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ABSTRACT

HOW SENSE OF COMMUNITY RELATES TO RECYCLING PARTICIPATION

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This study examines sense of community and its relationship to recycling participation. Three hypotheses were tested: 1) sense of community is positively related to recycling participation; 2) demographic factors (income, homeownership, education) are positively related to recycling participation; and, 3) sense of community predicts recycling better than demographic factors. Four hundred forty one residents from 36 street neighborhoods in Lansing, Michigan, were interviewed using a questionnaire that consisted of demographic questions and 17 Likert-type items reflecting four sense of community indicators (Belonging, Empowerment, Connection, and Support). Multiple regression analyses and partial correlation statistics indicated that only sense of community predicted recycling participation. Neighborhood development through physical planning, social policies, and partnerships for promoting sense of community and increasing recycling at the street neighborhood level are recommended.

DEDICATION

To my wonderful family,
Danny and Katrina

"*Gather the pieces that are left over. Let nothing be wasted.*"
(John 6:12, The Holy Bible, NIV)

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TABLE OF CONTENTS

LIST OF TABLES viii

LIST OF FIGURES ix

CHAPTER I: THE RESEARCH PROBLEM 1

Introduction 1
Problem Statement 4
Objectives of the Study 5
Relevance of the Study 5
Research Questions 6
Hypotheses of the Study 6

CHAPTER II: LITERATURE REVIEW 8

Determinants of Recycling Behavior 8
- Extrinsic Incentives 9
- Intrinsic Incentives 12
- Internal Facilitators 12
- External Facilitators 13
- Demographic Factors 14
- Summary of the Determinants of Recycling Participation 15

Concepts Related to Sense of Community 16
- Environmental Altruism and Social Influence 16
- Behavior Modeling and Imitation 18
- Environmental Collective Action 18

The Sense of Community Construct 19
- Definition 19
- Prior Studies on Sense of Community 19
- Benefits of Sense of Community 22

CHAPTER III: RESEARCH DESIGN AND METHODOLOGY 23

Research Design 23
- Hypotheses and Definition of Key Variables 24
  - Recycling Participation 25
  - The Hypotheses 25

Methodology 34
- Sample Selection 34

Validity and Reliability of the Instrument 40
Recruiting and Training of Interviewers 40
Conducting Structured Interview 41
Collecting the Actual Recycling Participation Data 41
Data Analysis 41

CHAPTER IV: RESULTS AND DISCUSSION 43

Results 43
Characteristics of the Street Neighborhood 43
Actual Recycling Participation 45
Results of the Statistical Tests 45
Hypothesis 1 45
Hypothesis 2 49
Hypothesis 3 52
Discussion 57
Demographic Factors and Recycling Participation 57
Sense of Community and Recycling Participation 64
Recommendations for Promoting Sense of Community 66
Neighborhood Development through Physical Planning 66
Social Policy and Neighborhood Development 67
Partnerships in Community Development 69

CHAPTER V: SUMMARY AND CONCLUSION 72

Summary and Conclusion 72
Limitations of the Study 74
Recommendations for Future Research 74

APPENDIX A 76

REFERENCES 80

LIST OF TABLES

Table		Page
1	Characteristics of the sample	44
2	Bivariate correlation coefficients between sense of community, safety, and recycling participation	47
3	Regression of sense of community and safety on recycling participation	50
4	Bivariate correlation coefficients of demographic factors as related to recycling participation	51
5	Regression of demographic factors on recycling participation	53
6	Regression of all independent variables on recycling participation	54
7	Partial correlation coefficients of demographic factors and recycling participation controlling for sense of community and safety	56
8	Partial correlation coefficients of sense of community, demographic factors, and recycling participation controlling for safety	56
9	Partial correlation coefficients of demographic factors, safety, and recycling participation controlling for sense of community	56
10	Partial correlation coefficients of sense of community, safety, and recycling participation controlling for demographic factors	56

LIST OF FIGURES

Figure Page

1 Hypothetical relationship between predictor variables and recycling participation 33

2 A street neighborhood 35

3 Normal P-P plot of regression standardized residual 48

4 Empirical relationship between predictor variables and recycling participation 58

CHAPTER I

THE RESEARCH PROBLEM

Introduction

In the last few decades, the increasing solid waste problem has become one of the major issues that confront communities, policy makers, and environmental groups. Americans generate about 160 million tons of solid waste each year (Forester, 1988) and this amount continues to rise 3%-4% per year (Jacobs, Bailey, & Crews, 1984). In 1990, Americans generated more than 195 million tons of municipal waste, up from 151 million tons in 1980 (Environmental Protection Agency, 1992). The Environmental Protection Agency reported that many garbage landfills in the United States have closed because they are filled to capacity or due to their inability to meet new Subtitle D[1] regulations, and other new landfill sites are nearly impossible to identify. With landfill sites filling up, ecological concerns rising, and municipalities under pressure to find solutions, strategies to reduce the amount of solid waste are being sought.

Potential solutions to the waste problem include: (a) reduce the amount of waste initially generated; and (b) increase recycling (Porter, Leeming, & Dwyer, 1995). The strategy of increasing recycling as a way to manage solid waste, particularly household waste, has been explored and documented. The literature indicates that recycling is considered a very effective solution to the nation's garbage problem because it reduces the

[1] See Solid Waste Act. Section II Subtitle D of Pub. L. 94-580. Oct. 21, 1976. 90 Stat. 2795.

amount of waste going to disposal and saves our natural resources (Hornik, Cherian, Madansky, & Narayana, 1995). As an example, consider the savings generated by every ton of paper made from recycled material as compared to using virgin materials: the processing generates 60 less pounds of air pollution; 17 trees are not cut for pulp; three cubic yards of landfill space is not used; 4,200 kilowatt-hours of energy are saved, which is enough to power an average home for six months; and 7,000 gallons of water are conserved (Cravers, 1988). Thus, the basic argument for recycling is quite compelling. Also, recycling has good potential for success because it is endorsed by a large majority of people (Belsie, 1990). However, talking about recycling and engaging in recycling behavior are two different things. What people say and what people do, do not always correspond (Shrum, Lowrey, & McCarty, 1995).

Several polls conducted in the 1990s indicated that Americans are "green" (Shrum et al., 1995). Also, Dunlap and Scarce (1991) and Hastak, Horst, and Mazis (1994) as cited in Shrum et al. (1995), indicated that the trend in recent years has been one of increasing support for environmental protection. A number of indicators provide converging results: The incidence of people citing environmental protection as the most important issue has recently risen; environmental problems are increasingly viewed as threats to quality of life; support for government action has increased; and, the perception of the seriousness of environmentally related problems has risen (Shrum et al., 1995). Environmental issues are gaining attention at the local level as well. For example, during the Fall Semester 1996 Resource Fair at Michigan State University, the staff from the Student Life Department organized a Best Idea/Resource contest. MSU Recycling was

voted the best idea or resource among the campus wide resources presented in the fair. Given these findings, it appears that people are pro-environment and may behave accordingly. However, social marketers (i.e., people attempting to increase acceptance of environmental programs requiring voluntary behavior) and traditional marketers (i.e., people selling products by emphasizing pro-environmental attributes) point to the fact that, poll results aside, both voluntary compliance and purchase of green products are decidedly less than impressive (Shrum et al., 1995). The waste generation in America still continues to increase notwithstanding the growing body of scholarly literature on developing and encouraging people to recycle.

One area in recycling studies that is not yet adequately documented is the role of the "sense of community" in facilitating recycling participation. McMillan and Chavis (1986), define sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met by their commitment to be together" (p. 11). Prior studies about the sense of community have been related to positive social outcomes, such as neighboring and community participation (Chavis & Wandersman, 1990; Unger & Wandersman, 1982, 1985). It has also been related to crime prevention, drug abuse prevention, and mental health (Chavis & Wandersman, 1990). Moreover, it is believed that most of the critical problems in our society result from the weakening of the social infrastructure, or the sense of community. Yankelovich (1981), found that:

> in 1973, roughly one-third of Americans felt an intense need to compensate for the impersonal and threatening aspects of modern life by seeking mutual identification with others, on the basis of a sense of belonging together (p.91).

Problem Statement

The implications of the sense of community construct to citizen participation and related community development efforts indicated by different authors provided the impetus for designing this study. This study explores the relationship between sense of community and recycling participation in the context of thirty six (36) street neighborhoods in Lansing, Michigan.

Most of the studies done on recycling focus on ways of increasing participation by examining people's motivations (intrinsic and extrinsic) for recycling. Several studies have been conducted on specific demographic factors as well as the effects of educational programs on recycling and other resource conservation behavior. Hopper and Nielsen (1991) indicate that research on recycling has been dominated by applied behavior analysis and had been motivated largely by the practical desire to expand recycling participation. Very few studies focus on the effect of social interaction on recycling behavior and no study links sense of community to recycling participation. Social psychologists have rarely studied the direct effects or interaction effects of social structure and social context on recycling and other pro-environment behavior (Derksen & Gartrell, 1993).

Some concepts in the recycling literature that touch on aspects of sense of community include environmental collective action or ECA (Everett and Peirce, 1992), environmental altruism (De Young, 1986, Hopper and Nielsen, 1991, Hornik et al., 1995, Vining et al., 1992), social influence, and behavior modeling or imitation (Hornik et al., 1995; Oskamp et al., 1991; Vining et al., 1992).

Objectives of the Study

The primary purpose of this study is to develop better understanding of recycling behavior in the context of thirty six (36) street neighborhood communities situated within the boundaries of the City of Lansing, Michigan. More specifically, the objectives of this study are:

- To understand the relationship between sense of community and recycling participation;
- To identify the relationship between demographic factors (i.e., income, home ownership, education) and recycling participation; and
- To discuss implications of this study in promoting recycling and other forms of civic behavior.

Relevance of the Study

The importance of this study is twofold. First, it offers a potential contribution to the theoretical knowledge-base concerning recycling participation. As noted, there is inadequate information about how "sense of community" relates to recycling participation. Second, knowing the relationship between the "sense of community" and recycling behavior of residents in a locale will allow program planners and implementers to design interventions that will enhance recycling participation, especially in areas that have low participation rates. This study will also provide information about how to enhance residents' collective action and participation in community activities.

The primary beneficiary of this study will be the Lansing Operations and Maintenance, Office of Recycling and Composting. This office has noted a drop in

recycling participation of about 10% since its curbside recycling program began in November, 1991. The coordinator of the Office of Recycling and Composting has expressed interest in using the results of this study for the future citywide recycling program planning and implementation efforts.

The significance of this study goes beyond the scope of increasing recycling participation. The results can be used by policy makers and scholars in developing interventions that enhance development, support and promotion of other pro-environmental behavior.

Research Questions

The study of recycling behavior is a very broad and complex subject-matter. In order to focus the scope of this study, three questions will be addressed.

- Is there a positive relationship between sense of community and recycling participation?
- What is the relationship between demographic factors (homeownership, income, and education of residents) and recycling participation?
- How well does sense of community predict recycling participation compared to demographic variables?

