialized industry professionals such as teachers, farmers, and business owners. Most of the respondents in these studies are satisfied with the services provided and state that the knowledge gained from meetings, workshops, phone calls, etc., are important to the success of their businesses (Alston & Reding, 1998; Ford, 1995; Habeeb, Birkenholz, & Weston, 1987; Martin & Omer, 1987).

Many dollars are spent each year on producing extension programs. The total national CREES budget for 2003 is over \$1 billion (USDA, 2003). In 2002, local finances to fund Extension in Florida amounted to \$29.2 million. Therefore, suggestions have been made to the Extension service regarding better planning techniques that could increase participation (Alston & Reding, 1998; Bruening, Radhakrslma, & Rollins, 1992; Martin & Omer, 1987). Identifying the target audience is a common theme throughout the literature (Alston & Reding, 1998; Bruening, Radhakrslma, & Rollins, 1992; Habeeb, Birkenholz, & Weston, 1987; Martin & Omer, 1987; Schmitt, Durgan, & Iverson, 2000). Agents should understand the characteristics of their audience and focus on specific needs and expectations as they relate to the real problems of the participants (Alston & Reding, 1998; Place, 2001; Schmitt, Durgan, & Iverson, 2000). Therefore, understanding who participates and why are major factors that need to be addressed when planning educational programs (Alston & Reding, 1998; Bruening, Radhakrslma, & Rollins, 1992; Martin & Omer, 1987).

Environmental Horticulture in Florida

The Horticulture Industry in Florida is growing. The entire nursery and landscape industry was worth about \$8.5 billion in 2001. This figure has almost doubled since 1997 (DeSousa, 2002). The 2000 figures provided by FNGA indicate that the value added to the economy was \$4.38 billion. Also, the industry provided employment for approximately 170,000 people, and paid total wages and salaries of \$2.91 billion.

Information provided by the Florida Agriculture Statistical Service (2002) suggests that ornamental production, which includes cut flowers, potted plants, hanging baskets, potted foliage, cut foliage, bedding and garden plants, and woody ornamentals is a large business in Florida. The state is ranked second to California. However, Florida is leading the country in wholesale sales of potted foliage for use indoors and in hanging baskets. Sales for this particular industry were \$361.2 million in 2001. Lake, Orange and Seminole counties alone accounted for 35% of these sales (FASS, 2002).

According to this information, the industry is economically important to Florida. Of all the agriculture commodities in the state, the nursery industry is the "single largest dollar producer" (DeSousa, 2002). Over \$1.5 billion is contributed to Hillsborough County alone, which is equivalent to the revenues of the Port of Tampa or hosting a Super Bowl every weekend (DeSousa, 2002).

The industry is highly aware of issues concerning pest management, labor relations, technology advances and various other business related items. The people involved in this industry are a major contribution to its success. Therefore, it can be argued that the extension service, through its commitment to sharing resources and knowledge, should be a common link between the issues and the people.

Purpose and Objectives

The main goal of the Extension service is to generate information through research and education, and ultimately pass this information on to the public. Agriculture Extension programs have been developed to supply hands-on knowledge that consumers can use immediately (Habeeb, Birkenholz, & Weston, 1987). Developing and delivering these Extension programs is challenging for agents and usually requires immense amounts of time and resources (Place, 2001). It has been established that effective program planning in the Extension service begins and ends with clientele satisfaction. Therefore, identifying target audiences and understanding their needs are essential to planning and maintaining a successful program.

Therefore, the purpose of the current research was to determine why horticulture industry professionals participate in Extension programs and what would motivate those who do not attend to become more active

Based on the above, the objectives of the study are as follows.

- To describe Florida commercial nursery professionals in terms of demographics and perceptions toward the Florida Cooperative Extension Service and its programming.
- Utilizing the Theory of Planned Behavior framework, determine how differences in attitudes, subjective norms and perceived behavioral controls toward extension programming affect intent to participate.

Past research studies utilizing the Theory of Planned Behavior model have concluded that attitude and PBC correlate most strongly with behavioral intent, and subjective norm was the weakest predictor of intent (Ajzen, 1988; Beedell & Rehman, 2000; Eagly & Chaiken, 1993; Pouta & Rekola, 2001). Therefore, the study was designed to test the following null hypotheses.

H1: No significant difference exists between attendees and non-attendees regarding possible motivational factors.

H2: No significant difference exists for attendees and non-attendees regarding perceived level of knowledge about the Florida Cooperative Extension Service.

H3: No significant difference exists for attendees and non-attendees regarding perceived level of knowledge about Institute of Food and Agricultural Sciences.

H4a: No relationship exists between behavioral intention of horticulture professionals to attend Extension programs and the three determinant variables: attitude, subjective norm and perceived behavioral control.

H4b: No relationship exists between behavioral intention of horticulture professionals to attend Extension programs and the three determinant variables: attitude, subjective norm and perceived behavioral, controlling for attendees and non-attendees.

Theoretical Framework

One theoretical framework that has been used to look at the constructs of attitude, subjective norms and perceived behavioral controls is Icek Ajzen's Theory of Planned Behavior (TPB, see figure B-1). Developed in the late 1980s, the theory is an extension of Ajzen's Theory of Reasoned Action (Fishbein and Ajzen, 1975). Intention to perform a particular behavior is the central factor of the theory (Ajzen, 1988; Eagly & Chaiken, 1993). The three independent determinants of intentions developed by Ajzen are attitude toward the behavior, subjective norms, and perceived behavioral control (PBC).

According to Ajzen (2001), three sets of salient beliefs guide human behavior and create the determinants mentioned above. In the model, attitude refers to the individual's positive or negative evaluation of performing a behavior, and is determined by beliefs

relating to the behavior (behavioral beliefs) and the evaluation of performing the behavior (outcome evaluations).

Subjective norms are the individual's perceptions of social pressures that exist pertaining to performance of the behavior (Ajzen, 1988; Eagly & Chaiken, 1993). This concept is comprised of beliefs about social expectations (normative beliefs) and the need to adhere to those expectations (motivation to comply).

Perceived behavioral control is related to an individual's perception of how difficult the task will be to perform. According to Ajzen, PBC includes past experience and anticipated obstacles. PBC is based on beliefs about factors that are for or against performing the behavior and the perceived power of those factors (control belief strength and control belief power).

Generally, the intention to perform a behavior is strong when performance of a particular behavior elicits a favorable attitude from the individual, the surrounding social environment is conducive to the behavior, and the individual feels confident of their ability to perform the behavior (Ajzen, 1988; Eagly & Chaiken, 1993).

Another theory pertaining to adult participation in extension programs is the theory of adult learning or andragogy (Knowles, 1990). This theory has six main assumptions regarding adult education. Knowles (1990) states that adults must have an understanding of why the new information is important and how it will affect them. Self-concept is also a major factor for adults when they are approached with possible learning situations. Past learning experiences such as school create anxiety in the adult and may directly affect their desire to continue with the educational process (Knowles, 1990; Rogers, 2001). The level of experience an adult has pertaining to the educational

program also influences the success of the adult. This allows for adult educational sessions to be enriched with a more diverse group of people with different backgrounds and experience levels (Knowles, 1990). This factor must be taken into consideration because if past experience of the learner is not given due justice, then the educator risks insulting the self-identity of the adult learner (Knowles, 1990).

The adult must also be ready to learn, meaning they are in need of the information at that point in time (Knowles, 1990). For example, no need exists for adults to attend an information session on greenhouse irrigation if they have no intention of building a greenhouse. When they make the decisions to build, then irrigation will become more important to them. This factor is similar to Knowles' (1990) orientation to learn, which states that adults need learning situations to be related to realistic situations. Adults want to be able to apply what they learn to something tangible in their lives.

Finally, the last assumption of Knowles' andragogy theory is motivation. Both extrinsic and intrinsic motivation exists within adults, and Knowles (1990) states that intrinsic is the most important. Intrinsic motivation centers on the internal well-being of the individual and can serve to influence the participation in adult learning activities more than extrinsic motivational factors such as increased salary or bonus points (Knowles, 1990; Rogers, 2001).

Increasing evidence exists that the theory of adult learning is serving as a foundation for adult educators when producing programs and is changing the organization of these programs (Knowles, 1990).

An extensive amount of literature is available regarding the Theory of Planned Behavior (TPB) and its use in predicting behavior. Studies have been conducted using

the TPB in areas such as health (Sparks & Sheperd, 1992), leisure activities (Ajzen & Driver, 1992), education (Ingram, Cope, Harju, & Wuensch, 2000), and agriculture (Beedell & Rehman, 2000). As a consequence of the theory's extensive use, several meta-analyses have been performed to determine the validity of the theory and its constructs.

For example, a 1998 study by Sutton sought to evaluate the effectiveness of the TRA/TPB models. He uses a series of other meta-analyses to gather data about the predictive power of the models regarding intention and behavior. In the study, he also made a distinction between prediction and explanation. Explanation is the process of identifying and specifying intention or behavior determinants. Models regarding explanation are causal in nature and can be represented graphically. For this reason, Sutton states that both TRA and TPB models are causal in nature.

