

AN INCREMENTAL SHIFT TO THE ECOLOGICAL APPROACH OF OBESITY
PREVENTION: EXTENSION NUTRITION MANAGERS' USE OF
ENVIRONMENTAL STRATEGIES

A Dissertation

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AN INCREMENTAL SHIFT TO THE ECOLOGICAL APPROACH OF OBESITY
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Recommendations and strategic plans for obesity prevention emphasize use of the socio-ecological approach that necessitates collaborations among multiple stakeholders. As a partner in community-based projects aimed at improving the lives of New York residents, Cornell Cooperative Extension's (CCE) nutrition programs, supervised by Extension Nutrition Managers (ENMs), deliver direct education to low-income audiences disproportionately affected by obesity. ENMs' use of environmental strategies was previously undocumented.

This descriptive, sequential mixed methods study explored strategies ENMs used to change various environments to support healthy eating and physical activity. Guided by the Theory of Planned Behavior, multiple regressions and bootstrapping were performed to investigate the association between ENMs' strategy use and related factors. The organizational culture perspective was applied to examine ways ENMs used the strategies within their existing job context. In-depth qualitative interviews (n=7) informed development of and corroborated findings from an extensive quantitative survey (n=58).

Results indicated ENMs had limited and uncertain use of environmental strategies, and were ambivalent about their impact. The strategies used had multiple dimensions: *setting* targeted, *content* (nutrition or physical activity) addressed, and *tasks* performed in applying each

strategy. Strategy use was positively associated with whether ENMs had allocated funds; program size; community networking; perceptions of community readiness and job expectations; beliefs about obesity prevention; and time devoted to environmental work. Only at moderately high levels of networking were ENMs effective in using environmental strategies.

While direct funding for environmental work promoted strategy use, all ENMs applied organizational norms to begin this work despite lack of resources and restrictive funding objectives. When presented with opportunities through existing relationships, ENMs were motivated to engage by program objectives, agency requests, job scope, and personal interests. ENMs adapted the norms of conducting direct education to using environmental strategies by expanding the content, audience, and purpose of nutrition education, applying a systems perspective, and aiming to make small, incremental changes in their work. Strategy use happened only when intrinsic motivations complemented extrinsic opportunities. This study provides evidence for support by funders, program leaders, and local organizations for use of environmental strategies for obesity prevention.

BIOGRAPHICAL SKETCH

Angela Huiju Lu was born in Taipei, Taiwan. At age 10, Angela came to the US with her brother, Steve, to live with their aunt's family in Minot, ND. Five years later, Angela and Steve moved to Cupertino, CA. In 1992, Angela graduated from high school and became a freshman majoring in accounting at Purdue University in West Lafayette, IN. After just one year, Angela left Purdue, realizing that she had no hopes or interest of becoming a CPA. In 1997, after graduating from UC Davis with a bachelor's degree in dietetics, Angela stayed in Davis and worked as a teaching assistant for a food service laboratory course and a shift leader at Carl's Jr. Restaurant. She then moved to Muncie, IN, to attend a year-long dietetic internship at Ball Memorial Hospital in 1998. A year later, Angela "surprisingly" passed the RD (registered dietitian) exam, packed her bags, and left the States for her hometown, Taipei.

During the years 2000-2003, Angela worked as a dietitian in Taiwan, mostly with a dietitian in private practice, conducting nutrition education with groups at local churches and businesses, counseling individual clients, attending radio talk shows, and developing courses and educational material. Angela also worked on a part-time basis for John Tung Foundation, a nonprofit organization that focused on school lunch and childhood obesity, and temporarily for a commercial nutraceutical company, providing product information and nutrition counseling. One day while Angela was conducting a nutrition class, it suddenly dawned on her that although she was teaching people nutrition, ironically, she really did not understand them. Thus in August, 2003, Angela again packed her suitcases to attend graduate school in community nutrition at Cornell University in Ithaca, NY, to learn about human behaviors.

Angela's life at Cornell between 2003 and 2011 had been exceptionally interesting, challenging, and worthwhile. She spent the first four years taking various courses in nutrition and

education (minor field), serving as a teaching assistant, and completing her master's thesis titled Nutrition Counseling Self-Efficacy of Registered Dietitians. Instead of extending her thesis on dietitians' counseling skills into a PhD project, Angela chose to start from scratch with this dissertation focusing on community nutritionists' use of environmental strategies to address obesity, which was more in line with her adviser's work. It was also a valuable opportunity for Angela to expand the scope of her research and practice. Thus the next four long years was mainly spent learning much more about the principles of scientific research, developing her new found interest in organizational behavior (second minor field), and struggling through, but appreciating every step of the research process.

Other “fun” activities Angela did while at Cornell included the following: making presentations to nutrition students on nutrition in traditional Chinese medicine and Buddhism; being the academic events coordinator for Nutrition Graduate Student Organization (NGSO) and organizing Dr. Marion Nestle's event as the elected guest speaker; serving as a guest panelist on the graduate student and dietetic internship panels; cleaning up after the NGSO-sponsored International Cooking Demo; attending the International Coffee Hour and Tell Grads It's Friday (TGIF) events at the Big Red Barn with her fellow grads (sometimes eating too much chips and drinking too much beer); volunteering at graduate student orientation and Slope Day; attending the high ropes session at Hoffman Challenge Course; climbing the Lindseth wall with Meredith and Rosie; going to the gym with Amanda, Jian, and JAC. Outside of Cornell, Angela enjoyed visiting the downtown Tompkins County Public Library and the Alternatives Library in Anabel Taylor; going to Starbucks to write her dissertation; and jogging around Cayuga Heights. The best part of life in Ithaca was having deep discussions/conversations about research and life with

all the interesting and likeminded people she met. Along the way, Angela learned several important lessons about research, some of them also apply to life in general:

Presenting ideas to your adviser is like asking your parents to use their car: sometimes they will stubbornly refuse, other times they will happily (and easily) say “yes,” although it was the same question/idea.

Life/research is full of unexpected twists and turns; it is important to be adaptable and patient. At some point, you need to let go of what you always thought was it and have the courage to step into the unknown and faith and patience to continue to the end.

There are people who just will not give up on you, no matter how nasty you have treated them. They keep you on track and remind you to be a more tolerant and loving person.

Life/social sciences research is grey, not black and white; it is important to be accepting of differences and ambiguities. Things are usually easier to place on a continuum that allows variability rather than into categories that are distinct.

Doing research on human behaviors is a very difficult task of gathering information to prove what we already know.

Life/research is full of dichotomies: yin/yang, hot/cold, rational/emotional, etic/emic, top-down/bottom-up, outcome (structure)/process; it is best to consider both extremes but end up somewhere in the middle, just as Confucius preached.

When things get tough, tell yourself that it is just a necessary part of the process. Just suck it up and do it.

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Many people contributed to my learning and wellbeing over my extended journey at Cornell. They were the ones who had always readily responded to my cries for help.

First, I am fortunate to have had the opportunity to learn from my graduate committee members in the fields of nutrition, education, and organizational behavior who have dedicated their professional lives to helping people in global and local communities. While their achievements are great, they are some of the *most* humble people I know. Under their guidance, I have expanded the scope of my research and developed a more holistic view of the world and its workings. I am now more able to embrace the complexities and multiplicities that are inherent in dealing with human and social issues.

Dr. Jamie Dollahite was the chair of my graduate committee since I first entered Cornell in 2003. Working with her, I saw compassion and perseverance, two necessary components to working with people and promoting social change. Jamie “walked the talk,” demonstrating concern for her staff, colleagues in the Division of Nutritional Sciences (DNS) and Cornell Cooperative Extension, and especially her students. I will always remember the days when Jamie and her husband, Chris, phoned me because there was a typhoon in Taiwan and when they spent 3-hours on a Saturday afternoon preparing me for my dissertation seminar. While Jamie was mostly hands-off, she really knew her students, even on a personal level. She not only provided the guidance I needed, sharing with me her expertise in community nutrition, but also gave me much time and space to explore on my own. Jamie was firm and realistic, reminding me that all the challenges were a necessary part of the process; but she was always there with me. I am most grateful for her care, patience, and belief in me over these years.

Since 2004, Dr. Mark Conostas was like the really smart big brother I never had, who kept me feeling optimistic about research and finishing my dissertation during our often two-hour long meetings. Also, like a big brother, he was fun and humorous, sharing with me stories about his family (including his chickens) and past experiences in Hong Kong. In addition to taking his course in qualitative methods, he had provided me with much intellectual guidance for both my master's thesis and current dissertation. Learning to think like Mark-the-methodologist taught me the importance of accuracy and specificity that are so important in any scientific pursuit.

From Dr. Kate Dickin, I learned to think using rectangles and arrows. At each meeting, I was amazed by the high level of clarity with which she processed ideas and the rate at which she readily sketched a sophisticated conceptual framework. (I had a collection of Kate's "artwork" by the time I finished my degree.) Although it was often a challenge to keep up with Kate, she motivated me to learn, e.g. mediation and moderation in regression analysis (yooohoo!) Like Jamie, Kate is firm but friendly and caring, always giving generously her time and attention to her students.

Dr. Bill Sonnenstuhl taught me sociology and organizational culture through two courses and numerous face-to-face discussion sessions. I appreciate his passion toward his work and his patience in teaching me, a student coming from a quantitative and a more positivist perspective. When I felt confused about the qualitative aspect of my research, he always assured me that I was doing okay. His words were affirming, motivating me to delve deeper in my exploration. I also learned from him the importance of speaking steadily and clearly, a skill I have yet to develop.

Dr. Per Pinstrup-Andersen held research group sessions where I learned about nutrition on a global level and from an economic perspective, views that are still foreign to me. Although a busy man, Dr. Pinstrup-Andersen kept track of and often reached out to his students through emails, blogs, and research groups. I value the sense of ease and humor that he brings to working with his students. I learned from him that it is okay to say “I don’t know” (no matter who you are and even to the questions he poses). What is important to know is how to find the answers and piece them together into a workable solution.

Members of the Food and Nutrition Education in Communities (FNEC) team in DNS including Joan Doyle Paddock, Tisa Fontaine Hill, Sonya Islam, Megan Lent, Christina Stark, Michelle Scott-Pierce, Wendy Wolfe, Bonnie Schwenn, and Rachel Brown, have provided me with much guidance and assistance. Some of them spent numerous hours reviewing my extensive survey, discussing my data and analysis, and sharing with me their work and research experiences. Others made sure I had food, shelter, and rides. I thank them for being so knowledgeable, dependable, efficient, friendly, and patient with me.

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LIST OF ABBREVIATIONS

ATB	Attitude toward behavior
CCE	Cornell Cooperative Extension
CHANCE	Collaboration for Health, Activity, and Nutrition in Children's Environments
EFNEP	Expanded Food and Nutrition Education Program
ENM	Extension Nutrition Manager
EWPH	Eat Well Play Hard
NAPSACC	Nutrition and Physical Activity Self-Assessment for Child Care
NYSDOH	New York State Department of Health
PBC	Perceived behavioral control
PSN	Perceived social norms
SNAP-Ed	Supplemental Nutrition Assistance Program Nutrition Education
TPB	Theory of Planned Behavior
YSA	Youth-serving agency

Chapter 1

Introduction

Empirical investigations of community health practitioners' use of environmental approaches to address the serious public health issue of obesity are limited, despite numerous recommendations and action plans that target this issue. The purpose of this descriptive, sequential mixed methods study was to understand the work of Extension Nutrition Managers (ENM) in Cornell Cooperative Extension (CCE) in using environmental strategies for obesity prevention in order to identify ways to expand their strategy use within their existing work context. Preliminary results from a few ENMs indicated that some were already using environmental strategies in their jobs in partnership with other community agencies. Factors associated with their work in this area encompassed personal characteristics along with various organizational and community resources and constraints. Applying the Theory of Planned Behavior (Ajzen, 1991; Ajzen & Albarracín, 2007) and organizational culture perspective (Martin, 1992), this study explored how ENMs were making environmental changes to support healthy eating and physical activity in their communities, the factors associated with their strategy use, and the ways they implemented this work in their jobs.

Obesity Prevention: Shifting from the Individual to Socio-Ecological

The perspective for understanding the causes of and developing prevention strategies for obesity has evolved over time. American values of individualism, freedom, and justice are evident in views about health and wellness. In an individualistic society, identifying the causes of a problem means the ability to assign responsibility (Lawrence, 2004). Health promotion that focuses on personal responsibility was the dominant view throughout the 1970s and 1980s

(Lawrence, 2004; Minkler, 1999). At the same time that the National Institutes of Health first declared obesity to be a major public health threat in the mid-1980s (Lawrence, 2004), researchers began to emphasize the impact of environmental factors on health (McLeroy, Bibeau, Steckler, & Glanz, 1988; Stokols, 1992). The goal was to promote the socio-ecological perspective (Bronfenbrenner, 1979; McLeroy et al., 1988) by achieving “a balance between individual and social responsibility so that simplistic either/or positions are replaced by a greater appreciation of the contributions of *both* personal behavior change and broader environmental change in facilitating health improvement” (Minkler, 1999, p.121). However, this practice as applied to obesity prevention was not widespread (Egger & Swinburn, 1997) until the most recent decade (Kumanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002).

Currently, federal, state, and local government agencies and community organizations across the nation continue to search for and implement effective, feasible, and sustainable strategies to reverse the rising trend of obesity (e. g. Centers for Disease and Prevention, 2009; Institute of Medicine, 2005; New York State Department of Health, 2008). With the growing recognition that environmental barriers and opportunities shape individuals’ behaviors linked to high energy intake and low expenditure that result in unhealthy weight gain, researchers need to adopt the socio-ecological approach in order to be effective in stemming the obesity epidemic. This comprehensive perspective emphasizes the interactions and interdependencies of individuals with their nutrition and physical activity choices and layers of influence in interpersonal relationships, organizations, communities, and the greater society that surround them. It is essential that nutrition and public health professionals broaden their scope of understanding and practice related to obesity to include direct nutrition education of individuals

and modification of environments that support healthy choices.

Nutrition Managers in Cornell Cooperative Extension

As an integral partner among the diverse local organizations that have been urged to mobilize their resources to promote environmental changes that support healthy eating and physical activity, CCE in New York delivers the federally-funded Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program–Education (SNAP-Ed) in various counties and New York City. ENMs at local sites oversee these two programs that provide nutrition education directly to the low-income residents in their communities who are disproportionately affected by obesity. Over the recent years, ENMs have been prompted and trained to apply the socio-ecological perspective in their work to address obesity. For example, Cornell NutritionWorks (2010), the Internet-based continuing education and resource center for health and nutrition professionals, offers an interactive course, *Preventing Childhood Obesity: an Ecological Approach*, to teach practitioners to take a socio-ecological approach in understanding the causes of obesity and developing an action plan that results in environmental changes.

Furthermore, some ENMs have already effectively integrated environmental strategies into their direct nutrition education programming, to at least some extent, to improve the practices and policies related to food and physical activity in organizations and their community. For example, University faculty and nutrition educators in CCE organizations developed a multidisciplinary, multi-component project called Collaboration for Health, Activity, and Nutrition in Children’s Environments (CHANCE, 2011) to address childhood obesity and enhance EFNEP’s efforts to improve the lives of low-income individuals and families. It

incorporates nutrition, physical activity, parenting skills, worksite wellness, and environmental change and exemplifies a comprehensive nutrition education program to promote obesity prevention on multiple levels of the social ecology.

Based on funding sources and the CCE mission to deliver research-based knowledge to community residents, a significant portion of ENMs' job will continue to entail direct nutrition education. Instead of replacing existing nutrition education programming, the shift to using environmental strategies suggests redefining nutrition education to include making environmental changes. Being nutrition experts who are well-versed in the skills needed for addressing obesity, ENMs have the potential to become leaders among multiple stakeholders in their communities in applying the socio-ecological framework for obesity prevention.

Current Challenges

During a time of global economic crisis, budget cuts on the state and county levels have directly limited the resources available broadly for the public health and social services systems, and locally for community-based organizations like CCE, to engage in programs that target obesity. For the practitioners, such as ENMs who work in CCE, personal beliefs, knowledge, and skills are also associated with obesity prevention and the implementation of environmental approaches. Previous research suggests that professionals in the obesity prevention field felt more confident about education-based strategies than those aimed at modifying environments (Antipatis, Kumanyika, Jeffery, Morabia, & Ritenbaugh, 1999). A disconnect exists where, even if nutrition professionals believed the environment is heavily responsible for the rise in obesity, a majority of them still suggested nutrition education or methods that aimed to change individuals' behaviors as the solution (Woodruff, Dorfman, Berends, & Agron, 2003).

Furthermore, working toward environmental change is still a fairly new concept for most public health departments and the Cooperative Extension system. In a more recent report, health department personnel claimed a lack of knowledge and skills necessary to participate in activities for making environmental changes to support obesity prevention (Schwarte et al., 2010). Other empirical studies about community-based interventions targeting obesity with an environmental approach have mostly focused on the formative evaluation of program outcomes and effectiveness (Economos et al., 2007; Sanigorski, Bell, Kremer, Cutler, & Swinburn, 2008). Since not much research has been conducted to examine practitioners' perspectives in performing work in this area, there is a lack of understanding of what they are doing and how they are putting the socio-ecological perspective into their practice. Having this knowledge can better inform practice that is urgently needed to target obesity as well as future research.

Research Overview and Objectives

The goal of this descriptive, sequential mixed methods study was to understand what ENMs are doing on the environmental level to address obesity and how they are doing this work within their job constraints in order to enhance the involvement of community health practitioners like ENMs in using environmental strategies for obesity prevention. Five exploratory pilot interviews with ENMs who participated in the CHANCE project were conducted to generate theoretical insight for the development of ideas and hypotheses for the current study. Preliminary results showed that ENMs understand the need to apply the socio-ecological perspective for obesity prevention and some have the potential or are already able to use environmental strategies in their job. This study extended the previous pilot study and used both qualitative and quantitative research methods to describe ENMs' strategy use and

explore the various factors that are related to their work in this area. The specific research objectives were as follows:

1. To investigate the content and dimensions of the strategies that ENMs use to address obesity on the organizational and community levels of the socio-ecological model;
2. To describe the extent of ENMs' involvement in using environmental strategies and in performing the specific tasks related to each strategy;
3. To investigate how background factors, ENMs' beliefs toward using environmental strategies, their perceptions of others' expectations, and their perceptions of personal control over using those strategies are associated with their reported behavior;
4. To examine how the associations between ENMs' use of environmental strategies and contributing factors differ when ENMs do and do not have funds specifically dedicated to making environmental changes to address obesity;
5. To identify how ENMs' decide to become involved in obesity prevention efforts and in using environmental strategies; and
6. To describe the various perspectives and practices that facilitate ENMs' incorporation of environmental strategies into their existing job structure.

This study has significant implications for future research and especially practice for ENMs, their agency partners and other community stakeholders, local CCE organizations and system as a whole, and EFNEP and SNAP-Ed programs. Results of this study will serve as a guide for ENMs and their partners to modify and improve their practices in using environmental strategies and allow leadership on the organizational, community, state, and national levels to develop plans to provide the structure and support that ENMs need to increase their effectiveness

in promoting obesity prevention in the communities that they serve.

Overview of the Dissertation

This dissertation reports the work and changing role of ENMs in applying the environmental perspective to obesity prevention. Chapters 2, 3, and 4 are written in research paper format that includes literature reviews, research methods, results, and discussion. The first two chapters are mixed methods papers that report both the qualitative and quantitative phases of this study; Chapter 4 presents data from the qualitative phase. Chapter 2 answers the question, “*What* are ENMs doing to target obesity on the environmental level?” by operationalizing ENMs’ use of environmental strategies. It addresses the first two objectives by detailing the settings where ENMs use environmental strategies, the content of their strategies, and the processes by which they apply the strategies. Chapter 3, encompassing objectives 3 and 4, responds to the questions, “*How* are ENMs using environmental strategies?” by conceptualizing the associations among ENMs’ strategy use and the set of factors related to their strategy use according to the Theory of Planned Behavior (Ajzen, 1991; Ajzen & Albarracín, 2007). Chapter 4 answers the question, “How can ENMs extend their existing job scope to encompass environmental change work?” It addresses objectives 5 and 6 by detailing the processes by which ENMs became involved and the norms they adapted from direct nutrition education to using environmental strategies. Finally, Chapter 5 reports an overall summary of research results, study strengths and limitations, as well as a discussion of implications for future research and practice, suggesting ways this study could be used to impact the field of nutrition generally and the application to obesity prevention specifically.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. & Albarracín, D. (2007). Predicting and changing behavior: a reasoned action approach. In I. Ajzen, D. Albarracín, and R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Antipatis, V.J., Kumanyika, S.K., Jeffery, R.W., Morabia, A., & Ritenbaugh, C. (1999). Confidence of health professionals in public health approaches to obesity prevention. *International Journal of Obesity*, 23, 1004-1007.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Centers for Disease Control and Prevention. (2009). Recommended community strategies and measurements to prevent obesity in the United States, *Morbidity and Mortality Weekly Report*, 58, No. RR-7, 1-29.
- Collaboration for Health, Activity, and Nutrition in Children's Environments. (2011). CHANCE. Retrieved November 5, 2011, from http://www.fnec.cornell.edu/Our_Initiatives/CHANCE.cfm
- Cornell NutritionWorks. (2010). Cornell NutritionWorks. Retrieved September 6, 2010, from <http://www.nutritionworks.cornell.edu/home/>
- Economos, C.D., Hyatt, R.R., Goldberg, J.P., Must, A., Naumova, E.N., Collins, J.J., & Nelson, M.E. (2007). A community intervention reduces BMI z-score in children: Shape Up Somerville first year results. *Obesity*, 15(5), 1325-1336.
- Egger, G. & Swinburn, B. (1997). An "ecological" approach to the obesity pandemic. *British Medical Journal*, 315, 477-480.
- Institute of Medicine. (2005). *Preventing childhood obesity: health in the balance*. Jeffrey P. Koplan, Catharyn T. Liverman, Vivica I. Kraak (Eds.). Washington, D.C.: The National Academies Press.

- Kumanyika, S., Jeffery, R.W., Morabia, A., Ritenbaugh, C., & Antipatis, V.J. (2002). Obesity prevention: the case for action. *International Journal of Obesity*, 26(3), 425-436.
- Lawrence, R.G. (2004). Framing obesity: the evolution of news discourse on a public health issue. *The Harvard International Journal of Press/Politics*, 9(3), 56-75.
- Martin, J. (1992). *Cultures in organizations: Three perspectives*. New York, NY: Oxford University Press.
- McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, 15(4), 351-378.
- Minkler, M. (1999). Personal responsibility for health? A review of the arguments and the evidence at century's end. *Health Education and Behavior*, 26(1), 121-140.
- New York State Department of Health. (2008). Strategic plan for overweight and obesity prevention: policy and environmental changes. Retrieved May 13, 2011, from http://www.health.state.ny.us/prevention/obesity/strategic_plan/
- Sanigorski, A.M., Bell, A.C., Kremer, P.J., Cutler, R. & Swinburn, B.A. (2008). Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well. *International Journal of Obesity*, 32(7), 1060–1067.
- Schwarte, L., Samuels, S.E., Boyle, M., Clark, S.E., Flores, G., & Prentice, B. (2010). Local public health departments in California: changing nutrition and physical activity environments for obesity prevention. *Journal of Public Health Management and Practice*, 16(2), E17–E28.
- Stokols, D. (1992). Establishing and maintaining healthy environments: toward a social ecology of health promotion. *American Psychologist*, 47(1), 6-22.
- Woodruff, K., Dorfman, L., Berends, V., & Agron, P. (2003). Coverage of childhood nutrition policies in California newspapers. *Journal of Public Health Policy*, 24(2), 150-158.

Chapter 2

Community Nutritionists Use Environmental Strategies in Various Settings

But In a Limited Way

“The buzz word, *environmental changes*...just really understanding what that meant took a while.” - Cornell Cooperative Extension Nutrition Manager

Background

Obesity is a multifaceted public health issue resulting from a wide range of biological, behavioral, and environmental factors (Bray & Champagne, 2005; Schwartz & Brownell, 2007; Story, Neumark-Sztainer, & French, 2002). Its seriousness lies within the numerous adverse consequences associated with the health and well-being of individuals (Field et al., 2001) and collectives such as organizations, communities, and the society at large (Institute of Medicine [IOM], 2005; Wolf & Colditz, 1998). Although obesity affects people from all socioeconomic backgrounds, a disproportionately high percentage of obese people are low-income and less educated (Paeratakul, Lovejoy, Ryan, & Bray, 2002; Trust for America’s Health, 2011). The environment is especially harsh for this population because they are less able to afford “healthy” foods (i.e. foods with high nutrient density) that are on average more expensive than high energy dense foods (Drewnowski & Spector, 2004) and live in low wealth neighborhoods where fast food restaurants are more prevalent (Morland, Wing, Diez Roux, & Poole, 2002).