Hypotheses of the Study

Three general hypotheses were derived for this study:

- Sense of community is positively related to recycling participation.
- Demographic factors (income, home ownership, and education) are positively related to recycling participation; and

- Sense of community predicts recycling participation better than the demographic factors.

CHAPTER II

LITERATURE REVIEW

This chapter provides a review of the recycling studies that have been conducted in the last few decades. Studies that examine strategies to increase recycling were identified, and the lack of studies linking sense of community to recycling participation is noted. Based on this review, a conceptual framework denoting the relationship of sense of community to recycling behavior is developed.

Determinants of Recycling Behavior

In the last few decades, several major research areas in recycling studies have evolved. Tasaday (1991) indicated that recycling behavior has been extensively researched; over 400 articles about waste disposal have been published during the last two decades. Recycling has been researched from several points of view ranging from economics, sociology, psychology, engineering, law, communication, and social marketing, among other disciplines. Each discipline and its subdisciplines look at the influence of different variables on recycling. Porter et al. (1995) and Hornik et al. (1995) conducted comprehensive summaries of recycling studies conducted in the last two decades or so. Porter et al. (1995) examined studies that employed behavioral interventions in increasing recycling, while Hornik et al. (1995) identified five broad classifications of determinants of recycling behavior including: 1) external incentives,

2) internal incentives, 3) internal facilitators, 4) external facilitators, and 5) demographic factors.

Hornik et al. (1995) indicated that understanding and motivating people to engage in recycling behavior was marked by two major phases. The initial phase, spanning a period from about 1970 to about 1982, emphasized external incentives such as monetary rewards and sought to profile the recycler on several demographic characteristics. This phase led to one widespread view that external incentives, by themselves, can initiate and sustain recycling behavior (Geller, Winnett, & Everett, 1982). Hornik et al. (1995) further classified the five determinants of recycling behavior into incentives that are a) altruistic - internal incentives that depend on altruism, and b) utilitarian - external incentives that depend on utilitarianism. They emphasized that the effects of altruistic variables endure longer than the effects of utilitarian variables. Altruistic behaviors are believed to be sustained indefinitely by the individual, while utilitarian behaviors can only be sustained by something outside the individual. The effectiveness of external/utilitarian incentives decreases far more rapidly than that of internal/altruistic incentives (Hornik et al., 1995).

The five determinants of recycling behavior are described below.

Extrinsic incentives

This strategy makes use of external motivations for promoting recycling. Porter et al. (1995) reviewed behavioral programs that have been used to increase recycling in the last 25 years. They found 27 published articles that focused specifically on the behavioral-intervention approach to promote recycling. The behavioral-intervention approach focuses on measuring the effects of manipulations of specific to promote recycling.

Interventions designed to alter behavior were identified and conceptualized in terms of a) antecedent strategies (occur before the target behavior), and b) consequence strategies (occur after the target behavior).

Porter et al. (1995) classified studies that examined prompts (written or verbal), environmental alteration, commitment, and goal setting as antecedent strategies to promote recycling. Consequence strategies used to promote recycling included feedback, rewards, and penalty for not recycling.

Porter et al. (1995) found some consistent findings in this review of behavioral programs. All of the behavioral intervention approaches and strategies (antecedent and consequence) employed in the different studies reported at least some success in increasing recycling. With the antecedents, verbal prompts by block leaders reliably resulted in more recycling than prompts delivered in a written format. Written commitment strategies also were more successful at increasing recycling than were verbal commitments. Providing additional recycling containers as an environmental-alteration technique always increased initial recycling levels. Finally, giving a goal to groups for the amount of recycling desired also increased recycling above pre-treatment levels.

The review of consequence interventions also allowed some general conclusions. Feedback increased recycling behavior, as indicated in one experiment that used it as a main intervention. However, Hamad, Cooper, Bettinger, & Semb (1980-1981) indicated that feedback was not as effective as goal setting. The studies employing rewards produced large increases in recycling, especially when lotteries were used to reward individuals. Other contingencies rewarding recyclers with immediate, smaller rewards or

group rewards were somewhat less effective. Finally, a penalty-based study provided strong evidence that the reality of an economic loss increased recycling of wastes.

Despite these positive findings, several methodological problems were found. Porter et al. (1995) noted that few studies were designed to compare intervention techniques. The authors also noted that the apparent effectiveness of techniques was influenced by the dependent variable measured, with the strongest effects found when the percentage of subjects participating in the recycling program was used. Weaker effects were observed when the measure was of absolute amount of material recycled. In some cases no effects have been found on this measure despite substantial changes in participation rates (e.g., Jacobs and Bailey, 1983). Strong effects have also been reported by the few investigators who relied on self-reports rather than directly measuring recycling behavior. With the tendency of self-reported recycling information to be upward biased, these effects could be highly questionable.

Porter et al. (1995) and Dwyer, Leeming, Cobern, Porter & Jackson (1993), noted that a major concern with the behavioral approach to improve recycling and pro-environmental behavior in general, is the lack of evidence for long-term effects. Among the studies reviewed, only one study by Levitt and Leventhal (1986) reported maintenance of increased participation in recycling extending to one year. This finding was not surprising at all considering that the intervention under study involved penalty for not recycling: the "bottle law." Penalty based strategy for sustaining recycling participation appeared to be effective.

The lack of long term effects of behavioral interventions provided the impetus for looking into other external and internal incentives for recycling, such as social and psychological motivators (Hornik et al., 1995).

Hornik et al. (1995) have identified social influence as another external incentive or motivator for recycling. This influence may be defined as a person's concern about how relevant others, such as family and friends, would react to seeing the person not recycling (Vining & Ebreo, 1990). Social influence is also described as the presence or absence of social support for recycling within one's household or community.

Intrinsic Incentives

Hornik et al. (1995) identified empirical studies that employed psychological scales to relate some of the individual's intrinsic motivations to recycling. The intrinsic motivations they cited include locus of control, personal satisfaction in avoiding wastes and being more self-sufficient, general satisfaction from participating in a program where one's actions seem to help the community and the nation, and the gratification of conserving natural resources. De Young (1986b) found that internal incentives such as feeling good about doing something good for the community and environment significantly influenced recycling. Similarly, Oskamp et al. (1991) showed that internal incentives such as satisfaction with conservation and frugality in consumption strongly influence recycling.

Internal Facilitators

Internal facilitators were identified as cognitive variables which enable an individual to recycle. Examples include awareness of the importance of recycling and

knowledge about recycling programs. Several environmentalists indicated that consumer ignorance, misunderstanding, and confusion about recycling are internal barriers hindering recycling behavior (Hornik et al., 1995). Another internal barrier develops when one portrays recycling as primitive, time-consuming, and inconvenient. When viewed in this manner, recycling seems improper in a technologically advanced society (Hornik et al., 1995).

External Facilitators

Hornik et al. (1995) indicated that providing incentives to recycle may not be enough. Recycling, which is a behavior that requires individual resources (time, space, money, and effort), implies that external facilitators must outweigh the disincentives to recycle. Time, money, space, and effort can be external barriers to recycling. If the external barriers are higher than the incentive to recycle (external or internal incentive), engaging in consistent recycling may be unlikely. An example of external facilitators of recycling are the convenience and user-friendliness of recycling program.

According to several researchers, making recycling more convenient and easier to perform, thereby reduced the response cost of recycling (Porter et al., 1995). Altering the environment was found to increase recycling. Examples of such techniques included adding more recycling containers to a particular area (i.e., increasing the proximity of containers to potential recyclers), providing containers to people participating in a curbside recycling program (i.e., making separation of recyclables from household wastes easier), and changing the day of curbside pickup to coincide with the regular trash pickup (i.e., making it easier for residents to assemble wastes for collection).

Demographic Factors

Demographic factors are the most commonly investigated predictors in recycling (Hornik et al., 1995). Education, youth, and ownership of a single home are often thought to correlate strongly with the propensity to recycle. Specific socioeconomic characteristics are found to associate positively with recycling participation. In particular, Peters (1973) as cited in McGuire (1984), determined that recycling behavior was a direct function of income and education. He found that the higher the income and the more years of education, the greater the likelihood of an individuals participation in recycling programs.

In a more recent study, Katzev, Blake, & Messer (1993) found that the level of tenant participation in multi-family recycling program was positively associated with income, education, and some other motivational factors. Van Liere and Dunlap (1980) and Vining and Ebreo (1990) have also documented a positive relationship between conservation behavior, including recycling, and both income and education. These authors argue that upper income individuals have higher levels of consumption, and therefore have more materials to recycle than lower income individuals. With respect to education, their findings supported the notion that individuals with more schooling have read more about environmental issues, including recycling, and as a result are more likely to recycle their solid waste materials than less-informed individuals. In a similar study, Oskamp et al. (1991) found that recyclers had significantly higher family income than non-recyclers, were more likely to live in a single-family house, and were more likely to own their home.

Summary of the Determinants of Recycling Participation

Hornik et al. (1995) subjected these five clusters of variables (extrinsic incentives, intrinsic incentives, internal facilitators, external facilitators, and demographic factors) to meta-analysis (Hunter-Schmidt technique[2]), with all these five clustered variables used as independent variables, and "propensity to recycle" used as the dependent variable. Results indicated that the strongest predictors of recycling were internal facilitators, specifically, consumer knowledge. This result indicated that propensity to recycle was quite strongly related to variables like level of consumer awareness or knowledge of recycling programs.

The second strongest predictors were external incentives, in particular, monetary rewards and social influence. This finding indicated that social influence (support among friends, neighbors, and family members) influences recycling. The third most predictive set of variables were internal incentives; specifically, satisfaction derived from recycling, locus of control, and ecological concern. Thus, those residents who felt that their actions could effect real change (i. e., those people with strong internal locus of control) were more likely to recycle than those individuals who felt that their actions could not effect real change (i.e., those people with a strong external locus of control). The external facilitators and demographic variables were found to have weak relationships with the criterion (propensity to recycle) variable.

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[2] According to Hornik et al. (1995), the Hunter-Schmidt technique is a method of meta-analysis which is based on correlations. This procedure allows the identification of those variables which have been found by the research to be associated with the study domain. The method also permits the determination of the relative strengths of the correlations; it is common practice not to simply average a correlation across studies but to weight it by the sample sizes of each study (Hunter & Schmidt, 1990, as cited in Hornik et al, 1995). Further, the technique suggests way to critically evaluate moderator variables; potential moderators are used to split the study into subsets, and the mean correlation within each of these subsets are calculated.

To summarize, Hornik et al. (1995) indicated that the most striking findings of the meta-analysis for the 67 studies reviewed were the strong relationships of knowledge and perceived social influence on one's propensity to recycle. While monetary incentives seemed to work well in encouraging recycling behavior, there were a number of other factors that appeared to initiate and sustain recycling, including perceived satisfaction, commitment, and locus of control. An empirically derived model based on these findings was proposed by Hornik et al. (1995).

Concepts Related to Sense of Community

The two comprehensive reviews of the literature on recycling studies showed a lack of research conducted about sense of community on recycling participation. The concepts that conceptually relate to the study of sense of community are: a)environmental altruism (De Young, 1986a; Hopper and Nielsen, 1991; Vining et al., 1992; and Hornik et al., 1995), b) environmental collective action or ECA (Everett & Peirce, 1992); c) social influence and behavior modeling or imitation (Hornik et al., 1995; Oskamp et al., 1991; Vining et al., 1992). These concepts were used in the present study as the basal information for the proposed relationship between sense of community and recycling participation.

