A RECRUITING CHALLENGE FOR EXTENSION EDUCATION: A COMPARISON OF NONPARTICIPANTS AND PARTICIPANTS IN HOMEOWNER LANDSCAPING PROGRAMS[1]

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Abstract

This study examines factors which influence homeowners' participation in a Cooperative Extension Service (CES) yard care program. A survey was administered to two groups of homeowners -- program participants and nonparticipants from the same area. Six hundred fifty-two participants who attended one of 24 CES workshops completed a survey during Spring, 2000. The comparison group, a random sample of homeowners, was selected from the list of single-family residences from the same area. A total of 462 homeowners returned usable surveys for the comparison group. The data show that some market segments were better represented among participants, including persons with a college degree, using an irrigation system, a high level of sharing information, less concern about neighborhood norms, and more frequent use of CES services, than nonparticipants. No significant bias was found for environmental behavior. The findings suggest that improved recruiting can expand CES' outreach efforts.

Introduction

Nitrate pollution of water is a significant public health threat (Follet, 1989). One potentially large source of nitrate pollution is excessive fertilizer application on residential and commercial landscapes. Many homeowners are not well informed about the environmental impact of their landscaping practices but, at the same time, place great importance on lawn appearance and, by inference, on fertilization (Salazar, 1997). Many residents who use fertilizer apply it more frequently than recommended, do not follow the manufacturer's instructions, and do not use slow-release fertilizers that minimize the potential for nitrate contamination. Nationally, Cooperative Extension spends considerable resources on programs to teach homeowners about landscaping best management practices (BMPs) in an effort to minimize the impact of these activities on environmental quality. Though evaluations document that extension programs increased use of BMPs (Israel, Easton, & Knox, 1999), an important question is whether homeowners who impact the environment most (those "at-risk") participate in these programs. If environmental education efforts attract participants who already use BMPs and fail to recruit those who don't, then coverage bias is a significant problem (Rossi, Freeman, & Lipsey, 1999). That is, resources are spent on people who don't need the educational program and opportunities to reach those that need help are missed. Furthermore, the program will be only partially successful if some segments of the intended audience participate and others are left out. Thus, the purpose of this study was to assess the extent of coverage bias resulting from typical recruitment practices for landscape maintenance education programs. Specifically, this study compares self-selected program participants with a random sample of homeowners from the same area to identify factors contributing to coverage bias.

Theoretical Framework

Few would argue that recruiting participants for environmental education programs and influencing their adoption of environmental BMPs is a complex and difficult process. Researchers working in the adoption/diffusion arena have identified many

factors that might influence this process (Hines, Hungerford, & Tomera, 1986; Nitsch, 1999; Rogers, 1995). For this study, these factors were classified as social-psychological and behavioral characteristics, demographic attributes, and residential landscape attributes. In addition, an important subset of the behaviors involves current landscape maintenance practices.

Social-psychological and Behavioral Factors

Hines et al. (1986) identified several factors affecting environmentally responsible behavior (hereafter referred to as BMPs). They focus on the notion that an individual's verbal intention to act is critical to adoption of new practices. According to Hines et al. (1986), several factors influence a person's verbal expression to act: 1) locus of control, 2) sense of personal responsibility, 3) environmental attitudes, 4) knowledge of issues, and 5) knowledge and skills of action strategies. Because recruitment is an important phase of educational programs, factors that affect adoption also will likely be important influences on recruitment. This is because participation in Extension's programs is voluntary and the decision to participate represents a behavior change in a manner similar to decisions on adopting BMPs (Hatry, 1999). Finally, household characteristics, landscape attributes, and neighborhood norms are situational factors which can constrain or facilitate program participation and subsequent use of BMPs. These variables are discussed in detail below.

Locus of control refers to a person's concept of who is in charge (Rotter, 1966). An internal locus of control is described as an individual's belief that he or she can alter situations and outcomes, while an external locus of control is defined as an individual's belief that the power to change things lies elsewhere. In the context of environmental education, beliefs about self-efficacy, that is whether an individual can carry out specific behaviors and whether those behaviors are effective in realizing specific outcomes, should be more important to decisions about participation and adoption than more generalized beliefs of control (Bandura, 1997; Smith-Sebasto, 1995). Beliefs about self-efficacy are important because few people are likely to attend environmental education programs when they can be characterized as apathetic (Bandura, 1997).