To combat the rise of obesity, researchers and practitioners have increasingly applied the social ecological perspective that emphasizes the role of the environment on multiple levels (Swinburn, Gill, & Kumanyika, 2005). As adopted by the Centers for Disease Control and Prevention (2009), the socio-ecological model (McLeroy, Bibeau, Steckler, & Glanz, 1988) depicts these levels as a set of concentric spheres with the innermost level being the *individual*;

extending outward through the levels of *interpersonal*, *organizational*, and *community* to the outermost level of the *society* (Figure 2.1). The “ecological orientation” (Bronfenbrenner, 1979) refers to the dynamic relations between people and their surroundings and the collective impact of multiple environments on individuals’ well-being (Grzywacz & Fuqua, 2000).

Swinburn and colleagues (1999) have also devised the ANGELO (ANalysis Grid for Environments Linked to Obesity) framework for understanding the obesogenicity of environments and prioritizing research and practice needs. This model more precisely defines the two dimensions of environment as size and type. Microenvironments are *settings* such as households, schools, workplaces, restaurants, and community organizations. They overlap across the interpersonal, organizational, and community levels of the socio-ecological model (Figure 2.1). Macroenvironments refer to *sectors* that include systems of health, education, and transportation and industries of food, media, and technology and correspond to the societal level. The various settings and sectors on the multiple levels of the socio-ecological continuum are interconnected and interact with and exert influence over each other.

The types of environments include physical, economic, political, and sociocultural (Swinburn, Egger, & Raza, 1999). The *physical* environment refers to the availability of actual objects (including the built environment) or opportunities that may facilitate individuals’ behaviors toward well-being. Examples encompass vending machine offerings, menu choices, school recess periods, and availability of sidewalks. The *economic* environment pertains to the cost associated with food and physical activity, such as taxes, subsidies, and financial support. The *political* environment encompasses the rules, laws, and formal and informal policies related to food and physical activity that can be applied in homes, daycare centers, or to the school district or the entire public school system in the country. The *sociocultural* environment refers to

the attitude, beliefs, and values in a group, community, or the greater society. These different types of environments are not mutually exclusive. For example, schools may not only remove snack items that are high in fat from their vending machines (physical), but they may also decrease the price of the healthier items (economic) and make this practice sustainable by incorporating its regulation into their wellness policies (political). When a behavior is performed repeatedly, it ultimately becomes the norm (sociocultural).

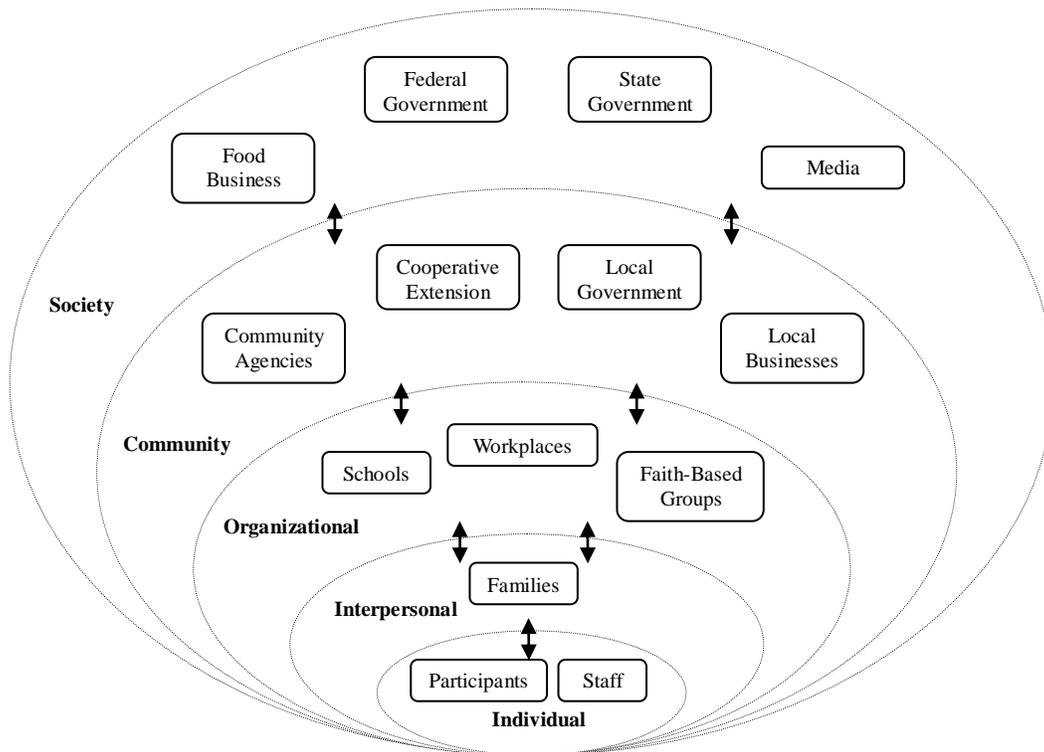


Figure 2.1: The socio-ecological model: components and their interactions at each level

The application of the environmental perspective in practice, including the socio-ecological model and the ANGELO framework, was not widespread until the most recent decade (Kumanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002). Communities across the country have been urged and funded to mobilize their resources to promote environmental changes that support healthy eating and physical activity. Publications from Centers for Disease Control and Prevention (2009) and Institute of Medicine (2005) along with state strategic plans

(e.g. Arizona Department of Health Services, 2005; New York State Department of Health [NYSDOH], 2008; Georgia Department of Human Resources, 2005) outline strategies for obesity prevention to serve as both goals and guidelines for practitioners and organizations to participate in environmental change projects. Obesity prevention plans list partners ranging from health departments, health care facilities, school districts, and community-based organizations to local businesses. As an integral partner among the diverse organizations, State Cooperative Extension offices across the country often participate actively in state and local public wellness and disease prevention efforts.

The roles of Cooperative Extension staff as environmental change agents have been detailed in some state plans and published literature. They include participating in community-wide coalitions to create environments that facilitate healthier lifestyles for families (Espinosa-Hall et al., 2007) and working on multiple levels of the socio-ecological model (Georgia Department of Human Resources, 2005). State plans such as that of New York (NYSDOH, 2008) highlight the achievements of various organizations like Cornell Cooperative Extension (CCE) and related programs such as Eat Well Play Hard (EWPH; NYSDOH, 2010), some of which are delivered by Extension Nutrition Managers (ENM) in CCE. Although comprehensive, the recommended strategies and action plans are often written as simple directives without regard for the inherent complexity of their implementation, which stems from the strategies' multiple components and sequence of activities. It is unclear what strategies and extent of participation would be considered feasible and reasonable for each partner to engage in within their existing work context.

Although community-based interventions have been implemented to address obesity on the environmental level, existing literature mostly centers on the evaluation of program outcomes

and effectiveness and infrequently emphasizes the actual roles of the community organizations in the program. For example, Economos and colleagues (2007) presented their unprecedented work on Shape Up Somerville, a community-based intervention program that aimed to evaluate the effect of environmental change on children's body mass index (z-score). The authors mentioned a process evaluation, but this has not been published. Other researchers have made their process evaluation records public to allow researchers and practitioners to learn from their experiences (The Victorian Department of Health, 2010). Understanding of the role of community change agents is still limited compared to the greater availability of outcome evaluations.

Further, while strategies have already been enacted by community nutrition professionals and government service agents, empirical research describing the practitioners' perspectives and practices in using environmental strategies to address obesity is scant. Schwarte and colleagues (2010) examined the practices, resources, and opportunities of the California public health system in changing nutrition and physical activity environments for obesity prevention. Working toward environmental change is still a fairly new concept for staff of public health departments and Cooperative Extension offices and they may lack the knowledge and skills necessary to participate in these activities to support obesity prevention (Schwarte et al., 2010). Researchers have also reported a disconnect between nutrition professionals' beliefs about the causes of obesity and their actions to address it; even if they believed that the environment was heavily responsible for the rise in obesity, they still suggested nutrition education or other methods that aim to change individual level behaviors as a solution (Woodruff, Dorfman, Berends, & Agron, 2003). Overall, there is a lack of personal knowledge, skills, and confidence of nutrition professionals in making environmental changes, but from an organizational and funding systems perspective, there is also a lack of guidance and support to promote practitioners' involvement.

Research Objectives

The overall purpose of this descriptive study was to identify the strategies and delineate the specific tasks that ENMs perform in their job to strive toward making environmental changes for obesity prevention. Studying the work of ENMs in this area is particularly important because they serve low-income populations, which are more severely affected by obesity than are more affluent groups (Levi et al., 2011; Paeratakul et al., 2002), through the Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program–Education (SNAP-Ed). Preliminary results revealed that ENMs have begun to use environmental strategies by participating in the EWPH and CHANCE (Collaboration for Health, Activity, and Nutrition in Children’s Environments, 2011) programs. However, empirical data on the environmental strategies that practitioners use for obesity prevention are not available.

The results of this study will add to previous findings by defining environmental strategies and describing the extent of ENMs’ involvement in using the strategies and providing community nutritionists with guidance to begin or improve work in this area. This understanding will minimize the gap between research and practice by revealing whether and to what extent recommendations are actually put into practice. As a sequential mixed methods study, qualitative data were first obtained from in-depth interviews with ENMs followed by quantitative results derived from an extensive survey of all ENMs to reveal the richness and magnitude of their current practices in addressing obesity on the environmental level. The objectives of this study were

1. To investigate the content and dimensions of the strategies that ENMs use to address obesity on the organizational and community levels of the socio-ecological model; and
2. To describe the extent of ENMs’ involvement in using environmental strategies and in

performing the specific tasks related to each strategy.

In this research the term “environment” was defined with respect to the socio-ecological model. Environmental change was defined as an alteration or modification designed to influence people’s practices and behaviors (CDC, 2009). Environmental approaches (or strategies) were those aimed at altering any of the four types of environments: physical, economic, political, or sociocultural (Brownell, 2005; Swinburn et al., 1999) and beyond the interpersonal level of the socio-ecological model (Figure 2.1), excluding the home environment.

Qualitative Phase

Methods

This descriptive study used a sequential mixed methods approach that included qualitative interviews with seven ENMs followed by a quantitative survey of the 58 ENMs in CCE.

Sample Selection

Seven ENMs were selected using the maximum variation purposeful sampling technique (Patton, 2002) and the procedures suggested by Trost (1986). Interviewing a heterogeneous mix of ENMs was intended to generate a more comprehensive list of strategies and varied perceptions of associated factors that exemplify the diverse population of ENMs. This type of sampling also led to the identification of common patterns that cut across variations (Patton, 2002).

ENMs were chosen based on two dimensions that were relevant to the study: 1) whether or not the ENM was already involved in using environmental strategies to address obesity (i.e. beyond usual direct nutrition education programming and 2) whether the ENM worked in a rural or urban setting. The first dimension represented the continuum of ENMs who were mostly focused on direct nutrition education on the individual level to those who were most actively

using environmental strategies. The second dimension of geographical location diversified the factors associated with ENMs' work because urban and rural areas differ in culture, government, structure, and resources that ultimately impact ENMs' funding, networking, and effectiveness of using of environmental strategies.

After selecting the ENMs for their involvement in environmental change work (whether individual or environmental), two were chosen to represent each geographical location (whether rural or urban) for comparison purposes. Thus, of the four ENMs who were more extensively using environmental strategies; two were from an urban area; of the three ENMs who were more involved in direct nutrition education programming, only one worked in an urban setting. This unbalanced design with more ENMs from the rural county focusing on direct nutrition education could result in more contextual data reflecting the rural conditions. However, differences in the strategies used between ENMs from the two areas were not observed.

Interviews

Two in-depth, semi-structured interviews were conducted with each ENM in person; each lasted on average 1.5 hours and was recorded and transcribed verbatim. In the first interviews, after obtaining informed consent, ENMs were asked to describe their job in general and what they were currently doing and planning to do to address obesity. ENMs were prompted to discuss the purposes of using each strategy mentioned in order to differentiate between those that were focused on individual behavior change and those intended to alter environments. They also described factors that contributed and hindered their progress. Additional job-related information (e.g. CCE's mission, current tenure, salary sources, programs managed) was gathered. Scripts for the second interviews with ENMs were revised during the iterative process of data analysis and customized to fit each ENM's job situation. At the second interview, ENMs explicated their

perspectives and practices related to their use or non-use of each of the strategies that promoted environmental changes. This included their perception of the strategy being within their job scope and other reasons they considered when deciding to be engaged in using each strategy. ENMs were also asked to discuss the socio-ecological model and define “environmental” in their own words. (Refer to Appendix A and B for the complete interview guides.)

In addition to collecting data on newly developed concepts, the second interviews also served as opportunities to perform member checks with ENMs to verify the accuracy of data and interpretations for strengthening the credibility of the study (Miles & Huberman, 1994). Second interviews were conducted soon after the completion of the first set of interviews and the first iteration of data analysis, i.e. initial coding and surface content analysis (Anfara, Brown, & Mangione, 2002). Member check was also performed at a campus-sponsored statewide conference where the researcher presented study results to the group of ENMs and received their written feedback on the accuracy of the information.

Additional data were collected from interviews with the ENMs’ immediate supervisors to understand what they expected ENMs to do in their job to address obesity. These interviews were used to triangulate findings from ENMs’ interviews to enhance the study’s credibility (Lincoln & Guba, 1985). These interviews were not transcribed. Reflective field notes were written immediately after and between interviews to record ideas and insights. Documents that were relevant to ENMs’ job in general and practices to prevent obesity on the environmental levels were reviewed to more comprehensively understand their work context, job expectations, and scope of practice. These included CCE organization/program plans of work, organization worksite wellness policy, position descriptions, and state-wide ENM semi-annual meeting agendas and handouts. The researcher also attended various types of meetings with ENMs

whenever they were happening on the day of the interviews. They included those with all CCE organization staff, nutrition program staff, or local obesity task force/coalition.

Data Analysis

After transcription of the interviews, ATLAS ti (2006) was used to manage interview data. Approximately 338 single-spaced pages of transcripts were generated from all interviews with ENMs (41 to 54 pages for each ENM). Throughout the study period, data were analyzed using the constant comparative method (Strauss & Corbin, 1990). As part of a larger study that conceptualized ENMs' use of environmental strategies and its association with various factors according to the Theory of Planned Behavior (TPB) (Ajzen, 2001; Ajzen & Albarracín, 2007), this analysis focused on the operationalization of environmental strategies. In the first step, codes were identified inductively to represent the multiple dimensions of environmental strategy use. The open coding technique (Strauss & Corbin, 1990) was used to apply codes to the variety of agencies that ENMs worked with (i.e. settings), the wide range of environmental strategies they reported using (e.g. recipe/menu, worksite wellness, committees), the type of strategy (e.g. individual, environmental, nutrition, or physical activity), and the tasks involved in executing each strategy (e.g. providing information, developing action plan). This method was more desirable than line-by-line analysis because keeping the data intact maintained the richness of the extracted information. Each time a segment was examined within one interview, it was compared with the previous categories to determine the appropriateness of applying the same code or whether it needed to be renamed or revised in order to maintain consistency of its meaning. For some codes, the first word is the category name followed by a more specific unit that subsumes the category, for example, "strategy school menu" indicates "strategy" as the category and the specific activity is working on school menus.

After coding, ENMs' use of various strategies were extracted and displayed in a role-ordered matrix (Miles & Huberman, 1994) for comparison purposes. The content of these categories were examined to compare both within ENM and among ENMs, based on their involvement with using environmental strategies, to identify patterns of regularities (Miles & Huberman, 1994). Using these matrices, the tasks ENMs performed for each strategy were further identified. Similarities and differences between ENMs who were considered to be more engaged in environmental work vs. those less involved were particularly emphasized.

Coding was performed only by the researcher and could be biased by the researcher's own professional and personal experiences and perceptions. However, throughout this phase of the study, she regularly discussed findings and interpretations with six members of her research team, including the New York EFNEP State Director, EFNEP State Coordinator, two research associates, and two Extension associates, one of whom coordinates a program with an environmental focus. Another source of credibility (Appendix C) stemmed from the researcher's prolonged engagement (Lincoln & Guba, 1985) with the ENMs since 2007 to conduct five pilot interviews that served both to guide and corroborate this study's findings.

Interview Results

Participant Characteristics

Table 2.1 displays the characteristics of the ENMs who were interviewed. All but one were female. As nearly all ENMs in CCE are female (only three males in recent years), female pronouns were used in this report to protect the identity of the male staff. All ENMs interviewed were full-time staff, although one worked part-time in two counties. The extent of involvement in using environmental strategies varied along a continuum with three ENMs focused on direct nutrition education programming and four others more engaged in projects aimed at

environmental changes, in addition to direct education. Classification as having an environmental focus rather than an individual focus was based on the ENM managing a program that specifically mandated making environmental changes to support healthy eating and physical activity, such as EWPH (NYSDOH, 2010), or having a salary source specifically allocated to doing environmental change work, such as a subcontract from the local health department.

Table 2.1: Characteristics of ENMs interviewed (n=7)

	N	%
Full-time	7	100
Rural	4	57
Urban	3	43
Manages EFNEP	5	71
Manages SNAP-Ed	7	100
Manages EWPH or has EWPH in county	5	71
Has registered dietitian credential	4	57
	Range	Mean
Staff load	2-36	11
Years working in current position	2-20	6

Interviews revealed that ENMs participated in a myriad of activities with various partners to address obesity at the organizational and community levels. From an examination of ENMs' work in this area, three themes emerged: 1) strategies as defined by settings where environmental change occurred, 2) activities that were food- and physical activity-oriented, and 3) tasks performed in using each strategy.

Settings and Strategies

ENMs mentioned collaborating with various agencies to make environmental changes in two general settings: those that serve mainly adults or mainly children. Programs or agencies serving adults included faith-based organizations, physicians' offices, community centers, career centers, drug treatment facilities, transitional homeless housing, adult education centers and for-profit businesses. Those serving children and youth aged 3-12 (i.e. youth-serving agencies, YSAs) included Head Start, WIC (Women, Infants, and Children), schools, preschools/child

daycare centers, after school programs, recreation centers, summer youth camps/programs, 4-H, and Boys and Girls Club. ENMs often belonged to committees or coalitions in their communities with environmentally-focused programs such as EWPH (NYSDOH, 2010) and Steps to a HealthierNY (NYSDOH, 2005), and other local obesity task forces that promote general wellness through healthy eating and physical activity. They were grouped into four strategies based on the different settings: 1) organizations that target adults, 2) organizations that target children (i.e. schools/YSAAs), 3) CCE organization, and 4) the community. This section describes the variety of activities associated with using each strategy. Activities performed vary by their content (nutrition- or physical activity-oriented) and duration of engagement (one-time event or repeated sessions).

Strategy 1: Educate agency leaders and staff to improve their organizations' environments related to food and physical activity

Relative to other strategies, ENMs least frequently talked about working with agency partners to provide education to their staff in order to promote changes within the agency to improve food and physical activity to support the adult population, i.e. their staff or clients. Of ENMs who used this strategy, they primarily educated agency staff to improve individual food-related practices, such as making lower fat and sugar snacks more available and cooking with less fat. One ENM promoted breastfeeding by collaborating with health care providers to stop handing out formula gift packs to women post-partum, and with local businesses to establish worksite breastfeeding facilities. ENMs also focused on physical activity by collaborating with agencies to implement worksite walking programs.

ENMs' engagement with partner agencies varied in duration. Nutrition education sessions conducted with staff in organizations and businesses were often one-time events. Implementing a

particular worksite walking project was also a one-time event with each agency, although the event spanned several weeks as staff continued to walk toward their goals. This project was short in duration relative to the one that involved delivering repeated nutrition education sessions with cooks and staff in food pantries to prepare healthier foods for their clients or the implementation of CCE worksite wellness program because these projects encompassed multiple components, a series of steps, and a wide range of goals.

Most of the projects targeting adult settings were still in progress or were informal. ENMs who worked on local CCE worksite wellness had begun to expose other agency partners to the idea of improving their organizations' environment related to food and physical activity. However, some agencies such as community recreation centers and drug rehabilitation centers were still unwilling to take action. ENMs rarely mentioned following up with their partners and reported not always monitoring and evaluating the progress made. Yet, ENMs have observed unintended environmental level changes that resulted from nutrition education of agency staff as they applied their knowledge to promote organizational change on their own.

Strategy 2: Collaborate with schools and/or youth-serving agencies to develop and implement action plans to improve their environments related to food and physical activity

Across strategies, ENMs interviewed were most often involved in activities associated with improving environments to support children's eating and physical activity. Activities ranged from informal and short-term engagements to more formal and comprehensive involvement. Informally and typically by request, ENMs assisted schools/youth-serving agencies (YSA), including primarily Head Start and daycare centers, to review, revise, and approve children's menus and recipes. The variety of activities included replacing snack items high in fat and sugar and adding more fruit, vegetables, and whole grain products to meals and snacks. These ENMs

sometimes conducted one-time nutrition education workshops with agency staff or daycare council members by request, without continuing the relationships. However, an ENM mentioned that a childcare provider sought her help to make organizational level changes as a result of a one-time presentation.

Some ENMs collaborated closely with schools/YSAs for a longer duration of time to develop more comprehensive plans and to make the environmental changes more sustainable by formalizing them into policies. For example, having an EWPH (NYSDOH, 2010) grant allowed an ENM to subcontract with a registered dietitian to conduct assessments (e.g. Nutrition and Physical Activity Self-Assessment for Child Care [NAPSACC]; UNC Center for Health Promotion and Disease Prevention, 2009) and develop and implement action plans with school districts and daycare centers. Another ENM under subcontract with the health department served on school wellness advisory committees and collaborated with an agency to develop and facilitate workshops to train schools and YSAs to create action plans and implement wellness policies. ENMs were more likely to be involved in monitoring and evaluating progress with partnering agencies when the projects were more formalized and supported by specific funds. A third ENM with funds to make environmental changes in children's environments (CHANCE, 2011) conducted nutrition education with staff at the YMCA and after school programs to improve food and physical activity environments. Specific activities included modifying menu and snack items, incorporating more whole grain products, increasing physical activity sessions, not using foods as rewards and in fundraising events, and promoting the use of locally grown produce. Another activity was educating teachers, teaching assistants, and Head Start family workers on ways to teach nutrition to children and model appropriate dietary behaviors, which can eventually contribute to a positive social environment.

Two ENMs who did not work directly with schools/YSAs on improving children's environments to support wellness did not perceive these activities to be a part of their job responsibility. There were other agencies and programs in their communities to support work in that area or the schools/YSAs had the means to do this work themselves. For example, one ENM claimed that "Head Start has pretty specific guidelines that they serve. So they are in a place that they know what they are supposed to be doing." However, if requested, ENMs will assist in the planning process and provide their expertise in nutrition and health. The other ENM delegates a staff member to serve on the Head Start policy council to provide assistance and influence their decisions.

Strategy 3: Develop and implement worksite wellness policies related to food and physical activity in CCE organization

ENMs' description of their use of this strategy ranged from informally and sporadically delivering loosely structured activities to more formally developing and implementing worksite wellness policies. Informal activities were likely to be one-time events whereas policy development required long-term engagement. Policies were to be incorporated into the organization's established practices. Most ENMs perceived their role as a nutrition expert within their own organization and at least performed activities such as providing healthy nutrition guidelines for meetings and offering recipes and assistance to colleagues in other program areas, and promoting wellness practices related to food and physical activity within their own program area. Without specific funding, ENMs did not perceive their role to include formal regulation of health practices in their organization, but rather informally supporting wellness measures and providing expertise.

On the other hand, only one ENM with funds from CHANCE (2011) to promote worksite

wellness was able to establish formal policies within her organization. She also received instrumental support from the organization board, executive director, colleagues, and staff to form a wellness committee. Together, they successfully conducted an assessment of their work environment and implemented worksite wellness policy related to nutrition and physical activity. This change affected the foods offered in vending machines, at meetings, and in programs delivered to their audiences. Their organization also competed annually in a community physical activity event with other agency staff and promoted walking in their organization. These policies required “constant vigilance” to ensure staff and colleagues adhere to the rules. This ongoing monitoring of the implemented plans was necessary until the practices became the norm of the organization.

The other ENM with CHANCE funding to conduct worksite wellness was only able to coordinate a few “spotty” nutrition and physical activity events in her organization. They held food-tasting and movie-showing sessions to increase CCE staff’s awareness toward wellness. However inconsistent these events were, the ENM reported having heard positive anecdotal stories, for example, where her colleagues had made changes to the foods they provided for their 4-H participants and had considered nutrition and health as they planned for food purchases.