Environmental Altruism and Social Influence

Hopper and Nielsen (1991) examined the extent to which recycling can be conceptualized as an altruistic behavior. By definition, altruistic behavior is a normative behavior, and norms are developed through social interaction (p. 202). Altruism is the unselfish concern for the welfare of others; acting in the best interest of the general society

regardless of personal costs (De Young, 1986a; p.398). Based upon the Schwartz Model of Altruism[3], Hopper and Nielsen explored social processes that were considered to influence altruistic behavior. In their study, block leaders were introduced as social interventions specifically to promote recycling participation. One of the tasks of the block leaders was to promote personal interaction among residents in their assigned blocks. The object of this interaction was to promote normative processes, as suggested by the altruism model. Results indicated that block leaders did have an impact on norms. Beyond that, they had a marked impact on behavior compared to the other experimental interventions used in the study. The authors maintained that it was possible that block leaders influenced behavior directly, without changing attitudes, through a process of behavioral modeling and imitation. Hopper and Nielsen also cited several pro-ecology behaviors that have been conceptualized as altruism during the past 15 years. Energy conservation, littering, and purchasing lead-free gasoline have all been shown to conform to a social-psychological model of altruistic behavior.

Vining et al. (1992) also found altruism to be the most important motive for recycling during their comparison of four community solid waste management programs. Further, environmental altruism was the only category of motivation that was consistently endorsed by the research participants and was active in all four communities studied.

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[3] The Schwartz Model of Altruism indicates that the process begins with social norms regarding moral behavior which people generally agree upon in a sort of abstract and detached way. These norms represent the values and attitude of significant others; we expect others to act in the morally proper way, and they in turn expect the same of us. By themselves, however, these norms are far too general and detached to govern behavior. Instead, the social norms are adopted by each of us on a personal level, and hence become personal norms. Personal norms derived from socially shared norms, are distinct from personal norms because the consequences of violating or upholding them are tied to one's self-concept. To violate a personal norm engenders guilt, and to uphold a personal norm engenders pride. In short, social norms exist on the social structural level, whereas personal norms are strongly internalized moral attitudes (Hiberlein, 1975b; Schwartz & Howard, 1980 as cited in Hopper and Nielsen, 1991).

These authors also mentioned the importance of social pressure, or in a more positive sense, social facilitation, as an effective approach for promoting recycling. The perception of social pressure to recycle, from family, neighbors, and friends, can result from an individual's concern for family members' or neighbors' perceptions about their behavior. Social facilitation may occur when friends or families encourage a particular behavior. Conversely, lack of support from members of one's household may increase pressure not to perform conservation behaviors (Vining et al., 1992). The notion of social facilitation closely parallels the essence of the Schwartz Model of Altruism.

Behavior Modeling and Imitation

Behavior modeling as a social facilitation strategy was also found to be a strong predictor in recycling participation in the study conducted by Oskamp et al (1991). They found that having friends and neighbors who recycle was the second strongest predictor in recycling participation after convenience. They concluded that peer participation and modeling are important determinants of recycling behavior.

Environmental Collective Action

Everett and Peirce (1992) introduced the notion of environmental collective action or ECA. They maintain that environmental collective actions (ECAs) attempt to motivate individuals to reduce pollution, an internally produced collective bad (p. 68). Examples of ECAs include programs for litter prevention, energy conservation, and recycling. Everett and Peirce surveyed block leaders, and found that block participation in the recycling program was associated with higher "social tie density" (a measure of how well block residents know each other). Also, a more comprehensive strategy of data collection by

conducting face to face interviews and a survey of actual recycling participation is employed. Everett and Peirce concluded that: "A more detailed study, in which block members or the residents are questioned, and with measurement of actual participation rates, should provide significant additional information (p. 81)."

These findings suggest the relevance of examining social processes, specifically sense of community and its potential relationship to recycling participation. The following section explains sense of community and its potential link to recycling participation.

The Sense of Community Construct

Definition

Sense of community is a term that has been used most frequently in studies that address social and psychological aspects of community and community life. In the past decades, several scholars have explored valid ways of defining, operationalizing, and measuring sense of community. Efratt (1974) described this construct as "communityness" while others use sense of community interchangeably with the constructs: neighborhood attachment, community solidarity, belongingness, and neighborliness (McMillan & Chavis, 1986).

Prior Studies on Sense of Community

Riger and Lavrakas (1981) studied sense of community as reflected in neighborhood attachment and found two empirically distinct but correlated factors which they called, social attachment and behavioral rootedness. The social attachment factor contained items concerning the ability to identify neighbors, feeling part of the neighborhood, and the number of neighborhood children known to the respondent.

Behavioral rootedness referred to years of community residency, whether one's home is owned or rented, and expected length of residency. Using these factors, the authors identified four "meaningful" and distinct groups of citizens: young mobiles (low bonded, low rooted); young participants (high bonded, low rooted); isolates (low bonded, high rooted) and established participants (high bonded, high rooted). This study showed that social attachment and behavioral rootedness are variables that promote community attachment and development of a sense of community among residents.

Ahlbrandt and Cunningham (1979) studied sense of community in the context of the neighborhood. They viewed sense of community as an integral contributor to one's commitment to, and satisfaction with a neighborhood. They found that those residents who were most committed and satisfied saw their neighborhood as a small community nested in a city, were more loyal to the neighborhood than to the rest of the city, and thought of their neighborhood as offering particular activities for its residents. These characteristics represent the authors' conceptualization of sense of community. Social fabric was also considered to be a contributor to commitment to, and satisfaction with the neighborhood. The authors used this term to capture the strengths of interpersonal relationships as measured through different types of neighbor interactions.

Bachrach and Zautra (1985) studied the coping response to a proposed hazardous waste facility in a rural community. They found that a stronger sense of community led to problem-focused coping behaviors - behaviors that attempt directly to alter or counter the threat. A path analytic model showed that problem-focused coping contributed strongly to the level of one's community involvement (i.e., reading reports, attending meetings,

signing petitions), and the authors concluded that stronger sense of community led to a "greater sense of purpose and perceived control" in dealing with an external threat. These authors used a sense of community scale based on scales developed in previous studies (e.g., Kasarda & Janowitz, 1974; Rhoads, 1982). Five items were included in this measure: a) feeling at home in the community, b) feeling of belonging in the community, c) interest in what goes on in the community, d) feeling an important part of the community, and e) attachment to the community. The scale was internally consistent (alpha = .76).

McMillan and Chavis (1986) proposed a definition and theory of sense of community. These authors defined sense of community as a "feeling that members of a group have a sense of both belonging and being important to each other, and a shared faith that members' needs will be meet by their commitment to be together" (p.11). A unique aspect of this definition centers on the integration of ideas surrounding the definition of community as a "territory" and "relationship." They identified four elements in their definition which include: 1) membership - a feeling of belonging or of sharing a sense of personal relatedness, 2) influence - a sense of mattering, of making a difference to a group and the group mattering to its members, 3) reinforcement - integration and fulfillment of needs, a feeling that members' needs will be met by the resources received through their membership in the group, and 4) shared emotional connection - the commitment and belief that members have shared and will share history, common places, time together, and similar experiences.

Benefits of Sense of Community

The "sense of community" concept has been explored more specifically in studies concerning civic activities such as voting and participation in community development efforts, crime prevention and drug abuse prevention, mental health (Chavis & Wandersman, 1990), urban and regional planning (Cochrun, 1994), and toxic exposure and related environmental issues (Bachrach & Zautra, 1985; Edelstein, 1987). These authors found that one benefit of "sense of community" includes promoting collective action for the mutual benefit of group members. Sense of community is a vital construct that has practical implications transcending community-problem-solving-capability or empowerment, crime prevention and general health of communities.

The basic argument surrounding sense of community is its practical application in community and people development. Dockeki (1983) cited the implications of sense of community in public policy formulation and has proposed that public policy should be modeled around the values of human development and community. A clear and empirically validated understanding of sense of community can provide the foundation for lawmakers and planners to develop programs that meet their stated goals by strengthening and preserving community (Chavis and McMillan, 1986). And, promoting sense of community among residents can be a step in enhancing collective action such as recycling and other forms of civic behavior. By promoting sense of community, these stated goals for human and community development can be achieved.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

This chapter provides an outline of how this study was conducted. Based on correlational research design, variables for this study were identified and sample selection was undertaken. Consequently, data gathering was employed to obtain information. These activities and the actual process of the field work will be discussed in this chapter.

Research Design

The literature base on the study of recycling participation indicated a wide use of correlational research design. Correlational research design is most often used in exploratory studies, in examining relationships between recycling and variables describing psychological aspects of recycling such as attitudes, motivations, values, knowledge, satisfaction derived from recycling, and a host of demographic variables (Leeming, Porter, & Cobern, 1993).

This study uses the correlational type of research design. The main reason for choosing this design is that this study is intended to generate explanations of the relationship between recycling participation and sense of community rather than to establish causation. An advantage of the correlation design is that it allows for analyzing relationships among a large number of variables. In analyzing recycling behavior, particularly participation, a number of factors have to be examined. In the same manner, understanding and measuring the sense of community among residents in a locale also

requires extensive examination of a number of predictor variables. Another significant advantage of this research design is its ability to provide information on the degree of relationship between variables being investigated.

In this correlational research design, individual interviews were aggregated in order to obtain data at the street neighborhood level. The correlational design of this study consisted of the following procedures:

- Formulating the hypotheses
- Identifying samples and/or selecting the communities.
- Conducting structured interviews and collecting data on recycling participation
- Applying appropriate statistical tests to the data to obtain possible correlational patterns
- Interpreting results and identifying relationships among the variables.

Hypotheses and Operational Definition of Key Variables

Three general hypotheses are tested in this study. First, sense of community is positively related to recycling participation. Second, demographic factors (income, home ownership, and education) are positively related to recycling participation. And third, sense of community predicts recycling participation better than the demographic factors. Figure 1 illustrates the hypothesized relationship between these sets of variables.

It is essential that key variables in this study are defined. The following sections will define recycling participation, describe the measures used, and, list the hypotheses with the relevant variables.

Recycling participation

Recycling participation was operationalized as the voluntary participation of residents in the curbside recycling program, a program administered by the City of Lansing, Office of Recycling and Composting. Actual recycling participation was observed for six consecutive weeks, or six curbside recycling days, from April 1 to May 15, 1996. Observers recorded whether residents have their filled recycling bins in front of their houses or not during these scheduled curbside recycling days.[1] The rate of recycling participation was determined using the expression:

$$\text{recycling participation rate (\%)} = \frac{\text{total number of bins}}{\text{total number of households (6)}} \times 100$$

Wherein, the rate of the actual recycling participation at the street neighborhood level is equal to the total number of bins observed during the six consecutive recycling days for a particular street neighborhood, divided by the total number of houses on the street times six. The quotient is converted to percentage form by multiplying it by 100.