However, prediction does not require explanations. This means that if the exact reason for a behavior or process is not completely understood, a prediction can still be made. According to Sutton, targeted interventions are easier to make if a prediction is available. However, he stressed that understanding the reasoning behind an action is much more useful.

Sutton's conclusions, based on the findings of the research, indicated that the models explained between 40% and 50% of the variance in intention, and between 19% and 38% of the variance in behavior in the studies he analyzed. He concluded that the models' performance depended on the comparison standard and he suggested nine reasons for poor predictions. These may be regarded as limitations in some research studies. These possible limitations were: (1) intentions may change, (2) intentions may be provisional, (3) violation of the principle of compatibility, (4) violation of scale

correspondence, (5) unequal number of response categories for intentions and behavior, (6) random measurement error, (7) Restrictions of range or variance, (8) marginal distributions do not match, (9) intention not sufficient causes of behavior. Finally, Sutton recommended some strategies for further research using the models based on the nine reasons. Some suggestions were to include the role of memory, situational factors, and past behavior.

A 2001 study of the efficacy of the TPB by Armitage and Conner used a “quantitative integration and review” of 161 published journal articles and book chapters utilizing the theory. Major findings include support for PBC as a determinant for intention. This analysis concluded that the correlation of PBC and intention accounted for 27% of the variance in predicting behavior. PBC was added to the original model and many studies have been conducted regarding its usefulness. Not only is PBC used to predict intention, but it also has a direct link with prediction of behavior (Ajzen, 1988; Eagly & Chaiken, 1993). It is important to remember that PBC refers to perceived control, not actual control. Actual control takes into account actual factors of available resources and opportunity, whereas perceived control is only the perception of ability to perform a behavior (Ajzen, 1988; Eagly & Chaiken, 1993).

The analysis found supporting evidence for the use of attitude and subjective norms in the models as well. However, subjective norm was determined to be the weakest predictor of intention. Other literature suggests the same finding (Pouta & Rekola, 2001; Sparks & Shepherd, 1992). Armitage and Connor offer the suggestion that measurement error was the cause of the weak predictive power of subjective norms. Use of "multi-item" scales verses "single-item" scales could be more reliable for measuring this construct. Overall,

the model was successful for predicting intention and behavior. The analysis also supported Ajzen's theory that PBC independently contributes to the prediction of intention and behavior.

CHAPTER 2 LITERATURE REVIEW

A broad base of literature is available regarding the Cooperative Extension Service, the Theory of Planned Behavior, and adult participation in educational programs. This review is organized conceptually based on these factors.

First, literature pertaining to Extension participation studies will be presented. These are articles that attempt to explain why adults may or may not participate in educational programs. They offer suggestions to professionals in the industry about successful marketing and retention of clientele. This information also suggests reasons for effective or non-effective Extension programs and indicates clientele perceptions of the extension service.

Last, a review of agriculturally-based items that specifically utilize the TPB. This is important to understand the success of the theory when predicting farmers' behavior.

Norland (1992) synthesized information from various sources and a 1987 study of Ohio Cooperative Extension Service clientele. She sought to answer some of the questions that plague Extension personnel on a daily basis. Why do adults participate? What barriers exist to participating? Why do some adults drop out of programs or stop attending? She cited Johnstone and Riveria (1965) when referring to situational barriers, institutional barriers, sociodemographic barriers, and dispositional factors that describe adult participation. Norland cited a 1987 Ohio study as her main source of information and made conclusions based on the results. The survey studied Extension clientele who

had previously been involved in Extension programs. Questionnaires were sent to 599 individuals with a final response number of 276. They did a principal-component factor analysis of the results and discovered five main factors related to participation: low anticipated difficulties with arrangements, high commitment to Extension organization, anticipated positive social involvement, anticipated high quality of information, and possession of high internal motivation to learn.

The implications of the study were that people participate in Extension programs based on what they know about extension and what learning opportunity is available for them from the program. Therefore, the image of Extension as perceived by potential or existing clients is important and can be used as a marketing tool for recruitment.

Opportunity for social interaction among clientele and convenience of the programs were also major factors of participation.

Dollisso and Martin (1999) determined that young farmers are both intrinsically and extrinsically motivated to participate in educational programs. They mailed a questionnaire to 148 members of the Iowa Young Farmers Educational Association (IYFEA) to determine their perceptions toward learning, preferred learning methods, participation motivators, and barriers of participation. Major findings focused on the idea that adults desire a sense of choice. The young farmers preferred hands-on activities and individual projects. Economic sustainability was a motivator for most farmers to participate. The study indicated that farmers' participation might increase as a result of their inclusion in the planning process. The authors inferred that researchers and teachers could use this information to better prepare programs for their audiences. The authors recommended that program planners focus on profitability and new technology when

targeting this audience. Current information and practicality of the subject matter were also important tips for planners. They also recommended that larger populations, including non-farmers and agribusinesses, be studied using various methods for comparability and reliability purposes.

A previous study of IYFEA by Martin and Omer (1987) sought to determine their use of various agriculture agencies, especially the agriculture extension service. Their main purpose was to discover awareness and participation factors. They mailed surveys to approximately 75 people, and had a final response rate of 68% (51 respondents). The extension service awareness and satisfaction levels were high among the young farmers. They indicated an interest in programs that focused on marketing, record keeping, and management techniques.

The authors determined that understanding the characteristics of participation and profiles of the audience were important factors in program planning. They also concluded that involvement of the young farmers in the planning process was needed. The process would begin with the clientele input, guiding the direction of the program to meet their needs.

Alson and Reding (1998) conducted a study to determine what factors were associated with adoption and educational techniques of the integrated pest management program in Utah. Two hundred sixty two fruit tree growers and 1,700 field crop producers in Utah received questionnaires. Results indicated that both groups preferred the Extension service (agent and/or office) for information regarding pest management practices. Other growers and trained employees were also important sources of information. The publications and workshops provided by the extension service were the

preferred information sources. Computer access was on the list of least preferred sources for pest management facts. Growers whose major source of income was their farm placed more emphasis on the use of Extension services and recommendations than those whose farm was not their primary employment. The conclusion was that in order to reach these grower audiences with information about IPM programs, grower backgrounds, perceptions, practices and preferences should be given extreme consideration.

Ford (1995) assessed the educational priorities of small farmers in West Tennessee. Specifically, the study was designed to determine the preferred delivery methods, programs, and program activities of their Extension service. Descriptive research methods were used to survey a sample of 150 small farmers who made less than \$20,000 in gross income from farm sales. Farmers rated their feelings on a one-99 scale, with individual values given to no importance, little importance, etc. Farm visits were used to gather data because extension agents in the area indicated that response rates with mailed questionnaires were historically very low with the small farmers. A final response rate of 72% was achieved with this method.

The author discovered that crop marketing, soil conservation, and pesticide use were areas that needed more emphasis from educational programs. The small farmer also expressed an interest in the use of extension agents for one-on-one help with solving various problems. Recommendations were made regarding the development of programs that would focus on technical and business related skills, especially marketing.

A 1987 study by Habeeb, Birkenholz, and Weston sought to determine the perceptions of county extension officers and extension clientele toward the Missouri Extension service. Four hundred farmers with some extension background and

prominence in the community, and 150 extension officers were stratified by counties and then selected randomly. A 43-item questionnaire was used to determine their level of extension knowledge and opinions. Significant differences were found between officers and clientele perceptions of extension information and extension specialists. Amount of extension contact, attendance of extension meetings, and innovativeness level of the respondent explained some of the variability associated with the differing opinions.

Overall, extension information, specialists, methods, and programs were considered satisfactory. The higher the level of contact with the extension service and agents, the higher the satisfaction ratings of the extension service tended to be. The recommendations of the authors included planning and conducting meetings for a larger target audience, and increasing the amount of clientele/agent contact.

With respect to adoption behavior of extension clientele and the general public, Pouta and Rekola (2001) tested the TPB model for predicting the “willingness to pay [WTP] for abatement of forest regeneration”. They used survey research methods to gather data for the contingent valuation (CV) study of 600 people in Loppi, Finland. Two rounds of surveys were administered—one concerned forest recreation and respondent background, and the other focused on WTP measures and regeneration attitudes.

One important aspect of the study was that it focused on predicting WTP responses using the attitudes, subjective norms, and perceived behavioral controls of the respondents. Two attitudes were used—attitude toward forest regeneration and attitude toward supporting the abatement policy. The results indicated that the use of both attitude variables explained WTP significantly. PBC contributed significantly to the

prediction of WTP, suggesting that respondents fully understood their personal limitations. Subjective norms were not significant.