Strategy 4: Serve on committees and/or coalitions that make environmental changes related to food and physical activity in the community

Compared to other strategies, nearly all ENMs reported serving on committees and/or coalitions geared toward making environmental changes in their communities. Their participation ranged from serving as nutrition experts, making recommendations and supporting other members’ projects, to taking the lead on projects that aimed to make community-level environmental changes. ENMs were more likely to work on other partners’ projects rather than

leading community-wide efforts to address obesity. The content of these projects were more physical activity than nutrition-oriented. They included a school walking project, sidewalk and crosswalk planning, trail maintenance, and public use of school gym for residents to exercise. One ENM focused on contributing to two newly-developed coalitions, including participating in a large citywide partnership to better coordinate obesity prevention efforts and establishing a central database where agencies can find out “who is doing what, with whom, and where”; and discussing the operating guidelines of an EWPH grant, and deciding on projects to pilot as a part of the grant.

Being in a leadership role, ENMs’ involvement could be short- or long-term in duration. Short-term activities included conducting a community assessment on obesity and prevention and coordinating a TV turn-off challenge to reduce school children’s screen time. Other projects were more long-standing. One ENM collaborated with farmers and other food producers to develop the community’s farmers’ market over the years working at CCE. Today, the project had evolved into a well-established community supported agriculture (CSA) program that included delivering food to low-income housing areas and donating left-over produce to a local emergency food system. This increases community residents’ access to fruits and vegetables, allowing them to improve the quality of their diets, which may eventually contribute to obesity prevention.

Tasks: Process of Strategy Use

In addition to detailing the variety of activities ENMs performed, they described the elaborate processes associated with using each strategy. This information was mostly derived from ENMs who had funds devoted to environmental change work, allowing them to more formally and thoroughly apply environmental approaches to address obesity. For example, one

ENM managed the EWPH program and another implemented a worksite wellness program in her organization through the CHANCE project. Interview content revealed the following tasks:

1. Networking and building relationships with agency partners
2. Providing information to agency partners
3. Identifying key influential people in the organization or community
4. Communicating with and educating people to get buy-in
5. Negotiating with agency partners to establish written contract/agreement
6. Conducting an assessment of the environment
7. Developing and implementing action plans
8. Monitoring and evaluating progress

Tasks 1 to 8 can be considered a formal process of collaborating with other agencies to make environmental changes. However, the sequence of tasks may not be linear or proceed straightforwardly; ENMs may also begin their project with any task depending on the given situation. For example, as an ENM described, some of her involvement with child care agencies was initiated by organizations that were already interested and ready to modify their environments. In this case, it was not necessary to get buy-in from the agency leader. ENMs also frequently acted as nutrition experts, brainstorming with and providing technical assistance to partners as part of committees/coalitions. They also developed or modified educational resources and curricula to educate agency leaders and staff to make environmental changes in their organizations. For example, one ENM who worked with school wellness compiled a resource binder for educating school teachers and staff on developing action plans to improve school nutrition and physical activity. These tasks contributed positively to their overall relationships with their partners and facilitated their use of environmental strategies for obesity prevention.

Quantitative Phase

Methods

Survey Development

Data from qualitative interviews provided the content to construct the survey. To establish content validity, survey content drew on the technical and practical expertise of the research team. The group scrutinized drafts of survey items and provided input on whether to revise, eliminate, and/or combine items. Decisions were made based on consensus. Three former EFNEP/SNAP-Ed managers pilot tested the draft survey, recording time for completing the survey and commenting on item clarity, conciseness (DeVellis, 2003), and ease or difficulty of completion. Only minor revisions in wording were made to reduce ambiguity.

Variables

Use of Strategies

The general behavior is ENMs' *use of environmental strategies*, sometimes referred to as approaches. Since various government recommendations on obesity prevention refer to strategies and strategic plans, the term *strategy* was adopted to encompass the various activities ENMs participated in to address obesity. CDC (2009) defined it as "an environmental change or policy-related activity intended to prevent disease or promote health in a group of people." It is both action-oriented and goal-focused, thus it is best regarded as a behavior-goal unit (Ajzen & Madden, 1986).

The four strategies that emerged from qualitative interviews were distinguished by settings in which ENMs functioned; those targeting adults, children, local CCE organizations, and the community. Thus, strategies define *where* strategy use occurs. These settings situate on the organizational and community levels of the socio-ecological continuum. Since these strategies

were the most commonly mentioned by ENMs, they were likely to be feasible to engage in within their existing job context. According to the researcher's team, the strategies were also the ones that NYS EFNEP leadership would recommend ENMs to use in their work, if they were not already doing so. The four strategies are as follows:

Strategy 1: Educate agency leaders and staff to improve their organizations' environments related to food and physical activity.

Strategy 2: Collaborate with schools and/or youth-serving agencies to develop and implement action plans to improve their environment related to food and physical activity.

Strategy 3: Develop and implement worksite wellness policies related to food and physical activity in CCE organization.

Strategy 4: Serve on committees and/or coalitions that make environmental changes related to food and physical activity in the community.

Qualitative interviews also uncovered a variety of *activities* that ENMs performed to either improve environments related to food or physical activity. Thus, activities define *what* the specific strategy content is. These activities subsume strategies and can address any of the four types of environments described by Swinburn and colleagues (1999). Examples include improving the foods offered at staff meetings or establishing a walking break to promote worksite wellness or working with schools to decrease high-fat snacks. While qualitative interviews revealed that ENMs' participated in numerous environmental activities, the quantitative survey only asked about ENMs' performance of the general behavior, "using environmental approaches to address obesity" and use of each of the four strategies. Figure 2.2 shows the hierarchy among the terms used in this phase of the study to refer to ENMs' strategy use.

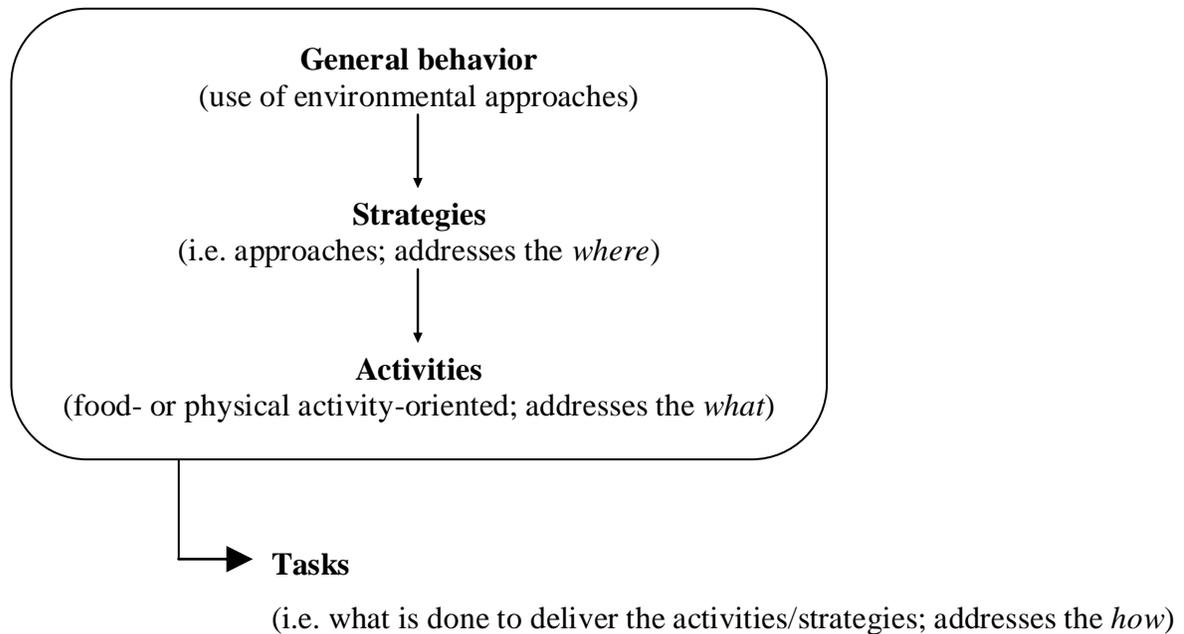


Figure 2.2: Relationships among strategies, activities, and tasks

Task Levels

Interviews also revealed that a series of *tasks* made up the multicomponent processes in ENMs' use of strategies and activities (Figure 2.2), such as identifying potential partners, providing information to partners, educating partners to get buy-in, and brainstorming to develop action plan for environmental change. Thus, tasks define *how* strategy use occurs. To capture ENMs' involvement using a quantitative survey, each strategy encompassed three task levels. Level 1 task involved providing information and making recommendations to others on healthy eating and physical activity. For strategies 1-3, level 2 task involved developing and implementing action plans; and level 3 task was evaluating action plans. For strategy 4, level 2 task was working to *support* other committee members' projects while level 3 task was to *take the lead* to work on projects that make environmental changes in their community to support healthy foods and physical activity. It is assumed that the three task levels increased in intensity,

e.g. ENMs are more intensely engaged in a strategy when developing and evaluating action plans than when they are simply providing information. ENMs then indicated the frequency of their performance of each task on a 5-point scale (“almost never,” “seldom,” “sometimes,” “often,” and “almost always”). Table 2.2 shows the task levels for all strategies.

Other Items

In addition to the survey items used to assess ENMs’ use of each strategy, another question elicited the amount of time each week ENMs spent on tasks that aimed to make environmental changes. Response categories were “None,” “1-5 hours,” “6-10 hours,” “11-15 hours,” and “more than 15 hours”. Demographic information (e.g. part-time/full-time, education, current tenure) was also gathered.

Survey Distribution

Quantitative data collection occurred during an hour-long session at a semi-annual program conference for ENMs. A set of survey instructions were given during the session, including the definition of “environment” and “environmental” as used in this study to ensure common interpretation among ENMs (Appendix D). Fifty ENMs who were present completed the survey (Appendix E) in person. Eight ENMs who were absent were contacted within one week of the conference by electronic mail (e-mail) and telephone to seek their participation; all eight consented. These ENMs filled out the paper-based survey then mailed it to the researcher. All 58 ENMs who manage the EFNEP and/or SNAP-Ed Program in CCE and supervise frontline staff participated in the study, resulting in a 100% response rate.

Table 2.2: Task levels for each strategy

Strategy 1: Other organizations’ environments	
Level 1	1. We make recommendations and provide information on ways to increase the organizations’ staff and audience access to healthy foods and physical activity.
Level 2	2. We work with organizations to conduct assessments and develop and implement action plans to <u>make environmental changes</u> to increase their staff and audience access to healthy foods and physical activity.
Level 3	3. We follow-up with organizations to evaluate their progress in <u>making environmental changes</u> to increase their staff and audience access to healthy foods and physical activity.
Strategy 2: School/YSA environments	
Level 1	1. We make recommendations (e.g. menu planning) and provide information to schools/agencies on ways to increase children’s access to healthy foods and physical activity.
Level 2	2. We work with schools/agencies to conduct assessments and develop and implement action plans to <u>make environmental changes</u> to increase children’s access to healthy foods and physical activity.
Level 3	3. We follow-up with schools/agencies to evaluate their progress in <u>making environmental changes</u> to increase children’s access to healthy foods and physical activity.
Strategy 3: Organization worksite wellness	
Level 1	1. We make recommendations and provide information to our colleagues on ways to increase our staff and audience access to healthy foods and physical activity.
Level 2	2. We work with our colleagues to conduct assessments and develop and implement worksite wellness policies to increase our staff and audience access to healthy foods and physical activity.
Level 3	3. We work with our colleagues to evaluate our progress in implementing worksite wellness policies to increase our staff and audience access to healthy foods and physical activity.
Strategy 4: Community committees/coalitions	
Level 1	1. In these working groups, I/my staff make recommendations and provide information on ways to increase residents’ access to healthy foods and physical activity.
Level 2	2. In these working groups, I/my staff support others’ projects that <u>make environmental changes</u> in our community to increase residents’ access to healthy foods and physical activity.
Level 3	3. In these working groups, I/my staff take the lead to work on projects that <u>make environmental changes</u> in our community to increase residents’ access to healthy foods and physical activity.

Quantitative Data Analysis

Statistical Package for the Social Sciences 14.0 (SPSS, 2006) was used for conducting descriptive analyses. Frequencies were derived to understand ENMs' current involvement (dichotomous variable: use or non-use) in using environmental approaches to address obesity in general and the four specific strategies. Descriptive statistics illustrated the extent of ENMs' involvement with each task level and the amount of time they spent on tasks aimed at making environmental changes.

Chi-square tests of independence were performed to examine the relationships and synergy among strategy use and participation at each task level. To ensure adequacy of group size for these analyses, frequency categories "almost never" and "seldom" were collapsed into "low" frequency of performance; "often" and "almost always" were combined into "high" frequency of performance. Two sets of analyses were conducted to compare the results with and without the moderate performing group. Since both led to the same conclusion, the group that indicated "sometimes" (moderate frequency) was excluded from analyses. Fisher's exact test was used on the resultant 2×2 matrix with this limited study population of 58.

Survey Results

Quantitative data were collected using a survey to further examine the extent and prevalence of environmental strategy use among all ENMs in CCE. Table 2.3 presents the personal and job-related characteristics of the 58 ENMs who responded to the survey. Most were female, held a master's degree, and spent 1-5 hours each week on tasks that aimed to make environmental changes to address obesity.

Table 2.3: Respondent characteristics (n=58)

Variable	Categories	n	%
Gender	Female	56	97
Age (year)	35 and under	7	12
	36-45	13	22
	46-55	21	36
	56 and over	17	29
Degree	Bachelor's	15	26
	Master's	40	69
	Doctoral	2	3
	Other	1	2
Registered dietitian	Yes	16	28
Programs managed ^a	SNAP-Ed	58	100
	EFNEP	31	53
	CHANCE ^{bc}	7	12
	Farm-to-School ^b	6	10
	Eat Well Play Hard ^b	5	9
	Healthy Heart Program ^b	2	3
	Steps to a HealthierNY ^b	1	2
Hours spent on tasks toward making environmental changes each week	0	6	10
	1-5	36	62
	6-10	10	17
	More than 11	6	10
		Mean	SD
Current tenure (year)		7.7	8.3
Staff load (number of staff)		7.0	5.0

^a Programs managed are not mutually exclusive; totals do not add to 100%

^b Programs identified as focusing on making environmental changes

^c Collaboration for Health, Activity, and Nutrition in Children's Environments: a multicomponent nutrition education, parenting skills and environmental change program

Use of Strategy

Table 2.4 describes the distribution of ENMs using each strategy and combination of strategies. It indicates that their use varied by strategy. Most ENMs were likely to use strategy 4; fewest used strategy 2, a finding that contrasted with the qualitative data. A majority of ENMs (53%) used three or four strategies in their job. Chi-square tests revealed significant relationships between use of strategies 1 and 3 (other organizations and CCE organization; $\chi^2=7.2$, $p<0.01$, $\Phi=0.37$), 1 and 4 (other organizations and committee/coalition; $\chi^2=7.82$, $p<0.05$, $\Phi=0.28$), and 2 and 4 (schools/YSA's and committees/coalitions; $\chi^2=13.01$, $p<0.001$, $\Phi=0.47$). ENMs were likely to be using strategy 4 despite their lack of use of strategies 1 and 2. This finding corroborates

data from interviews illustrating that ENMs who were generally less involved in using environmental approaches to address obesity were still engaged in obesity prevention efforts by participating on committees or coalitions.

Table 2.4: Number and proportion of ENMs who used each strategy and combination of strategies

Strategy						Combination of Strategies	
1 ^{ab}	2 ^c	3 ^{ac}	4 ^{bc}			n	%
Number of users				n	%	n	%
33	28	33	45				
57%	48%	57%	78%				
No strategy				6	10	6	10
One strategy							
•				1	2	8	14
	•			0	0		
		•		3	5		
			•	4	7		
Two strategies							
•	•			1	2	13	22
•		•		2	3		
•			•	2	3		
	•	•		0	0		
	•		•	6	10		
		•	•	2	3		
Three strategies							
•	•	•		0	0	17	29
•	•		•	5	9		
•		•	•	8	14		
	•	•	•	4	7		
Four strategies							
•	•	•	•	14	24	14	24
Total				58	100	58	100

Strategy 1: Educate agency leaders and staff to improve their organizations' environments related to food and physical activity.

Strategy 2: Collaborate with schools and/or youth-serving agencies to develop and implement action plans to improve their environment related to food and physical activity.

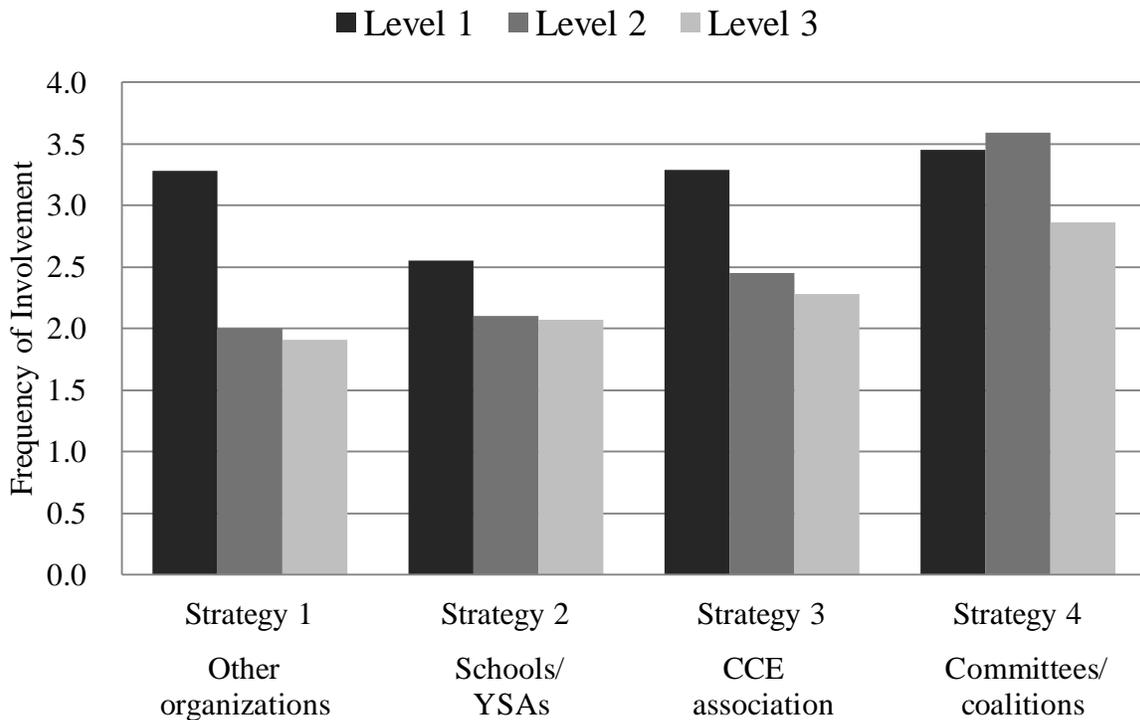
Strategy 3: Develop and implement worksite wellness policies related to food and physical activity in CCE organization.

Strategy 4: Serve on committees and/or coalitions that make environmental changes related to food and physical activity in the community.

^{abc} Indicates significant relationship between two strategies labeled with the same letter at $p < 0.05$.

Frequency of Task Performance

Figure 2.3 illustrates the average frequency of ENMs’ performance of each task for the four strategies. For strategies 1-3, ENMs were most likely to be performing level 1 task of making recommendations and providing information and were least likely to be performing level 3 task of evaluating action plans (for strategies 1-3), which confirms the expectations prior to data collection. For strategy 4 (committees/coalitions), ENMs performed levels 1 and 2 tasks with nearly the same frequency, i.e. they made recommendations and provided information as often as they supported other partners’ projects. The decreasing trend over task levels 1-3 was thus not observed. Chi-square tests revealed significant relationships between strategy use and frequency of task performance in all pairs of associations ($p < 0.001$).



Level 1 of Strategy 1-4: making recommendations and providing information
 Level 2 of Strategy 1-3: developing and implementing action plans; Strategy 4: supporting others’ projects
 Level 3 of Strategy 1-3: evaluating action plans; Strategy 4: taking the lead on projects

Figure 2.3: Mean frequency of ENMs’ performance of each level for each of the four strategies

Discussion

This study described ENMs' involvement in environmental change work and defined the multiple dimensions of environmental strategies as settings, activities, and tasks. The relationships between two strategies and between a strategy and each of its three tasks were also examined. Since research on practitioners' perspectives and practices related to obesity prevention on the environmental level is scant, findings in this study are compared to recommended practices, primarily from the CDC and state strategic plans.

Most ENMs currently devoted 1-5 hours of their weekly work time (i.e. 3-13%) to performing tasks that aimed to make environmental changes. A majority of the time spent on making environmental changes is for building and maintaining relationships, a time-consuming task that ENMs described as being integral to their work. Although the amount of time ENMs contributed to environmental tasks was limited, a majority of them used 3-4 environmental strategies. It is likely that ENMs who used more strategies had pre-existing relationships with the different agencies such that they did not have to spend much additional time building them. The limited amount of time they devoted to environmental tasks also indicated that while they worked in multiple settings, ENMs' usually reported performing the simple level tasks of providing information and making recommendations to their partners. These activities would require less time than formal activities of developing, implementing, and evaluating environmental action plans. For ENMs who used fewer strategies and spent less time on environmental tasks, they still mostly focused on delivering EFNEP/SNAP-Ed direct nutrition education programs and not environmental change work.

Settings and Strategies

ENMs were currently involved in a wide variety of projects that aimed to make changes in settings where people live, learn, work, and play. ENMs were most likely to be serving on community committees/coalitions, followed by working with other agencies and within their own CCE organizations, and then collaborating with schools/youth-serving agencies (YSA) to make environmental changes. ENMs' partnerships with schools, YSAs, and other organizations to promote healthy eating and physical activity were consistent with the strategies identified as organizational level and primarily involving the sectors of education and food service (Sacks, Swinburn, & Lawrence, 2008). This includes working to improve children's (Drummond et al. 2009; NYSDOH, 2005; Schwarte et al., 2010) and workplace environments (Minnesota Department of Health, 2008; NYSDOH, 2005; New Jersey Department of Health and Senior Services, 2006; Schwarte et al., 2010). Mobilizing communities and neighborhoods and fostering coalitions and networks for obesity prevention are approaches that aim to change the external factors on the community level of the social-ecological model that exerts influence on individuals' behaviors related to food and exercise (Kumanyika et al., 2008; Healthy Eating Active Communities, 2007).

While most ENMs interviewed reported working actively with YSAs, survey results indicated that, as a group, they worked less frequently with schools and YSAs (strategy 2) than with other general organizations, CCE itself, and community groups. Interviews with ENMs revealed difficulties and multiple reasons for their lack of involvement. Some ENMs reported that they simply did not have a youth component in their program or were in the initial stages of its development. Schools and YSAs, such as Head Start, often have their own nutritionists or dietitians, thus they did not require ENMs' assistance in dealing with issues related to food and

physical activity. Also, as ENMs explained, it is not their main job responsibility to work with schools/YSAs on their menus, recipes, and wellness plans. ENMs also claimed that schools can be too large or difficult to work with, for example, due to the intricate organizational structure or disinterest from school leaders, staff, teachers, and even parents.

The relationships among strategy use indicated that working with partners in one setting led to work with other settings. Working within CCE on worksite wellness (strategy 3) and other organizations targeting adult audiences (strategy 1) were also related, signifying that both strategies entailed similar tasks, including educating staff about obesity and environmental change to get people's buy-in, working with leadership and other staff to develop and implement action plans, and following through with evaluation of progress. Qualitative data indicated that ENMs who had begun working on worksite wellness in their own organizations were likely to impart their knowledge and experiences to their partners in order to motivate them to do the same in their own workplace.

Use of strategies 1 and 4 and strategies 2 and 4 were associated perhaps because these three strategies involved working with other organizations outside of CCE. Also, since strategy 4 was most highly used, it was likely to co-occur with other strategies. Qualitative data showed that members in committees/coalitions tend to be representatives of various community-based organizations, local government agencies, and schools/YSAs from where EFNEP and SNAP-Ed participants were recruited; thus the individual organizations and committees may overlap. As data indicated ENMs' frequent use of strategy 4, working in community groups would be an ideal entry point for ENMs to begin using environmental strategies by exposing their agency partners to the notion of environmental change and encouraging them to make changes in their organizations and communities, as some ENMs have already done. They could also extend their

networks through the relationships built through committees/coalitions to use environmental strategies.

The more extensively an organization participates in committees/coalitions, the more opportunities it has to develop personal relationships that facilitate their work (Foster-Fishman, Salem, Allen, & Fahrbach, 2001). This is also in line with qualitative findings within this study where ENMs consistently regarded existing relationships as the primary catalyst for their involvement in doing environmental work (Chapter 4). Building upon existing assets and connecting with and supporting partners who share similar missions are recommended practices in collaborating with others (Huberty, Balluff, O'Dell, & Peterson 2010).