The Hypotheses

Hypothesis 1. There is a positive relationship between sense of community and recycling participation.

The literature on recycling participation does not mention any study conducted about sense of community. However, environmental collective action or ECA (Everett & Peirce, 1992), behavioral modeling and imitation, environmental altruism, and social influence(De Young, 1986a; Hopper & Nielsen, 1991; Hornik et al., 1995; Vining et al.,

[1] A score of 1 means "yes bin" for a particular household that had a filled recycling bin in front of the house and a score of 0 means "no bin" was observed.

1992) are concepts found in recycling studies that seem to touch on some aspects of the sense of community construct. More specifically, these concepts focus on the essence and effects of social processes which were found to promote recycling behavior. These concepts laid the foundation for the hypothesized relationship between sense of community and recycling participation.

In this study, sense of community was operationalized using the theoretical model proposed by McMillan and Chavis (1986). Four subscales, consisting a total of 17 Likert type items, were hypothesized to comprise sense of community, including Belonging, Support, Connection, and Empowerment. All items measuring the four subscales were designed with the intention of aggregating the responses at the street neighborhood level. Though scale reliability analysis indicated that each subscale yielded individually satisfactory scales, Principal Components factor analysis indicated that these subscales also fit together well into one large factor. Thus, a sense of community measure (SOC Index) at the street neighborhood level was created by first taking the mean of the values for all 17 items across individual respondents, and then, across street neighborhoods. The sense of community measure (SOC Index) consisted of the following Likert type items with responses ranging from strongly disagree (1) to strongly agree (5):

Belonging

People on this street neighborhood feel like a family.

Residents are committed to the street neighborhood's future.

People on this street neighborhood feel they belong here.

People on this street neighborhood like living here.

Connection

People on this street neighborhood know each other.

People on this street neighborhood participate in social activities (e.g., pot lucks, group garage sales, etc.).

People on this street neighborhood like each other.

People on this street neighborhood feel isolated from each other.

Support

On this street neighborhood people talk to each other about community problems.

People on this street neighborhood feel comfortable borrowing and lending things from each other.

People on this street neighborhood watch out for each other.

People on this street neighborhood comfort each other in times of need.

People on this street neighborhood give rides to each other if needed.

Empowerment

Residents on this street neighborhood are able to resolve conflict when it arises.

People on this street neighborhood influence each others' behavior.

People get things done to improve the street neighborhood.

People on this street neighborhood have a voice regarding important community issues.

Safety

A variable, feeling of safety in the street neighborhood, is included in the hypothesized relationship between sense of community and recycling participation. In theory, a feeling of safety partly accounts for the sense of community that exists among

residents in a particular locale. Wilson (1975) argued that the presence of crime in a neighborhood not only affects individuals directly through an increase in fears about their safety, but also indirectly by reducing their interaction with one another. This indirect effect seriously impedes the development and/or maintenance of community at the local level. Fear about safety in a neighborhood creates distrust among residents, which consequently hinders them from building social support networks. Social support networks facilitate collective efforts in addressing safety problems within that neighborhood. And the lack of it in a neighborhood prevents the development of sense of community among neighbors affecting not just satisfaction with their neighborhood but their overall life satisfaction as well (O'Brien and Ayidiya, 1991).

Fear of safety has also made an impact on one's propensity to engage in behaviors that are deemed beneficial to him/herself and the community. For example, The New York Times (September, 1995) and Editor and Publisher (January, 1995) magazines have indicated the increasing trend of a new breed of urban thief in the city of New York and other big cities across America. Stealing recyclable materials, especially newspaper and other items made of newsprint has devastated not just curbside recyclers and other civic organizations administering voluntary drop-off recycling programs but municipal officials as well. Newspaper "poachers" are especially prevalent in neighborhoods that have high recycling rates[2]. While measures to address this problem are being undertaken by city officials and several concerned groups from those cities, the propensity to continuously

[2] Also called "scavengers" - people who take recyclable materials before city trucks do, then sells the materials to recycling processors that would have otherwise been bought from the city. This act amounts to outright theft from taxpayers.

engage in recycling is affected, especially for those residents in areas where this type of crime has taken place.

For this study, safety is used as an independent variable and is operationalized as two Likert-type statements. These items included:

It is fairly safe to walk on this street neighborhood at night.

People on this street neighborhood feel that it is a safe place to live.

Hypothesis 2. Demographic factors (home ownership, income, and education) are positively associated with recycling participation. That is, the higher the level of income, education, and number of home owners in a street neighborhood, the higher is the recycling participation.

The conventional idea that specific socioeconomic characteristics are directly linked to recycling participation is empirically supported by several studies. In particular, Peters (1973) determined that recycling behavior was a direct function of income and education. He found that the higher the income and the more years of education, the greater the likelihood of participation in recycling programs. McGuire (1984) indicated that studies by Cummings (1975) in Staten Island, New York, by Tobias (1977) and the League of Women Voters (1977) in Tucson, Arizona, and by Statistical Services Incorporated (1979) in Seattle, Washington, have confirmed this conclusion. Van Liere and Dunlap (1980), Vining and Ebreo (1990), Oskamp et al. (1991), and Katzev et al. (1993) are some of the more recent studies indicating a positive relationship between the specified demographic factors and recycling participation.

The present study uses the street neighborhood level demographic factors, which sets the difference between the previous studies conducted by the different authors mentioned above. Responses to the specific demographic questions were aggregated at the street neighborhood level. Homeownership was determined by asking whether the respondent owns or rents the house that he/she is living in. The rate of homeownership at the street neighborhood level was then computed.

Income was determined by asking the respondent to identify the financial condition of the people living in the street neighborhood. Five categories were provided as response options:

1. Poor/low income
2. Middle income on the lower side
3. Middle income
4. Middle income on the higher side
5. Well-off

An average income level at the street neighborhood level was computed for all street neighborhoods.

Education was determined by asking the respondent to indicate the educational attainment of all adults in the household. Then, an average household educational level also computed for all street neighborhoods.

Hypothesis 3. Sense of community predicts recycling participation better than the demographic variables.

The wealth of information about resource conservation, specifically recycling, is impressive. Researchers have found that many existing strategies to increase recycling do not promote long-term behavioral change (Samdahl & Robertson, 1989; Vining & Ebreo, 1990). So that,studies attempting to identify workable and sustainable strategies to promote recycling and other resource conservation approaches continue to grow.

Sense of community can be a sustainable strategy in increasing recycling and other pro-environment behavior. As noted, the benefits of sense of community transcends merely promoting collective action. It empowers both the individual to improve the group, and the group to make changes (Chavis & Wandersman, 1990). In the context of neighborhoods, sense of community allows people to address problems within their locality and to make changes that improve the quality of life for residents, improve the quality of the physical environment, enhance services, prevent crime, and improve social conditions (Chavis & Wandersman, 1990). It can lead to physical improvement of a neighborhood, which increases residential satisfaction and informal social control, and as a result aids in crime prevention (Chavis & Wandersman, 1990). The underlying importance of sense of community is its connection to altruistic behavior and/or civic responsibility, which has also been found to relate to recycling participation (Hopper & Nielsen, 1991). In addition, behaviors based on altruism are believed to be sustained indefinitely by the individual unlike those behaviors motivated by external incentives (Hornik et al., 1995).

The promotion of sense of community appears to be an appropriate and sustainable strategy for increasing participation at the street neighborhood level.

Geller (1995) stated:

> That people are needed, people who have an attitude to actively care for the environment is the best long term approach in resource conservation. People who actively care enough to emit other-directed (or altruistic) behaviors for environmental protection (p.184).

Geller proposed a multifactor model to predict the propensity of an individual to care actively for the environment or for another person. These factors included: self-esteem, belongingness, self-efficacy, personal control, and optimism. Geller (1995) further indicated that the more positive and long term approaches for changing human behavior and attitudes for environmental protection are only feasible for large-scale application if increasing numbers of people actively care enough to implement these techniques. It is each individual in concert with millions of other individuals who have to ameliorate environmental problems, and who must recognize that they are, as individuals, responsible for the development and existence of present and emerging environmental problems (Fridgen, 1994). The promotion of social interaction and other processes, and more specifically, sense of community, to increase recycling participation and other pro-environment behavior appears to be a sustainable and long-term approach to resource conservation. An established and strong sense of community can be a potential strategy for increasing and sustaining recycling participation.

A hypothetical model of the relationship between the predictor variables (demographic factors, sense of community, safety) and recycling participation is shown in Figure 1.

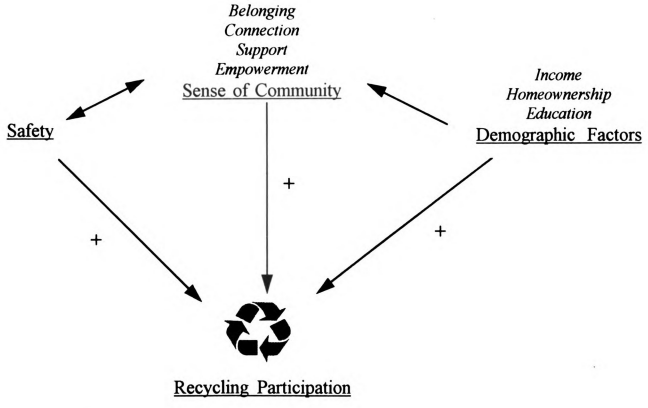

Figure 1. Hypothetical Relationship Between Predictor Variables and Recycling Participation.

Methodology

This section describes the process by which the information for this study were generated. This process involved identification of the samples of the study and the actual collection of the information needed from the samples identified.

Sample Selection

The "Community"

Before selecting the sample for this study, it was important to define the "community" in terms that the researchers and potential subjects of the research could relate to. Definition of community has been sought in a number of disciplines. Much has been said about what constitutes and what does not constitute "community." According to Hillery (1955), of the 93 definitions of community that he examined from the urban and rural sociology and anthropology disciplines, 73 indicated "area" as the major defining characteristic of a community. And after area, the two most commonly included in definition of community were common ties and social interaction (Hillery, 1955; p.118). For this study, a physical or geographic definition of community is used, specifically "street neighborhood" (Lorimer and Myfanwy, 1971)or "neighborhood street communities" (Efratt, 1974).

"Street neighborhood" is defined as the area of a residential street bounded by two cross streets (Figure 2). A "street neighborhood" characterizes a level of spatial area that is one unit larger than the household. Residents of the street neighborhood have more opportunities for neighboring to take place than residents of a larger neighborhood unit.

Figure 2. A Street Neighborhood

For example, residents maybe more likely to borrow and lend things, help each other in emergency situations, and pursue other forms of social interactions, which may facilitate connection and a greater sense of community (Lorimer & Myfanwy, 1971; McMillan & Chavis, 1986; Philiber, 1976). Also, social influence is more likely to be stronger among neighbors in closer proximity. People feel pressure both from other individuals and from their community to confirm with certain social standards or norms to fulfill their needs for consensual validation (McMillan & Chavis, 1986).