Having a strong sense of personal responsibility and pro-environment attitudes also might be sufficient to cause individuals to seek information and, subsequently, to adopt BMPs (Hines et al., 1986). On the other hand, Kronus and Van Es (1976) argue that the opposite might be true; that is, change in a person's environmental behavior causes a corresponding shift in attitudes. This may account for research showing environmental attitudes to be a weak and sporadic influence on behavior (Scott & Willits, 1994). Numerous studies have shown that environmental attitudes are often a result of acquired knowledge and correlated with a number of demographic factors (Jones & Dunlap, 1992; Jones, Fly, & Cordell, 1999; McMillan, Hoban, Clifford, & Brant, 1997; Scott & Willits, 1994).

Knowledge of issues is integral to pro-environment attitudes, but is not necessarily indicative of the adoption of environmental BMPs. Knowledge of action strategies is also essential to behavior change. Without acquiring the corresponding action skills to implement new practices, adoption of environmental BMPs is unlikely (Hines et al., 1986; Smith-Sebasto, 1995). Environmental education can be used to affect attitudes about environmental issues and increase knowledge and skills conducive to adopting BMPs. When knowledge of specific issues and skills are learned, a person's self-efficacy and beliefs about his or her ability to cause desired outcomes might be enhanced.

In addition to factors identified by Hines et al. (1986), other factors may be important to influencing participation in environmental education programs and adopting BMPs, including neighborhood norms, social networks, and prior exposure to environmental education programs. Regarding neighborhood norms, nonconforming changes of landscape design may be unacceptable to adjacent homeowners. It is not unusual for homeowners to pander to pressure regarding the appearance of their landscape (Salazar, 1997). In such situations, homeowners might not see the value of pursuing information about environmental landscaping practices and, as a consequence,

behavior change is unlikely to occur. Formal deed restrictions and covenants might have similar effects on homeowners.

An individual's current lawn practices also might influence the choice to adopt new practices. If new practices are perceived as easy to adopt without much physical effort or capital investment and they don't require a major shift in social norms, it is much more likely that the practices will be adopted (Rogers, 1995). In the case of the nitrate-relevant BMPs, each can be implemented independently of the others. In addition to specific practices, homeowners who spend time during the week to maintain their yard can be expected to attribute a higher salience for environmental education programs and, hence, to participate in such programs.

Also, some of the environmental BMP's might require a change of lawn-care service specifications for homeowners who use a lawn and landscape maintenance professionals. Professional landscape service providers are hired by many homeowners for various reasons and those who can afford the expense often choose to have a service maintain their property. Homeowners using a lawn mowing service may be disengaged from landscaping activities and, hence, from participation in environmental education programs.

In addition, homeowners who develop relationships with friends and neighbors can share more information about landscape maintenance. These social networks provide a setting for testing ideas (e.g., a BMP's ease of use and consistency with neighborhood norms) and facilitating adoption decisions (Rogers, 1995). People with more active social networks also are likely to be participants in education programs.

Finally, homeowners who had participated in prior environmental educational programs, specifically Extension's, are more likely to participate. Extension's clienteles have reported high satisfaction levels and are likely to continue their patronage (Israel & Fugate, 1998).

Demographic Factors

The groups to which people belong, location in the life cycle, and other factors comprise some of the situational influences on recruitment and adoption processes. A person's educational attainment, for example, can have a significant influence on attitudes and proclivity to adopt environmental BMPs (Arcury & Christianson, 1993; Dietz, Stern, & Guagano, 1998; Jones & Dunlap, 1992; Jones et al., 1999; McMillan et al., 1997; Scott & Willits, 1994). Education influences other variables as well, such as income and wealth, information seeking behavior, attitudes, and action strategies. Though people with higher educational levels often hold more positive attitudes toward the environment, it does not necessarily lead to use of sustainable practices (Scott & Willits, 1994). Knowledge of issues, action strategies, and implementation skills may need to accompany education for adoption of BMPs to occur.