Strategy Content

Qualitative data revealed the details of ENMs' use of environmental strategies as focusing not only on the nutrition aspect of the energy balance equation, but also the physical activity aspect. They were in line with the objectives of NYS Strategic Plan "to increase policy and environmental supports for physical activity and healthy eating, including breastfeeding" (NYSDOH, 2005), as well as those found in the *Recommended Community Strategies and Measurements to Prevent Obesity in the United States* (CDC, 2009). ENMs' work encompassed specific CDC strategies, for example, "to promote the availability and affordability of healthier food and beverage choices;" "discourage consumption of sugar-sweetened beverages;" "increase support for breastfeeding;" "increase the amount of physical activity in physical education programs in schools;" "reduce screen time;" "improve access to outdoor recreational facilities;" and "enhance infrastructure" supporting walking and bicycling in various settings.

Even more specifically, ENMs talked about working with schools to encourage improvements such as not using food in fundraisers and as rewards and incorporating more

whole wheat and lower fat items into children's menus. Other activities were in line with those outlined in other state plans such as using the NAPSACC to improve child feeding and exercise environments in child care centers (Devlin & Plescia, 2006), promoting availability of water, low-fat milk and healthy snacks in vending machines in organizations, and providing access to fruits and vegetables through community gardens and farmers' markets (Georgia Department of Human Resources, 2005), as well as preventing staff from restricting active play time for children who misbehave as suggested by NAPSACC (Drummond et al., 2009).

Process of Strategy Use: Task Levels

Since each of the four strategies and specific activities is considered both a behavior to be performed and a goal to be achieved (Ajzen & Madden, 1986), several steps of action are required. The extent of ENMs' involvement was defined by whether they only informally made recommendations and provided information to their partners or collaborated more formally to develop, implement, and evaluate action plans. Broadly speaking, using environmental strategies encompasses nutrition education "delivered through multiple venues" and involves activities on all levels of the socio-ecological continuum (Contento, 2007, p. 15). In their use of environmental strategies, the tasks of sharing information and making recommendations, developing and implementing action plans, and evaluating plans can all involve instances of nutrition education where ENMs impart nutrition and health knowledge to their partners.

Qualitative and quantitative data were consistent with each other, indicating that ENMs were most likely to be informally making recommendations and providing information (level 1) when working with partners to promote environmental change. Information sharing is the least intense task for interorganizational networks (Wendel, Prochaska, Clark, Sackett, & Perkins, 2010) and is fundamental to community practitioners' jobs and are regularly performed at all

levels of partnerships (Mattessich, Murray-Close, & Monsey, 2001). However, since ENMs already frequently networked with agencies for recruitment purposes, they could capitalize on these opportunities to conveniently give advice to other agencies on ways to improve their organizations' food and physical activity environments. Providing technical assistance to others can eventually increase the capacity of community-based practitioners (Drummond et al., 2009; Schneider et al., 2007).

The multitude of tasks to be performed in collaborative relationships, although not specifically targeting obesity prevention, can be found in strategic plans and published literature. They are consistent in that the key components of an intervention or project involve the fundamental steps of an assessment followed by the development, implementation, and evaluation of action plans (Drummond et al., 2009; Henderson & Armah, 2010; Schneider et al., 2007; The Victorian Department of Health, 2010). Results indicated that while ENMs who developed and implemented action plans (level 2) were likely to be evaluating them (level 3), the gap in performance is greater from making recommendations and providing information (level 1) to actually engaging in a collaborative partnership to develop and implement environmental change plans. It is likely that these more formal task levels were not a part of ENMs' traditional job delivering direct nutrition education programs and were less feasible to perform without additional funding. The higher level tasks were also the ones that were collaborative and demanded the partners' readiness and commitment (Mattessich et al., 2001; Sullivan, Barnes, & Matka, 2002) that was often not present in ENMs' work to make environmental changes.

Specific to using strategy 4, ENMs more often described committees/coalitions as an information-exchange forum. Mattessich and colleagues (2001) defined this level of involvement as a cooperation, where relationships are informal and information is shared as needed, rather

than a high-level collaboration. Serving in community committees/coalitions, ENMs were more likely to be supporting other people's projects (level 2 task) than making recommendations and providing information (level 1 task) and taking the lead on projects to make environmental changes (level 3 task). It was surprising to find that more ENMs were supporting other people's projects than making recommendations and providing information related to making environmental changes in the committees/coalitions. This unexpected finding could be attributed to the ENMs' interpretation of "supporting" other people's work as simply being in agreement with the goals and values of their partners' projects and not necessarily an investment of ENMs' tangible resources such as time and money. More ENMs performing task level 2 also reflected the greater effort required for ENMs' to take the initiative to make recommendations and provide information to their partners than to passively support others' projects. Further, this finding suggests a reexamination of the tasks chosen for strategy 4 and their differences from those of other 3 strategies. It is possible that the degree of difference between ENMs' supporting other people's projects and taking the lead on their own projects is greater than the difference between implementing and evaluating actions. This would explain the differences in the observed patterns of task performance (Figure 2.3). Nonetheless, the data obtained in this study prompt future research to refine this scale in order to more accurately reflect the task levels.

Implications for Research

Although emphasis on modifying environments in obesity prevention began nearly a decade ago, the role and expectations of community health practitioners have not yet been updated to address this urgent need. To enhance the generalizability of this study and to better understand what practitioners in various sectors of the society can do in their job, more qualitative and quantitative research is needed on the perspectives and practices of other

community change agents. Such agents include health care providers, public health and social services staff, and other members of community-based organizations (e.g. churches, community centers, childcare programs, emergency care centers) whose work contributes directly to the wellbeing of community residents. Research also needs to be replicated in other state Cooperative Extension systems. Since obesity is an issue that will require the collective effort of many individuals and groups on all levels of the society to use multiple means to change the relevant environments, understanding the roles and values of all stakeholders in order to find common ground may enhance ENMs' use of environmental strategies in their communities.

Although the strategies identified in this study represent what ENMs in New York are doing, they are not exhaustive. As evidenced by the published literature and the current study, the possible range of strategies that community nutritionists can use to address obesity on the environmental level is broad. This study only defined the strategies by setting or target population; characterizing them based on other dimensions is possible. They were also defined at a more general level without differentiating between the ones that were nutrition- and physical activity-focused. Additional research can examine the activities specifically to more finely illustrate the work of community staff and nutritionists.

Finally, more work is necessary to describe the intricate process by which community nutritionists and other service staff learn to use environmental strategies. Outlining the sequence of tasks may guide practitioners interested in engaging in community-based obesity prevention activities.

Implications for Practice

This study described ENMs' work in the area of obesity prevention using a socio-ecological approach that extends beyond direct participant education. The results have

significant implications especially for practitioners and nutritionists who promote the health and wellness of the low-income population in their communities as these residents tend to live in neighborhoods with limited availability of healthy affordable foods (Larson, Story, & Nelson, 2009) and fewer resources for physical activity (Moore, Davis, Baxter, Lewis, & Yin, 2008; Powell, Slater, & Chaloupka, 2004). While the environmental strategies that span the organizational and community levels of the socio-ecological continuum are still not widely used among community nutritionists (Kumanyika et al., 2002), they can be incorporated into the practitioners' job, since some ENMs were already performing various tasks to promote environmental change with their existing partners. Results revealed variations in the strategy ENMs used, but they suggest that strategy 4, working in committees/coalitions as a group to promote changes in the community for obesity prevention, may be a good starting point because collaborating with others is considered a main aspect of community practitioners' job responsibility. Data also suggest that practitioners may find it easier to begin engaging in a level 1 task of making recommendations and providing information related to making environmental changes to their partners across agencies and settings. This is in essence a form of nutrition education to other leaders and practitioners in their community to enhance their collective capacity to do work in this area.

This study also suggests that the strategies be applied in *settings* where the practitioners' partners work because the relationship already exists to facilitate future work (Rosenthal, 1998). They can be environments that serve adults (e.g. community centers, career/adult learning centers, drug rehabilitation facilities); those that serve children, adolescents, and young adults (e.g. schools, daycare centers, after school programs, camps); their home organizations; or the larger community or neighborhood. Worksites and schools are often the targets of intervention,

since they are places where people spend a significant amount of their everyday lives. Next is to define the *activity* that can be categorized as nutrition- or physical activity-focused. Practitioners may consider applying the ANGELO framework to more specifically define the different types of environments: physical, economic, political, and sociocultural (Swinburn et al., 1999).

If practitioners are to be expected to use the strategies in their work, organizations and policies that are intricately connected to their work need to change. This includes Cooperative Extension organizations which need to provide the necessary structure and resources to support ENMs' environmental work including revising their position description to include educating agency partners, seeking grants, and collaborating within their organization to do work in this area. State leaders should provide the necessary training for ENMs to use environmental strategies. Training of practitioners in public health and community services should emphasize community assessment; social marketing; program evaluation; understanding the policy process; designing healthy communities (including learning about the socio-ecological model and various settings for making multilevel environmental change); and making partnerships work (Schneider et al., 2007). The capacity of the organizations in which community nutritionists and other practitioners work needs to be examined carefully before positive changes in their work can happen.

Conclusion

In the obesity field, practitioners and researchers often talk about what is being done; rarely do they delineate the means by which work is actually performed. ENMs wanted to know what they can do and more specifically, how they could get started in using environmental strategies to address obesity. The current study attempted to answer their questions in order to motivate them to act. It indicated that ENMs' use of environmental strategies is a

multicomponent behavior that occurred in various settings and involved a wide range of partners from schools/youth-serving agencies and other community organizations. ENMs performed various activities to modify the physical and sociocultural environments in organizations and the community at large to facilitate healthy eating and physical activity. The sequence of steps ENMs performed to achieve environmental change goals are consistent with recommended practices for promoting community development. Their work in using environmental strategies to address obesity contributes to the overall goal of obesity prevention in the US through using a multitude of strategies and engaging many stakeholders to address multiple levels of the social ecological continuum. Community nutritionists such as ENMs should begin or continue to adopt these environmental change practices within their existing job context, especially to improve the lives of the low-income population adversely affected by the serious issue of obesity.

References

- Ajzen, I. & Albarracín, D. (2007). Predicting and changing behavior: a reasoned action approach. In I. Ajzen, D. Albarracín, and R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Ajzen, I. & Madden, T.J. (1986). Prediction of goal directed behavior: attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22(5), 453-474.
- Anfara, V.A., Brown, K.M., & Mangione, T.L. (2002). Qualitative analysis on stage: making the research process more public. *Educational Researcher*, 31(7), 28-38.
- Arizona Department of Health Services. (2005). Arizona nutrition and physical activity state plan: Comprehensive plan to reduce chronic disease and obesity in Arizona. Retrieved April 2, 2010, from <http://www.physicalactivityplan.org/resources/PA-Plans/ArizonaPA.pdf>
- ATLAS.ti. (2006). Version 5.2. Berlin, Germany: Scientific Software Development.
- Bray, G.A. & Champagne, C.M. (2005). Beyond energy balance: there is more to obesity than kilocalories. *Journal of the American Dietetic Association*, 105(5 Suppl 1), S17-S23.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Brownell, K.D. (2005). The chronicling of obesity: growing awareness of its social, economic, and political contexts. *Journal of Health Politics, Policy, and Law*, 30(5), 955-964.
- Centers for Disease Control and Prevention. (2009). Recommended community strategies and measurements to prevent obesity in the United States, *Morbidity and Mortality Weekly Report*, 58, No. RR-7, 1-29.
- Collaboration for Health, Activity, and Nutrition in Children's Environments. (2011). CHANCE. Retrieved November 5, 2011, from http://www.fnec.cornell.edu/Our_Initiatives/CHANCE.cfm
- Contento, I.R. (2007). *Nutrition education: linking research, theory, and practice*. Sudbury, MA: Jones and Bartlett Publishers.

- DeVellis, R.F. (2003). *Scale development: theory and applications* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Devlin, L. & Plescia, M. (2006). The public health challenge of obesity in North Carolina. *North Carolina Medical Journal*, 67(4). Retrieved August 12, 2010, from <http://www.ncmedicaljournal.com/jul-aug-06/toc0706.shtml>
- Drewnowski, A. & Spector, S.E. (2004). Poverty and obesity: the role of energy density and energy costs. *American Journal of Clinical Nutrition*, 79(1), 6–16.
- Drummond, R.L., Staten, L.K., Sanford, M.R., Davidson, C.L., Ciocazan, M.M., Khor, K.N., and Kaplan, F. (2009). Steps to a Healthier Arizona: A pebble in the pond: the ripple effect of an obesity prevention intervention targeting the child care environment. *Health Promotion Practice*, 10(2), 156S-167S.
- Economos, C.D., Hyatt, R.R., Goldberg, J.P., Must, A., Naumova, E.N., Collins, J.J., & Nelson, M.E. (2007). A community intervention reduces BMI z-score in children: Shape Up Somerville first year results. *Obesity*, 15(5), 1325-1336.
- Espinosa-Hall, G.B., Metz, D., Johns, M., Smith, D., Crawford, P.B., Siemering, K., & Ikeda, J. (2007). UCCE helps community coalitions reduce childhood overweight. *California Agriculture*, 61(3). Retrieved April 2, 2010 from <http://www.escholarship.org/uc/item/96g7236s>
- Field, A.E., Coakley, E.H., Must, A., Spadano, J.L., Laird, N., Dietz, W.H., Rimm, E., & Colditz, G.A. (2001). Impact of overweight on the risk of developing common chronic diseases during a 10-year period. *Archives of Internal Medicine*, 161(13), 1581-1586.
- Foster-Fishman, P.G., Salem, D.A., Allen, N.A., & Fahrback, K. (2001). Facilitating interorganizational collaboration: the contributions of interorganizational alliances. *American Journal of Community Psychology*, 29(6), 875-905.
- Georgia Department of Human Resources (2005). Georgia's nutrition and physical activity plan: To prevent and control obesity and chronic diseases in Georgia. Retrieved April 3, 2010, from <http://health.state.ga.us/pdfs/familyhealth/nutrition/NutritionandPhysicalActivityPlanFINAL.pdf>
- Grzywacz, J.G. & Fuqua, J. (2000). The social ecology of health: leverage points and linkages. *Behavioral Medicine*, 26(3), 101-115.

- Healthy Eating Active Communities. (2007). Nutrition and physical activity in California: The landscape of funding and the role of state and local health departments. Retrieved August 12, 2010, from http://www.healthyeatingactivecommunities.org/downloads/Public_Health_Policy_and_Practice/Nutrition_and_Physical_Activity_in_California.pdf
- Henderson, B.R. & Armah, N. (2010). Making the case for community-based wellness programs. *National Civic Review*, 99(1), 27-34.
- Huberty, J.L., Balluff, M., O'Dell, M., & Peterson, K. (2010). From good ideas to actions: a model-driven community collaborative to prevent childhood obesity. *Preventive Medicine*, 50(Suppl 1), S36–S43.
- Institute of Medicine. (2005). Preventing Childhood Obesity: Health in the Balance. Jeffrey P. Koplan, Catharyn T. Liverman, Vivica I. Kraak (Eds). Washington, D.C.: The National Academies Press.
- Kumanyika, S., Jeffery, R.W., Morabia, A., Ritenbaugh, C., & Antipatis, V.J. (2002). Obesity prevention: the case for action. *International Journal of Obesity*, 26(3), 425-436.
- Kumanyika, S.K., Obarzanek, E., Stettler, N., Bell, R., Field, A.E., Fortmann, S.P., Franklin, B.A., Gillman, M.W., Lewis, C.E., Poston, W.C., Stevens, J., & Hong, Y. (2008). Population-based prevention of obesity: the need for comprehensive promotion of healthful eating, physical activity, and energy balance: a scientific statement from American Heart Association Council on Epidemiology and Prevention, Interdisciplinary Committee for Prevention (formerly the expert panel on population and prevention science). *Circulation*, 118(4), 428-464.
- Larson, N.I., Story, M.T., & Nelson, M.C. (2009). Neighborhood environments: disparities in access to healthy foods in the U.S. *American Journal of Preventive Medicine*, 36(1), 74-81.
- Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Mattessich, P.W., Murray-Close, M., & Monsey, B.R. (2001). *Collaboration: What makes it work*. St. Paul, MN: Amherst H. Wilder Foundation.
- McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, 15(4), 351-378.

- Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Minnesota Department of Health. (2008). Minnesota plan to reduce obesity and obesity-related chronic diseases 2008-2013. Retrieved April 3, 2010, from <http://www.health.state.mn.us/cdrr/obesity/pdfdocs/obesityplan20090112.pdf>
- Moore, J.B., Davis, C.L., Baxter, S.D., Lew, R.D., & Yin, Z. (2008). Physical activity, metabolic syndrome, and overweight in rural youth. *Journal of Rural Health, 24*(2), 136-142.
- Morland, K., Wing, S., Diez Roux, A., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American Journal of Preventive Medicine, 22*(1), 23-29.
- New Jersey Department of Health and Senior Services. (2006). The New Jersey obesity prevention action plan. Retrieved April 3, 2010, from http://www.state.nj.us/health/fhs/documents/obesity_prevention.pdf
- New York State Department of Health. (2010). Eat Well Play Hard. Retrieved May 13, 2011, from http://www.health.state.ny.us/prevention/nutrition/resources/eat_well_play_hard/
- New York State Department of Health. (2005). Obesity-related diseases. Retrieved May 13, 2011, from http://www.health.ny.gov/prevention/obesity/strategic_plan/ob_diseases.htm
- New York State Department of Health. (2008). Strategic plan for overweight and obesity prevention: policy and environmental changes. Retrieved May 13, 2011, from http://www.health.state.ny.us/prevention/obesity/strategic_plan/
- Paeratakul, S., Lovejoy, J.C., Ryan, D.H., & Bray, G.A. (2002). The relation of gender, race and socioeconomic status to obesity and obesity comorbidities in a sample of US adults. *International Journal of Obesity, 26*(9), 1205-1210.
- Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Beverly Hills, CA: Sage Publications.
- Powell, L.M., Slater, S., & Chaloupka, F.J. (2004). The relationship between community physical activity settings and race, ethnicity, and socioeconomic status. *Evidence-Based Preventive Medicine, 1*(2), 135-144.

- Rosenthal, B.B. (1998). Collaboration for the nutrition field: synthesis of selected literature. *Journal of Nutrition Education, 30*(5), 246-267.
- Sacks, G., Swinburn, B.A., & Lawrence, M.A. (2008). A systematic policy approach to changing the food system and physical activity environments to prevent obesity. *Australia and New Zealand Health Policy, 5*, 13-19.
- Schneider, L., Ward, D., Dunn, C., Vaughn, A., Newkirk, J., & Thomas, C. (2007). The Move More Scholars Institute: a state model of the physical activity and public health practitioners course. *Preventing Chronic Disease, 4*(3), 1-8. Retrieved September 22, 2010, from http://www.cdc.gov/pcd/issues/2007/jul/06_0157.htm
- Schwartz, L., Samuels, S.E., Boyle, M., Clark, S.E., Flores, G., & Prentice, B. (2010). Local public health departments in California: changing nutrition and physical activity environments for obesity prevention. *Journal of Public Health Management and Practice, 16*(2), E17–E28.
- Schwartz, M.B. & Brownell, K.D. (2007). Action necessary to prevent childhood obesity: creating the climate for change. *Journal of Law, Medicine, and Ethics, Spring*, 78-89.
- SPSS for Windows. (2006). Version 14.0.2. Chicago: SPSS Inc.
- Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association, 102*(3 Suppl), S40-S51.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: grounded theory procedures and techniques*. Newbury Park, CA: SAGE Publications.
- Sullivan, H., Barnes, M., & Matka, E. (2002) Building collaborative capacity through “theories of change”: early lessons from the evaluation of Health Action Zones in England. *Evaluation, 8*(2), 205–226.
- Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*(6 Pt 1), 563-570.
- Swinburn, B., Gill, T., & Kumanyika, S. (2005). Obesity prevention: a proposed framework for translating evidence into action. *Obesity Reviews, 6*(1), 23–33.

- Trost, J.E. (1986). Statistically nonrepresentative stratified sampling: a sampling technique for qualitative studies. *Qualitative Sociology*, 9(1), 54-57.
- Trust for America's Health. (2011). F As in Fat: How Obesity Threatens America's Future 2011. Washington DC: TFAH. Retrieved August 30, 2011, from <http://www.rwjf.org/files/research/fasinfat2011.pdf>
- UNC Center for Health Promotion and Disease Prevention. (2009). Nutrition and Physical Activity Self-Assessment for Child-Care. Retrieved May 13, 2011, from http://www.center-trt.org/downloads/obesity_prevention/interventions/napsacc/NAPSACC_Template.pdf
- The Victorian Department of Health. (2010). Be Active Eat Well: Information for professionals. Retrieved May 30, 2010, from http://goforyourlife.vic.gov.au/hav/articles.nsf/pracpages/Be_Active_Eat_Well
- Wendel, M.L., Prochaska, J.D., Clark, H.R., Sackett, S., & Perkins, K. (2010). Interorganizational network changes among health organizations in the Brazos Valley, Texas. *Journal of Primary Prevention*, 31(1-2):59-68.
- Wolf, A.M. & Colditz, G.A. (1998). Current estimates of the economic cost of obesity in the United States. *Obesity Research*, 6(2), 97-106.
- Woodruff, K., Dorfman, L., Berends, V., & Agron, P. (2003). Coverage of childhood nutrition policies in California newspapers. *Journal of Public Health Policy*, 24(2), 150-158.

Chapter 3

The Relationship between Use of Environmental Strategies and Its Determinants Depends on Community Networking

“We have huge amounts of networking that happens in one focal place so that people can communicate well with each other...and it’s easier to move a concept like environmental issues along.” - Cornell Cooperative Extension Nutrition Manager

Background

Obesity is a multifaceted public health issue resulting from a wide range of biological, behavioral, and environmental factors (Bray & Champagne, 2005; Schwartz & Brownell, 2007; Story, Neumark-Sztainer, & French, 2002). Its seriousness lies in the numerous adverse consequences associated with the health and well-being of individuals (Field et al., 2001) and collectives such as organizations, communities, and the society at large (Institute of Medicine [IOM], 2005; Wolf & Colditz, 1998). Although obesity affects people from all socioeconomic backgrounds, a disproportionately high percentage of obese people are low-income and less educated (Paeratakul, Lovejoy, Ryan, & Bray, 2002; Trust for America’s Health, 2011). The environment is especially harsh for this population because they are less able to afford “healthy” foods (i.e. foods with high nutrient density) that are on average more expensive than high energy dense foods (Drewnowski & Spector, 2004) and live in low wealth neighborhoods where fast food restaurants are more prevalent (Morland, Wing, Diez Roux, & Poole, 2002).

To combat the rise of obesity, researchers and practitioners have increasingly applied the social ecological perspective that emphasizes the role of the environment on multiple levels (Swinburn, Gill, & Kumanyika, 2005). As adopted by the Centers for Disease Control and Prevention (CDC, 2009), the socio-ecological model (McLeroy, Bibeau, Steckler, & Glanz, 1988) depicts these levels as a set of concentric spheres with the innermost level being the *individual*; extending outward through the levels of *interpersonal*, *organizational*, and *community* to the

outermost level of the *society*. Publications from the CDC (2009) and Institute of Medicine (2005) along with state strategic plans (e.g. Arizona Department of Health Services, 2005; New York State Department of Health [NYSDOH], 2008; Georgia Department of Human Resources, 2005) have outlined numerous strategies for obesity prevention on the environmental level that correspond to making changes on the organizational and community levels of the socio-ecological model. These are common components of community interventions developed to prevent the rise of obesity in communities across the country. Examples include organizing coalitions to work on environmental changes in communities, collaborating with youth-serving agencies to modify menus and physical activity policies, and educating social and health service providers on making their workplace more conducive to health.

Community interventions to target obesity have become more widespread in the last decade (Egger & Swinburn, 1997; Kumanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002). Public health and nonprofit community organizations have increasingly been funded to work on environmental changes in various settings on multiple levels of the socio-ecological continuum to support healthy eating and physical activity for local residents. Also, funding agencies have increasingly mandated collaboration as a requisite for support of community interventions/programs (Wandersman, Goodman, & Butterfoss, 2005). Due to the collaborative nature of their job, much of the content is thus driven by the activities of their partners in the communities.