Street neighborhoods in Lansing, Michigan, were selected for this study using the following criteria:

- Residential neighborhoods

Street neighborhoods needed to be primarily residential areas. A geographic boundary (either a dead end or cross streets) identified the ends of a street neighborhood. Some street neighborhoods are part of neighborhood associations, have community police officer assigned to the area, or have existing neighborhood watch organizations. All of the street neighborhoods selected were located within the City of Lansing boundaries.

- Geographic locations and mean housing value.

A map provided by the Lansing Neighborhood Council facilitated the selection of street neighborhoods from the different parts of Lansing. 1993 census statistics were used to identify street neighborhoods with varied mean housing values, which is an approximation for socio-economic status.

The Research Participant

The research participant needed to be 18 years of age or older living in a house in a street neighborhood selected to be part of the study. He/she must have: a) lived in the street neighborhood for at least a month, b) willing to participate in the interview, and c) knowledgeable of the social and physical characteristics of the street neighborhood.

Data Collection

Two phases of data collection were conducted for this study: a) a household survey for examining the sense of community, and b) an observation of actual recycling participation at the street neighborhood level. The following sections will describe the processes by which the data collection for sense of community and recycling participation was conducted.

The Survey Instrument for Sense of Community

The Sense of Community project in Michigan State University's Urban Affairs Programs, in which the author was directly involved, administered the sense of community survey in Lansing street neighborhoods. The questionnaire was developed based on the results of conceptual and empirical studies of sense of community found in the existing literature, focus group sessions with Lansing Neighborhood Organization representatives, and an exploratory sense of community study at University Apartments complexes at Michigan State University.

The sense of community questionnaire consisted of Likert-type statements reflecting the residents' feelings of safety, belonging, empowerment, connection, and support toward their particular street neighborhood. Demographic questions were also

included in this questionnaire. From this questionnaire, seventeen (17) Likert-type items and some questions about demographic characteristics were extracted and analyzed for this study (Appendix A).

Pretesting the Instrument

Pretesting was conducted to detect weaknesses of the instrument. One of the objectives of pretesting was to modify and improve the instrument so that valid and reliable information could be obtained. Further, it provided the investigator/s relevant feedback and more effective ideas and approaches which were otherwise unforeseen.

Hill Street was the community selected for the pretesting of the final draft of the instrument. Five graduate students and a professor from Urban Affairs, in teams of two, conducted interviews with a household member from each of the 8 households in the street. Each of the interviews lasted an average of 25 minutes. At the end of the pretesting session, a staff meeting was conducted to discuss experiences and generate suggestions to improve the instrument. The pretest set out to answer and explain the following questions:

- Were the instructions or opening statements clearly understood by the interviewee?
- Was the organization of the questionnaire adequate so that the flow of the interview was smooth?
- Was the instrument so lengthy that respondents found it boring?
- Were there redundant statements or questions?
- Were there particular questions that respondents had a hard time understanding/answering?

- Was it hard for the interviewer to explain questions?
- Were there large numbers of "I don't know" or "Neutral" responses?
- What was the overall impression of the interviewer regarding the instrument?

After conducting the pretest, the research team reviewed every question contained in the instrument. Several changes were made. These included:

- Re-organizing the layout of the instrument, such that the question about the respondent's length of residency was asked at the very beginning before the Likert-type items. This aided in determining the respondent's knowledge about the street neighborhood and his/her willingness to continue with the interview.
- Some questions were eliminated because they were found to be redundant. Also, a few were added, along with open-ended questions to clarify responses that seemed to need further elaboration and explanation.

Some suggestions from the members of the research team were implemented which included a) developing a similar form of introduction that interviewers should follow in conducting the interview, b) providing the respondent a copy of the scale which he/she used in responding to the Likert-type items, and c) creating a flyer to be posted or distributed to every household in the street neighborhood prior to the actual request for interviews. This strategy was believed to promote awareness of the survey and the study in general, and reduce residents' feeling of intrusion from people not from their neighborhood. It was also believed that this strategy could promote higher participation in the survey.

Validity and Reliability of the Instrument

Parts of the instrument were based on previous research investigations and were validated by respective investigators as found in the literature review. The items were carefully studied to determine whether they were applicable to the communities in Lansing. Reliability analysis was conducted on all items and scales in the instrument.

Recruiting and Training of Interviewers

Paid interviewers were recruited by word-of-mouth. Team members of the research project identified and recruited potential interviewers. Interviewers were encouraged to attend staff meetings to learn about the overall concept of the project. Subsequently, one-on-one training for each of the interviewers was conducted by the graduate students who were members of the research project, to ensure that a) a description of the research study and objectives were understood, b) the instrument was clear and information that was hoped to be generated from each question were discussed, c) guidelines for the interview process were clear and understood, and d) interviewers knew who was supervising them and monitoring their needs. The training also included an interview process at the street neighborhood, wherein the graduate student conducting the training was to model the process to the interviewer who was being trained. The interviewer being trained was then allowed to conduct a formal interview under the supervision of a graduate student. Feedback and ways to improve the process were discussed after the training. Only when the interviewers indicated confidence in doing the process by themselves were they allowed to conduct interviews without graduate student supervision.

Conducting Structured Interviews

Trained interviewers, most of whom were Psychology major undergraduate students with prior interviewing experience, conducted the face-to-face interviews. Prior to conducting the survey, flyers were distributed to each household, informing residents of the study, its purpose, and the benefits of participating in the study. At least three attempts were made by the interviewer to contact potential respondents in each household on the street neighborhoods that they were assigned. Vacant houses were not accounted for in determining the response rate in each street neighborhood

Collecting the Actual Recycling Participation Data

Actual recycling participation data were obtained with the assistance of the staff from the Lansing Recycling and Composting office. Weekly recycling participation was determined by observing and recording the total number of filled recycling bins found in street neighborhoods. This observation took place for six consecutive weeks or six recycling days. A data sheet with pre-listed house numbers for each street neighborhood was used in recording the observation. The weekly recycling participation rate at the street neighborhood level for all 36 neighborhoods was computed.

Data Analysis

The correlational research design was used in this study to determine relationships among the variables sense of community, safety, demographic factors (income, education, home ownership) and recycling participation. These major groups of variables included more specific factors which were subjected to appropriate statistical tests. The outcomes

revealed through each set of variables were examined, and preliminary inferences were drawn to explain such results.

The statistical package SPSS for Windows was used in examining and analyzing the data from this study. Sample characteristics were examined using descriptives statistics, bivariate and partial correlation statistics were used in understanding relationships between individual variables, Principal Components factor analysis was used to develop and test theories for one of the independent variables (sense of community), and Standard Multiple Regression was conducted to test the hypotheses derived for this study.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter details the results of the statistical tests conducted based upon the three hypotheses. The first part of this chapter will cover the general characteristics of the data set, followed by the results of the statistical tests. The last section of the chapter discusses the results and implications of the relationships between the variables examined.

Results

Characteristics of the Street Neighborhood

Thirty six street neighborhoods in Lansing, Michigan, were surveyed during the months of May to December 1995. The survey generated a total of 441 interviews resulting in an average street neighborhood response rate of 62%, not including home vacancies found in each of the street neighborhoods. As shown in Table 1, the average number of households on each street neighborhood is about 21. More than half of the respondents in the survey were female (65% overall). The rate of home ownership was also high at 73%. The length of residency or the number of years that respondents indicated they had lived in a street neighborhood was 12.41 years. The average age of respondents was 43.39 years; respondents identified themselves as middle income; and their educational attainment was found on average to be 1-2 years in college or completion of some sort of skill training.

Table 1. Characteristics of the sample

Variable Name	Mean	Std Dev	Min	Max
Number of houses	20.61	5.88	9	39
% Response	62%	14%	36%	88%
% Female respondent	65%	18.94%	25%	92.3%
% Home owned	73%	25%	20%	100%
Age (years)	43.39	8.38	32.25	65.4
Education (all adults/household)	4.23	.96	2.59	6.25
Income level	2.58	.53	1.38	4.08
Years living on street neighborhood	12.41	6.19	1.71	28.33
% household recycling	24.4%	9%	6%	40%

(N=36)

Actual Recycling Participation

The data obtained from the survey on actual recycling participation indicated an average of 24.4% of the households, or about 5 households in a street neighborhood of 21 houses, participating on a given recycling day. Participation across neighborhoods varied, ranging from 6% - 40%. Reliability of the measure for actual recycling participation indicated a Reliability Coefficient Alpha = 0.83.

Results of the Statistical Tests

The assumption for testing the regression hypothesis states that "the relationship between the dependent and the independent variables is linear and that for each combination of values of the independent variables, the distribution of the dependent variable is normal with a constant variance" (Norusis, 1995; p.473). Tests for normality, independence, linearity, and constant variance were requested to be included in the multiple regression output, specifically, the ANOVA table, collinearity statistics, and normality plots. Values for these tests and their interpretation will be discussed accordingly.

Hypothesis 1. <u>There is a positive relationship between sense of community and recycling participation.</u>

The initial step conducted to test this hypothesis was to examine the individual relationship between the dependent and independent variables using bivariate correlations statistics. The bivariate correlation statistics were also used to detect if multicollinearity among independent variables existed. A correlation coefficient r of greater than or equal to .90 suggests that there is multicollinearity among the independent variables which could

render problems in interpreting the results of statistical tests (see Chapter 4, Pedhazur & Schmelkin, 1991).

Sense of community positively correlated with recycling participation ($r = .46$) at a statistically significant level $p < .01$. Safety was positively correlated with actual recycling participation ($r = .15$) but was not statistically significant at the .05 level ($p > .05$). The two independent variables sense of community and safety correlated positively ($r =. 64$) and at the statistically significant level of $p < .05$. Table 2 summarize these results.

Multiple regression analysis (enter method) was then conducted to test the hypothesized relationship between sense of community, safety and recycling participation. Results indicated that 24% (R square) of the variance in recycling participation was accounted for by the combined independent variables sense of community and safety at a statistical significance level of $p < .05$. The variable sense of community indicated a higher standardized partial regression coefficient (beta = .61; $p < .01$) than that of the variable safety (beta = - .23; $p> .05$). This finding indicates that the sense of community measure explained more of the variability on recycling participation than the safety measure. Linearity, normality, independence, and measure for constant variance for the combined independent variables were assumed to have been met based on the F value and its significance level ($F = 4.8$, Sig F = .02).

A P-P plot in Figure 3 shows that the sample came from a normal distribution. The plot shows that the values follow an approximately straight line pattern. If the data are a sample from a normal distribution, the points fall more or less on a straight line (Norusis, 1995, p. 452). The tolerance level, which checks for

Table 2. Bivariate Correlation Coefficients Between Sense of Community, Safety, and Recycling Participation.