Though younger persons tend to have pro-environment attitudes and behaviors (Dietz et al., 1998; Jones & Dunlap, 1992; Jones et al., 1999; McMillan et al., 1997), many also may have less time and resources to participate in environmental education programs or to implement BMPs. Environmental education programs might be a lower priority for younger persons who have families with children or two-worker households. This would not be the case for retirees.

While strong relationships between women and pro-environment attitudes and behavior have not been found, there is evidence of gender-based differences in evolving roles concerning environmental stewardship (Dietz et al., 1998; Jones et al., 1999; McMillan et al., 1997; Scott & Willits, 1994). Likewise, there is some evidence of race-based differences on environmental attitudes and behaviors, with whites exhibiting greater environmentalism (Dietz et al., 1998; Jones et al., 1999; McMillan et al., 1997). These differences also may influence participation.

Given Florida's mobile population, length of residence might be an important factor for participation. Jones et al. (1999) found that in-migrants to southeastern Appalachia expressed pro-environment attitudes and used environmental behaviors more than did natives of the area. Likewise, short-term residents might be more receptive to information about environmental BMPs during the initial adjustment period after moving to the state than longer-term residents.

Finally, political party affiliation can

distinguish between people who are concerned about the environment and those who are not. Jones and Dunlap (1992) found Democrats had higher levels of environmental concern than Republicans. A similar relationship may exist for participation in environmental education programs.

Residential Landscape Factors

Though an earlier study found that residential landscape factors have little influence on adopting BMPs (Israel et al., 1999), homeowners living in single-family houses might be more likely to participate in environmental landscaping programs than those living in mobile homes, condos, or other structures. In the case of the latter, the landscape may be either owned or maintained by a homeowners association and thereby inhibit an individual's ability to enact environmental BMPs. This might cause these homeowners to feel powerless and discourage participation in environmental education programs.

By offering a convenient, labor-saving means for maintaining a landscape, permanent irrigation systems can have offsetting effects. Automated irrigation systems may be installed because the homeowner has little interest in landscaping and wishes to minimize his or her labor. On the other hand, homeowners who want to have an aesthetically attractive landscape may install an irrigation system to help maintain a high quality lawn. If more homeowners have irrigation systems for the latter reason than for the former, then irrigation systems might be associated with participation in Extension programs and adoption of BMPs.

Purpose and Objectives

Using the theoretical framework above, this study assessed the extent of coverage bias resulting from typical recruitment practices for landscape maintenance education programs. By comparing self-selected program participants with a random sample of homeowners from the same area, factors contributing to coverage bias were identified. The objectives were to:

1. Determine the net contribution of demographic and residential landscape attributes to self-selection,
2. Determine the net contribution of social-psychological and behavioral characteristics to self-selection, and
3. Determine the net contribution of landscape maintenance practices to self-selection.

Methods and Procedures

Based on the theoretical framework, the researchers developed a questionnaire to evaluate which factors influence homeowners' participation in extension's Florida Yards and Neighborhoods (FYN) program and to obtain baseline data for a follow-up study. The survey was reviewed by professional peers and pilot tested on a small number of homeowners. After further revision, the survey was administered to two groups -- FYN participants in two counties and a random sample of homeowners from the same area. Program attendees were given surveys to fill out after having completed an FYN workshop at one of 24 sites during Spring, 2000, and 652 usable surveys were obtained in this manner (a completion rate of 65%). Of the participants who did not complete a survey, some were members of the same household as a respondent. Names and addresses also were obtained from 369 FYN participants at 10 sites. At the other 14 locations, information from secondary sources could not be linked with the survey data.

For the comparison group, a stratified random sample of homeowners was selected from the list of single-family residences provided by the respective county property appraiser's office. Nearly 1,000 homeowners were selected in proportion to the number of residences in each of the two counties (out of a population of approximately 200,000 residences). Using a multi-wave method for mail surveys (Dillman, 2000), 887 homeowners were contacted and 462 returned usable surveys (a completion rate of 52%). The market value of houses owned by these respondents was compared with the entire sampling frame to assess non-response bias. The average market values were $95,123 and $95,119, respectively, which indicates that the obtained sample was not biased on this attribute. The survey data for participants and the comparison group were supplemented by

voter registration data from the Florida Department of State and residential market value from county property appraisers.