Beedell and Rehman (2000) studied farmers' conservation behavior by using the TPB model. One hundred twenty five farmers in Bedfordshire, England participated in the study and were divided into three groups: farmer, FWAG farmers, and conservationist (FWAG: Farming and Wildlife Awareness Group). The authors added moral obligation to the model because respondents indicated an obligation to the land and this obligation affects business decisions.

Six behaviors were studied: hedge management, field margin management, tree planting management, hedge removal, hedge planting, and pesticide use. FWAG farmers viewed these behaviors more importantly than farmers. Hedge removal was not regarded as good because it is an "anti-conservation" practice. FWAG farmers felt a stronger moral obligation than farmers, suggesting that farmers have an internal obligation to the land and the FWAG farmers feel both social pressures and internal motivation to conserve. The two groups also behaved differently regarding managing field margins. However, the authors explained that the definition of a "good" field margin might differ among groups. They suggest further research in that particular area.

Results of the study showed that FWAG farmers were more aware of conservation concerns than non-member farmers. FWAG farmers were more concerned with environment issues than business issues regarding farming behavior. From these results, the authors concluded that the TPB model was an acceptable tool for predicting farmer behaviors.

Based on the review of literature, understanding audience profiles and characteristics are an important aspect to program planning in Extension. Clientele are interested in learning about practical, current information that is relevant to their interests and will attend programs based on this information. Regarding the prediction of particular behaviors, the TPB model has been successful in many different fields of study, including agriculture. Therefore, utilizing the TPB model to predict attendance at horticulture-based Extension programs is a logical step toward improved program planning.

CHAPTER 3 METHODOLOGY

This study utilized the Theory of Planned Behavior as a model for determining the intention of nursery industry professionals in Florida to attend Florida Cooperative Extension Service programs. This behavior is under investigation for several reasons. Mainly, Extension agents in Florida have expressed a need to understand what motivates nursery professionals to attend programs that are targeted specifically for them. The TPB was used because it has been widely accepted as a framework for predicting and attempting to understanding specific behaviors.

Subjects

The population for the current study was horticulture industry professionals in Florida, which included the wholesale, retail, landscape and allied trade industries. To conduct the study, two mailing lists were obtained and combined. One was from the Florida Nurserymen and Growers Association (N=2700), and the other was from a Commercial Horticulture Extension agent in Central Florida (N=300). Because the entire group of professionals, (N=3000), was utilized, it is known as a purposive sample.

Research Design

The basic design of this study is known as ex post facto research. In Latin, ex post facto means “after the fact” and is conducted once the variable of interest has already been altered or changed in some fashion (Ary, Jacobs, and Razavieh, 2002). The purpose of this method is to determine cause and effect relationships among independent variable,

which is why this design is sometimes referred to as causal comparative research. One of the main reasons this method is used is when the research does not allow for manipulation of variables, as is the case with a true experiment.

Instead of exposing a group of people to different treatments, ex post facto research begins with the group having already been exposed and attempts to determine what differences exist and why. In the present study, nursery industry professionals were examined to determine what factors strongly influence their attendance at horticulture based Extension programs.

Pilot Study

The Theory of Planned Behavior model is based on beliefs about a particular behavior. Behavioral beliefs lead to the formation of attitudes. Normative beliefs lead to an understanding of the perceived level of social pressure that exists about a behavior, and control beliefs about the behavior lead to overall perceived behavioral control. These beliefs can be measure directly (direct measures) and indirectly (belief-based measures).

In order to identify the salient beliefs of horticulture industry professionals, a series of pilot studies was conducted at various Extension programs in Central Florida. Participants were asked a range of closed- and open-ended questions that addressed various aspects of the Extension programs they attend or would like to attend. A list of the most common beliefs were constructed and used to create the final questionnaire. A panel of 10 experts examined and approved the final questionnaire.

Procedure

In order to attempt to achieve a good response rate with a high-quality mailed survey, Dillman (2000) suggests the Total Design Method (TDM). Basically, the TDM

focuses on creating a user friendly survey environment that “increases perceived rewards for responding, decreases perceived costs and promotes trust in beneficial outcomes from the survey (Dillman, 2000).” It is based on multiple personalized contacts with the participants, also known as waves. This method has been proven to increase response rates when compared to traditional mail surveys (Dillman, 2000). The five main elements of the TDM include a respondent-friendly questionnaire, up to five contacts with the participants, stamped return envelopes, personalized correspondence and a financial incentive (Dillman, 2000).

The current study involved sending a packet containing a cover letter, a 62-item questionnaire and a business reply envelope to the nursery professionals in Florida (N=3000). The second wave was a reminder post card sent to all participants. No financial incentive was offered.

On November 8, 2002, the packets were mailed to all 3000 professionals. A reminder post-card was mailed six weeks later. By February 12, 411 surveys had been returned for a response rate of 14% (N=411). The majority of those responses, 75% (N=308), had been returned by the end of November.

Considering that the response rate was low, a comparison of early to late respondents was conducted for validity reasons. According to Ary, Jacobs and Razavieh (2002) nonrespondents and late respondents are usually similar. Therefore, the two respondent groups were created. The 411 respondents were divided into four quartiles for the purpose of comparing the first quartile (early respondents) to the fourth quartile (late respondents). The two groups were compared via an independent sample t-test based on the following variables: attitude, subjective norms, perceived behavioral control and

intent. With an alpha level of .05, none of the differences were significant, and it was concluded that late respondents were similar to the nonrespondents. Table 3-1 displays the results.

Variable	N	Mean	t
Attitude			
Early respondents	98	4.91	1.21*
Late respondents	109	4.78	
Subjective Norm			
Early respondents	96	3.09	.910*
Late respondents	107	2.10	
PBC			
Early respondents	96	4.30	.389*
Late respondents	108	4.27	
Intent			
Early respondents	94	4.18	.951*
Late respondents	103	4.18	

*p > .05

Instrumentation

The Theory of Planned Behavior served as the theoretical framework of this study as well as supplying the basic model for the questionnaire and interpretation of the results. The 62-item instrument utilized in this research elicited responses, directly and indirectly, based on the constructs of the model, as well as several factors outside the model used for profiling the industry. Thirty-five questions were directly based on the theory and were used to create indices of each construct. Answers were given using a 5-point Likert scale where responses ranged from 1=Strongly Agree to 5=Strongly Disagree.

Attitude was measured directly using a 7-point semantic differential scale comprised of six items. Table 3-2 provides an example. Two attitudinal variables were

measured: the attitude toward attending extension programs related to the horticulture industry, and the attitude toward the Florida Cooperative Extension Service.

Table 3-2: Attitude Scale Item (Direct Measure)

My attitude toward *attending extension programs* is

Favorable: _____:_____:_____:_____:_____:_____:_____:Unfavorable

Useful: _____:_____:_____:_____:_____:_____:_____:Useless

Good: _____:_____:_____:_____:_____:_____:_____:Bad

Pleasant: _____:_____:_____:_____:_____:_____:_____:Unpleasant

Reliable: _____:_____:_____:_____:_____:_____:_____:Unreliable

Valuable: _____:_____:_____:_____:_____:_____:_____:Worthless

Attitude was also measured indirectly based on the behavioral beliefs and outcome evaluations of the respondents (belief-based measures). According to Ajzen (2001), these beliefs and evaluations impart important information regarding an individual’s decision to behave in a particular manner. Seven behavioral belief questions and five outcome evaluation questions were constructed. Table 3-3 presents an example.

Table 3-3: Behavioral Belief Scale Items

Extension programs offer up-to-date information on the horticulture industry.¹

Strongly Agree 1 2 3 4 5 Strongly Disagree

Keeping up-to-date on the horticulture industry is important to me.²

Strongly Agree 1 2 3 4 5 Strongly Disagree

¹Behavioral Belief

²Outcome Evaluation

To construct the belief-based measures index for attitude, the beliefs were multiplied by the outcomes as shown in the following equation.

$$A_B \propto \sum b_i e_i$$

Subjective norms were also measured directly and indirectly. The questions were used to determine the respondent's perception of social pressure regarding attendance at Extension programs. Two questions elicited the direct measure for subjective norms, and eight normative belief- and motivation to comply-type questions were used to create an index for indirect measuring. Example questions for subjective norm are in Table 3-4 and, the equation for creating the index based on multiplying normative beliefs strengths and motivation is:

$$SN \propto \sum n_i m_i$$

Table 3-4: Subjective Norm Scale Items

It is expected of me to attend as many extension programs as I can that are about horticulture issues.¹

Strongly Agree 1 2 3 4 5 Strongly Disagree

The opinions of horticulture professionals in my industry are important to me.²

Strongly Agree 1 2 3 4 5 Strongly Disagree

Generally speaking, I do what other horticulture industry professionals think I should do regarding attendance at extension programs.³

Strongly Agree 1 2 3 4 5 Strongly Disagree

¹Direct measure

²Normative belief

³Motivation to comply

Perceived behavioral control was also measured directly and indirectly. Seven questions were designed to create the index for perceived behavioral control, measuring the respondent's evaluation of how easy or difficulty it would be to attend extension programs. Example questions for PBC are in Table 3-5, and the equation for constructing the PBC index is:

$$PBC \propto \sum c_i p_i$$

Table 3-5: PBC Scale Items

It is mostly up to me whether or not I attend extension programs relating to the horticulture industry. ¹						
Strongly Agree	1	2	3	4	5	Strongly Disagree
If I wanted to, I could attend an extension program relating to the horticulture industry. ²						
Strongly Agree	1	2	3	4	5	Strongly Disagree
I feel in complete control over whether I attend an extension program relating to the horticulture industry. ³						
Strongly Agree	1	2	3	4	5	Strongly Disagree

¹Direct measure

²Control Belief Strength

³Control Belief Power

Also on the survey were several questions designed to determine what would motivate horticulture industry professionals to attend more Extension programs. Two open-ended questions and five questions using the Likert scale were created for this purpose. An example of each of these questions is in Table 3-6.