	Recycling	SOC	Safety
Recycling	1.0	.46	.15
SOC	.46 *	1.0	.64**
Safety	.15	.64**	1.0

*p < .05 N = 36
**p< .01

Dependent Variable: % actual recycling participation in a given recycling day/week

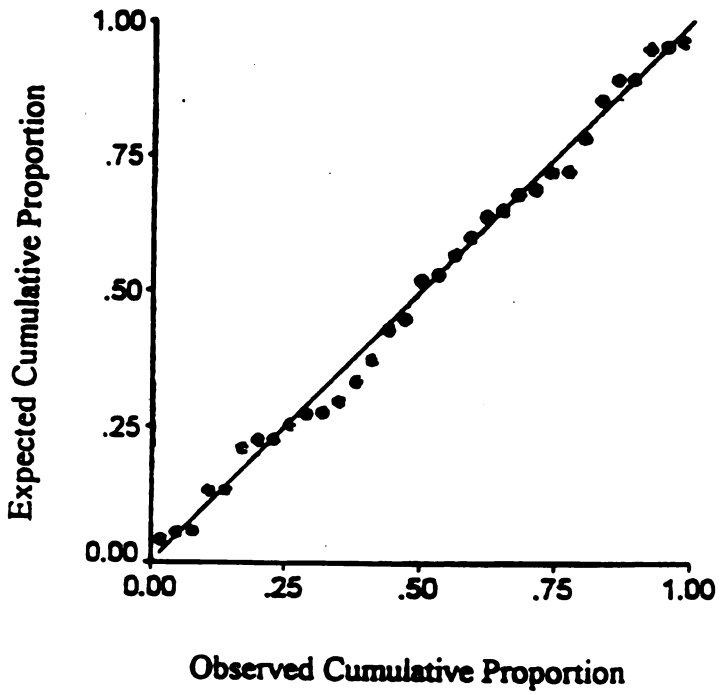

Figure 3. Normal P-P Plot of Regression Standardized Residual

multicollinearity between independent variables, was found to be acceptable at >.10. Tolerance statistics for the independent variables (sense of community and safety) were found to be at the .60 level for both variables suggesting that multicollinearity was not a concern. Table 3 summarizes these results.

Hypothesis 2. Demographic factors (income, home ownership, and education) are positively associated with recycling participation.

The variables income, home ownership, education, and actual recycling participation were also subjected to bivariate correlation statistics. Results indicated that income ($r = .37$, $p < .05$) and homeownership ($r = .38$, $p < .05$) were the variables that correlated significantly positively and moderately strongly with recycling participation. Income and homeownership correlated significantly positively and relatively strongly ($r = .60$, $p < .01$). Collinearity between these variables was considered less of a concern since the correlation coefficient r indicated lower than the .90 threshold for collinearity (see chapter 4 of Pedhazur & Schmelkin, 1991). Education indicated positive and weak (statistically not significant) relationship ($r = .20$), with recycling participation ($p > .05$). This suggests that higher street neighborhood level educational attainment does not correlate with higher level of recycling participation. Table 4 summarizes these results.

The results of the regression test involving the combined demographic factors indicate that the combined factors accounted for 18% (R square = .18) of the variability of recycling participation. However, this relationship between the combined demographic factors and recycling participation indicated no statistical significance at

Table 3. Regression of Sense of Community and Safety on Recycling Participation

Variables	B	SE B	*Beta*	T	Sig T
Sense of Community	.19	.07	.61	2.95	.01
Safety	-.04	.04	-.23	-1.14	.26

Multiple R = .49

R sqr = .24

Adj R sqr = .19
Standard E = .08
F value = 4.8
Sig F = .02

Table 4. Bivariate Correlation Coefficients of Demographic Factors as Related to Recycling Participation

	Recycling	homeownership	education	income
Recycling	1.0	.38**	.20	.37*
homeownership	.38**	1.0	.16	.60**
education	.20	.16	1.0	.51**
income	.37*	.60**	.51**	1.0

*p < .05 N=36
**p < .01

.05 level. The F value (F = 2.05) and its significance level (Sig F = .13) suggested that the hypothesized relationship between demographic factors and recycling participation did not fit the data. The standardized regression coefficients for each variable were low and indicated no statistical significance at .05 level to recycling participation. Table 5 summarizes these results.

Hypothesis 3. Sense of community predicts recycling participation better than the demographic factors.

Testing this hypothesis involved putting all independent variables (sense of community, safety and demographic factors) into one model. Result indicated that the combined independent variables accounted for 32% (R square = .32) of the variance of recycling participation at the statistical significance level of p = .05. Like the previous test conducted for the second hypothesis of this study, none of the demographic factors in the equation indicated statistical significance on recycling at the .05 level. Also, safety in the street neighborhood did not indicate statistical significance on recycling participation at the .05 level. Only sense of community predicted recycling participation at a statistically significant level ($p < .05$). Table 6 summarizes these results.

The tolerance statistics which indicated values ranging from .35 to .58 and an eigenvalue of greater than 1.0 suggested that multicollinearity between independent variables was not a concern in this model. Tolerance means that whatever information each of the independent variable provides with respect to recycling participation has some uniqueness. Also, the correlation coefficients of r between paired variables

Table 5. Regression of Demographic Factors on Recycling Participation

Demographic Factors	B	SE B	*Beta*	T	Sig T
Home Ownership	8.997E-04	7.439E-04	.26	1.29	.24
Education	.01	.02	.07	.33	.74
Income	.03	.04	.18	.712	.48

Multiple R = .42
R sqr = .18
Adj R sqr = .09
Std Error = .08
F value = 2.05
Sig F = .13

Table 6. Regression of all Independent Variables on Recycling Participation

Variables	B	SE B	*Beta*	T	Sig T
Home Ownership	5.157E-04	7.172E-04	.15	.72	.48
Education	-.01	.02	-.11	-.56	.58
Income	.04	.04	.27	1.01	.32
Sense of community	.17	.07	.54	2.35	.03
Safety	-.07	.04	-.39	-1.67	.11

Multiple R = .57
R sqr = .33
Adj R sqr = .20
Std Error = .08
F value = 2.57
Sig F = .05

confirmed this finding. No paired variables had correlation coefficient $r \geq .90$ (see Chapter 4, Pedhazur & Schmelkin, 1991).

A partial correlation test was also conducted to determine the effect of removing a variable/s from the model, in other words, to control the effects of one or more independent variable/s on recycling participation. By controlling for the sense community and safety variables, the demographic factors (income, homeownership, and education) indicated weak (not statistically significant) correlations with recycling participation (Table 7). By controlling just the safety variable, the relationship between recycling participation and each of the variables income, homeownership, and sense of community was positive and statistically significant at $p < .05$. Education indicated weak (non significant) and negative correlation with recycling participation at the .05 level (Table 8).

A third partial correlation test involved removing the sense of community variable from the model. The relationships between all of the remaining variables and recycling participation were weak, some in negative direction, and none indicated statistical significance at the .05 level (Table 9).

The last partial correlation test involved removing the demographic factors from the model. The result indicated that sense of community positively correlates with recycling participation at a statistically significant level ($p = .05$). Safety in the street neighborhood indicate a weak, non significant ($p > .05$), negative correlation with recycling participation (Table 10).

Table 7. Partial Correlation Coefficients of Demographic Factors and Recycling Participation Controlling for Sense of Community and Safety.

	Education	Income	Homeownership
Recycling	-.03	.26	.27

$p > .05$

Table 8. Partial Correlation Coefficients of Sense of Community, Demographic Factors and Recycling Participation Controlling for Safety.

	Income	Education	Homeownership	SOC
Recycling	.35*	.17	.35*	.47*

* $p < .05$

Table 9. Partial Correlation Coefficients of Demographic Factors, Safety and Recycling Participation Controlling for Sense of Community.

	Income	Education	Homeownership	Safety
Recycling	.15	-.02	.23	-.20

$p > .05$

Table 10. Partial Correlation Coefficients of Sense of Community, Safety, and Recycling Participation Controlling for Demographic Factors.

	SOC	Safety
Recycling	.31*	-.10

* $p = .05$

To summarize these results, sense of community was the only variable that predicted recycling participation among the five variables examined in this study. Demographic factors and safety were found to have no statistical significance in relation to recycling participation. The different tests confirmed and supported the hypothesized relationship between sense of community and recycling participation at the street neighborhood level. An empirical model illustrating the relationship between recycling participation and predictor variables (sense of community, safety, demographic factors) is shown in Figure 4.

Discussion

In view of the findings described above, several topics warrant discussion. This last section of the chapter will discuss two major relationships that were identified: a) between demographic factors and recycling participation; and, b) between sense of community variables and recycling participation.

Demographic Factors and Recycling Participation

The findings for the relationships between demographic factors (income, homeownership, and education) and recycling participation in the present study were somewhat inconsistent. Bivariate correlations indicated income and homeownership to have moderately strong, positive, and significant relationships with recycling participation at the street neighborhood level. However, multiple regression tests indicated none of the demographic factors predicted variation on recycling participation. This variation in results may be explained by the difference between the two statistical procedures used in finding relationships between recycling participation

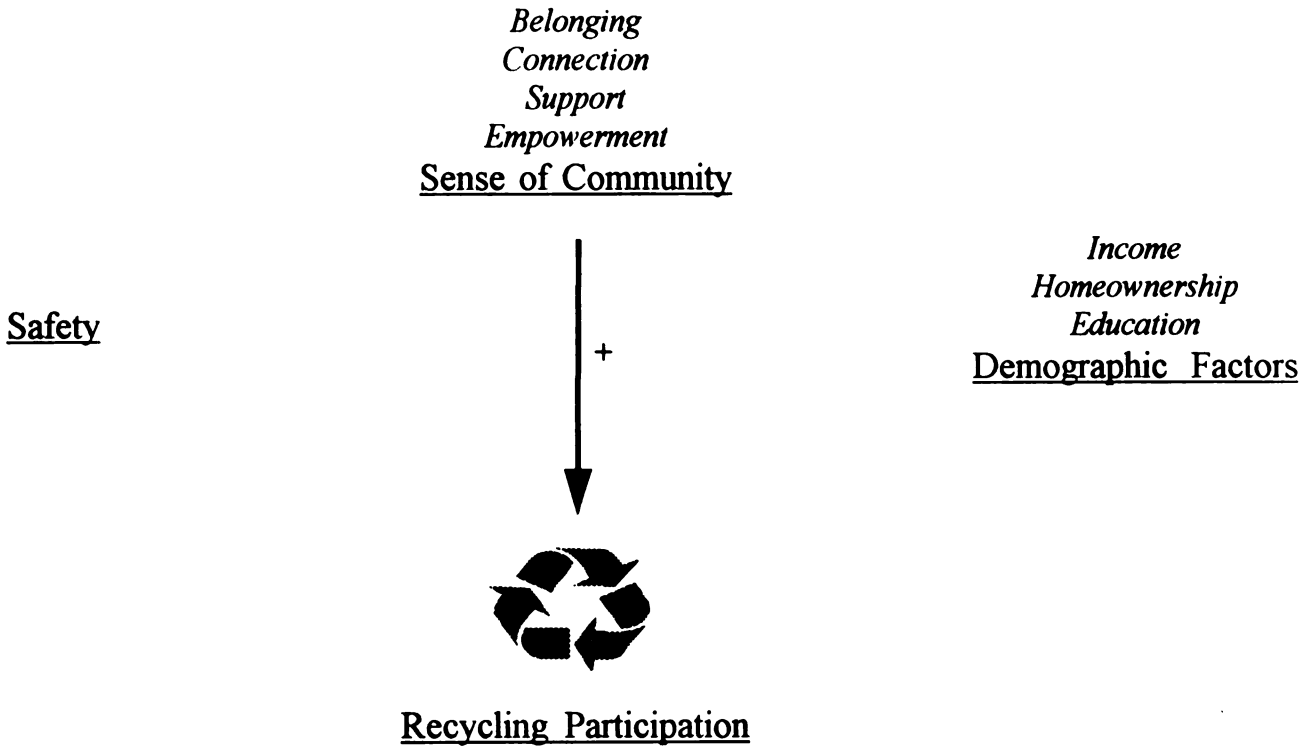

Figure 4. Empirical Relationship Between Predictor Variables and Recycling Participation

and the demographic factors. Bivariate correlations test is appropriate for analyzing relationships between individual pairs of variables, which, therefore, becomes an inadequate procedure for testing relationships between a dependent variable and multiple independent variables. The use of regression tests is more appropriate because it expands the characteristics of the relationships found between dependent and independent variables. According to Kachigan (1986), regression analysis 1) determines whether or not a relationship exists between variables, 2) describes the relationship in the form of a mathematical equation, 3) assesses the degree of accuracy of description of prediction achieved by the regression equation, and 4) in multiple regression analysis, assesses the relative importance of the various independent variables in their contribution to variation in the dependent variable. Multiple regression reduces even further errors of prediction that could be otherwise undetected when only one independent variable is used in the model (Kachigan, 1986). However, the number of variables can affect the prediction of the relationship between variables, because with more variables in the model, degrees of freedom are also reduced (Kachigan, 1986).