Previous literature revealed a wide range of facilitating factors that contribute to the success of general community prevention programs/interventions (Fredericksen & London, 2000). These factors include personal and organizational capacities and community readiness. However, research specifically about environmental changes to prevent obesity and from the

public health and community nutritionists' perspectives is rare. Most literature about community-based interventions targeting obesity focused on the evaluation of program outcomes and effectiveness (Economos et al., 2007; Sanigorski, Bell, Kremer, Cutler, & Swinburn, 2008). Schwarte and colleagues (2010) studied public health personnels' perspectives on practices, opportunities, strategies, and barriers to participate in efforts to modify nutrition and physical activity environments for obesity prevention. Researchers have also reported a disconnect where even if nutrition professionals believe the environment is heavily responsible for the rise in obesity, they still suggest nutrition education or other methods that aim to change individuals' behaviors as a solution (Woodruff, Dorfman, Berends, & Agron, 2003). Overall, there may be a lack of personal knowledge, skills, and confidence of nutrition professionals and other community service staff in making environmental changes; but from an organizational and community readiness perspective, there is also a lack of resources to support practitioners' use of environmental strategies to address obesity.

As an integral partner in community-based obesity prevention plans, the role of Cooperative Extension as an environmental change agent has been detailed in literature and many state strategic plans to target obesity. These plans are in addition to existing programs that focus on direct education to modify individuals' behaviors such as the Extended Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program – Education (SNAP-Ed). Notable examples are found in the plans of California, Georgia, and New York. In 1999, California Extension began guiding extension specialists to form community-wide coalitions in 13 communities to create environments that facilitate healthier lifestyles for families (Espinosa-Hall et al., 2007). Guided by the CDC, Georgia divided the strategies by the levels of the socio-ecological model and specified the ones where Cooperative

Extension is a contributing partner (Georgia Department of Human Resources, 2005). New York highlighted the achievements of various organizations like Cornell Cooperative Extension (CCE) and programs such as Eat Well Play Hard (EWPH; NYSDOH, 2010).

Extension Nutrition Managers (ENM) in CCE regularly deliver EFNEP and SNAP-Ed to the low-income audience who are more severely affected by obesity than the more affluent groups (Levi et al., 2011; Paeratakul et al., 2002). Over recent years, they have also been delivering programs such as Collaboration for Health, Activity, and Nutrition in Children's Environments (CHANCE, 2011) and EWPH that require them to make environmental changes to support healthy eating and physical activity. CHANCE is a multi-prong project that includes a research-based curriculum specifically developed to teach parents of children aged 3-11 practical skills related to food choices and active play, community collaboration to make environmental changes, and worksite wellness within CCE. EWPH is a NY State-funded project that aims to make environmental changes in youth-serving agencies and schools through changing organizational practices and policies. In doing work on the environmental level, how do previous research findings apply to ENMs' use of environmental strategies for obesity prevention? What factors hinder or facilitate their strategy use?

Conceptual Framework

This study investigated ENMs' perspectives and practices in using environmental strategies to address obesity. It was guided by the Theory of Planned Behavior (TPB), a prominent conceptual model for studying various human behaviors (Ajzen, 2001; Ajzen & Albarracín, 2007; Armitage & Conner, 1999; Bogers, Brug, van Assema, & Dagnelie, 2004; Kassem, Lee, Modeste, & Johnston, 2003), including intentional, multicomponent behaviors such as entrepreneurial activity (Krueger & Carsrud, 1993), succession planning (Sharma,

Chrisman, & Chua, 2003), and obstetrical nurses' collaboration with midwives (Schottle, 1999). According to the TPB, human *behavior* results from a person's *intention* to act. This intention stems from a set of background factors, salient beliefs, and corresponding attitudes. Most distal to the behavior of focus are *background factors*, such as personal experiences, education, mass media, and interactions with other people (Ajzen & Albarracín, 2007), that are weakly and indirectly associated with the behavior and are not considered a part of the TPB, but can be included to better understand the determinants of the target behavior (Ajzen & Albarracín, 2007).

Background factors contribute to the person's beliefs: *behavioral beliefs* reflect the likely consequences of performing the behavior; *normative beliefs* are the perceived expectations of important referent individuals surrounding the person; and *control beliefs* are the perceptions of the factors that may facilitate or hinder the performance of the behavior (Ajzen, 1991, 2001, 2002; Ajzen & Albarracín, 2007). Evaluation of these beliefs results in the following constructs: *attitude toward behavior*, an evaluation of the behavioral outcome that is either favorable or unfavorable; *subjective norm*, referred to as perceived social norms in this study, the perceived social pressure to comply with the expectations of others; and *perceived behavioral control*, the perceived ease or difficulty in performing the behavior (Ajzen, 1991, 2002). It is expected that "the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual's intention to perform the behavior under consideration" (Ajzen & Albarracín, 2007, p. 5).

The conceptual framework (Figure 3.1) that guided the examination of ENMs' perspectives and practices in using environmental strategies to address obesity was developed by adapting the TPB to better suit the study population and research purposes. The goal of this study was not to test the theory, *per se*; instead, the model was applied to frame the beliefs, social

expectations, and the barriers and facilitators related to ENMs' use of environmental strategies. Identifying the essential elements that contribute to ENMs' action has significant implications for practice in finding ways to modify ENMs' perceptions related to their strategy use. Additionally, this study focused on current reported behaviors instead of future intentions because intention does not always translate into behavior, especially in the context of ENMs' work where funding is often uncertain. Furthermore, a set of background factors related to ENMs' job was incorporated to more fully comprehend the antecedents of their use of environmental strategies (Ajzen & Albarracín, 2007). The conceptual model thus shows that the relationships between the background factors and ENMs' use of environmental strategies are mediated through the TPB variables of beliefs toward using environmental strategies, others' expectations, and perceived control over using the strategies according to available resources.

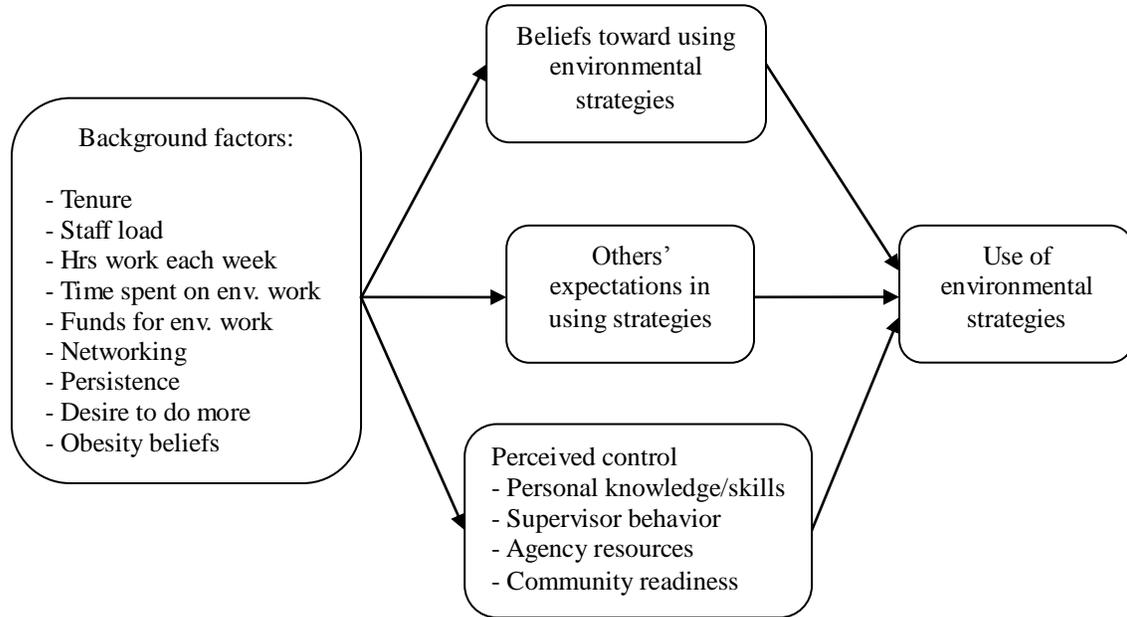


Figure 3.1: Conceptual model

Research Objectives

This was the first study to examine in depth the behaviors and perceptions of a group of community nutritionists who work in CCE (i.e. ENMs) in contributing to environmental changes to support healthy eating and physical activity in the organizations with which they collaborate and the communities in which they work. Understanding what factors influence ENMs' use of environmental strategies will ultimately minimize the gap between research and practice for obesity prevention through using environmental approaches. The objectives of this study were

1. To investigate how background factors, ENMs' beliefs toward using environmental strategies, their perceptions of others' expectations, and their perceptions of personal control over using those strategies are associated with their reported behavior; and
2. To examine how the associations between ENMs' use of environmental strategies and contributing factors differ when ENMs do and do not have funds specifically dedicated to making environmental changes to address obesity.

Methods

This descriptive study used a sequential mixed methods approach that included qualitative interviews with seven ENMs followed by a quantitative survey of the 58 ENMs in the CCE system. While quantitative results revealed the statistically significant factors associated with ENMs' use of environmental strategies, data from qualitative interviews were used to triangulate those findings and illustrate the various reasons and detailed mechanisms by which the relationships existed.

Qualitative Sample Selection

Seven ENMs were selected using the maximum variation purposeful sampling technique (Patton, 2002) and the procedures suggested by Trost (1986). Interviewing a heterogeneous mix

of ENMs was intended to generate a more comprehensive list of strategies and varied perceptions of associated factors that exemplify the diverse population of ENMs. This type of sampling also led to the identification of common patterns that cut across variations (Patton, 2002).

ENMs were chosen based on two dimensions that were relevant for the purpose of this study: 1) whether or not the ENM was already involved in using environmental strategies to address obesity (i.e. beyond usual direct nutrition education programming and 2) whether the ENM worked in a rural or urban setting. The first dimension represented the continuum of ENMs who were mostly focused on direct nutrition education on the individual level to those who were most actively using environmental strategies. The second dimension of geographical location diversified the factors associated with ENMs' work because urban and rural areas differed in, for example, culture, government, structure, and resources that could ultimately impact ENMs' funding, networking, and effectiveness of using of environmental strategies.

After selecting the ENMs for their involvement in environmental change work (whether individual or environmental), two were chosen to represent each geographical location (whether rural or urban) for comparison purposes. Thus, of the four ENMs who were more extensively using environmental strategies; two were from an urban area; of the three ENMs who were more involved in direct nutrition education programming, only one worked in an urban setting. This unbalanced design with one more ENM from the rural county focusing on direct nutrition education resulted in more contextual data reflecting the rural conditions. However, differences in strategy use and associated factors between ENMs from the two areas were not observed.

Qualitative Interviews

Two in-depth, semi-structured interviews, each lasting on average 1.5 hours were

conducted with each ENM in person. Interviews were recorded and transcribed verbatim. The first interview encompassed questions about the process of ENMs' use of environmental strategies; the second interview mainly elicited their perceptions of factors that facilitated or hindered their strategy use. (Refer to Appendix A and B for the complete interview guides.) The second interviews also included member checks with ENMs to verify the accuracy of data and interpretations from the first interviews, strengthening the credibility of the study (Miles & Huberman, 1994). Additional information was gathered through attending various types of meetings with ENMs that occurred on the day of the interviews; these included CCE organization-wide, program staff, and committee meetings, as well as county obesity task force/coalition meetings.

Qualitative Data Analysis

Approximately 338 single-spaced pages of transcripts were generated from all interviews with ENMs (41 to 54 pages for each ENM). Data were analyzed using the constant comparative method (Strauss & Corbin, 1990) and managed using ATLAS ti (2006). This analysis focused on the conceptualization of ENMs' use of environmental strategies in relationship to the multitude of factors that are related to their actions as shown in Figure 3.1. In the first step, a priori codes based on the TPB, attitude toward the behavior (ATB), perceived social norms (PSN), and perceived behavioral control (PBC) were applied to segments of interview text. In the second step, the open coding technique (Strauss & Corbin, 1990) was used to apply inductive codes to the text segments to reveal facilitators and barriers related to ENMs' strategy use. Unique constructs that emerged inductively, for example, the ENM being proactive and persistent, were also identified. Often, large sections of text were labeled with multiple co-occurring codes (e.g. both "facilitator" and "perceived behavioral control"). Each time a segment was examined within

one interview, it was compared with the previous categories to determine the appropriateness of applying the same code or whether the existing category needed to be renamed or revised in order to maintain consistency of meaning.

After coding, the various reasons that were associated with ENMs' use of strategies were extracted and displayed in a role-ordered matrix (Miles & Huberman, 1994) for comparison purposes. Each matrix was set up with individual ENMs across the columns from left to right in decreasing order of their involvement in using environmental strategies to address obesity. The content of these categories were examined to compare both within ENM and among ENMs, based on their involvement with using environmental strategies, to identify patterns of regularities (Miles & Huberman, 1994). Similarities and differences between ENMs who were more engaged in environmental work versus those less involved were particularly emphasized.

Coding was performed only by the researcher and could be biased by the researcher's own professional and personal experiences and perceptions. However, throughout this phase of the study, the researcher discussed findings and interpretations with six members of her research team, the New York EFNEP State Director, EFNEP State Coordinator, two research associates, and two Extension associates, one of whom coordinates a program with an environmental focus. Another source of credibility (Appendix C) stemmed from the researcher's prolonged engagement (Lincoln & Guba, 1985) with the ENMs since 2007 to conduct five pilot interviews that served both to guide and corroborate the findings of this study.

Survey Development

To ensure that the beliefs related to the strategies were salient for the population of ENMs (Ajzen & Albarracín, 2007; Krueger & Carsrud, 1993; Moñtano, Kasprzyk, & Taplin, 1997), a majority of the scale items were derived from qualitative interview data, as described with each

variable below. Some scale items were adapted from past research in nutrition and organizational behavior. To establish content validity, the survey content drew on the technical and practical expertise of the aforementioned research team. The group scrutinized drafts of survey items and provided input on whether to revise, eliminate, and/or combine items. Decisions were made based on consensus. Three former managers of EFNEP/SNAP-Ed Program pilot tested the draft survey. They recorded the time it required and commented on item clarity, conciseness (DeVellis, 2003), and ease or difficulty of completion. Minor revisions in wording were made to reduce ambiguity.

Operationalization of Variables

Dependent Variable: Use of Environmental Strategies

Interviews revealed that ENMs worked in multiple settings, performed various activities related to food and physical activity, and proceeded through a series of steps in using environmental strategies to address obesity within their current job context (Chapter 2). The survey focused on four strategies, differentiated by the settings where their partners worked, including the community at large. They were as follows:

Strategy 1: Educate agency leaders and staff to improve their organizations' environments related to food and physical activity

Strategy 2: Collaborate with schools and/or youth-serving agencies to develop and implement action plans to improve their environment related to food and physical activity

Strategy 3: Develop and implement worksite wellness policies related to food and physical activity in CCE organization

Strategy 4: Serve on committees and/or coalitions that make environmental changes related to food and physical activity in the community

For each strategy, three items elicited the frequency of ENMs' involvement in performing the tasks at each intensity level. Level 1 tasks were providing information and making recommendations to others on healthy eating and physical activity. For strategies 1-3, level 2 tasks involved developing and implementing action plans for environmental changes; and level 3 tasks entailed evaluating the progress of the action plan. For strategy 4, level 2 task was to support other members' projects and level 3 task was to take the lead to work on projects that make environmental changes in their community.

ENMs' use of environmental strategies, the behavior of focus and the dependent variable in this study, was calculated using the equation shown in Figure 3.2. They rated the three levels of tasks for each strategy on a frequency scale with 1 = "almost never," 2 = "seldom," 3 = "sometimes," 4 = "often," and 5 = "almost always." Weighted scores of one point for each level 1 task, two points for each level 2 task, and three points for each level 3 task were assigned. The possible range of summative score for all four strategies was thus 24 to 120. The total score for use of environmental strategies reflected ENMs' current reported frequency of performing each task level for all four strategies.

$$\begin{aligned}
 &\text{Strategy 1: } [(Level\ 1\ frequency \times 1) + (Level\ 2\ frequency \times 2) + (Level\ 3\ frequency \times 3)] + \\
 &\text{Strategy 2: } [(Level\ 1\ frequency \times 1) + (Level\ 2\ frequency \times 2) + (Level\ 3\ frequency \times 3)] + \\
 &\text{Strategy 3: } [(Level\ 1\ frequency \times 1) + (Level\ 2\ frequency \times 2) + (Level\ 3\ frequency \times 3)] + \\
 &\text{Strategy 4: } [(Level\ 1\ frequency \times 1) + (Level\ 2\ frequency \times 2) + (Level\ 3\ frequency \times 3)] \\
 &= \text{Use of environmental strategies (range 24-120)}
 \end{aligned}$$

Figure 3.2: Calculation of ENMs' use of environmental strategies

Factor Analysis of Independent Variables

Although the TPB has often been applied to simple behaviors (e.g. to apply sun tan lotion, to exercise) and the three constructs of ATB, PSN, and PBC are assumed to be unidimensional (Fishbein & Ajzen, 1975), this study used factor analysis and multiple variables to reveal the multidimensionality of the constructs. Treating them as unidimensional constructs would negatively affect the predictive power of the statistical model (Hankins, French, & Horne, 2000). Further, identifying the specific variables for each construct that are associated with ENMs' use of environmental approaches is desirable because they signify intervention points where action can be taken to facilitate ENMs' work in this area.

Statistically, due to the small sample size (N=58) and an abundant data set, confirmatory factor analysis using principle component methods with varimax rotation was performed to examine and simplify the underlying structures of the independent variables. It also served to minimize variance inflation and reduce risk for collinearity. Factors were retained when they contained at least three items with an acceptable Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of >0.70, a significant Bartlett's test of sphericity, and Cronbach's alpha of >0.70 to ensure internal reliability. Items were retained at factor loadings >0.6 (Francis et al., 2004); those that loaded on more than one factor were removed to improve scale validity (Farrell, 2010). Multiple scales were constructed to assess the variables of the background factors and TPB constructs (Figure 3.1), which were then used in subsequent statistical analyses.

Background Factors

Background factors include global dispositions, demographic factors, and other psychosocial variables that influence behavior indirectly by affecting people's behavioral, normative, and control beliefs (Ajzen & Albarracín, 2007). They were salient in ENMs'

descriptions of how they addressed obesity on the environmental level. Several scales were constructed to assess the background factors associated with ENMs' use of environmental strategies: persistence, desire to do more, networking, and belief that obesity is contributed by individual (as opposed to environmental) factors (i.e. obesity beliefs). All of the items were rated on a 7-point scale with 1 being "strongly disagree" to 7 being "strongly agree", except obesity beliefs which were rated on a 5-point scale with 1 being "strongly disagree" to 5 being "strongly agree." Table 3.1 shows the characteristics for the five scales, demonstrating their internal reliability.

Table 3.1: Scale characteristics for the five scales in background factors

Scale/Variable	# of Items	% Variance	Cronbach's α	KMO*	Bartlett's Test ($p < 0.05$)	
					χ^2	Df
1. Networking	5	63.5	0.85	0.81	132.9	10
2. Persistence	5	62.3	0.84	0.79	115.3	10
3. Desire to do more	4	60.5	0.75	0.70	68.5	6
4. Obesity beliefs	3	60.3	0.66	0.66	24.8	3

*Kaiser-Meyer-Olkin measure of sampling adequacy

Networking and collaborating with people was reported by ENMs to be one of the most fundamental and frequent tasks in which ENMs engage in their job. This 5-item scale was not a self-evaluation of ENMs' networking skills, but an assessment of the utility of their networking with other partners for program delivery. The items reflect ENMs' enthusiasm toward building effective collegial and informal relationships with leaders in other organizations and the mutual benefits of long-term, trusting, working relationships with their partners. This variable is related to the more general, multidimensional construct of social effectiveness (Ferris, Perrewé, & Douglas, 2002), which Ferris and colleagues (2005) defined as the ability to develop and use diverse networks of people.

Persistence, assessed using five items, is a dimension of the construct proactive personality,

a term used in the field of organizational behavior to describe people who are not bound by situational forces, show initiative, identify and act on opportunities to make changes, and persevere until they effect changes in their surroundings (Bateman & Crant, 1993; Seibert, Crant, & Kraimer, 1999). Qualitative interviews revealed instances where ENMs persevered in various aspects of their work, such as repeatedly contacting potential partners despite initial non-response to initiate environmental change projects.

Desire to do more is the other dimension of proactive personality. This variable, assessed using four items, denoted ENMs' outlook toward future possibilities to expand and do more in their jobs. ENMs who were already using environmental strategies expressed broader goals in working with others, such as to expand their programs beyond the low-income population, make sustainable changes in their communities, and initiate requests to participate in a local coalition to make environmental changes.

Obesity beliefs assessed ENMs' perceptions about three individual-focused contributing factors to the obesity epidemic. While ENMs' reported contributors to obesity, including the power of media, changes in social norms, increased TV/screen time, and genetics, encompassing the spectrum from individual to environmental, the scale for environmental factors was not reliable and was thus dropped from additional analysis. Although the KMO measures for obesity beliefs did not meet the 0.70 criteria (Table 3.1), the scale was kept because general beliefs is considered an important set of background factor related to the behavior of focus (Ajzen & Albarracín, 2007).

Table 3.2 shows the scale items and their factor loadings for the background variables. All items were either created from interview data or adapted from pre-existing scales, as indicated in the table footnote.

Table 3.2: Items for the five scales used to assess background factors

Survey Item	Factor Loading
Networking	
1. In my job, I know and am well connected to a lot of influential leaders. ^a	0.915
2. I am good at using my connections and network to make things happen in my job. ^a	0.855
3. I am knowledgeable of the politics of our partnering agencies.	0.796
4. I have developed a large network of colleagues and agency partners whom I can call on for support when I really need to get things done. ^a	0.760
5. I have a lot of freedom to decide what agencies I will collaborate with.	0.627
Persistence	
1. If I believe in an idea, no obstacles will prevent me from making it happen. ^b	0.843
2. I excel at identifying opportunities. ^b	0.838
3. I love being a champion for my ideas, even against others' opposition. ^b	0.789
4. I will not stop contacting an agency partner until I hear from them.	0.756
5. No matter what the odds, if I believe in something I will make it happen. ^b	0.714
Desire to do more	
1. I am constantly on the lookout for ways to expand my program area. ^b	0.829
2. I am always looking for better ways to do things. ^b	0.796
3. I collaborate with agency partners to expand my programs beyond low-income audiences.	0.758
4. I collaborate with the specific intent of making sustainable changes in how our community operates.	0.725
Obesity beliefs	
1. Low self-esteem ^{cd}	0.801
2. Hormones/slow metabolism ^{cd}	0.768
3. Lack of willpower ^e	0.760

^a Ferris, Treadway, Kolodinsky, Hochwarter, Kacmar, Douglas, & Frink, 2005

^b Bateman & Crant, 1993

^c Ogden & Flanagan, 2008

^d Oliver & Lee, 2005

^e Barry, Brescoll, Brownell, & Schlesinger, 2009

TPB Variables

Research that applies the TPB has often used direct and/or indirect measures to assess the constructs of ATB, PSN, and PBC in the model (Ajzen, 1991; Conner & Armitage, 1998; Francis et al., 2004; Gagne & Godin, 2000; Krueger & Carsrud, 1991; Nejad, Wertheim, & Greenwood, 2004; Sharma et al., 2003). However, this study used results from the indirect measures because the detailed contents revealed ways to intervene in motivating ENMs' use of environmental

strategies (J. Francis, Personal communication, May 12, 2008). Further, this study only used data from the measures based on beliefs as suggested by Hankins and colleagues (2000).

Measurement and scaling methods suggested by Gagne and Godin (2000) were adopted.

Confirmatory factor analysis was used to create six 7-point scales to assess beliefs toward using environmental strategies, perceived social norms, and perceived behavioral control. Scale characteristics are shown in Table 3.3, illustrating their adequate internal reliability.

Table 3.3: Scale characteristics for the six scales of TPB variables

Scale/Variable	# of Items	% Variance	Cronbach's α	KMO *	Bartlett's Test ($p < 0.05$)	
					χ^2	Df
Beliefs toward using environmental strategies						
1. Impact on obesity prevention	3	71.77	0.80	0.69	54.7	3
Perceived social norms						
2. Others' expectations	7	58.44	0.88	0.85	192.6	21
Perceived behavioral control						
3. Personal resources	3	86.15	0.92	0.75	124.4	3
4. Supervisor behavior	7	59.99	0.89	0.86	198.6	21
5. Agency resources	3	85.49	0.91	0.66	136.7	3
6. Community readiness	4	66.58	0.83	0.72	97.4	6

*Kaiser-Meyer-Olkin measure of sampling adequacy

Beliefs toward using environmental strategies

Impact of strategy use on obesity prevention was determined to be a belief toward using environmental strategies as ENMs expressed their enthusiasm toward their work in this area. Beliefs toward the behavior assessed the likely outcome or certain attribute of performing the behavior (Ajzen, 1991), such that using environmental strategies could possibly lead to increasing people's awareness of obesity and its prevention and that it has great potential in preventing obesity. ENMs also conveyed the need to address obesity on multiple levels of the social ecology using environmental approaches, reflecting their positive belief toward the behaviors. A 7-point bipolar scale from -3 (strongly disagree) to +3 (strongly agree) was used to

assess this variable (Ajzen, 1991) with three items.