Table 3-6: Motivation

If I knew that I could learn about employee management techniques, I would be more likely to attend extension programs.						
Strongly Agree	1	2	3	4	5	Strongly Disagree

The biggest problems facing the horticulture industry are...¹

¹open-ended question

Two questions asked the respondents' perceived level of knowledge about the Florida Cooperative Extension Service and the Institute of Food and Agricultural Sciences (IFAS) and are displayed in Table 3-7.

Table 3-7: Perceived Level of Knowledge

My knowledge of the Florida Cooperative Extension service is:

Extremely High: ___ : ___ : ___ : ___ : ___ : ___ : ___ :Extremely Low

My knowledge of the Institute of Food and Agricultural Sciences (IFAS) is:

Extremely High: ___ : ___ : ___ : ___ : ___ : ___ : ___ :Extremely Low

Finally, behavioral intent was measured directly via four questions on the instrument. Ajzen (1988) states that behavioral intention of an individual is comprised of the motivational factors involved in making the decision to engage in the behavior. Basically, intention is an indicator of the individuals' willingness to attempt the behavior. If the individuals state their intent to perform the behavior, they can be relied upon to do so (Ajzen, 1988). Therefore, we should be able to accurately predict behavior by determining intentions. Two examples are shown in Table 3-8.

Table 3-8: Behavioral Intent Scale Items

I intend to attend extension programs relating to the horticultural industry within the next year.						
Strongly Agree	1	2	3	4	5	Strongly Disagree
I will try to attend extension programs relating to the horticultural industry within the next year.						
Strongly Agree	1	2	3	4	5	Strongly Disagree

Data Interpretation

The questionnaire was initially written with higher numbers representing lower evaluations of the questions (i.e. Strongly Agree=1 to Strongly Disagree=5). Therefore, the data was recoded in the Statistical Package for Social Science (SPSS) in order to have higher numbers represent higher evaluations of the items (i.e. Strongly Agree=5 to Strongly Disagree=1).

Reliability

To measure the internal consistency of the items prior to creating the indices for each construct, Cronbach alpha coefficients were determined. Cronbach alpha is used when items are scaled and the scores can be a range of values, as is the case with Likert scales and semantic differential scales (Ary, Jacobs and Razavieh, 2002). Alphas in the

range of .50 to .60 are acceptable when making decisions regarding groups of people for research purposes (Ary, Jacobs and Razavieh, 2002). Cronbach alphas are listed in

Tables 3-9 through 3-18

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
Belief 1	4.27	.71	.72	.78
Belief 2	4.04	.83	.64	.79
Belief 3	4.31	.87	.54	.81
Belief 4	4.28	.75	.65	.80
Belief 5	3.51	.90	.45	.82
Belief 6	4.43	.69	.52	.80
Belief 7	4.32	.88	.51	.81

Behavioral Belief Scale Alpha = .83

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
OE 1	4.47	.59	.65	.68
OE 2	4.54	.56	.66	.67
OE 3	4.42	.74	.65	.66
OE 4	4.27	.77	.52	.70
OE 5	3.88	1.11	.33	.83

Outcome Evaluation Scale Alpha = .75

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
Attitude 1	6.22	1.12	.88	.95
Attitude 2	6.17	1.10	.89	.95
Attitude 3	6.24	1.00	.93	.95
Attitude 4	6.10	1.10	.82	.96
Attitude 5	6.08	1.12	.88	.96
Attitude 6	6.10	1.15	.89	.95

Attitude Scale Alpha = .96

*measured on 7-point scale

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
Norm 1	3.45	.94	.59	.68
Norm 2	3.28	1.01	.67	.57
Norm 3	2.88	1.03	.51	.76

Table 3-12. Continued

Normative Belief Scale Alpha = .78

Table 3-13: Cronbach Alpha Reliability Coefficients: Motivation to Comply

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
MC 1	2.31	1.05	.73	.78
MC 2	2.40	1.02	.76	.74
MC 3	2.23	.99	.66	.84
Motivation to Comply Scale Alpha = .85				

Table 3-14: Cronbach Alpha Reliability Coefficients: Subjective Norm (direct measure)

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
SN 1	3.84	.92	.47	.
SN 2	3.59	1.03	.47	.
Subjective Norm Scale Alpha = .64				

Table 3-15: Cronbach Alpha Reliability Coefficients: Control Belief Strength

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
Strength 1	4.37	.71	.57	.
Strength 2	4.47	.68	.57	.
Control Belief Strength Scale Alpha = .72				

Table 3-16: Cronbach Alpha Reliability Coefficients: Control Belief Power

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
Power 1	4.29	.85	.56	.
Power 2	4.35	.68	.56	.
Control Belief Power Scale Alpha = .71				

Table 3-17: Cronbach Alpha Reliability Coefficients: Perceived Behavioral Control (direct measure)

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
PBC 1	4.02	1.08	.49	.
PBC 2	4.31	.73	.49	.
PBC Scale Alpha = .62				

Table 3-18: Cronbach Alpha Reliability Coefficients: Intent

Item	Mean	Standard Deviation	Corrected item-total correlation	Alpha if item deleted
Intent 1	4.26	.87	.78	.82
Intent 2	4.21	.86	.82	.81

Intent 3	4.07	.96	.66	.88
Intent 4	4.27	.75	.70	.86
Behavioral Intent Scale Alpha = .88				

An overall descriptive analysis revealed the means for each of the constructs based on the averages of each of their respective measures. The results can be found in Table 3-19.

Variable	N	Mean	SD
Attitude	402	4.85	.65
Subjective Norm	394	3.03	.71
PBC	395	4.30	.58
Intent	385	4.18	.72

In addition, the descriptive analysis of each of the TPB constructs was conducted on attendees and non-attendees. Table 3-20 displays the results.

Variable	N	Mean
Attitude		
Attendee	321	4.97
Non-attendee	72	4.41
Subjective Norm		
Attendee	320	3.10
Non-attendee	73	2.75
PBC		
Attendee	320	4.37
Non-attendee	74	3.99
Intent		
Attendee	312	4.30
Non-attendee	72	4.18

Pearson product moment correlations between each of the variables for the entire sample indicated significant relationships with behavioral intention at the .05 alpha level. In addition, significant relationships were observed among each of the variables. The results can be found in Table 3-21.

Table 3-21: Pearson Correlations between the TPB Model Constructs

Variable	1	2	3	4
1. Attitude	---			
2. Subjective Norm	.463*	---		
3. PBC	.393*	.150*	---	
4. Intent	.686*	.403*	.393*	---

*p < .01

Hypotheses

Based on the objectives of this study, the following hypotheses were developed.

H1: No significant difference exists between attendees and non-attendees regarding possible motivational factors.

H2: No significant difference exists for attendees and non-attendees regarding perceived level of knowledge about the Florida Cooperative Extension Service.

H3: No significant difference exists for attendees and non-attendees regarding perceived level of knowledge about Institute of Food and Agricultural Sciences.

H4a: No relationship exists between behavioral intention of horticulture professionals to attend Extension programs and the three determinant variables: attitude, subjective norm and perceived behavioral control.

H4b: No relationship exists between behavioral intention of horticulture professionals to attend Extension programs and the three determinant variables: attitude, subjective norm and perceived behavioral, controlling for attendees and non-attendees.

Data Analysis

The following data analyses were conducted using SPSS.

- Frequencies and Cross-tabulations were used to gain an understanding of the demographics of the respondents.
- Correlational analyses using the Pearson product moment correlation coefficient were conducted to determine the strengths and directions of relationships between variables.

- Multiple linear regression was used to examine the amount of variation in the dependent variable that was explained by the independent variables.
- Analysis of variance was used to compare the differences in means of the independent variables on the dependent variable.