Measures

A dichotomous dependent variable denotes the two groups of interest-participants in extension's FYN program and a comparison sample of homeowners. To distinguish group membership, a set of independent variables was used.

Demographic and Landscape Attributes

The respondent's level of education (some high school or less, high school grad or GED, some college, bachelor's degree, post graduate degree), gender, race-ethnicity (white, non-Hispanic and non-white/Hispanic), age, market value of the home, voter's registration status, political party affiliation (Democrat, Republican, and other), and the number of years lived in Florida were included. Respondents without a matching voter registration record were assumed to be unregistered.

Landscape attributes included residential type (single-family house and mobile home/condo/other) and presence of a permanent irrigation system. Because neighborhoods volunteered for the FYN program, the effect of residential type on participation might be confounded by other unmeasured variables. Caution should be used for interpreting the parameter estimate for this variable. Parameter estimates for other variables are unaffected.

Behavioral and Social-psychological Attributes

The data included the 12-item New Environmental Paradigm (NEP) index developed by Dunlap and Van Liere (1978) as a measure of environmental attitudes. Previous studies have established the reliability of the NEP index (Kuhn & Jackson, 1989; Noe & Snow, 1982; McMillan et al., 1997; Scott & Willits, 1994). Another six indexes using five-point Likert-type items were developed specifically for this study. The indexes included: knowledge of issues ("I am concerned about fertilizer's potential to pollute drinking water" and "I think that fertilizer used on lawns and landscape plants is a major source of nitrate pollution"); knowledge and skills of action strategies ("I read newspaper and magazine articles on proper techniques of caring for my yard," "I know how to accurately calibrate a fertilizer spreader," "I know the amount of square feet of lawn in my yard," and "When you need information about your landscape, who helps you determine what, if anything, to do?...Extension Service agent, Master Gardener, or Extension Service Publications"); self-efficacy ("My accomplishments in maintaining my yard are due to hard work and skill," "I can learn almost anything about yard maintenance if I set my mind to it," and "I usually don't make plans for my yard because I have a hard time following through on them" (reverse coded)); and an individual's sense of personal responsibility ("I believe that I must do my part to protect the environment" and "When I learn that something I do harms the environment, I feel a responsibility to change it"). The above indexes were calculated as means (the sum of the item scores was divided by the number of items in the index). A 4-item Likert-type scale was also used to assess homeowner's perceived networking with friends and neighbors for sharing information. The items asked about how often the respondent talked to friends and neighbors about lawn and landscape maintenance, how much he or she shared information, how many did the respondent talk to about yard maintenance, and how often he or she was a source of advice. An index measuring sensitivity to neighborhood norms included three items, "I feel responsible for making sure that my landscape looks its best," "I think its important for everyone in my neighborhood to keep their yard mowed and trimmed," and "I don't worry about what my neighbors think about how my yard looks" (reverse coded).

Reliability for each index was assessed using Chronbach's α and principal components analysis (Carmines & Zeller, 1979). All six indexes were unidimensional, every item had a factor loading of .5 or higher, and most exceeded criteria for capturing 50% of the variance. The 1-factor model captured 73% of the variance for the knowledge of issues index ($\alpha = .634$); 40% for knowledge and skills of action strategies ($\alpha = .487$); 53% for self-efficacy ($\alpha = .523$); 77%

for personal responsibility (α = .706); 73% for networking with friends and neighbors and sharing information (α = .874); and 48% for neighborhood norms (α = .390). Though some indexes had undesirable levels of measurement error, their theoretical importance warranted using them on an exploratory basis.

Two landscape maintenance behaviors: using a lawn mowing service and the number of hours per week spent on lawn and landscape care (0 hrs., 1-5 hrs., 6-10 hrs., 11-15 hrs., and over 15 hrs) were included. Finally, prior use of Extension was measured as the number of times during the last 12 months that a respondent had attended a program or visited the office for landscaping information (excluding the FYN workshop).