Others' expectations of ENMs in using environmental strategies

Others' expectations assessed ENMs' perceived social pressure (Ajzen, 1991) to use environmental strategies. During interviews, ENMs described the catalyst for their initial involvement in using environmental strategies as being requested by partnering agencies or mandated by grant objectives. They had mixed views toward whether using environmental strategies fell within their job scope or whether it was a job priority. Interview data also revealed several categories of individuals with whom ENMs frequently interact in their jobs. These included the ENMs' supervisors, CCE colleagues, staff they supervise, and agency partners. A 7-point bipolar scale from -3 (should not use strategy or strongly disagree) to +3 (should use strategy or strongly agree) was used to assess this variable (Ajzen, 1991) with seven items.

Perceived control over using environmental strategies

Perceived behavioral control over performing the behavior included ENMs' perception of the presence of opportunities and resources as well as impediments related to the behaviors that are not fully under volitional control (Ajzen, 1991). In the interviews, ENMs identified facilitators and barriers associated with their use of environmental strategies. Since the main barriers identified were time and money, survey questions asked ENMs to rate how much they agreed that the four categories of resources were available to support their use of environmental strategies: their personal knowledge and skills, supervisor behaviors, agency resources, and community readiness. Variables used to assess perceived control beliefs were evaluated with a 7-point unipolar scale (1="strongly disagree" and 7="strongly agree") (Ajzen, 1991).

Personal knowledge and skills, assessed using three items, included tasks that ENMs performed in the process of using environmental strategies. Interviews revealed that they

conducted assessments of the environments of focus, e.g. schools, youth-serving agencies, and/or the community. ENMs then collaborated with partners to develop and implement action plans to make environmental changes. They also were able to incorporate environmental strategies into their existing programs.

Supervisor behavior as a form of organizational resource was often described as an important factor that motivated ENMs to work on the environmental level. ENMs' supervisors were usually the executive directors of the CCE organization, whose main job responsibility was to support ENMs' work by securing funds and establishing a strong network of collaborators within their community/county. Supervisor behavior ranged from providing instrumental support like writing for grants to deliver environmental change programs for obesity prevention and endorsing ENMs' use of environmental strategies within CCE to simply granting approval for ENMs to act on their own. This variable was assessed with eight items.

Agency resources, assessed using three items, referred to ENMs' having existing relationships with agency partners to work toward environmental changes to support healthy eating and physical activity. Some were eager to request ENMs' assistance in making environmental changes while others lacked interest, commitment, or resources to commit to collaborative efforts.

Community readiness, assessed using three items, referred to ENMs' perception that their community was ready to address obesity on the environmental level. They described examples where other leaders viewed obesity as an important issue to be dealt with in the community. Some communities had long-standing working relationships among agencies that supported each other to secure grants toward common goals. Other communities had agencies with fewer resources for development of collaborative relationships.

Table 3.4 displays the scale items for the TPB variables. Most items were created from interview data; a few were adapted from pre-existing scales, as indicated in the table footnote.

Table 3.4: Items for the six scales used to assess background factors

Survey Item	Factor Loading
Impact of strategy use on obesity prevention	
Using environmental approaches to address obesity	
1. will increase people’s awareness of obesity and its prevention.	0.884
2. will contribute positively to obesity prevention.	0.840
3. has great potential in obesity prevention.	0.816
Others’ expectations	
Using environmental approaches to address obesity	
1. falls within the scope of my job.	0.851
2. is a priority in my work agenda.	0.826
3. is something I am asked to do.	0.759
Please indicate whether the following people would think that you should or should not use environmental approaches to address obesity.	
4. Colleagues	0.816
5. My staff	0.711
6. My supervisor	0.700
7. Agency partners	0.668
Personal knowledge and skills	
Please indicate how much you agree that each of the following resources is available to support your engagement in using environmental approaches to address obesity.	
1. I have the knowledge and skills to develop and implement action plans to make environmental changes to target obesity.	0.947
2. I have the knowledge and skills to conduct a community assessment, including gathering information from community and agency leaders about their views toward obesity and its prevention.	0.921
3. I have the knowledge and skills to incorporate other projects that involve making environmental changes into my existing programs.	0.916
Supervisor behavior	
My supervisor:	
1. develops connections in our community that directly facilitate my work.	0.838
2. encourages me to develop my skills and interests. ^a	0.836
3. helps me secure funding for projects that involve using environmental approaches to address obesity.	0.786
4. is always available to meet with me when I seek help from him/her. ^a	0.777
5. helps me find more time to work on projects that involve using environmental approaches to address obesity.	0.734
6. understands what it means to use environmental approaches to address obesity.	0.732
7. encourages me to speak up when I disagree with a decision. ^a	0.707

Table 3.4 (Continued)

Survey Item	Factor Loading
Agency resources	
Please indicate how much you agree that each of the following resources is available to support your engagement in using environmental approaches to address obesity.	
1. Agency partners who are committed to making environmental changes to target obesity	0.967
2. Agency partners who have resources (funding, staff) to make environmental changes to target obesity	0.916
3. Existing relationships with agency partners	0.889
Community readiness	
Please indicate how much you agree that each of the following resources is available to support your engagement in using environmental approaches to address obesity.	
1. Leaders in my community are ready to do something about obesity ^b	0.895
2. The political and social climate in my community seems to be “right” for starting collaborative projects that make environmental changes to target obesity ^b	0.830
3. Agencies in my community have a history of working together ^b	0.810
4. Technical support from funders	0.718

^a Cammann, Fichman, Jenkins, & Klesh, 1983

^b Mattessich, Murray-Close, & Monsey, 2001

Survey Distribution

Quantitative data collection occurred during an hour-long session at a semi-annual program conference for ENMs. A set of survey instructions were given during the session, including the definition of “environment” and “environmental” as used in this study to ensure common interpretation among ENMs (Appendix D). Fifty ENMs who were present completed the survey (Appendix E) in person. Eight ENMs who were absent were contacted within one week of the conference by electronic mail (e-mail) and telephone to seek their participation; all eight consented. These ENMs filled out the paper-based survey then mailed it to the researcher. All 58 ENMs who manage the EFNEP and/or SNAP-Ed Program in CCE and supervise frontline staff completed the survey, resulting in a 100% response rate.

Statistical Analyses

Statistical Package for the Social Sciences 14.0 (SPSS, 2006) was used to conduct statistical analyses. First, factor-based mean composite scores were calculated for the variables assessed with multiple items. Scores were calculated by adding the scores for all items in each scale then dividing by the number of items in the scale. Next, correlation matrices and scatterplots were examined to determine the relationships among variables and presence of outliers. Further, bivariate regressions were performed with each of the independent variables and ENMs' use of environmental strategies as the dependent variable. Only the significant variables that resulted from bivariate analysis were used in subsequent analyses.

According to the conceptual framework (Figure 3.1) based on the TPB, the background factors were the independent variables, the TPB variables were the mediators, and ENMs' use of environmental strategies to address obesity was the dependent variable. Multiple regression and bootstrapping were performed to investigate the relationships among the set of variables. Since this study was cross-sectional, the associations between variables do not imply causality. Analysis of mediation (or indirect effects) was first performed using the causal steps approach (Baron & Kenny, 1986). The backward elimination variable selection method was first applied to the group of background variables then the TPB variables to exclude the nonsignificant ones individually. Finally, mediator models revealed the significant indirect pathways between the independent and mediating variables. However, because the causal steps approach had been criticized for its low power and method of inferring (as opposed to direct testing) the indirect effect by a series of hypothesis tests, the more valid and powerful bootstrapping technique was also applied for comparison purposes (Hayes, 2009).

Bootstrapping was carried out using the SPSS macro developed by Preacher and Hayes

(2008) that examines multiple mediators simultaneously. The process involved taking random samples of size n from the original data and estimating the coefficients for the indirect paths from the independent variable to the mediating variable and from the mediating variable to the dependent variable (Hayes, 2009). The indirect effect was then computed by multiplying the coefficients for the two pathways for each sample. Random samples were returned to the pool to be reselected. This process was repeated $k=10,000$ times to obtain a 95% confidence interval sorted from the smallest to largest, in which the lower bound is in the 250th ordinal position and the upper bound is in the 9751st ordinal position. The bias-corrected confidence interval was reported in this study because it has consistently been found to be the most powerful test across conditions (Fritz & McKinnon, 2007). The test was considered significant when the confidence interval did not contain zero.

Following mediation analysis, moderating effects were examined first using multiple regression to test the significance of each possible two-way interaction in the various pathways of the conceptual model. Another bootstrapping method developed by Preacher, Rucker, and Hayes (2007) was also used to examine conditional indirect effects, i.e. when the mediated relationship varied in strength according to the value of the moderator. Resampling occurred 10,000 times to derive the 95% confidence intervals for the conditional indirect effects at each value of the moderator (e.g. 1-7 for a 7-point response scale). At each moderator value, the lower and upper levels of the interval along with the estimated coefficients were then plotted on a graph to better illustrate the significant moderating effect (Preacher et al., 2007).

Results

Population Characteristics

Table 3.5 displays the characteristics of the ENMs in this study. A majority were aged 46 and over, held a master’s degree, and spent less than 6 hours each week on environmental change work. Everyone managed SNAP-Ed while about half managed EFNEP; fewer ENMs managed environmental programs.

Table 3.5: Characteristics of ENMs who responded to the survey (n=58)

Variable	Response Categories	n	%
Gender	Female	56	96.6
Age (year)	35 and under	7	12.1
	36-45	13	22.4
	46-55	21	36.2
	56 and over	17	29.3
Degree	Bachelor’s	15	25.9
	Master’s	40	69.0
	Doctoral	2	3.4
	Other	1	1.7
Registered dietitian	Yes	16	27.6
Hours spent on tasks toward making environmental changes each week	0	6	10.3
	1-5	36	62.1
	6-10	10	17.2
	More than 11	6	10.3
Programs managed ^a	SNAP-Ed	58	100.0
	EFNEP	31	53.4
	CHANCE ^{bc}	7	12.1
	Farm-to-School ^b	6	10.3
	Eat Well Play Hard ^b	5	8.6
	Healthy Heart Program ^b	2	3.4
	Steps to a HealthierNY ^b	1	1.7

^a Programs managed are not mutually exclusive; totals do not add to 100%

^b Programs identified as focusing on making environmental changes

^c Collaboration for Health, Activity, and Nutrition in Children’s Environments: a multicomponent nutrition education, parenting skills and environmental change program

Table 3.6 shows the means (SD) and correlation matrix for additional job-related characteristics and ENMs' perspectives toward using environmental strategies. Their use of environmental strategies varied widely. On average, ENMs were mostly full-time staff, used environmental strategies in a limited way, worked in their current job for about eight years, and managed seven staff. They rated their networking, desire to do more in their work, and persistence levels as moderate. ENMs felt ambivalent about whether using environmental strategies contributes positively to obesity prevention, and slightly agreed that others (i.e. supervisor, colleagues, staff, partners) expect them to use environmental strategies and that individual (rather than environmental) factors contribute to the obesity epidemic. Further, ENMs slightly agreed that personal knowledge and skills, supervisor behavior, agency resources, and perceived community readiness as were adequate resources for them to use environmental strategies.

Table 3.6: Mean (SD) and correlation coefficients of background and TPB variables and ENMs' use of environmental strategies

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Use of strategies	60.2	22.2													
2. Current tenure	7.7	8.3	0.255 ^c												
3. Staff load	6.5	5.0	0.502 ^a	0.317 ^b											
4. Hours work per week	43.1	8.0	0.265 ^b	0.235 ^c	0.334 ^b										
5. Networking	5.3	1.1	0.421 ^a	0.316 ^b	0.295 ^b	0.592 ^a									
6. Desire to do more	5.5	0.9	0.356 ^a	0.161	0.368 ^a	0.477 ^a	0.437 ^a								
7. Persistence	5.0	1.0	0.205	-0.011	0.284 ^b	0.382 ^a	0.343 ^a	0.575 ^a							
8. Obesity belief individual	3.5	0.7	-0.280 ^b	-0.097	-0.148	0.185	0.160	0.176	0.274 ^b						
9. Positive impact	1.6	-0.2	0.452 ^a	0.055	0.376 ^a	0.138	0.166	0.333 ^b	0.385 ^a	-0.087					
10. Others' expectations	1.2	1.2	0.490 ^a	0.033	0.356 ^a	0.020	0.230 ^c	0.101	0.290 ^b	-0.062	0.568 ^a				
11. Knowledge / skills	5.0	0.9	0.338 ^a	0.079	0.453 ^a	0.253 ^c	0.180	0.368 ^a	0.431 ^a	0.045	0.547 ^a	0.467 ^a			
12. Supervisor behavior	4.5	1.3	0.357 ^a	-0.030	0.128	-0.034	0.061	-0.172	-0.050	-0.280 ^b	0.356 ^a	0.443 ^a	0.203		
13. Agency resources	4.8	1.4	0.439 ^a	0.106	0.215	0.251 ^c	0.357 ^a	0.309 ^b	0.167	-0.191	0.407 ^a	0.419 ^a	0.487 ^a	0.345 ^a	
14. Community readiness	4.7	1.3	0.528 ^a	0.155	0.284 ^b	0.191	0.305 ^b	0.121	0.150	-0.245 ^c	0.413 ^a	0.431 ^a	0.270 ^b	0.587 ^a	0.498 ^a

^a $p < 0.01$; ^b $p < 0.05$; ^c $p < 0.10$

Test of Mediation

Figure 3.3 shows the empirical model with the mediated pathways and interactions that resulted from multiple regression and bootstrapping analyses.

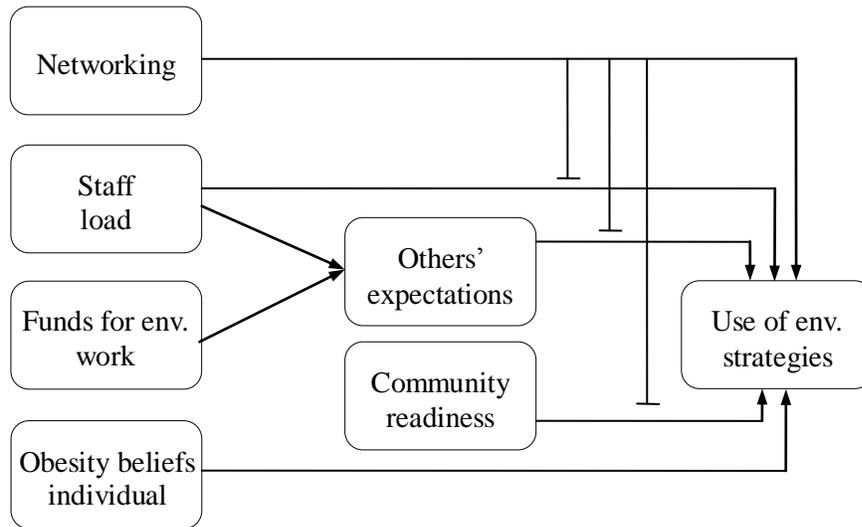


Figure 3.3: Final empirical model that shows the results of mediation and moderation analyses (n=58)

Table 3.7 Model 1 shows the main effects model with the significant background variables and their unstandardized coefficients. They were significantly associated with ENMs' use of environmental strategies as shown by the main effects in Model 1. All of the relationships between the independent variables and use of strategies were positive such that a unit increase in any of the variables of networking, staff load, and funds for environmental work resulted in a corresponding increase in use of environmental strategies as reflected by each of the regression coefficients. For example, with an increase in a unit of networking level, ENMs' use of environmental strategies increased by 6.05 (SE=2.379, $p<0.05$) units. ENMs' belief that individual factors contribute to the by obesity epidemic (i.e. obesity beliefs-individual) was negatively associated with their use of environmental strategies to address obesity. This means

that for each unit increase in ENMs' belief that individual choices contribute to obesity, their use of environmental strategies decreases by 7.58 (SE=3.611, $p<0.05$) units.

Table 3.7: Unstandardized coefficients (B), standard errors (SE), and model statistics for main effects models (n=58)

Model	1		2		3	
Dependent Variable	Use of environmental strategies					
	Unstandardized Coefficients					
	B	SE	B	SE	B	SE
Background Variables						
Networking	6.050 ^a	2.379	4.900 ^a	2.288	-	-
Staff load	1.357 ^a	0.496	1.039 ^a	0.481	-	-
Funds for env. work	11.330 ^b	5.713	5.506	5.691	-	-
Obesity beliefs-indiv.	-7.578 ^a	3.611	-6.447 ^b	3.486	-	-
TPB Variables						
Others' expectations	-	-	3.873 ^b	2.104	6.000 ^a	2.222
Community readiness	-	-	3.641 ^b	2.064	6.912 ^a	2.120
Intercept	42.741 ^b	15.256	26.988	16.785	20.893 ^a	9.385
Adjusted R ²	0.409		0.480		0.340	

^a $p<0.05$; ^b $p<0.10$.

The regression coefficients of the main effects in Model 2 and 3 can be interpreted the same way. The unique amount of variance explained by each of the four variables in Model 1 was: staff load = 7.73%, funds for environmental work = 4.08%, obesity beliefs-individual = 4.58%, and networking = 6.71%, calculated by the square of the semipartial correlation (Hankins, French, & Horne, 2000).

Model 2 in Table 3.7 shows the main effects model with all the significant background and TPB variables; Model 3 is the main effects model with only the TPB variables. The positive coefficients of the TPB variables meant that a unit increase in either variable was associated with an increase in ENMs' use of environmental strategies (Model 2 in Table 3.7). The decrease in coefficients for all the background variables in the presence of TPB variables suggests that their relationship with ENMs' strategy use was partially accounted for by the TPB variables; ENMs'

having funds for environmental work became nonsignificant and was completely explained by the TPB variables. The unique amount of variance contributed by each of the significant variables in Model 2 was: staff load = 4.24%, obesity beliefs-individual = 3.13%, networking = 4.20%, others' expectations = 3.10%, and perceived community readiness = 2.82%.

Next, the significance of the mediated pathways as indicated by the TPB was investigated (Figure 3.1). Table 3.8 shows that the two relationships between 1) networking and use of environmental strategies and 2) belief that individual factors contribute to the obesity epidemic and use of environmental strategies were not mediated by either of the two TPB variables. The relationships between staff load and others' expectations ($SE=0.032$, $p<0.10$) and between having funds for environmental work and others' expectations ($SE=0.366$, $p<0.05$) and perceived community readiness ($SE=0.748$, $p<0.10$) revealed the significant mediated pathways (Figure 3.1). These overall positive relationships (i.e. positive regression coefficients) mean that an increase in the independent variable was associated with an increase in the mediating variable. For example, a unit increase in having funds for environmental work was associated with an increase in others' expectations by 0.800 ($SE=0.366$, $p<0.05$) unit.

Table 3.8: Unstandardized coefficients (B), standard errors (SE), and model statistics for mediator models (n=58)

Model	1		2	
Dependent Variable	Others' expectations		Community readiness	
	Unstandardized Coefficients			
	B	SE	B	SE
Background Variables				
Networking	0.057	0.153	0.255	0.156
Staff load	0.059 ^b	0.032	0.025	0.032
Funds for env. work	0.800 ^a	0.366	0.748 ^b	0.374
Obesity beliefs-individual	0.063	0.232	-0.378	0.236
Intercept	0.055	0.978	4.268	0.998
Adjusted R ²	0.157		0.258	

^a $p<0.05$; ^b $p<0.10$.

The significant mediated pathways were verified using bootstrapping. Table 3.9 shows others' expectations as the only significant variable that mediated the relationship between 1) staff load and use of environmental strategies and 2) having funds for environmental work and use of environmental strategies, since the confidence intervals did not pass through zero. The positive signs of the mediation indicated that an increase in staff load was associated with an increase in others' expectations, which was associated with an increase in ENMs' use of environmental strategies. ENMs having funds for environmental work was positively related to others' expectations and others' expectations was again associated with increased use of environmental strategies. Unlike the results from causal steps approach, perceived community readiness was not a significant mediator between ENMs having funds for environmental work and their use of environmental strategies. Since the bootstrapping approach is considered more powerful (Hayes, 2009), which is especially important with this study sample of 58, and accounted for the two mediators simultaneously, it was determined that others' expectations was the only significant mediator in the conceptual model (Figure 3.1).

Table 3.9: Confidence intervals of indirect effects for others' expectations and community readiness (n=58)

Mediating Variable	Others' expectations		Community readiness	
	95% Confidence Interval		95% Confidence Interval	
Independent Variables	Lower	Upper	Lower	Upper
Networking	-0.319	2.533	-0.033	2.869
Staff load	0.039	0.681	-0.076	0.433
Funds for environmental work	0.194	8.185	-0.811	7.504
Obesity beliefs-individual	-1.955	2.166	-4.385	0.211

Test of Moderation

Results of testing for interactions (Table 3.10) in the conceptual model consistently revealed networking as the most essential variable that moderated multiple pathways (Figure 3.3): the direct associations between 1) staff load and use of strategies and 2) perceived community

readiness and use of strategies and 3) the mediated pathways through others' expectations (with each of staff load and having funds for environmental work as the independent variable). This means that these sets of relationships depended on ENMs' level of networking in their communities. For example, the relationship between staff load and use of environmental strategies depends on the level of ENMs' networking (Table 3.10, Model 1).

Table 3.10: Unstandardized coefficients (B), standard errors (SE), and model statistics for models with interaction terms (n=58)

Model	1		2		3	
Dependent Variable	Use of environmental strategies					
	Unstandardized Coefficients					
	B	SE	B	SE	B	SE
Background Variables						
Networking	-0.764	3.432	0.347	2.930	-15.982	10.130
Staff load	-5.183 ^b	2.921	0.917 ^b	0.464	0.816 ^b	0.477
Funds for env. work	3.766	5.556	3.029	5.557	3.649	5.577
Obesity beliefs-indiv.	-7.188 ^a	3.385	-5.903 ^b	3.351	-8.715 ^a	3.541
TPB Variables						
Others' expectations	4.602 ^a	2.061	-20.339 ^b	10.529	4.852 ^a	2.088
Community readiness	3.576 ^b	1.994	3.981 ^a	1.984	-23.772 ^b	13.130
Interactions						
Network*Staff load	1.042 ^a	0.483				
Network*Expectations			4.643 ^a	1.982		
Network*Comm. readiness					4.890 ^a	2.315
Intercept	62.439 ^a	23.086	47.319 ^a	18.282	151.400 ^a	61.093
Adjusted R ²	0.515		0.523		0.514	

^a $p < 0.05$; ^b $p < 0.10$.

The regression coefficients of the variables involved in interaction terms presented in the three model cannot be interpreted similarly as those in a main effects model (without interaction terms). For example in Model 2, the coefficient of networking at 0.347 is the effect of networking on use of environmental strategies when others' expectations=0; and the coefficient of -20.339 is the effect of others' expectations on use of environmental strategies when networking=0. Thus the negative coefficient values for staff load in Model 1, others'

expectations in Model 2, and perceived community readiness in Model 3 means that when ENMs' networking=0, these variables depress ENMs' use of environmental strategies. Furthermore, the coefficient of the two-way interaction term indicates the amount of change on the slope of one variable when the other variable increases by one unit. For example, in Model 2, the coefficient for the interaction term means that a unit increase in networking is associated with an increase in the slope of others' expectations by 4.643.

Table 3.11 displays the bias corrected confidence intervals (95% CI with 10,000 resamples) at three levels of networking. Significance was observed only at networking=5.28 (mean) and 6.35 (+1 SD).

Table 3.11: Conditional effects at networking=mean and ± 1 SD (n=58)

Networking	Coefficient	SE	<i>z</i>	<i>p</i>	Bias Corrected 95% CI	
					Lower	Upper
Relationship between staff load and use of strategies through others' expectations						
4.21	-0.041	0.158	-0.256	0.798	-0.461	0.210
5.28	0.238	0.158	1.504	0.133	0.033	0.672
6.35	0.516	0.287	1.798	0.072	0.086	1.120
Relationship between Funds for environmental work to use of strategies through others' expectations						
4.21	-0.407	1.777	-0.229	0.819	-5.438	2.275
5.28	2.363	1.565	1.511	0.131	0.356	7.131
6.35	5.068	2.829	1.792	0.073	0.920	12.562

Plots of conditional indirect effects (Figures 3.4 and 3.5) show that the relationships mediated through others' expectations (between both having funds for environmental work and staff load and their use of environmental strategies) occurred at levels of networking greater than 5, i.e. the points where the confidence interval does not pass through zero. This value is near the mean of 5.3. It is only at moderately high levels of networking that staff load and ENMs having funds for environmental work are positively associated with ENMs' use of environmental strategies.