CHAPTER 4 RESULTS

The purpose of this study was to determine what factors affected the behavioral intent of a sample of horticulture industry professionals to participate in Extension programs. The Theory of Planned Behavior was chosen as the theoretical framework and basic model for this study because it has been shown to aid in the prediction and understanding of how people behave (Ajzen, 1988). When applying the model to this study, behavioral beliefs about Extension programs relating to the horticulture industry create a particular attitude toward attending these programs. Normative beliefs regarding the social pressure to attend these programs create an individual's subjective norm. Control beliefs about the ability to attend these programs indicate the perceived behavioral control of the individual (Ajzen, 1988). All of these variables combined were utilized to provide an explanation of the intentions of a sample of horticulture industry professionals to attend Extension programs targeted for them.

Descriptive Information

One of the main objectives of this research was to gather demographic profiling information on the horticulture industry in Florida. The instrument contained 12 questions used for this purpose. As to demographics, the majority, 76% (N=313), of the respondents were male and 19% (N= 79) were female. Regarding position of the respondents in the business, 61% (N=254) were owners, 16% (N=66) were managers and 3% (N=11) said they were both. To assess possible differences between men and women,

a cross-tabulation was created and revealed that 68% (N=209) of the male respondents were owners and 16% (N=51) were managers, while 50% (N=38) of the women respondents were owners and 18% (N=14) were managers. Nineteen business positions were stated other than the five offered on the survey. Answers included representatives of the education field, parks and recreations department, as well as combinations of positions such as owner/manager/sales or sales/support staff.

When respondents were asked if they attended Extension programs relating to the horticulture industry, 78% (N= 321) answered yes and 21% (N=86) said no. Twenty-nine percent (N=120) stated that they attended the programs themselves, 3% (N=15) sent employees and 31% (N=130) stated that they attended the programs with their employees. Forty-three percent (N=178) of the respondents were in wholesale production and 25% (N=105) classified themselves in the landscape industry. Two-percent (N=10) of the respondents said they were in allied trade, and 4% (N=18) stated they had a retail nursery operation. Twenty-one other business categories were represented ranging from golf courses to municipalities.

Overall, 44% (N=183) of the respondents had average annual sales over \$500,000, and 12% (N=50) had sales in the \$250,000-\$499,000 range. To determine if differences existed between attendees and non-attendees regarding annual sales, a cross-tabulation was created. Of those who attend, 58% (N=155) have average annual sales over \$500,000, while 36% (N=27) of those who do not attend have average annual sales over \$500,000. This cross-tabulation between attendees and non-attendees regarding average annual sales also indicated that 85.3% (N=155) of the respondents indicating sales above \$500,000 attend programs, while 14.8% (N=27) do not. The respondent

group with the next highest level of attendance had average sales between \$50,000 and \$149,999. Of this group, 80% (N=32) attended programs and 20% (N=8) did not.

Results are displayed in Table 4-1.

	\$0 - \$19,999	\$20,000 - \$49,999	\$50,000 - \$149,999	\$150,000 - \$249,999	\$250,000 - \$499,999	\$500,000 +
Attend						
Yes	15 (62.5%)	10 (52.6%)	32 (80%)	16 (59.3%)	39 (78%)	155 (85.2%)
No	9 (37.5%)	9 (47.4%)	8 (20%)	11 (40.7%)	11 (14.6%)	27 (14.8%)
Total	24	19	40	27	50	182

When asked about production systems, container production was the primary answer, 58% (N=239), and field production was the least chosen system, 38% (N=156). To determine the differences among attendees and non-attendees, a cross-tabulation was conducted. It revealed that, of those who attend, 55% (N=140) use greenhouses, 61% (N= 159) use shadehouses, 52% (N=124) use field production and 69% (N=188) use container production. Of those who do not attend programs, 46% (N=30) use greenhouses, 46% (N=31) use shadehouses, 49% (N=32) use field production, and 66% (N=50) use container production. Table 4-2 displays the results.

Production System used	Attend	
	Yes	No
Container	188 (69%)	50 (66%)
Shadehouse	159 (61%)	31 (46%)
Greenhouse	140 (55%)	30 (46%)
Field	124 (52%)	32 (49%)

Furthermore, cross-tabulations revealed that of the respondents who utilize container production (N=238), 79% (N=188) attend programs and 21% (N=50) do not.

Of those respondents who stated they used greenhouses (N=170), 82% (N=140) attend programs and 18% (N=30) do not. Eighty-three percent (N=159) of the 190 respondents who utilize shadehouses attend programs, while 16% (N=31) do not. For the respondents who use field production (N=156), 79% (N=124) attend programs and 21% (N=32) do not. These results indicate that horticulture professionals who utilize greenhouse production systems and container production systems might be a large target audience for the Commercial Horticulture Extension Agents.

Another aspect of this study was to determine various motivating factors that might influence the participation level of horticulture professionals at Extension programs. Five questions were designed using a 5-item Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). An example of one of the questions was “If I could learn about business management techniques, I would be more likely to attend Extension programs.”

Overall, of the five questions, results indicated that learning about the programs at least one month in advance would be a possible motivational factor (M=4.08). Another important factor to respondents was learning about the latest pesticides, herbicides and fungicides available on the market (M=4.09). Table 4-3 displays the results.

Question	N	Mean	SD
Learn about latest pesticides, herbicides and fungicides	384	4.09	.85
Learn about programs at least one month in advance	389	4.08	.83
Learn about employee management techniques	379	3.75	.96
Learn about business management techniques	382	3.71	1
Receive CEUs	379	3.55	1.07

In addition to the general demographic information, descriptive statistics were obtained for the direct and belief-based measures of attitude. These analyses were

conducted on attendees and non-attendees to further understand some of the differences that exist among the two groups.

Attitude toward attending Extension programs was measured directly using a 7-point semantic differential scale comprised of six items, with higher values representing positive attitudes and lower values representing negative attitudes. Results indicated that attendees had a higher mean attitude ($M=6.31$) than non-attendees ($M=5.46$). This suggests that respondents who attend horticulture-based Extension programs had a more positive attitude toward attending those programs than respondents who do not attend. Results are shown in Table 4-4.

In addition to the direct measure of attitude toward attendance, the belief-based measures were also analyzed. The behavioral beliefs of the sample of horticulture professionals as well as their evaluation of those beliefs (outcome evaluations) were measured using a 5-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). For attendees, the mean for behavioral beliefs was 4.27, and the mean for non-attendees was 3.73. The means for the outcome evaluations were also higher for attendees ($M=4.39$) than for non-attendees ($M=4.04$). These results support the conclusion that respondents who attend Extension programs have more positive beliefs about Extension than non-attendees. Results are displayed in Table 4-4.

Table 4-4: Descriptive Statistics: Direct/Belief-Based Attitude Measures

Measure	N	Mean	SD
Attitude (direct)*			
Attend	313	6.31	.83
Not attend	73	5.46	1.45
Behavioral Beliefs			
Attend	320	4.26	.47
Not attend	77	3.73	.74
Outcome Evaluations			
Attend	319	4.39	.50

Table 4-4. Continued

Not attend	73	4.04	.67
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*measured on a 7-point scale

Examples of the behavioral beliefs that were analyzed and their means for each group (attendee/non-attendee) are displayed in Table 4-5. This analysis revealed that attendees agreed with the following two statements more than non-attendees: (1) Extension programs offer up-to-date information; (2) Extension programs offer an opportunity to increase their knowledge of new products on the market more than non-attendees. Attendees also strongly agreed that Extension programs offer an opportunity to obtain CEUs. Furthermore, non-attendees agreed more than attendees with the following two statements: (1) Horticulture professionals do not benefit from participating in Extension programs; (2) Extension programs are not an effective way to spread information to the horticulture industry.

Table 4-5: Descriptive Statistics: Belief-Based Attitude Measures: Attendees/Non-attendees

Belief	N	Mean
Extension programs offer opportunity to obtain CEUs	Attendee	295 4.56
	Non-attendee	67 3.94
Extension programs offer up-to-date information	Attendee	293 4.39
	Non-attendee	70 3.75
Extension programs offer an opportunity to increase knowledge of latest chemicals	Attendee	294 4.37
	Non-attendee	67 3.83
Extension programs offer an opportunity to increase knowledge of products on the market	Attendee	294 4.09
	Non-attendee	69 3.73
Extension programs provide information about business management techniques		

Table 4-5. Continued

	Attendee	291	3.49
	Non-attendee	68	3.37
Horticulture professionals do not benefit from participating			
	Attendee	292	1.53
	Non-attendee	67	2.36
Extension programs are not an effective way to spread information to the horticulture industry			
	Attendee	294	1.55
	Non-attendee	68	2.26

Testing the Hypotheses

The current study was designed to determine how the attitudes, subjective norms and perceived behavioral control of horticulture industry professionals in Florida affect their intent to attend Cooperative Extension Service programs. The TPB model constructs as well as motivational factors and perceived knowledge were analyzed separately for respondents who attend programs and for those who do not attend programs.

Therefore, this section is organized in the following manner. To understand some of the differences between attendees and non-attendees, the first three hypotheses concerning motivation and knowledge were analyzed. Then, to determine the influence of attitude, subjective norm and PBC on the behavioral intent of this sample of horticulture professionals, the final two hypotheses were tested.