Current Practices

Seven BMPs were identified that can limit nitrate contamination of water: 1) always apply nitrogen fertilizers at the rate of one pound per thousand square feet; 2) apply nitrogen fertilizers twice a year or less; 3) always use slow release nitrogen fertilizers; 4) usually leave grass clippings on yard to recycle nutrients; 5) use iron-sulfate to "green-up" yard in the summer instead of a complete fertilizer; 6) always set mower blade heights to cut top one third of grass; and 7) do not fertilize established trees all the time. Each BMP was coded as used or not.

Analysis

Logistic regression was used to estimate the effects of demographic, landscape, behavioral, social-psychological variables, as well as currently used BMPs on the dichotomous dependent variable, participant/nonparticipant. A significant parameter estimate means that the predictor variable affected the probability of participating in the FYN program. Because item nonresponse was considerable for some variables, a series of models using blocks of variables (demographic and landscape attributes, behavioral and social-psychological attributes, and current practices) was estimated using SAS' logistic regression procedure (SAS Institute, 1996). After incorporating indicator variables for missing data, models combining the blocks of variables were estimated. SAS' Proc Logistic estimates parameters which are interpreted differently than the typical regression coefficient. For example, the coefficient for age is -.035 in the reduced model and it indicates that the probability being in the comparison sample (coded as 0) decreased with age relative to the participant group (coded as 1).

Findings

Bivariate associations show that participants differed from the comparison group on many of the demographic and landscape attributes (Table 1). Extension participants were more likely to have a permanent irrigation system than the comparison sample. Also, participants were better educated, more likely to be female, white, affiliated with the Republican Party, and having lived in Florida fewer years. Several of the behavioral and social-psychological measures also differed for the two groups, with program participants being more likely than the comparison group to have obtained information from Extension in the past year, have knowledge about the issue, action strategies knowledge and skills, and networking for sharing information. Program participants displayed more self-efficacy than the comparison group. Both program participants and the homeowner comparison sample had a mean environmental attitude (NEP) index similar to that reported by McMillan et al. (1997). Extension participants also were more likely to work more hours in the yard than the comparison sample. Finally, participants were more likely to leave grass clippings on the lawn while more of the comparison group reported refraining from fertilizing established trees all of the time.

The combined effects of demographic and landscape attributes, behavioral and social-psychological attributes, and current practices were estimated (Table 2). The demographic and landscape attributes make the strongest contributions for distinguishing Extension participants and the homeowner comparison sample. Residence type, presence of a permanent irrigation system, hours per week spent on yard work, years of education, age, years lived in Florida, gender, and race-ethnicity remained significant factors. For

example, homeowners who had a college degree were more likely, by 10.8%, to participate than those with a high school diploma or less. Though the influence of level of education and years lived in Florida is consistent with Jones et al. (1999) study, it was not the case for gender. Women were more numerous among program participants, which may reflect an unmeasured dimension of pro-environment attitudes (McMillan et al., 1997). Voter status, party affiliation, and the property value did not differentiate the two groups in the initial block model, so these were not included in the full and reduced models (data not shown).

Networking and information sharing was significant after controlling for the demographic and landscape attributes, with a one-unit increase in the index predicting a 9.1% gain in participation. The interaction between previous use of Extension and neighborhood norms was significant in the block model (data not shown) but was no so in the full model in Table 2. The main effects,