The term degrees of freedom describes the number of observations in the data collection that are free to vary after the sample statistics have been calculated. Normality of the distribution is affected as the degrees of freedom are increased or decreased by the inclusion or exclusion of variables in the model. For all practical purposes, the distribution is very nearly the shape of the normal curve once the degrees of freedom exceed thirty (Kachigan, 1986). This factor could explain for having an inconsistent result between demographic factors and recycling participation using the two different statistical tests.

The use of bivariate correlation tests was key in analyzing the data in this study, however, the multiple regression test was the appropriate procedure, since the model tested recycling participation using more than one independent variable. As the multiple regression analysis indicated, demographic factors did not predict recycling participation. This finding implies that a level of recycling participation is attained regardless of level of income, education of residents and rate of homeownership in street neighborhoods. Therefore, the second hypothesis of this study is not supported. It does not appear that recycling participation gets higher with neighborhoods that have higher level of residents' income, education, and rate of homeownership.

A possible explanation of this finding could be that those neighborhoods with higher rates of homeownership and higher levels of residents' income and education may be affected by moderating factors that hinder residents from engaging in the behavior. The cost (in terms of efforts and money) associated with recycling may be one of them. Recycling is costly because it is a behavior that needs commitment, and investment of valuable human resources (i.e., time, effort, money) and space (Hopper & Nielsen, 1991). People with higher income and education, and who own their homes are most likely to have regular full time jobs, and may find recycling an additional responsibility and a bother. Residents in neighborhoods with higher levels of these demographic characteristics may perceive that money received for recyclable material is not equivalent to the effort and time spent in preparing and sorting the materials.

The cost in recycling has been noted to be the major reason for finding strategies that would increase convenience for potential recycling participants. Environmental-

alteration techniques, such as adding more recycling containers to a particular area, providing containers to people participating in a curbside recycling program, and changing the day of curbside pickup to coincide with the regular trash pickup, are some of the ways that were found to increase recycling. By altering the environment, researchers have made recycling more convenient and easier to perform, thus reducing the cost of recycling (Porter et al., 1995).

The notion of ecological fallacy can be another explanation for not finding a significant relationship between demographic factors and recycling participation in this study. The previous studies that found significant relationships between demographic factors and recycling participation did not suffer from the ecological fallacy because those studies all attempted to generalize about individual behavior from surveys or other individual level information. This study attempted to find such relationships from aggregated data (i.e., street neighborhood level income, education, homeownership rates). The aggregation of the data may have concealed some of the effects of the variables in explaining variation in recycling participation.

The method used to collect recycling participation data in this study can be another explanation for the insignificant relationships found between demographic factors and recycling. This study used actual recycling data, and the observation was conducted without the residents' knowledge that such observation was taking place. Most of the studies in the past that found a positive and significant relationship between demographic factors and recycling participation relied on self-reported participation via questionnaires or interviews (Everett & Peirce, 1992; Oskamp et al., 1991; Vining & Ebreo, 1990).

Everett and Peirce (1992), for example, found a direct relationship between socio-economic factors and recycling participation using information provided by the block leaders who were the research participants of their study. Self-reported recycling participation is noted to concern researchers because it can provide information that is upward biased rendering the analysis and conclusion questionable (Barker, et al., 1994). This upward bias in self-reported recycling participation can be due to the social desirability of the behavior and as Belsie (1990) has indicated, strong endorsement of the behavior by a majority of people. When people are asked about socially proscribed behaviors such as recycling, social desirability may tilt self-perceptions about attitudes and behavior in an inaccurate direction (Thogersen, 1996). Thogersen (1996) cites that the social pressure surrounding a recycling program presumably is a pressure to recycle rather than a pressure to put out bins as frequently as possible. The cost involved in obtaining the actual or observational recycling data often hinders researchers from using this method in recycling studies (Barker et al., 1994). Perhaps, the use of observational/actual data and self-reported data provide two different messages. It is possible that demographic factors, in reality, may not positively relate to recycling participation. The results of this study also suggest that the demographic factors/recycling hypothesis is worth further consideration.

Finding no positive relationship between demographic factors and recycling participation in this study also led to speculations that those factors that affect participation in the curbside recycling program are the same for all neighborhoods regardless of demographic characteristics (homeownership, education, and income). The

cost for engaging in recycling (in terms of time and effort) could be the reason that hinders residents from engaging in the recycling behavior.

For those people who are engaging in recycling behavior, it is possible that increasing number of recycling programs adopted in many communities throughout the country may have increased their awareness of the value of recycling. The increasing number of recycling programs may also have impacted those people in terms of being provided with the opportunity to recycle. According to Goldstein (1993), results from a poll on The State of Garbage in America survey conducted for the annual issue of Biocycle (1993) showed that there has been continuous progress in the recycling movement in terms of increasing numbers of recycling programs being adopted nationwide. For example, in 1988, 1,042 curbside recycling programs were established. Four years later, this number had increased to 5,404 (Goldstein, 1993) and 7,375 in 1995 (Steuteville, 1996). It is possible that with more recycling programs established, municipal waste management offices are able to provide curbside recycling service to a wider audience. People from all demographic characteristics may have been tapped and impacted with the different forms or strategies that program developers and implementers use to increase recycling participation. The effects of prompting (Burn, 1991; Hopper & Nielsen, 1991) and other antecedent strategies could have encouraged residents of different demographic backgrounds to engage in recycling behavior.

Though opportunity to recycle does not automatically translate into participation, it does provide, however, an avenue for increased awareness of the recycling program and increased awareness for the need for resource conservation. Research has suggested that

people's intrinsic motives to conserve can be nurtured and developed (De Young, 1986a; Vining & Ebreo, 1990). Vining and Ebreo (1990) noted that an individual's conservation behavior can shift from being initiated and maintained by extrinsic motives toward being influenced by intrinsic motives. Increasing opportunities to recycle both provides opportunities for increasing awareness and the development of intrinsic motivation for resource conservation.

Also, programs and strategies that have been undertaken by public and private institutions to educate and promote recycling may have had an impact on neighborhood residents of all demographic backgrounds. Local schools, universities, and the media may have been effective in promoting recycling. Schools, for example, provide recycling programs, teaching and instilling in children the value of recycling. Promoting the habit of recycling to children in school encourages household waste recycling. This scenario is particularly true of the author: she started recycling about four years ago, after her preschooler initiated collecting and bagging papers around the house for recycling. A form of behavior modeling has taken place, wherein a child's behavior at school impacted the behavior of adults at home.

Sense of Community and Recycling Participation

The findings of this study supported the hypothesized relationship between sense of community and recycling participation. The statistical analysis indicated that as sense of community in street neighborhoods gets stronger, the rate of recycling participation increases. This result supports the findings of previous studies that sense of community promotes people to engage in civic behavior, such as participation in community

development activities. It appears that a feeling of sense of community encouraged residents in street neighborhoods to care actively for one another and their shared environment.

As noted earlier, a majority of these street neighborhoods indicated having residents who have lived there longer and owned their homes. Stability in these neighborhoods may have encouraged residents to engage in social interactions with their neighbors, and invest their time, effort, and money in different capacities in their neighborhood. Additionally, having residents who have lived in these neighborhoods for a longer period of time could have promoted a stronger sense of community among neighbors or stronger feelings of belonging, social ties or connection, empowerment, and support. This finding implies that, with sense of community in place in these neighborhoods, residents may have been consequently encouraged or even pressured to behave in ways that are socially acceptable to one another. The pressure to put the bin out in the curb could have encouraged residents to participate in the curbside recycling program, suggesting that an indirect positive relationship between home ownership and recycling participation exists. The lack of statistical significance for homeownership's relationship to recycling participation using partial correlation statistics may again be due to the aggregation of the demographic factors which may have concealed their relative effects in explaining variation in recycling participation.

As the finding suggests, a strong sense of community among residents positively influences recycling participation. So, promoting sense of community can be an effective strategy for bringing the rate of participation to a higher level. Recycling is a resource

conservation behavior which effects are tangible only when there is a collective effort for reducing pollution and other environmental threats. Identifying strategies to promote sense of community at the street neighborhood level can be the initial step for increasing recycling participation. The following section consists of ideas and strategies that hope to promote sense of community effectively and consequently lead to increased recycling participation.

Recommendations for Promoting Sense of Community

Neighborhood Development through Physical Planning

People want to be part of a larger network that allows expression of their needs for intimacy, diversity, usefulness, and belonging; but the social structures that might allow people to take action to achieve a sense of community are missing in many communities (Sarason, 1974). Getting people to interact and connect is the basic requirement wherein a sense of community can be developed. By planning neighborhoods with appropriate physical planning strategies, social structures favorable to promoting sense of community can be achieved. Planning specialists will have a very important role in realizing the strategies described below.

In street neighborhoods, features of the sidewalk and streets could promote opportunities for social interaction. A widened sidewalk, reduced traffic lanes and decreased traffic speed could provide residents suitable spaces for sitting and playing games. Also, building one or two stationary benches at strategic locations (along the side of the street) can provide residents a place to gather around and interact. In rural communities in countries like the Philippines, benches along the streets provide a public

space where neighbors interact and share information. It is through these informal gatherings that a sense of belonging, shared emotional connection, and influence are enhanced. In the literature, the rural prewar community in America has been described similarly to the description of the rural Philippine community, in terms of social and interpersonal interaction (Efratt, 1974). Contemporarily, a tendency to model community renewal based on this image of community life has been noted (Louv, 1996).