H1: No significant difference exists between attendees and non-attendees regarding possible motivational factors.

To determine if a difference existed between attendees and non-attendees, an independent samples t-test was conducted with regard the five motivational questions. At the alpha level of .05, the means for all five questions differed significantly among the

two groups. The null hypothesis was rejected. The means for attendees were consistently higher than the means of non-attendees. Learning about the latest pesticides, herbicides and fungicides (chemicals) was the most important factor for respondents who attend programs (Chemicals, M=4.19). The second factor that was important to attendees was learning about the programs at least one month in advance (Time, M=4.18). For respondents who do not attend programs, chemicals and time were also the factors with the highest means. However, time had a slightly higher mean (Time, M=3.70) than chemicals (Chemicals, M=3.68). For both attendees and non-attendees, the questing regarding CEU availability received the lowest means (attendees, M=3.68; non-attendees, M=3.00). These results indicate that chemical update programs are important to horticulture professionals. Timely promotion of programs dealing with pesticides, fungicides and herbicides might increase attendance levels at these programs. The results can be found in Table 4-6.

Table 4-6: Independent Samples Test: Attendees/Non-attendees

Question	N	Mean	SD	t
Chemicals				
Attend	311	4.19	.78	-4.71*
Not attend	72	3.68	.97	
Time				
Attend	314	4.18	.74	-4.51*
Not attend	74	3.70	1.05	
Employee Mgmt				
Attend	306	3.84	.90	-3.65*
Not attend	72	3.39	1.10	
Business Mgmt				
Attend	310	3.77	.96	-2.24*
Not attend	71	3.48	1.13	
CEU				
Attend	308	3.68	1.02	-4.93*
Not attend	70	3.00	1.11	

*Significant at the 0.05 level

H2: No significant difference exists for attendees and non-attendees regarding perceived level of knowledge about the Florida Cooperative Extension Service.

H3: No significant difference exists for attendees and non-attendees regarding perceived level of knowledge about the Institute of Food and Agricultural Sciences.

Two questions on the survey were designed to gather information regarding the perceived level of knowledge that respondents believe they have about the Florida Cooperative Extension Service and the Institute of Food and Agricultural Sciences. The 7-item semantic differential scale ranged from extremely low (1) to extremely high (7). Overall, the mean knowledge level for the Extension service was 5.08 with a standard deviation of 1.5 (N=396). The mean level for IFAS was 4.40 with standard deviation of 1.8 (N=393).

To analyze these hypotheses, an examination of the differences between attendees and non-attendees was conducted. An independent samples t-test revealed a significant difference in means between attendees and non attendees with regard to the perceived level of knowledge about the Extension service ($t = -8.86$; $p = .000$) and perceived level of knowledge of IFAS ($t = -5.63$; $p = .000$). The null hypotheses were rejected. Those who attended Extension programs had higher perceived knowledge levels about both the Extension service and IFAS than those who did not attend programs. This indicates that Extension programs might be successful at relaying information about other services provided by the Cooperative Extension Service, but may not be helping horticulture professionals make the connection between Extension and IFAS. The results are displayed in Table 4-7.

Table 4-7: Independent Samples Test: Knowledge/Attendance

Variable	N	Mean	SD	t
Knowledge of Extension				
Attend	316	5.40	1.2	8.86*
Not attend	79	3.87	1.9	
Knowledge of IFAS				
Attend	315	4.66	1.7	5.63*
Not attend	77	3.39	1.9	

*Significant at the 0.05 level

H4a: No relationship exists between behavioral intention of horticulture professionals to attend Extension programs and the three determinant variables: attitude, subjective norm and perceived behavioral control.

To test the hypothesis, a multiple linear regression analysis using the TPB variables in the enter method was performed. The regression was significant ($F=145.57$; $p<.001$), and the constructs of the TPB model accounted for 53% of the variance in the intent of horticulture professionals to attend programs. For all respondents, attitude, subjective norm and PBC were significant predictors of behavioral intent ($p < .05$). Attitude toward attending programs exerted the strongest influence on intent ($\beta = .578$), followed by PBC ($\beta = .155$) and then subjective norm ($\beta = .150$). The null hypothesis was rejected, and the results are presented in Table 4-8.

Table 4-8: Multiple Regression Coefficients: Entire Sample, (N=380)

Variable	B	SE B	Beta
Attitude	.693	.051	.578*
Subjective Norm	.158	.041	.150*
PBC	.206	.051	.155*

*Significant at the .05 level

H4b: No relationship exists between behavioral intention of horticulture professionals to attend Extension programs and the three determinant variables: attitude, subjective norm and perceived behavioral, controlling for attendees and non-attendees.

This data was further analyzed to determine what differences existed among attendees and non-attendees with regard to the TPB model. First, the multiple linear regression analysis was conducted for attendees only. Then, the analysis was run on non-attendees and comparisons were made between the two groups.

Controlling for attendees, the regression was significant ($F=80.43$; $p < .001$), and the model explained 44% of the variance in behavioral intent. All three constructs were significant predictors of intent at the alpha .05 level. Attitude remained the strongest predictor ($\beta = .451$), followed by PBC ($\beta = .235$) and subjective norm ($\beta = .165$). For respondents who attend programs, attitude, subjective norms and PBC all contribute to their intent to participate in Extension, with their attitudes influencing their decisions the most. The results are presented in Table 4-9.

Table 4-9: Multiple Regression Coefficients: Attendees, (N=311)

Variable	B	Std. Error B	Beta
Attitude	.573	.065	.451*
Subjective Norm	.156	.044	.165*
PBC	.277	.055	.235*

*Significant at the 0.05 level

Next, the multiple regression analysis was conducted controlling for non-attendees. The regression was significant ($F=32.39$; $p < .001$), and the model explained 60% of the total variation of behavioral intent. However, the influence of the variables changed considerably. Attitude continued to be the strongest predictor of intent ($\beta = .709$), but was followed by subjective norm ($\beta = .131$). PBC exerted a negative influence on behavioral intent ($\beta = -.029$). In addition, attitude was the only significant predictor of the behavioral intent of non-attendees to attend programs. Therefore, for respondents who do not attend programs, attitude was the primary indicator of their intent to participate in Extension. Their behavior was not affected significantly by their

surrounding social environment or their perceived levels of control regarding attendance. The negative beta on PBC indicates that more control over their attendance at Extension programs, may actually result in less intent to attend. Results are presented in Table 4-10.

Table 4-10: Multiple Regression Coefficients: Non-attendees, (N=68)

Variable	B	Std. Error B	Beta
Attitude	.773	.104	.709*
Subjective Norm	.147	.103	.131
PBC	-.044	.126	-.029

*Significant at the 0.05 level

Summary

Overall, the results indicated that learning about programs at least one month in advance and learning about the latest chemicals available in the market were two factors that might help Commercial Horticulture Extension Agents increase participation levels of horticulture professionals. In addition, paying close attention to the attitudes of these professionals is important to program planning and marketing.

CHAPTER 5 DISCUSSION

Reasons for participation and possible motivational factors were the goals of this research. The Theory of Planned Behavior was used as the theoretical framework of the study as well as the basic model for conducting the research because it has been successful at predicting behavioral intention. It is based on three main ideas, attitude toward the behavior, subjective norms (perceived social pressures) and perceived behavioral control. Generally, the behavioral intention of a person to perform an action is strengthened when all three constructs are viewed favorably. A questionnaire was created based on the constructs of the TPB model and administered to horticulture industry professionals in Florida.

Demographic information and the four hypotheses were analyzed using the Statistical Package for Social Science (SPSS). The following procedures were conducted: frequencies, cross-tabulations, Pearson product moment correlations, multiple linear regression and ANOVA. All hypotheses were tested at the alpha level of .05.

Key Findings and Implications

The overall results of the study indicated that attitudes, subjective norms and perceived behavioral control of horticulture industry professionals in Florida were positively related to intention to attend horticulture based Extension programs. Demographic information provided the profile of those professionals who do attend or do

not attend programs. Possible motivational factors for promoting future attendance of horticulture professionals were also determined from the results.

According to the results a large portion of horticulture industry professionals attend programs or at least send representatives. Over half of the respondents had average annual sales over \$500,000. Furthermore, of those who stated that they did not attend programs, one-third were in the \$500,000 and up category. A major aspect of this research was determining possible motivation factors that would help increase attendance at Extension programs. Pilot testing and anecdotal information initially revealed that horticulture professionals attend programs in order to receive CEUs for licensing and re-certification purposes. Therefore, five items were tested for importance. These five questions asked respondents if they would be more likely to attend programs if they knew they would be learning about business management techniques, receiving continuing education units (CEUs), learning about the programs one month in advance, learning about employee management techniques, and updates on latest pesticides, herbicides and fungicides. The results of this study indicated that acquiring CEUs was not as likely to attract or maintain participants as chemical updates. Learning about the program at least one month in advance was also very important to the respondents.