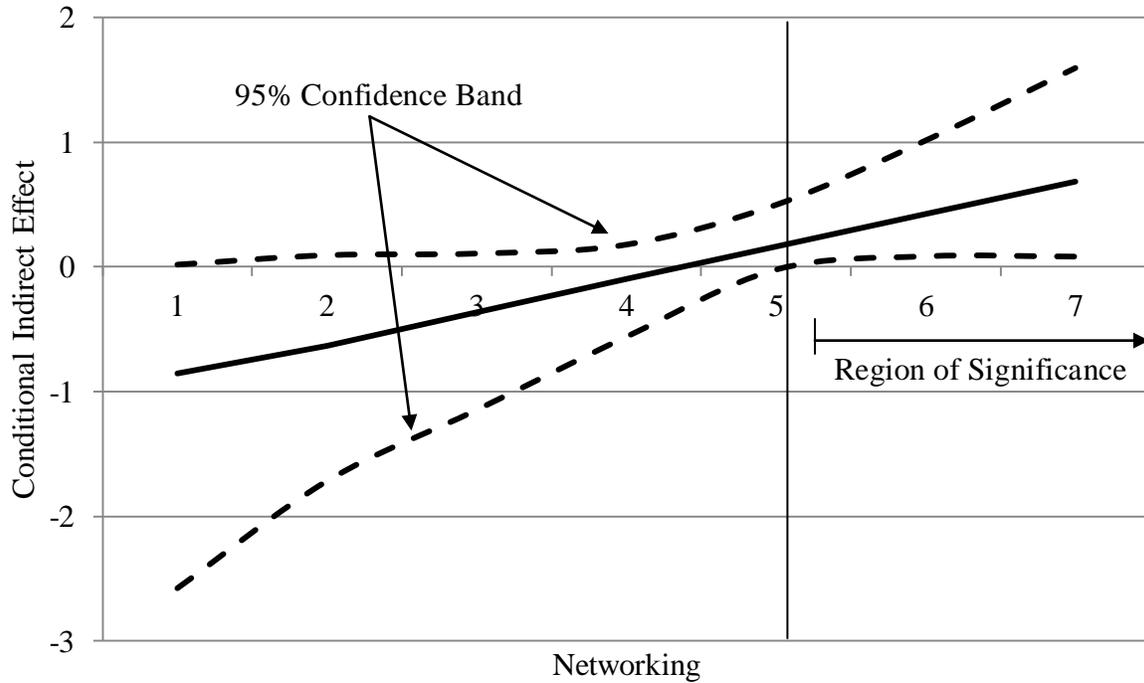


Figure 3.4: Graph of indirect relationship (mediated by others' expectations) between staff load and use of strategies at various levels of networking (n=58)

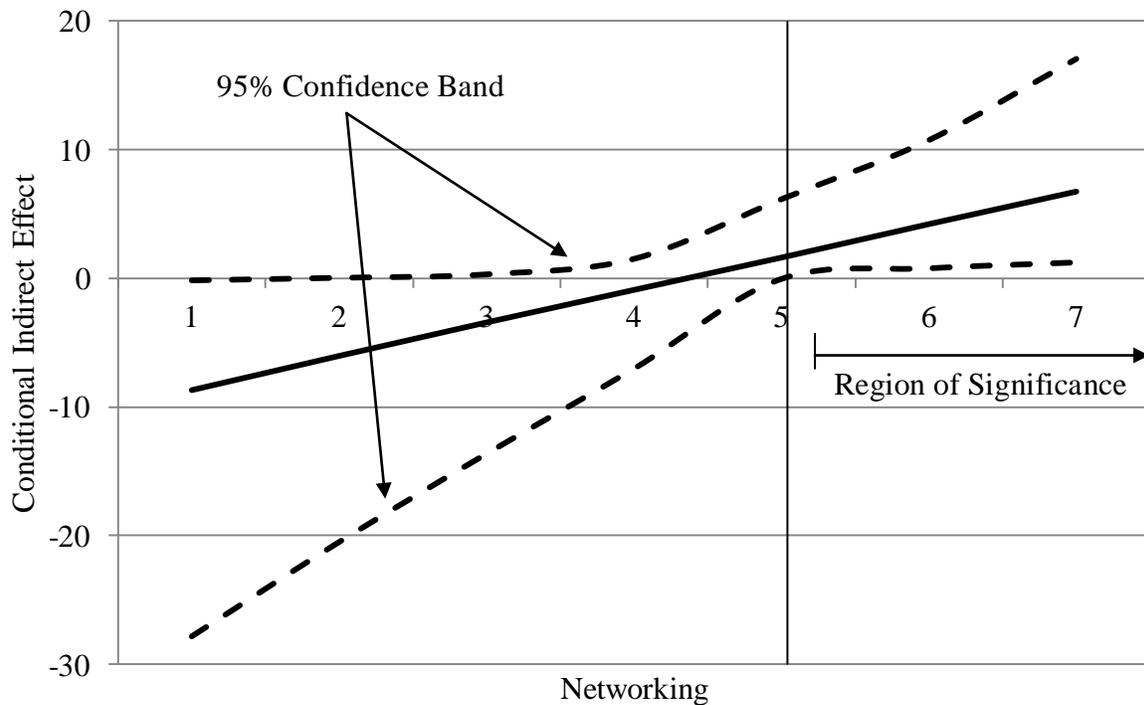


Figure 3.5: Graph of indirect relationship (mediated by others' expectations) between having funds for environmental work and use of strategies at various levels of networking (n=58)

In summary, ENMs' strategy use was positively associated with their networking in their communities, the number of staff they supervise, whether or not they had funds allocated to environmental change work, and perceived community readiness (Figure 3.3). Strategy use was negatively associated with ENMs' belief that individual factors contribute to the obesity epidemic. According to the TPB, the association of staff load and having funds for environmental work with strategy use was mediated by their perception that they were expected to use environmental strategies in their work. Importantly, ENMs used environmental strategies only when they networked at a moderately high level.

While applying the TPB assumes that these relationships are linear and unidirectional, it is more likely that in practice, the associations among some variables are reciprocal and mutually reinforcing as ENMs explained in interviews. For example, Figure 3.3 shows that ENMs having funds for environmental work was associated with ENMs' use of environmental strategies as mediated by their perception of others' expectations to use the strategies. However, an ENM indicated a reciprocal relationship where her having EWPH funds was due to the county having a well-established committee comprised of various community-based organizations who collaborate to identify county needs and apply for grants in order to expand their services for their residents. Also, from a funder's perspective, grants are likely to be awarded to programs or agencies that have long-standing working relationships with other organizations in the community. This is especially true with grants that target environmental factors, since changes on the organizational and community levels require multiple willing and interested partners collaborating with each other. Reciprocally, having grants to work on the environmental level together then allows the partners to nurture the existing relationships and educate each other, which can further contribute to ENMs' use of environmental strategies.

Another example of reciprocal causality related to ENMs being requested by agency partners to work on projects toward environmental change. This mechanism was especially evident among the three ENMs who were more focused on direct nutrition education programming, since their initial involvement was catalyzed by external factors, i.e. others' requests. Gaining new experience working toward environmental change then motivated ENMs to seek future funds to extend work in this area. These projects included working with schools and after school programs to modify menus and collaborating with agencies to implement a walking program. The last example addressed a possible relationship between two background factors, managing a grant and staff load. Typically, current staff members were assigned to work on environmental projects; however, several ENMs indicated instances where having additional funds for making environmental changes allowed them to hire more staff to do the work.

Analysis of subsample of ENMs who did not have funds for environmental change program

Because previous analysis identified ENMs having funds for environmental change work as a significant variable associated with their strategy use, the same set of procedures was performed without those who had funds (n=42) in order to understand the relationships among the remaining variables and ENMs' use of environmental strategies. Figure 3.6 illustrates the empirical model with the significant relationships among the background and TPB variables and ENMs' use of strategies. Results from multiple regression and bootstrapping analyses are presented below.

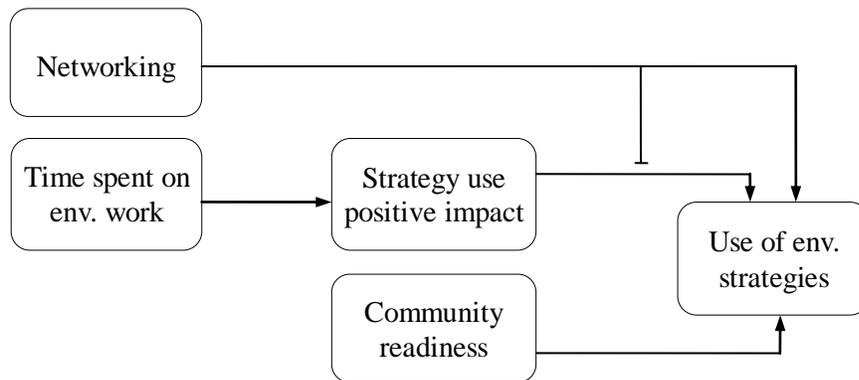


Figure 3.6: Final empirical model that shows the results of mediation and moderation analyses without ENMs who manage an environmental program (n=42)

Results differed from the first set of analysis with all 58 ENMs. Only two background variables, hours spent on environmental tasks and networking, were found to be significant predictors of ENMs’ use of environmental strategies (Table 3.12 Model 1). The positive coefficients in the three main effects models indicate that an increase in either independent variable was associated with an increase in ENMs’ use of environmental strategies. For example, a unit increase in networking was associated with an increase of 4.350 (SE=2.280, $p<0.10$) units in use of environmental strategies. The unique amount of variance contributed by hours spent on environmental tasks was 6.71% and networking was 7.95%.

The significant TPB variables were ENMs’ belief in the positive impact of using the strategies on obesity prevention and perceived community readiness. The TPB variables were more strongly associated with ENMs’ use of environmental strategies (Table 3.12 Model 3) than the two background factors (Table 3.12 Model 1). The unique amount of variance contributed by each of the three significant variables in Model 2 was networking = 4.49%, belief in strategy’s positive impact = 8.01%, and perceived community readiness = 11.22%.

Table 3.12: Unstandardized coefficients (B), standard errors (SE), and model statistics for main effects models (n=42)

Model Dependent Variable	1		2		3	
	Use of environmental strategies					
	Unstandardized Coefficients					
	B	SE	B	SE	B	SE
Background Variables						
Time on env. work	5.353 ^b	3.053	0.678	3.026	-	-
Networking	4.350 ^b	2.280	3.352 ^b	1.982	-	-
TPB Variables						
Strategy use impact	-	-	3.618 ^a	1.602	3.615 ^a	1.396
Community readiness	-	-	5.083 ^a	1.901	5.767 ^a	1.877
Intercept	20.050	13.418	15.209	13.744	30.675 ^a	8.703
Adjusted R ²	0.106		0.358		0.341	

^a $p < 0.05$; ^b $p < 0.10$.

One of the background variables, time spent on environmental tasks, became nonsignificant after the TPB variables were added to Model 1 (Table 3.12), meaning its association with ENMs' use of environmental strategies was mediated through another variable. According to Model 1 in Table 3.13, the significant mediator was ENMs' belief that strategy use has a positive impact on obesity prevention ($F=7.096, p=0.002$). Model 2 in Table 3.13 shows that perceived community readiness was not a significant mediator ($F=1.212, p=0.309$). These results indicated that as ENMs spent more time on environmental tasks, they held more positive beliefs toward strategy use, thus the more they used environmental strategies to address the issue. A unit increase in time spent on environmental work was associated with a 1.019 (SE=0.271, $p < 0.05$) unit increase in ENMs' belief that strategy use positively impacts obesity prevention. Further, the test of interaction terms indicated networking was a significant moderator where it interacted with ENMs' positive belief toward strategy use (Table 3.13 Model 3). This means that the association between use of environmental strategies and positive belief toward strategy use depended on the ENMs' level of networking. In Model 3, the coefficient for strategy use's impact on obesity of -17.447 was the effect of ENMs' positive belief toward strategy use on their use of

environmental strategies when networking=0. A unit increase in networking was associated with a 3.936 increase in the slope of strategy use's impact on obesity (Table 3.13 Model 3).

Table 3.13: Unstandardized coefficients (B), standard errors (SE), and model statistics for mediator models and model with interaction term (n=42)

Model	1		2		3	
Dependent Variable	Strategy use impact		Community readiness		Use of env. strategies	
	B	SE	B	SE	B	SE
Background Variables						
Time on env. work	1.019 ^a	0.271	0.195	0.228	2.978	2.795
Networking	-0.031	0.202	0.219	0.170	4.975 ^a	1.840
TPB Variables						
Strategy use impact	-	-	-	-	-17.447 ^a	6.691
Community readiness	-	-	-	-	4.869 ^a	1.699
Interactions						
Network*Strategy use impact	-	-	-	-	3.936 ^a	1.221
Intercept	-2.620 ^a	1.189	2.817 ^a	1.002	2.365	12.905
Adjusted R ²	0.229		0.010		0.487	

^a $p < 0.05$; ^b $p < 0.10$.

ENMs' positive belief toward using environmental strategies depended on the level of their networking. The conditional indirect effects for networking at mean and ± 1 SD are shown in Table 3.14. Significant effects were observed at mean and +1 SD. Figure 3.7 shows the conditional indirect effects along with the 95% confidence band for this moderated mediation relationship at points 1-7 of networking. The effects were significant at both ends of networking such that at values less than 3, the relationship between time spent on environmental tasks and use of environmental strategies was negative and at values greater than 5 (at the mean of 5.1), that relationship was positive.

Table 3.14: Conditional effects at networking=mean and ± 1 SD for the association between time spent on environmental tasks and use of strategies through ENMs' positive belief toward strategy use (n=42)

Networking	Coefficient	SE	Z	p	Bias Corrected CI	
					LL	UL
3.96	-1.510	1.967	-0.768	0.443	-7.403	1.192
5.06	2.328	1.361	1.712	0.087	0.172	5.585
6.16	6.205	2.111	2.940	0.003	2.329	10.754

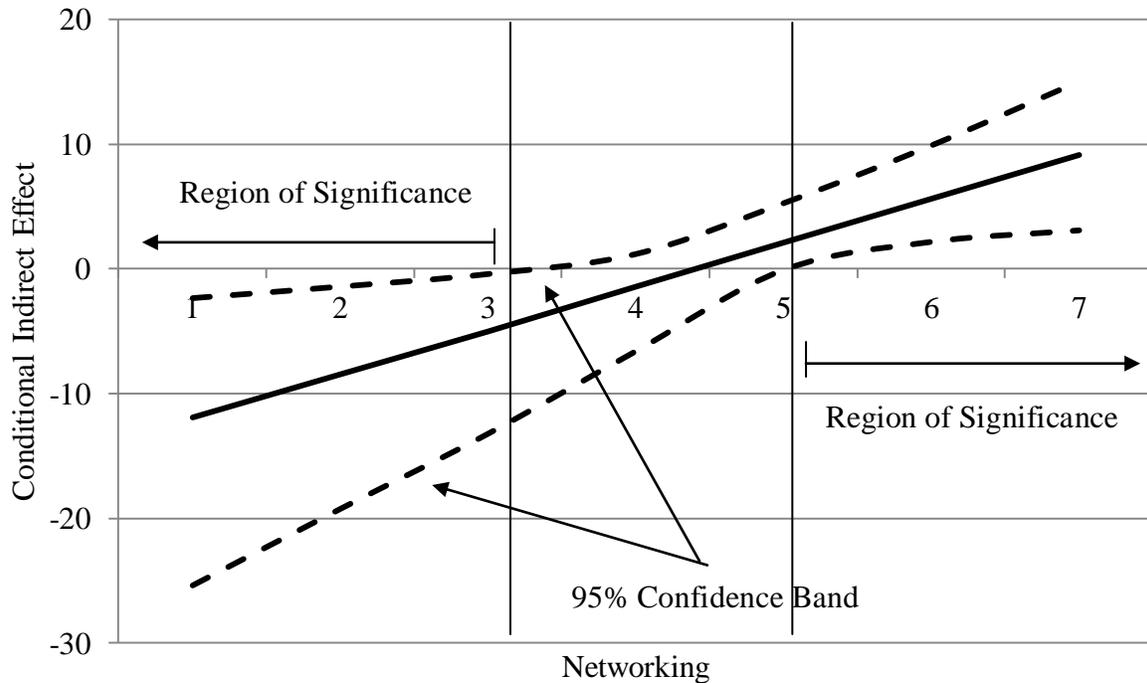


Figure 3.7: Graph of indirect relationship (mediated by positive belief in strategy use’s impact) between time spent on environmental tasks and use of strategies at various levels of networking (n=42)

In summary, without funds specifically dedicated to environmental work, ENMs’ use of strategies was related to their networking in their communities, the amount of time spent doing environmental change work, and perceived community readiness to engage in environmental change projects. The association between time spent on environmental tasks and strategy use was likely due to their belief that using the strategies will contribute positively to obesity prevention.

Discussion

This descriptive, cross-sectional study identified specific factors associated with ENMs’ use of environmental strategies to prevent obesity. Although data were derived from the ENMs’ perspectives, some of the significant variables are related to external factors, such as the level of community readiness to make environmental changes and other people’s expectations for ENMs to use environmental strategies. On the other hand, beliefs toward obesity and environmental

strategies and networking in the community are internally driven. This means that the factors that contribute to ENMs' use of environmental strategies include both their intrinsic motivation and a variety of external conditions. Findings from this study can be used to devise ways to enhance ENMs' currently limited use of environmental strategies.

In the overall group of ENMs (n=58), use of environmental strategies differed between those who had funds available for environmental strategy use and those who did not. It was also strongly associated with other people's expectation of them using the strategies and their staff load. Having funds allocated for environmental work allowed ENMs to more formally and comprehensively collaborate with other community-based organizations to make environmental changes to support healthy eating and physical activity. They were able to conduct assessments of the settings, carefully develop and implement action plans, and even monitor and evaluate the progress of those plans (Chapter 2). ENMs without funds available for environmental change work were still able to use environmental strategies, but less formally. All ENMs provided information and made recommendations related to nutrition and were asked to serve in community coalitions/committees in their effort to address obesity on the environmental level.

Results also revealed ENMs' staff as a source of support. ENMs with large staff load allocated more staff and their own time to environmental change work. Staff members' community relationships also led to ENMs' involvement in local environmental change programs, such as networking with other agency leaders and seeking additional grants to fund programs, both of which motivated ENMs to use environmental strategies. In programs with fewer staff, ENMs struggled between meeting current funding requirements and seeking future funding opportunities. However, having a large staff load could potentially detract ENMs from using environmental strategies due to the managerial demands, for example, signing leave slips

and handling staff interpersonal issues.

Furthermore, triangulating qualitative and quantitative findings, ENMs often described their community network as an important facilitator to their use of environmental approaches to prevent obesity. This included a community history of collaborating to apply for grants, to develop and implement community-wide systems to improve people's access to fresh produce, and to coordinate various community efforts to maximize performance and efficiency of each organization's programs. Perceived community readiness did not appear to differ due to the county being rural or urban. A rural county's prevalence of part-time staff in agencies prevented the formation of a community coalition; yet, in another county, the small size of the core network of agency partners contributed to the ENMs' use of environmental strategies. It is thus important that even if ENMs were asked to participate in committees/coalitions regularly in their job, the group needs to collaborate more deeply and specifically work towards making environmental changes (not just network to recruit participants or exchange information) before ENMs can effectively use environmental strategies.

This study also examined the association between the contributing factors and ENMs' strategy use after excluding the influence of having funds available for environmental work. Without such funds, ENMs' (n=42) actions were driven by their own belief that using environmental strategies would positively impact obesity prevention, which was related to the amount of time they devoted to tasks that aimed to change environments to facilitate healthy eating and physical activity. The more time ENMs devoted to tasks aimed at making environmental changes, the more they believed that using environmental strategies positively impacts obesity prevention (reverse causality), thus the more they used the strategies to address the issue. ENMs expressed their positive feelings about making small environmental changes

that led to desirable dietary behaviors in individuals. Even ENMs without funds dedicated to environmental work believed in the importance of addressing obesity on the environmental level and were already promoting small environmental changes working with their partners.

Networking was a significant moderator for ENMs who had and did not have funds available for using environmental strategies. Networking with partners allowed ENMs to disseminate and exchange information with each other. Rapid and complete information-sharing can lead to coordinated planning and implementation of activities, and proper mobilization and allocation of resources (Wendel, Prochaska, Clark, Sackett, & Perkins, 2010). Through networking, ENMs not only learned about what other agencies were doing (including environmental projects), they also acquired knowledge and skills from others about what environmental changes are and how to go about implementing them. Furthermore, these working relationships often benefited both direct nutrition education programs and environmental change projects. For example, all ENMs described instances where their use of environmental strategies depended on pre-existing relationships (Chapter 4). While marketing their programs and recruiting audiences, ENMs promoted their own expertise and increased their exposure in the community, which often led to their participation in projects aimed at making environmental changes. Also, the more ENMs networked with other agencies, the more likely they were to find willing and interested partners to engage in obesity prevention efforts to change environments. These personal connections are a means for community members to become collaborators (Bassett & Glandon, 2008).

While networking to achieve trusting relationships and enhance community involvement are important elements to successful partnerships (Dowling, Powell, & Glendinning, 2004; Lasker, Weiss, & Miller, 2001; Seifer, 2006) that are essential for ENMs in using environmental

strategies, it is a responsibility that consumes a significant amount of time and energy, as other researchers noted (Kreuter, Lezin, & Young, 2000; Wilensky & Hansen, 2001). Networking and collaborating with other agencies toward achieving mutual goals is often a recommended but infrequent practice (Baxter, 2010). Study results showed that ENMs have gradually made incremental progress in building relationships that contributed to their use of environmental strategies for obesity prevention (Chapter 4). Without ENMs' expertise in networking and collaborating with others in their community for making environmental changes, progress would not happen despite having other resources.

It is thus essential that ENMs develop their skills that contribute to their success in networking, including socializing, politicking, and interacting with others (Asllani & Luthans, 2003). They need to perceive networking for making environmental changes as a necessary part of their job in order for them to persevere through the difficulties, because when organizational members perceive a task to be above and beyond the normal workload of their job, it would be difficult for them to remain proactive (Bassett & Glandon, 2008). Furthermore, ENMs need to extend their relationships beyond the purpose of recruiting audiences for EFNEP and SNAP-Ed toward using environmental strategies.

Other essential elements that motivated ENMs' use of environmental strategies can be elucidated by considering the underlying determinants of the independent variables or confounders. For example, having more staff can be a proxy for the size of the ENMs' nutrition program in their community, program maturity, organizational structure, and operational capacity (Fredericksen & London, 2000). Since community-based service programs address community needs, program size could also be related to the community being rural or urban and thus the functioning of its various organizations. Therefore, the reason that large metro and

medium/small health departments were more skillful than nonmetro health departments (Schwarte et al., 2010) was likely due to the community's capacity to address various social and public health issues rather than the size of the staff, *per se*. This collective capacity is further related to the various individual organizations' capacities to deliver their programs. Provan and Milward (1995) identified the characteristics of effective nonprofit organizations as those that are mature with stable funding, experienced executives, a clear history of commitment to their constituencies, and a collaborative rather than competitive mindset. They also have a positive reputation among other agencies in the region (Fredericksen & London, 2000). These were often described by ENMs as reasons for their engagement in environmental change projects.

It was interesting that many factors expected to be influential were not clearly facilitators or barriers to ENMs' use of environmental strategies because their influence on strategy use was context specific and dependent upon various other factors. For example, even if ENMs had the desire to expand their programs or had a high level of networking, when they did not specifically strive toward the goal of making environmental changes with those efforts, they still only targeted obesity on the individual level. The main consideration for determining whether the tasks promote environmental change is thus to define the goal and purpose of the action, such as networking to do what; being persistent in doing what; and having more staff to do what. Nonetheless, high level networking and collaborating sets ENMs up to move into environmental change when the opportunity presents itself.

Moreover, while some variables were mentioned in interviews to be important contributors and were significantly related to ENMs' use of environmental strategies in bivariate analysis, they did not remain statistically significant in the empirical models. These variables included ENMs' current tenure, hours of work each week, level of persistence, desire to do more in their

work, supervisor behavior, and agency resources. Statistically, the possible reasons for the lack of significance included low variation, lack of power due to the small sample size, and collinearity (see Table 3.6, e.g. networking and weekly work hours $r=0.592, p<0.001$). Although these variables were conceptually important, they did not contribute uniquely to explaining the statistical variance observed in ENMs' use of environmental approaches to address obesity.