A special report indicated that parents are realizing that children need more than a strong family for their safety (Louv, 1996). Parents need to know that when a child walks out the door there are others who care and who will create a safe environment. Parents are discovering how to make neighbors out of strangers. One couple in Billings, Montana, discovered that meeting neighbors can be simpler than people think. This couple decided to place a wood and metal bench by their front yard next to a curb which became the block public meeting space. Neighbors and passersby use the bench as a place to rest during after-dinner walks, and to meet up with somebody else from the neighborhood. The local kids use the bench as a kind of bus stop for their car pools, and as a place to gather around to talk and play. A simple bench becomes a strategic structure for an effective way to promote social interaction and sense of community among neighbors. With increased interaction, resident participation in community development activities is more likely to take place.

Social policy and Neighborhood Development

The government at the national, state, and local levels will have an important role in street neighborhood development. A social policy strategy that existed for years but

needs to be aggressively pursued and enacted is to offer technical assistance to help initiate street neighborhood organization or block organization. The city government and the police force could assist neighborhoods in organizing crime watches, or the city Waste Management staff could work with residents in a street neighborhood wide campaign to increase recycling. Social institutions, like churches, and support services provided by the local government can help organize social activities with the neighborhood residents like block parties, and holiday or special events. Promoting civic participation by organizing locally based programs can be both an avenue for developing sense of community among residents and at the same time empowering residents to take responsibility for making their environment a safer and livable place.

Policies to increase homeownership could facilitate an increased neighborhood sense of community. McMillan and Chavis (1986) indicated that homeownership represents a major financial commitment, and people who have more invested in their neighborhoods are more likely to feel greater sense of community.

Owning a home has come to symbolize the realization of one's dream. Indeed, it has been said and written that owning a home is the American dream. Homeownership provides individuals to invest and commit to the community where they live. It discourages mobility which promotes creating bonds and relationships with the other residents. As President Clinton puts it: "Homeownership is one of the best ways to empower local residents, to give them a stake in the community, and to increase the bonds that tie people together" (U. S. Housing and Urban Development, July 1996). President

Clinton's National Homeownership Strategy[1] can be an effective tool in promoting and strengthening a sense of community and pride among residents. Housing and Urban Development and other public and private partnerships across the country have homeownership initiatives also that can provide potential ways for promoting and developing street neighborhood sense of community.

Partnerships in Community Development

Community development may be recognized as a new field of study but its principles are deeply rooted in human experience.[2] People have always worked together in an attempt to improve their situations. Community development is defined in many ways, but in the contemporary community development literature, several key concepts such as partnerships, community participation, coalitions, process and the like have emerged.

Promoting sense of community in street neighborhoods will entail partnerships between residents and both the public and private sectors. The role of the government as described earlier can be strengthened with facilitation by academic and other social institutions. Professors and students in universities can have important roles in promoting

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[1] President Clinton's National Homeownership Strategy starts with his commitment to expand homeownership opportunities dramatically in America. Specifically, the President asked HUD Secretary Cisneros to form a nationwide public-private partnership to achieve all-time high homeownership in America by the end of the century. The Nationals Partners in Homeownership was formed to work actively toward the goal of moving the national homeownership rate up to 67.5% by the end of the year 2000, generating 8 million new homeowners. The National Partnership has worked hard to carry out a comprehensive strategy of making homeownership opportunities more affordable and available by cutting the costs of buying and owning homes; removing discriminatory and regulatory barriers; streamlining and simplifying the process of building and financing homes; and raising homeownership awareness through education and counseling, outreach, training, technology, and community involvement (U. S. Department of Housing and Urban Development, July, 1996).

[2] According to Booth & Fear (1985) in their paper, Community Development: An old idea comes of age. The paper was prepared by the authors under the auspices of the Board of Directors of the Community Development Society. The paper was approved for submission to the U. S. Department of Labor for potential publication in the department's Occupational Outlook Quarterly.

sense of community among residents. They can initiate community organizing, assist residents in neighborhood development projects by directing them to resources that have otherwise been unknown to the residents, and create partnerships with existing organizations or agencies already involved in existing programs in the targeted street neighborhoods. These partnerships could benefit all parties involved. When appropriate community development strategies are utilized, street neighborhoods will be provided with opportunities to improve their conditions while academic personnel get the benefit of using knowledge to implement change.

A project that has been administered by the Sense of Community research team in Urban Affairs Programs at Michigan State University exemplifies the partnership between an academic institution, city government, and non-profit organization in promoting sense of community and community development in one of the most distressed street neighborhood in the City of Lansing. Hill Street is a street neighborhood in Lansing with a high crime rate, low social interaction among neighbors, and a structurally deteriorating residential area. For several months, the research team initiated a community development process that lead to a partnership between the Sense of Community research team, the staff of the Network Center, Food Movers, and the newly organized program volunteers who are residents of Hill Street. At present, most of the families in Hill Street receive bi-weekly supply of food from a local grocery store. The project has provided residents opportunities to interact, work together, and initiate plans to change the conditions of the street neighborhood. Recently, discussions have begun regarding a street clean up,

including removing graffiti from one of the buildings on the street, in addition to other small projects.

Promoting sense of community entails challenging processes, but the benefits are real and the effects can be long lasting. With an established sense of community, other community development projects can succeed. Subsequently, development of other forms of civic behavior such as recycling can be promoted.

CHAPTER V

SUMMARY AND CONCLUSION

Summary and Conclusion

This study was conducted primarily to explore the relationship between sense of community and recycling participation. This relationship was examined using survey data from 441 respondents of which 65% were female. Using multiple regression analyses, results indicated that sense of community predicted recycling participation, thus, supporting the hypothesized relationship between these variables. This finding implies that as the feeling of sense of community becomes stronger, the rate of recycling participation at the street neighborhood level increases. The demographic factors (income, education, and homeownership) did not show a statistically significant relationship. This study, therefore, supported the hypothesis that sense of community is a better predictor of recycling participation than the demographic factors.

This study has provided a unique contribution to the body of knowledge in recycling, because of the emphasis it has placed on the complex psycho-sociological components of recycling behavior. Because no other study like this one has yet been documented, it was challenging for the author to find information that she could compare it to.

This study should provide policy makers and program planners valuable information for promoting not just recycling participation but many other forms of civic

behavior. The City of Lansing Recycling and Composting office can primarily benefit from this study. Staff may focus on implementing the block leader approach in promoting recycling at the street neighborhood level. Block leaders recruited from street neighborhoods will be the most effective activator for recycling participation within that neighborhood. Using block leaders was found to promote recycling participation in previous researches (Burn, 1991; Hopper & Nielsen, 1991). Also, Everett and Peirce (1992) found that social tie centralization (a measure of how well block leaders know residents in their area) predicted recycling participation in their study. A resident from the same street neighborhood acting as the block leader would be more effective in encouraging fellow residents to recycle than block leaders coming from another street neighborhood.

The City of Lansing Recycling office needs to create partnerships with neighborhood leaders and local community academic and private institutions to promote recycling and individual awareness and responsibility for conserving natural resources and safeguarding the environment. Fridgen (1994) indicated that people feel both a lack of control over and responsibility for some of the environmental threats that currently exist, despite the fact that most of the threats examined in her study were human generated. It takes collective effort to promote recycling and other resource conservation behavior. Knowing that sense of community plays a significant role in residents' recycling behavior, promoting sense of community as suggested by the different strategies explained above can be the initial step for increasing recycling participation.

Limitations of the Study

While there have been several significant findings and practical applications that have been pointed out in this study, it must also be noted that there were certain limitations that would necessitate conducting a similar study in the future.

A limitation that necessitates replication of this study is the fact that sense of community is a theoretical construct and despite the efforts to develop a satisfactory measure of sense of community based on empirical findings, it is still a construct requiring further exploration and consideration.

Another limitation is the measurement of the variables used in this study. The aggregation of the variables at the street neighborhood level may have concealed information that could have otherwise determined if individual level information was used.

Timing of data collection is also considered a limitation for this study. The actual recycling participation survey was conducted early in the spring, three months after the sense of community survey for the 36 street neighborhoods was completed. The adverse weather conditions in the winter months discouraged the author and the staff of the City of Lansing Recycling and Composting office from conducting the actual recycling participation survey the same time when the sense of community survey was conducted. If there was a turnover of residents from any of these 36 neighborhoods during these 3 months, accuracy of the actual recycling data could be affected.

Recommendations for Future Research

Based on the limitations described above, it is therefore strongly recommended that future studies like this one be conducted. Efforts should be directed at finding a

measure of the variables that would explain the relationship between sense of community and individual level recycling participation, since recycling is a behavior that requires the involvement of individuals. It will also be helpful in understanding the relationship between sense of community and recycling participation if this study is replicated in communities with varied socio-demographic characteristics and cultural contexts. Such studies would shed additional insights as to how sense of community relates to recycling participation.

APPENDIX

APPENDIX A
Items Drawn from the Sense of Community Project Questionnaire

Date:_____
Interviewer:_____
Street neighborhood:_____
Household:_____

Sense of Community Questionnaire

PART I :Street neighborhood Questions
In this section, you will be asked questions about your street neighborhood (describe geographic boundaries).

_____ How long have you lived on this street neighborhood? [years & months]

I will be giving you a list of statements. Let me know how well each one describes the people on this street neighborhood, using the following categories:

(1) Strongly disagree or definitely false
(2) Disagree or False
(3) Neutral, not sure, or don't know
(4) Agree or true
(5) Strongly agree or definitely true

_____ People on this street neighborhood know each other.

_____ People on this street neighborhood participate in social activities (e.g., pot lucks, group garage sales, etc.)

_____ It is fairly safe to walk on this street neighborhood at night.

_____ On this street neighborhood people talk to each other about community problems.

_____ People on this street neighborhood feel comfortable borrowing and lending things from each other.

_____ People on this street neighborhood watch out for each other.

_____ People on this street neighborhood comfort each other in times of need.

_____ People on this street neighborhood feel like a family.

_____ Residents on this street neighborhood are able to resolve conflict when it arises.

_____ People on this street neighborhood give rides to each other if needed.

_____ People on this street neighborhood like each other.

_____ People on this street neighborhood feel isolated from each other.

_____ People on this street neighborhood influence each others' behavior.

_____ People get things done to improve the street neighborhood.

_____ Residents are committed to the street neighborhood 's future.

_____ People on this street neighborhood like living here.

_____ People on this street neighborhood have a voice regarding important community issues.

_____ People on this street neighborhood like living here.

_____ People on this street neighborhood feel that it is a safe place to live.

_____ People on this street neighborhood feel they belong here.

Which of the following categories best describes the financial condition of the people on this street neighborhood?

1. poor/low income
2. middle income, on the lower side
3. middle income
4. middle income, on the higher side
5. well-off

PART II: Individual Questions
In this section, you will be asked some questions about you or your household.

_____ Do you:

(1) own your home
(2) rent your home

_____ What is your age?

_____ What is your gender?

What is the highest level of education (how far in school) that the adults in your household have reached? [check for each adult]

_____ Junior high/middle school
_____ Some high school
_____ Graduated from high school/earned GED
_____ 1-2 years of college or other training
_____ 3-4 years of college
_____ Finished 4-year college (Bachelor's degree)
_____ Some post-college education
_____ Finished graduate/professional degree (MA, PhD, MD, DDS, etc.)

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