These findings suggest that while CEUs are important to horticulture professionals, they may not be the main influence on their attendance at programs. Chemical updates are more likely to attract and maintain participation of this population in Extension programs. Furthermore, horticulture professionals expressed a need to receive marketing or promotion materials well in advance of the programs.

Overall, a strong relationship existed between the TPB model constructs and behavioral intent to attend Extension programs. The attitude of the horticulture professionals was the strongest predictor of behavioral intent, followed by perceived behavioral control and subjective norm. This suggests that the TPB model was appropriate for use in predicting the attendance of horticulture professionals at Extension programs. Attitudes about horticulture-based Extension programs are extremely important to this group of people and, therefore, should be closely monitored by the Extension service. The horticulture professionals maintained a high level of perceived behavioral control suggesting that they believe barriers do exist regarding their attendance at programs. Social pressure from friends, family and co-workers are not viewed as important to horticulture professionals.

When the sample was separated into two groups, attendees and non-attendees, the results revealed that attitude was consistently the strongest predictor of behavioral intent. For those who do not attend programs, subjective norms followed attitude, and PBC exerted a negative influence on behavioral intent. This suggests that non-attendees have less control over their attendance at programs and, if they were to increase their perceived control, then their intent to attend programs would decrease even more. This group of professionals may be inclined to attend programs in the future, but only because they are required to do so for other reasons such as re-certification for a pesticide license. These results also suggest that attitude is a key factor for non-attendees. Therefore, it should be weighed heavily when planning future programs designed to attract this audience.

The results also indicated that perceived level of knowledge of the Florida Cooperative Extension Service and the Institute of Food and Agricultural Sciences

differed among attendees and non-attendees. Those who attend programs had higher means for both Extension and IFAS than did non-attendees. These findings suggest that by attending Extension programs, a certain amount of knowledge about the Extension Service and about IFAS is learned. Considering that the perceived knowledge level is lower for IFAS, Extension programs may be a setting for making the connection between the two and for passing on information about IFAS in general.

Limitations

The ability to generalize the findings to the entire horticulture industry in Florida is somewhat limited because of the use of a purposive sample. However, a large sample size was achieved, and testing was conducted to control for non-response error.

Conclusions and Directions for Future Research

The results of this study indicated that, while social pressure and perceived control are important to horticulture professionals, attitude is the key factor for predicting attendance. While few, if any, participation studies using the TPB exist regarding the Extension service, other studies reveal similar findings such as Norland's 1992 study of the Ohio Cooperative Extension Service. She basically concluded that attitudes drive participation levels, and the perceived image of Extension is important for promoting future attendance. Considering that attitudes are the main issue with non-attendees, a more thorough analysis of attitudes and the beliefs that create those particular attitudes among Extension clientele is needed.

Also, with regard to demographics, this study revealed that wholesale and landscape industries with average annual sales over \$500,000 are major target audiences for the Extension service in Florida. These groups were primarily interested in chemical

updates and learning about the programs in a timely manner. Furthermore, while obtaining CEUs may be important to this population, results of this particular study revealed that this was not a driving force behind participation. Past research indicates that successful program planning includes many variables such as timeliness and location, but equally important is knowing and understanding the characteristics of the audience. Therefore, a more detailed, individual analysis of each sector in the Florida horticulture industry may be useful for truly understanding and improving the program planning process.

Recommendations

Commercial Horticulture Extension agents in Florida have the difficult job of planning, promoting and implementing educational programs for a large, diverse industry. They are responsible for understanding the audience, predicting attendance and evaluating the programs in order to create an even better program. However, many times attendance at or response to the programs may not seem representative of the effort.

Several studies have shown that the higher the level of contact with the extension service and agents, the higher the satisfaction levels of the clientele. Therefore, a need may exist for the Extension service to re-determine audiences and re-evaluate the attitudes and beliefs of those audiences. Then, the goals and objectives of particular programs can be re-assessed to determine if they are meeting the needs of those target audiences. This is very similar to the idea behind the Program Life Cycle (Bowling, 2001). It is a methodology developed to help agents improve program efficiency and value to the consumer as well as to the Extension Service. The Life Cycle involves five steps: conceptualization, development, maturity, decline, and termination. In the 1st

stages, client involvement and understanding are very important. This is where a true understanding of the target audience and their needs is vital. The idea of this model is not to move past the maturity stage where the program is effective and attendance is high. Once the decline and termination stages have been entered, it is very hard to re-organize. Therefore, in the maturity stage, it is imperative to pay attention to signs of decline and attempt to offset them by redefining, redeveloping and revising the program.

Based on this research and the literature involved, the Extension service has a responsibility to its audience to provide educational programs that are timely and up-to-date. It has the responsibility of understanding the knowledge, skills and, most importantly, attitudes of the clientele in order to maintain these programs. In addition, the Extension service must do the research required for re-discovering existing audiences and exposing new ones. Then, the many valuable Extension agents can ultimately “help people help themselves.”

APPENDIX A
COVER LETTER AND QUESTIONNAIRE



UNIVERSITY OF ⁵² FLORIDA

Institute of Food and Agricultural Sciences
Environmental Horticulture
Department

Dr. Rick Schoellhorn
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PO Box 110670
Gainesville, FL 32611-0670
Phone (352) 392-1831 Ext. 364
Fax (352) 392-3870
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Dear Nursery Industry Professional,

The horticulture extension agents in your area have expressed a need to discover better ways of meeting your needs and encouraging you to participate in the many programs available. By better understanding their audience, these extension agents may be able to plan more effective programs for you.

Therefore, we are conducting a survey to determine why horticulture industry professionals decide to attend extension programs. We hope to discover how you feel about the extension service and how that affects your attendance at horticulture-based programs. Your valuable answers will help to provide guidance to extension agents when they begin the program planning process.

By taking time to fill out this survey, you are contributing to an extremely important project. One that is based on the ultimate discovery of what you want your extension service to do for you. However, your participation is voluntary, and there is no risk or direct benefit to you as a result of completing the questionnaire. You do not have to answer any question you do not wish to answer and you may quit at any time. Also, there is no compensation for participating in this study. Please understand that the number at the top of your questionnaire will only be used to check off your name when your survey is returned. Your identity will be kept confidential to the extent provided by law. If you have any questions about your rights concerning this study, please contact the UFIRB office, Box 112250, University of Florida, Gainesville, FL 32611-2250.

Please take the time to participate in this very important research. It should only take you about 10-15 minutes to complete, and we have supplied you with everything you need to return the completed survey. You have the opportunity to provide valuable input into the design of programs developed for you by the Florida Cooperative Extension Service.

If you have any questions about this research study or the survey, please contact us at 352-392-1831 ext. 364. You may also email any questions or comments to AlexisUF@ufl.edu.

Thank you very much for participating in this study.

Sincerely,

Alexis A. Richardson
Graduate Research Assistant, UF

Dr. Rick Schoellhorn
Professor and Floriculture Specialist, UF

Elizabeth A. Felter
Extension Agent, Commercial Horticulture



UNIVERSITY OF FLORIDA ⁵³

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UF/IFAS Florida Cooperative Extension Service Survey

Thank you for taking time to complete this questionnaire. Our ultimate goal is to determine better ways of meeting your needs regarding the extension service and the programs available to you. Your valuable answers will provide guidance to the extension agents and specialists when they plan programs for you.

Section 1: Please answer the following questions.

1. Do you attend Florida Cooperative Extension Service programs relating to the horticulture industry? **YES** **NO**
2. IF yes, please briefly explain why.
3. IF no, please briefly explain why not.
4. Do you normally send employees to the extension programs or do you attend the programs yourself? Please briefly explain.
5. How many extension programs relating to the horticulture industry do you attend each year? _____ **extension programs per year**

Section 2: Please indicate how strongly you agree with the following statements by circling the number that represents your answer.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6. Extension programs offer up-to-date information on the horticulture industry.....	1	2	3	4	5
7. Extension programs offer an opportunity for people in the horticulture industry to increase their knowledge of new products on the market...	1	2	3	4	5
8. Horticulture professionals <i>do not</i> benefit from participating in extension programs relating to their industry	1	2	3	4	5
9. Extension programs offer an opportunity for people in the horticulture industry to increase their knowledge of herbicides, pesticides and fungicides	1	2	3	4	5