Table 1
Percentages and Means for Variables Used in the Analysis by Group

Variable	------- Statistics for ------- Extension	Comparison	
Demographic and landscape attributes			
Residence type (% single family)	83.0	95.4	.000
Permanent irrigation system present (%)	75.4	58.4	.000
Educational attainment (% post grad)	20.6	14.3	.000
Gender (% male)	46.7	61.2	.000
Race-ethnicity (% white, non-Hispanic)	92.1	80.0	.000
Age (mean)	56.0	53.4	.429
Years lived in Florida (mean)	19.1	27.0	.000
Voting status (% registered)	79.2	81.1	.475
Political party affiliation (% Democrat)	24.5	34.4	.038
Market value of property (mean in $000)	92.9	95.2	.558
Behavioral and social-psychological attributes			
Uses lawn mowing service (%)	29.6	24.5	.058
Respondent works in yard (6-10 hours) (%)	22.3	10.4	.000
Number of contacts with Extension in past year	.989	.168	.006
Environmental attitudes (NEP) index (mean)	3.95	3.83	.005
Networking and information sharing index (mean)	3.32	2.80	.000
Action strategies knowledge and skills index (mean)	2.52	2.14	.000
Issues knowledge index (mean)	4.01	3.86	.002
Neighborhood norms index (mean)	4.11	4.14	.521
Self-efficacy index (mean)	4.01	3.90	.023
Personal responsibility index (mean)	4.69	4.64	.148
Current practices (BMPs)			
Lawn fertilized two times or less last year (%)	70.9	71.4	.836
Apply nitrogen fertilizers at the rate of one pound per thousand square feet, all of the time (%)	1.2	.4	.166
Use iron-sulfate to Agreen-up@ yard in the summer instead of a complete fertilizer (%)	24.7	19.9	.122
Use slow release nitrogen fertilizers, all of the time (%)	21.4	18.0	.250
Do not fertilize established trees, all of the time (%)	30.2	38.6	.000
Leave grass clippings on yard, most of the time (%)	71.5	65.4	.032
Set mower blade heights to cut top one third of grass, all of the time (%)	47.2	45.8	.660

Table 2
Participation Regressed on Demographic, Behavioral, and Social-psychological Attributes, and Use of BMPs

Variable	Full Model[a]		Reduced Model[b]		Predicted Probability for Participating
	Parameter Estimate	Significance Level	Parameter Estimate	Significance Level	
Intercept	-6.417	.013	-7.687	.000	
Residence type (single family)	-.860	.015	-.866	.013	-20.4%
Permanent irrigation system present	.567	.003	.575	.002	14.0%
Age (years)	-.037	.000	-.035	.000	-.87%
Years lived in Florida	.032	.000	.033	.000	.82%
Gender (male)	-1.007	.000	-.959	.000	-22.3%
Race-ethnicity (white, non-Hispanic)	1.172	.000	1.221	.000	27.7%
Attained some college education	.689	.005	.619	.010	11.5%
Attained college degree	.779	.003	.648	.010	10.8%
Attained graduate degree	1.190	.000	1.088	.000	24.8%
Use a lawn mowing service	-.146	.493			
Respondent works 1-5 hours/week in yard	1.044	.009	1.160	.002	26.1%
Respondent works 6+ hours/week in yard	1.687	.000	1.792	.000	41.4%
Number of contacts with Extension in past year	.350	.542	-.319	.005	7.9%
Knowledge and skills of action strategies index	-.087	.460			
Networking and information sharing index	-.347	.000	-.368	.000	9.1%
Neighborhood norms index	.032	.018	.298	.018	-7.4%
Use Extension x Neighborhood norms interaction	-.156	.268			
Do not fertilize established trees, all of the time	-.049	.621			
(Missing data for do not fertilize established trees)	.049	.821			
Leave grass clippings on yard most of the time	-.146	.431			
(Missing data for leaving grass clippings on yard)	-.446	.585			

[a]Full model Chi-square = 259.872, prob. = .000, n = 824, -2 Log Likelihood for the intercept only = 1127.578
[b]Reduced model Chi-square = 261.744, prob. = .000, n = 838, -2 Log Likelihood for the intercept only = 1146.158

however, were significant, as shown the reduced model. Using Extension during the previous year increased the likelihood of participation in the FYN program by 7.9% while placing importance on neighborhood norms reduced the likelihood of participation by 7.4% for each unit increase in the norms index. Though knowledge and skills about action strategies and using a lawn mowing service were significant predictors in one of the initial block models, neither was after controlling for demographic characteristics in the full model (Table 2). Knowledge of the issue, environmental attitudes, a sense of personal responsibility, and self-efficacy were not significantly different between Extension participants and the homeowner comparison sample in the initial block model and were not included in subsequent models.