Please Continue

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
10. Extension programs provide information about business management techniques	1	2	3	4	5
11. Extension programs offer an opportunity for people in the horticulture industry to obtain continuing education units (CEUs)	1	2	3	4	5
12. Extension programs <i>are not</i> an effective way to spread information to the horticulture industry	1	2	3	4	5
13. My <i>coworkers</i> think that I should attend extension programs relating to the horticultural industry	1	2	3	4	5
14. Other horticulture professionals in my industry encourage me to attend extension programs relating to the horticultural industry.	1	2	3	4	5
15. Generally speaking, I do what <i>other important people</i> think I should do regarding attendance at extension programs	1	2	3	4	5
16. The opinions of my coworkers are important to me.....	1	2	3	4	5
17. If I wanted to, I could attend an extension program relating to the horticultural industry.....	1	2	3	4	5
18. I prefer to make the decision regarding whether or not I attend extension programs relating to the horticulture industry	1	2	3	4	5
19. My friends and family encourage me to attend extension programs relating to the horticultural industry.	1	2	3	4	5
20. It is mostly up to me whether or not I attend extension programs relating to the horticulture industry	1	2	3	4	5
21. Generally speaking, I do what other horticulture professionals in my industry think I should do regarding attendance at extension programs	1	2	3	4	5
22. It is expected of me to attend as many extension programs as I can that are about horticultural issues	1	2	3	4	5
23. I feel in complete control over whether I attend an extension program relating to the horticultural industry	1	2	3	4	5
24. Generally speaking, I do what my <i>coworkers</i> think I should do regarding attendance at extension programs	1	2	3	4	5
25. The opinions of horticulture professionals in my industry are important to me	1	2	3	4	5

Please Continue

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
26. If I wanted to, it would be easy for me to attend extension programs relating to the horticultural industry within the next year	1	2	3	4	5
27. I have control over whether I attend an extension program relating to the horticultural industry	1	2	3	4	5
28. Learning about new products on the market is important to me	1	2	3	4	5
29. Keeping up-to-date on the horticulture industry is important to me.....	1	2	3	4	5
30. Learning about pesticides, herbicides and fungicides is important to me	1	2	3	4	5
31. Gathering new information about business management techniques is important to me	1	2	3	4	5
32. Obtaining continuing education units (CEUs) is important to me	1	2	3	4	5
33. If I knew that I could learn about business management techniques, I would be more likely to attend extension programs.....	1	2	3	4	5
34. If I knew that I could receive continuing education units (CEUs), I would be more likely to attend extension programs.....	1	2	3	4	5
35. If I knew about the extension programs at least one month in advance, I would be more likely to attend extension programs.....	1	2	3	4	5
36. If I knew that I could learn about employee management techniques, I would be more likely to attend extension programs.....	1	2	3	4	5
37. If I knew that I could learn about the latest pesticides, herbicides and fungicides being offered in the market, I would be more likely to attend.....	1	2	3	4	5
Section 3: Please indicate how likely you would be to do the following:					
38. For me to attend one extension program relating to the horticultural industry in the next year would be	1	2	3	4	5
39. For me to attend more than one extension program relating to the horticultural industry in the next year would be	1	2	3	4	5
40. I intend to attend extension programs relating to the horticultural industry within the next year.....	1	2	3	4	5
41. I will try to attend extension programs relating to the horticultural industry within the next year.....	1	2	3	4	5

Please Continue

42. I intend on becoming more aware of extension programs offered relating to my industry	1	2	3	4	5
43. I will try to utilize the services of my extension office	1	2	3	4	5
How likely would you be to attend extension programs relating to horticultural issues in the:					
44. <i>SPRING</i>	1	2	3	4	5
45. <i>SUMMER</i>	1	2	3	4	5
46. <i>FALL</i>	1	2	3	4	5
47. <i>WINTER</i>	1	2	3	4	5

Section 4: Please indicate your attitude by marking along the range of each item.

48. My attitude toward attending extension programs relating to the horticulture industry is

Favorable: _____:Unfavorable
 Useful: _____:Useless
 Good: _____:Bad
 Pleasant: _____:Unpleasant
 Reliable: _____:Unreliable
 Valuable: _____:Worthless

49. My attitude toward the Florida Cooperative Extension Service is

Favorable: _____:Unfavorable
 Useful: _____:Useless
 Good: _____:Bad
 Pleasant: _____:Unpleasant
 Reliable: _____:Unreliable
 Valuable: _____:Worthless

50. The biggest problems facing the horticulture industry are:

51. What specific topics would make you more likely to attend extension programs relating to the horticulture industry?

52. My knowledge of the Florida Cooperative Extension service is:

Extremely High: _____:Extremely Low

53. My knowledge of the Institute of Food and Agricultural Sciences (IFAS) is:

Extremely High: _____:Extremely Low

54. Please list **any** extension programs that you have been involved with (ex: 4-H, Master Gardener, etc).

Section 5: Please take a few more minutes to answer these basic demographic questions. Thank You.

55. Gender: **Male** **Female**

56. What is your position in the business?

- 1. Owner
- 2. Manager
- 3. Grower/Technician
- 4. Support Staff
- 5. Sales/Marketing
- Other (please specify)_____

57. Age of business_____

58. Number of employees in business_____

59. How many acres do you usually have in production?_____

60. Average Annual Sales (Please choose range or provide dollar amount)

- 1. \$0 - \$19,999
- 2. \$20,000 - \$49,999
- 3. \$50,000 - \$149,999
- 4. \$150,000 - \$249,999
- 5. \$250,000 - \$499,999
- 6. \$500,000+

61. Do you use any of the following production systems? (please circle your answer)

- 1. Greenhouse..... **YES** **NO**
- 2. Shade house..... **YES** **NO**
- 3. Field production **YES** **NO**
- 4. Container production **YES** **NO**

62. Business Category: (please circle the one that best describes your operation)

- 1. Wholesale production
- 2. Allied Trade
- 3. Retail Nursery
- 4. Landscape Industry
- 5. Interiorscape Industry
- 6. Other (please specify)_____

THANK YOU FOR TAKING TIME TO COMPLETE THIS IMPORTANT QUESTIONNAIRE. YOUR ANSWERS ARE EXTREMELY VALUABLE TO THE SUCCESS OF THE RESEARCH STUDY.

APPENDIX B
THEORY OF PLANNED BEHAVIOR

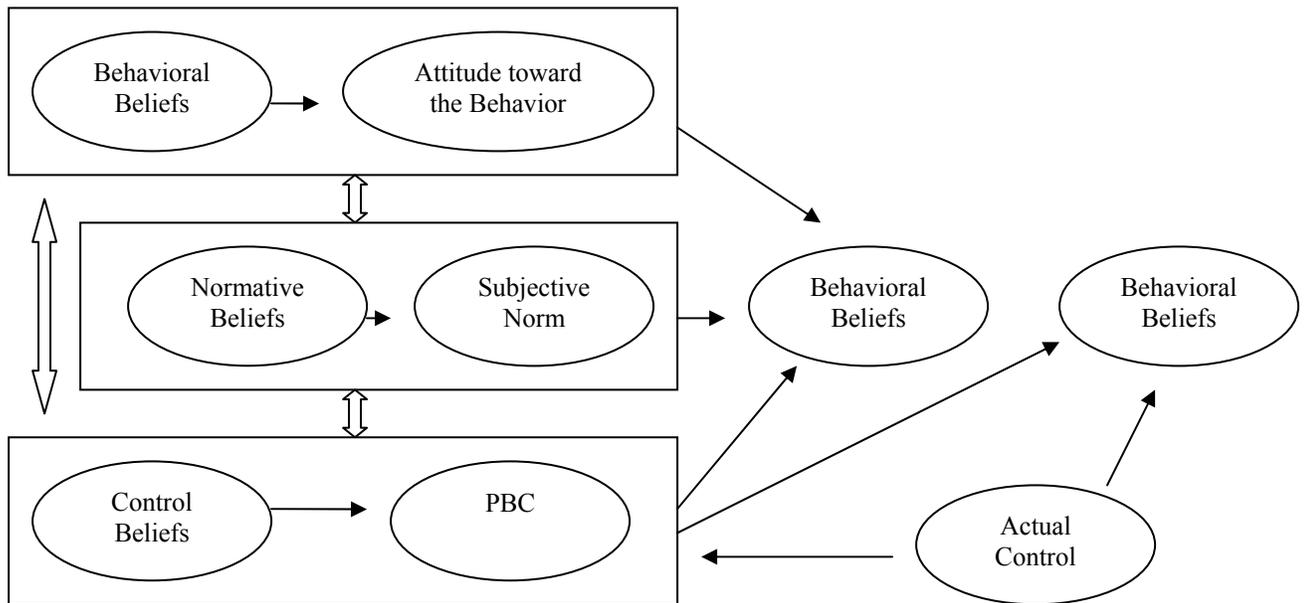


Figure B-1: Theory of Planned Behavior Model (Ajzen, 2002)

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BIOGRAPHICAL SKETCH

Alexis A. Clark-Richardson began her college education at Central Florida Community College where she received her Associate of Arts degree in 1998. She moved to Gainesville to begin her career at the University of Florida in 1999 and earned a Bachelor of Science degree in Agricultural Education and Communication in 2000. She finalized her education in 2003 with a Master of Science degree in Environmental Horticulture. Her research was based on the evaluation and marketing of Florida Cooperative Extension Service workshops and programs.

Mrs. Richardson married her husband, Steve, on May 11, 2002, and their first son is due in September 2003. They will be moving to Crystal River, Florida and pursuing careers in the Florida agriculture industry.