Finally, there was no apparent difference in the use of lawn care BMPs between Extension participants and the comparison sample after controlling for other factors. The differences observed in the bivariate associations reflect biases in the self-selection process by which homeowners with a set of demographic and landscape attributes and, concurrently, a set of pro-environment landscaping BMPs are pre-disposed to participate in Extension programs.

Conclusions

This study assessed the extent coverage bias resulting from typical recruitment practices for landscape maintenance education programs by comparing self-selected program participants with homeowners from the same area. By using a representative sample of homeowners as the standard for comparison, the data indicate that some market segments were positively disposed to participate in FYN programs. Demographic and landscape attributes accounted for most of the factors influencing self-selection, with participants disproportionately recruited from homeowners who were better educated, older, female, had lived in Florida fewer years, and had a permanent irrigation system. Several behavioral and socio-psychological factors also had a net effect, including homeowners who spent several hours per week on yard work, had used Extension during the past year, networked with friends and neighbors to share information, and showed less concern for neighborhood norms than nonparticipants.

There was no evidence, however, that FYN participants substantially differ at program entry from nonparticipants on use of environmental BMPs after controlling for other factors. Thus, participants were equally "at-risk" as nonparticipants for impacting the environment. None of the variables suggested by the Hines et al. (1986) framework for environmentally responsible behavior affected participation in FYN programs, net of other factors. Variables in the environmentally responsible behavior model might, however, play a larger role in subsequent adoption decisions.

Implications and Recommendations

The results suggest ways that improved recruitment efforts could reduce coverage bias resulting from self-selection. These efforts should include both program- and organizational-level strategies aimed at expanding outreach to under-represented segments of the target audience. At the program level, program staff and confederates should try to take advantage of existing interpersonal networks. Since FYN participants were "active networkers," explicitly asking participants to tell about or providing leaflets to hand out to friends and neighbors might recruit more homeowners who may be less active information seekers. Personalized approaches, such as word of mouth or personal invitation by mail or telephone, are effective ways to recruit (Duncan & Marotz-Baden, 1999).

Recruitment also can be expanded by using multiple communication channels to deliver promotional messages and educational information. Because most people, even those who are less active information seekers, use multiple communication channels (Duncan & Marotz-Baden, 1999; Israel, 1991), opportunities for recruitment and education are increased when integrated methods are used (Shepard, 1999). This implies that recruitment efforts should include times and locations where a broad cross-section of homeowners can be reached -- where they work, play, and obtain goods and services (Duncan & Marotz-Baden, 1999; Hobbs, 1999). For example, promotional materials

with a "healthy yard and personal health" theme could be placed in doctors' offices. Such efforts help to ensure that access and transportation are not barriers to receiving promotional messages about the program.

Since sensitivity to neighborhood norms reduced participation in the FYN program, one strategy to combat this could include activities which offer attractive alternatives to traditionally landscaped yards. This can be done through demonstration landscapes at parks or mobile exhibits which visit neighborhoods to recruit homeowners who may not have felt that he or she had a feasible alternative. Also, Extension might target local groups whose members are less sensitive to the pressure of neighborhood norms. Members of environmental groups, for example, may place less value on neighborhood norms if recruitment messages emphasize environmental benefits.

This study showed that previous use of Extension landscaping information increased the likelihood of participation in the FYN program and is likely due to the experience being a positive one. This implies that the positive experience of participants involved in other Extension programs such as nutrition and health, parenting, or community development can serve as a basis for recruitment to the FYN program. While the FYN program might be less salient to clients enrolled in other programs, Extension professionals can draw on satisfaction with other programs to recruit new clients for the FYN program.

At the organizational level, Extension might improve existing partnerships or strategically develop new ones. Given the large number of actors involved in environmental education, opportunities to coordinate efforts to increase program coverage abound. For example, a close working relationship has been established between the Tampa Water Authority and the county Extension office to conduct environmental education programs. Such partnerships can build a bridge to link Extension with people who have not previously been involved in its programs.

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