Although these variables were not statistically significant, qualitative interview data demonstrated their practical significance. For example, ENMs seemed to imply that their tenure in the current job position was an important factor in their use of environmental strategies because the longer they had worked in their communities, the better the ENMs knew the communities and the more established working relationships they had with other agencies to facilitate their strategy use. Moreover, employees with longer tenure may focus and engage more in social-oriented tasks such as helping others and maintaining positive relationships than other technically oriented tasks (Ng & Feldman, 2010). Since building relationships and being a part of collaborations requires developing trust with others, employees with longer tenure would be likely be better at these tasks. It is also possible that ENMs with longer tenure would be more familiar with routine tasks that they can devote more time and knowledge to experiment with new ideas (Ng & Feldman, 2010), such as using environmental strategies. However, one interview revealed a lack of positive relationship between tenure and strategy use. An ENM had only been working in her current position for three years, but due to her special interest and sense of urgency in building collegial relationships with other agency leaders, this ENM used environmental strategies extensively in her job.

Another example is related to ENMs' level of persistence and desire to do more in their job, two dimensions to the construct of proactive personality that did not remain significant in the

regression models. This was likely due to their collinearity with networking ($r=0.343, p<0.01$ and $r=0.437, p<0.01$, respectively) and with each other ($r=0.575, p<0.001$). ENMs demonstrated this “work habit or manner of conducting oneself” (p. 10) that contributed to their effective use of environmental strategies (Marrelli, 1998) by describing their repeated attempts to contact potential partners for establishing networks and using environmental strategies despite their frequent non-response.

Lastly, the Theory of Planned Behavior (TPB) provided a framework of possible mechanisms that contributed to ENMs’ use of environmental strategies. The results partially supported the TPB principle that associations between background factors and behavior are mediated through people’s beliefs and attitude toward the behavior, perceived social norms, and perceived behavioral control over performing the behavior (Ajzen & Albarracín, 2007). Due to a lack of research empirically assessing this indirect relationship, no similar data are available for comparing mediated relationships. This study’s finding that perceived community readiness was a significant factor related to ENMs’ perception of control in using environmental strategies was consistent with that of previous research (Godin & Kok, 1996). Others’ expectations of ENMs in using environmental strategies were also consistent with that of Sharma and colleagues (2003) where social norms were a significant determinant of individuals’ business succession planning. Another study revealing the significance of positive beliefs toward performing the behavior (Schottle, 1999) further corroborated current study results.

Although general beliefs and other background factors tend to be poorly associated with specific behaviors (Ajzen, 1991), study results indicated that the set of four background variables (networking, staff load, having funds for environmental work, and belief that individual factors contribute to the obesity epidemic) were more highly associated with ENMs’ use of

environmental strategies than the two TPB variables (others' expectations and perceived community readiness). Additional variance was accounted for by the two extra variables and the high contribution of networking and staff load as shown by the higher semipartial correlations relative to the two mediating (i.e. TPB) variables. However, excluding ENMs who had funds available for using environmental strategies, the two mediators, positive belief toward strategy use's impact on obesity prevention and perceived community readiness, were more strongly associated with ENMs' use of environmental strategies than the two background factors (networking and time spent on environmental tasks). This finding is thus more consistent with TPB (Ajzen & Albarracín, 2007).

The findings in this study based on the TPB were considered in light of qualitative results that revealed the details of the relationships among the factors and elucidated various instances where the relationships were not linear as the empirical models show (Figures 3.3 and 3.6), but instead, reciprocal. The results do not imply causality among the variables and are not intended to be generalized across different populations of community nutritionists and in different settings. Instead, they suggest various factors that public health and community practitioners who work in obesity prevention may perceive to be related to their job in making environmental changes. It was more likely that the variables exerted mutual influence on each other and that the pathways were bi- rather than unidirectional (i.e. reciprocal relationships), such as the influences among concepts in any system (Tseng & Seidman, 2007). For example, although ENMs' use of environmental strategies was the outcome variable, ENMs' actions would likely contribute positively to their belief toward the causes and prevention of obesity, as changing individuals' behavior is an effective way to alter their attitude and beliefs (Bem, 1970). Additionally, doing work in this area may also expand ENMs' existing network of partners and lead them to realize

that many agency partners are interested in or already engaged in using environmental strategies, which enhances the perception that their community is ready to address obesity on the environmental level or that they are expected to environmental strategies in their job.

Implications for Research

As emphasis on modifying environments to prevent obesity began nearly a decade ago, it is time to investigate the work of public health and community professionals in using environmental approaches to target obesity. Future research should examine the perspectives and practices of Extension staff in other program areas of the system and in other states in the country. Further, research should explore the roles of other community stakeholders, including public health personnel, since many closely collaborate with Extension staff in delivering environmental change programs/projects. These findings contribute to Feinberg and colleagues' (2004) suggestion to conduct more research to better understand the capacities of communities to address existing problems.

It is inadequate to conduct studies of human behavior using only quantitative methods because survey results do not capture the nuances associated with people's perceptions and behaviors. In addition to in-depth interviews and observations, future research may apply, for example, the Q-methodology (Brown, 1996) to emphasize the subjective viewpoints of public health and community professionals toward using environmental approaches to address obesity. This technique would lead to a better understanding of the intrinsic factors that motivate their actions and more effective ways to promote their use of environmental strategies.

Finally using observations, researchers can apply the TPB to explore practitioners' actual use of environmental strategies in longitudinal studies to examine both their intention and behavior. This would involve simultaneous tracking of the changes in the factors associated with

their action. The results of this study would serve as a point of reference. More applications of the TPB to complex behaviors with multiple dimensions can provide additional insights to the utility of the theory.

Implications for Practice

The results of this study have significant implications for practitioners who promote the health and wellness of the low-income population in their communities as these residents tend to live in neighborhoods with limited availability of healthy affordable foods (Larson, Story, & Nelson, 2009) and fewer resources for physical activity (Moore, Davis, Baxter, Lewis, & Yin, 2008; Powell, Slater, & Chaloupka, 2004). In promoting use of environmental strategies, the importance and purposes of networking should be emphasized because it is only at moderately high levels of networking that work can be done to address multifactorial problems like obesity that require the collaboration of multiple stakeholders. Increased networking would allow practitioners to better assess their community's readiness for engaging in environmental change work and brainstorming ways to collaborate toward making changes in their environments. Such collaboration may then contribute to the community's collective capacity to prevent obesity.

If practitioners are expected to use environmental strategies, then organizational structures and policies that are intricately connected to their work need to change. Extension and public health as community-based systems should consider implementing policies to support their staff's use of environmental strategies. This may include modifying position descriptions and providing necessary resources to support and motivate practitioners to engage in projects in this area. Having responsibilities explicitly outlined in their job descriptions will enhance practitioners' perception that they are expected to use environmental strategies. Providing adequate resources and social support to allow practitioners to make environmental changes for

healthy eating and exercise increases their perception of control over using the strategies. Further, opportunities for learning about using environmental strategies may begin in organizations in which practitioners work. For example, the Cornell Cooperative Extension (CCE) has been promoting a system-wide worksite wellness initiative to modify the practices of CCE organizations to support healthy nutrition and physical activity behaviors. This has increased the awareness of CCE staff toward obesity prevention by providing environments for them to practice what they preach. They are then positioned to educate other agency staff on ways to implement the same strategies to make changes in their organizations.

Conclusion

This study investigated factors that were associated with ENMs' use of environmental strategies to address obesity. ENMs' motivations to act were strongly associated with their perceptions of expectations to use the strategies as mandated by grants that target obesity on the environmental level. Without being asked by external parties, ENMs' motivation to use environmental strategies was derived internally from their own belief that using environmental approaches positively impacts obesity prevention. However, ENMs' action appeared to depend simultaneously on a multitude of factors including their beliefs toward obesity and its prevention, networking level, staff load, perceived community readiness, and their own level of persistence and desire to do more in their job. These factors and ENMs' use of environmental strategies mutually influenced each other. Understanding the motivations behind ENMs' actions and use of environmental strategies contributes to the overall goal of obesity prevention through use of a multitude of strategies to address multiple environmental influences.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27–58.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Ajzen, I. & Albarracín, D. (2007). Predicting and changing behavior: a reasoned action approach. In I. Ajzen, D. Albarracín, and R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Arizona Department of Health Services. (2005). Arizona nutrition and physical activity state plan: Comprehensive plan to reduce chronic disease and obesity in Arizona. Retrieved April 2, 2010, from <http://www.physicalactivityplan.org/resources/PA-Plans/ArizonaPA.pdf>
- Armitage, C.J. & Conner, M. (1999) Distinguishing perceptions of control from self-efficacy: predicting consumption of a low-fat diet using the theory of planned behavior. *Journal of Applied Social Psychology*, 29(1), 72–90.
- Asllani, A. & Luthans, F. (2003). What knowledge managers really do: an empirical and comparative analysis. *Journal of Knowledge Management*, 7(3), 53-66.
- ATLAS.ti. (2006). Version 5.2. Berlin, Germany: Scientific Software Development.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Barry, C.L., Brescoll, V.L., Brownell, K.D., & Schlesinger, M. (2009). Obesity metaphors: how beliefs about the causes of obesity affect support for public policy. *The Milbank Quarterly*, 87(1), 7–47.
- Bassett, E.M. & Glandon, R.P. (2008). Influencing design, promoting health. *Journal of Public Health Management and Practice*, 14(3), 244-254.

- Bateman, T.S. & Crant, J.M. (1993). The proactive component of organizational behavior: a measure and correlates. *Journal of Organizational Behavior*, 14(2), 103-118.
- Baxter, R.J. (2010). Making better use of the policies and funding we already have. *Preventing Chronic Disease*, 7(5). Retrieved January 27, 2010, from http://www.cdc.gov/pcd/issues/2010/sep/10_0055.htm.
- Bem, D.J. (1970). *Beliefs, attitudes, and human affairs*. Belmont, CA: Brooks/Cole Publishing.
- Bogers, R.P., Brug, J., van Assema, P., & Dagnelie, P.C. (2004). Explaining fruit and vegetable consumption: the theory of planned behavior and misconception of personal intake levels. *Appetite*, 42(2), 157-166.
- Bray, G.A. & Champagne, C.M. (2005). Beyond energy balance: there is more to obesity than kilocalories. *Journal of the American Dietetic Association*, 105(5 Suppl 1), S17-S23.
- Brown, S.R. (1996). Q methodology and qualitative research. *Qualitative Health Research*, 6(4), 561-567.
- Cammann, C. Fichman, M., Jenkins, G.D., & Klesh, J.R. (1983). Assessing the attitudes and perceptions of organizational members. In S.E. Seashore, E.E. Lawler, P.H. Mirvis, and C. Cammann (Eds.). *Assessing organizational change: a guide to methods, measures, and practices* (pp. 71-138). New York, NY: John Wiley and Sons.
- Centers for Disease Control and Prevention. (2009). Recommended community strategies and measurements to prevent obesity in the United States, *Morbidity and Mortality Weekly Report*, 58, No. RR-7, 1-29.
- Collaboration for Health, Activity, and Nutrition in Children's Environments. (2011). CHANCE. Retrieved November 5, 2011, from http://www.fnec.cornell.edu/Our_Initiatives/CHANCE.cfm
- Conner, M. & Armitage, C.J. (1998). Extending the theory of planned behavior: a review and avenues for further research. *Journal of Applied Social Psychology*, 28(15), 1429-1464.
- DeVellis, R.F. (2003). *Scale development: theory and applications* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Dowling, B., Powell, M., & Glendinning, C. (2004). Conceptualising successful partnerships. *Health and Social Care in the Community, 12*(4), 309-317.

Drewnowski, A. & Spector, S.E. (2004). Poverty and obesity: the role of energy density and energy costs. *American Journal of Clinical Nutrition, 79*(1), 6–16.

Economos, C.D., Hyatt, R.R., Goldberg, J.P., Must, A., Naumova, E.N., Collins, J.J., & Nelson, M.E. (2007). A community intervention reduces BMI z-score in children: Shape Up Somerville first year results. *Obesity, 15*(5), 1325-1336.

Egger, G. & Swinburn, B. (1997). An “ecological” approach to the obesity pandemic. *British Medical Journal, 315*, 477-480.

Espinosa-Hall, G.B., Metz, D., Johns, M., Smith, D., Crawford, P.B., Siemering, K., & Ikeda, J. (2007). UCCE helps community coalitions reduce childhood overweight. *California Agriculture, 61*(3). Retrieved April 2, 2010 from <http://www.escholarship.org/uc/item/96g7236s>

Farrell, A.M. (2010). Insufficient discriminant validity: a comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research, 63*(3), 324–327.

Feinberg, M.E., Greenberg, M.T., & Osgood, D.W. (2004). Readiness, functioning, and perceived effectiveness in community prevention coalitions: a study of communities that care. *American Journal of Community Psychology, 33*(3/4), 163-176.

Ferris, G.R., Perrewé, P.L., & Douglas, C. (2002). Social effectiveness in organizations: construct validity and research directions. *Journal of Leadership & Organizational Studies, 9*(1), 49-63.

Ferris, G.R., Treadway, D.C., Kolodinsky, R.W., Hochwarter, W.A., Kacmar, C.J., Douglas, C., & Frink, D.D. (2005). Development and validation of the political skill inventory. *Journal of Management, 31*(1), 126-152.

Field, A.E., Coakley, E.H., Must, A., Spadano, J.L., Laird, N., Dietz, W.H., Rimm, E., & Colditz, G.A. (2001). Impact of overweight on the risk of developing common chronic diseases during a 10-year period. *Archives of Internal Medicine, 161*(13), 1581-1586.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

- Francis, J.J., Eccles, M.P., Johnston, J., Walker, A., Grimshaw, J., Foy, R., Kaner, E.F.S., Smith, L., & Bonetti, D. (2004). Constructing questionnaires based on the theory of planned behavior: a manual for health services research. Newcastle upon Tyne, United Kingdom: Centre for Health Services Research. Retrieved June 11, 2008, from <http://www.rebeqi.org/ViewFile.aspx?itemID=212>
- Fredericksen, P. & London, R. (2000). Disconnect in the hollow state: the pivotal role of organizational capacity in community-based development organizations. *Public Administration Review*, 60(3), 230-239.
- Fritz, M.S. & MacKinnon, D.P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18(3), 233–239.
- Gagne, C. & Godin, G. (2000). The theory of planned behavior: some measurement issues concerning belief-based variables. *Journal of Applied Social Psychology*, 30(10), 2173-2193.
- Georgia Department of Human Resources (2005). Georgia's nutrition and physical activity plan: To prevent and control obesity and chronic diseases in Georgia. Retrieved April 3, 2010, from <http://health.state.ga.us/pdfs/familyhealth/nutrition/NutritionandPhysicalActivityPlanFINAL.pdf>
- Godin, G. & Kok, G. (1996). The theory of planned behavior: a review of its applications. *American Journal of Health Promotion*, 11, 87-98.
- Hankins, M., French, D., & Horne, R. (2000). Statistical guidelines for studies of the theory of reasoned action and the theory of planned behaviour. *Psychology and Health*, 15(2), 151-161.
- Hayes, A.F. (2009). Beyond Barron and Kenny: statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420.
- Institute of Medicine. (2005). Preventing Childhood Obesity: Health in the Balance. Jeffrey P. Koplan, Catharyn T. Liverman, Vivica I. Kraak (Eds). Washington, D.C.: The National Academies Press.
- Kassem, N.O., Lee, J.W., Modeste, N.N., & Johnston, P.K. (2003). Understanding soft drink consumption among female adolescents using the theory of planned behavior. *Health Education Research*, 18(3), 278-291.

- Kreuter, M.W., Lezin, N.A., & Young, L.A. (2000). Evaluating community-based collaborative mechanisms: implications for practitioners. *Health Promotion Practice, 1*(1), 149-163.
- Krueger, N.F. & Carsrud, A.L. (1993). Entrepreneurial intentions: applying the theory of planned behaviour. *Entrepreneurship and Regional Development, 5*(4), 315-330.
- Kumanyika, S., Jeffery, R.W., Morabia, A., Ritenbaugh, C., & Antipatis, V.J. (2002). Obesity prevention: the case for action. *International Journal of Obesity, 26*(3), 425-436.
- Larson, N.I., Story, M.T., & Nelson, M.C. (2009). Neighborhood environments: disparities in access to healthy foods in the U.S. *American Journal of Preventive Medicine, 36*(1), 74-81.
- Lasker, R.D., Weiss, E.S., & Miller, R. (2001). Partnership synergy: a practical framework for studying and strengthening the collaborative advantage. *Milbank Quarterly, 79*(2), 179-205.
- Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Marrelli, A. (1998). An introduction to competency analysis and modeling. *Performance Improvement, 37*(5), 8-17.
- Mattessich, P.W., Murray-Close, M., & Monsey, B.R. (2001). *Collaboration: What makes it work*. St. Paul, MN: Amherst H. Wilder Foundation.
- McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly, 15*(4), 351-378.
- Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Moñtano, D.E., Kasprzyk, D., & Taplin, S.H. (1997). The theory of reasoned action and the theory of planned behavior. In K. Glanz, F.M. Lewis, and B.K. Rimer (Eds.) *Health behavior and health education : theory, research, and practice* (2nd ed., pp. 85-112). San Francisco, CA: Jossey-Bass.
- Moore, J.B., Davis, C.L., Baxter, S.D., Lew, R.D., & Yin, Z. (2008). Physical activity, metabolic syndrome, and overweight in rural youth. *Journal of Rural Health, 24*(2), 136-142.

- Morland, K., Wing, S., Diez Roux, A., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American Journal of Preventive Medicine*, 22(1), 23-29.
- Nejad, L.M., Wertheim, E.H., & Greenwood, K.M. (2004). Predicting dieting behavior by using, modifying, and extending the theory of planned behavior. *Journal of Applied Social Psychology*, 34(10), 2099–2131.
- New York State Department of Health. (2010). Eat Well Play Hard. Retrieved May 13, 2011, from http://www.health.state.ny.us/prevention/nutrition/resources/eat_well_play_hard/
- New York State Department of Health. (2008). Strategic plan for overweight and obesity prevention: policy and environmental changes. Retrieved May 13, 2011 from http://www.health.state.ny.us/prevention/obesity/strategic_plan/
- Ng, T.W.H. & Feldman, D.C. (2010). Organizational tenure and job performance. *Journal of Management*, 36(5), 1220-1250.
- Ogden, J. & Flanagan, Z. (2008). Beliefs about the causes and solutions to obesity: A comparison of GPs and lay people. *Patient Education and Counseling*, 71(1), 72–78.
- Oliver, J.E. & Lee, T. (2005). Public opinion and the politics of obesity in America. *Journal of Health Politics, Policy, and Law*, 30(5), 923-954.
- Paeratakul, S., Lovejoy, J.C., Ryan, D.H., & Bray, G.A. (2002). The relation of gender, race and socioeconomic status to obesity and obesity comorbidities in a sample of US adults. *International Journal of Obesity*, 26(9), 1205-1210.
- Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Beverly Hills, CA: Sage Publications.
- Powell, L.M., Slater, S., & Chaloupka, F.J. (2004). The relationship between community physical activity settings and race, ethnicity, and socioeconomic status. *Evidence-Based Preventive Medicine*, 1(2), 135-144.
- Preacher, K.J., Rucker, D.D., & Hayes, A.F. (2007). Addressing moderated mediation hypotheses: theory, methods, and prescriptions. *Multivariate Behavioral Research*, 42(1), 185-227.

- Preacher, K. J. & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. In A. F. Hayes, M. D. Slater, & L. B. Snyder (Eds.), *The Sage sourcebook of advanced data analysis methods for communication research* (pp. 13-54). Thousand Oaks, CA: Sage. Retrieved June 9, 2010 from http://www.sagepub.com/upm-data/23657_Chapter2.pdf
- Provan, K.G. & Milward, H.B. (1995). A preliminary theory of interorganizational network effectiveness: a comparative study of four community mental health systems. *Administrative Science Quarterly*, 40(1), 1–33.
- Sanigorski, A.M., Bell, A.C., Kremer, P.J., Cutler, R. & Swinburn, B.A. (2008). Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well. *International Journal of Obesity*, 32(7), 1060–1067.
- Schottle, N.K. (1999). Obstetrical nurses' intentions toward collaborating with midwives. Master's thesis, Graduate Department of Nursing, University of Toronto.
- Schwartz, L., Samuels, S.E., Boyle, M., Clark, S.E., Flores, G., & Prentice, B. (2010). Local public health departments in California: changing nutrition and physical activity environments for obesity prevention. *Journal of Public Health Management and Practice*, 16(2), E17–E28.
- Schwartz, M.B. & Brownell, K.D. (2007). Action necessary to prevent childhood obesity: creating the climate for change. *Journal of Law, Medicine, and Ethics*, Spring, 78-89.
- Seibert, S.E., Crant, J.M., & Kraimer, M.L. (1999). Proactive personality and career success. *Journal of Applied Psychology*, 84(3), 416-427.
- Seifer, S.D. (2006). Building and sustaining community-institutional partnerships for prevention research: findings from a national collaborative. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 83(6), 989-1003.
- Sharma, P., Chrisman, J.J., & Chua, J.H. (2003). Succession planning as planned behavior: some empirical results. *Family Business Review*, 16(1), 1-16.
- SPSS for Windows. (2006). Version 14.0.2. Chicago: SPSS Inc.

- Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association*, 102(3 Suppl), S40-S51.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: grounded theory procedures and techniques*. Newbury Park, CA: SAGE Publications, Inc.
- Swinburn, B., Gill, T., & Kumanyika, S. (2005). Obesity prevention: a proposed framework for translating evidence into action. *Obesity Reviews*, 6(1), 23–33.
- Trost, J.E. (1986). Statistically nonrepresentative stratified sampling: a sampling technique for qualitative studies. *Qualitative Sociology*, 9(1), 54-57.
- Trust for America's Health. (2011). *F As in Fat: How Obesity Threatens America's Future 2011*. Washington DC: TFAH. Retrieved August 30, 2011, from <http://www.rwjf.org/files/research/fasinfat2011.pdf>
- Tseng, V. & Seidman, E. (2007). A systems framework for understanding social settings. *American Journal of Community Psychology*, 39(3/4), 217-228.
- Wandersman, A., Goodman, R.M., & Butterfoss, F.D. (2005). Understanding coalitions and how they operate. In M. Minkler (Ed.) *Community organizing and community building for health* (2nd ed., pp. 261-277). New Brunswick, N.J.: Rutgers University Press.
- Wendel, M.L., Prochaska, J.D., Clark, H.R., Sackett, S., & Perkins, K. (2010). Interorganizational network changes among health organizations in the Brazos Valley, Texas. *Journal of Primary Prevention*, 31(1-2):59–68.
- Wilensky, A.S. & Hansen, C.D. (2001) Understanding the work beliefs of nonprofit executives through organizational stories. *Human Resource Development Quarterly*, 12(3), 223-239.
- Wolf, A.M. & Colditz, G.A. (1998). Current estimates of the economic cost of obesity in the United States. *Obesity Research*, 6(2), 97–106.
- Woodruff, K., Dorfman, L., Berends, V., & Agron, P. (2003). Coverage of childhood nutrition policies in California newspapers. *Journal of Public Health Policy*, 24(2), 150-158.

Chapter 4

The Evolving Role from a Nutrition Educator of Individuals to a Change Agent of Environments

“I think if you do it long enough, it’ll eventually become culture, which is the highest form of wherever you want to be, but it’s not there yet.” - Cornell Cooperative Extension Nutrition Manager

Background

Obesity is a multifaceted public health issue resulting from a wide range of biological, behavioral, and environmental factors (Bray & Champagne, 2005; Schwartz & Brownell, 2007; Story, Neumark-Sztainer, & French, 2002). Its seriousness lies in the numerous adverse consequences associated with the health and well-being of individuals (Field et al., 2001) and collectives such as organizations, communities, and the society at large (Institute of Medicine [IOM], 2005; Wolf & Colditz, 1998). Although obesity affects people from all socioeconomic backgrounds, a disproportionately high percentage of obese people are low-income and less educated (Paeratakul, Lovejoy, Ryan, & Bray, 2002; Trust for America’s Health, 2011). The environment is especially harsh for this population because they are less likely to afford “healthy” foods (i.e. foods with high nutrient density) that are on average more expensive than high energy dense foods (Drewnowski & Spector, 2004) and live in low wealth neighborhoods where fast food restaurants are more prevalent (Morland, Wing, Diez Roux, & Poole, 2002).

In such an obesogenic environment (Schwartz & Brownell, 2007), nutrition education and therapeutic interventions that focus only on individual behavior change without regard for environmental factors are inadequate in combating the rise of obesity (Brownell, 2005; McTigue et al., 2003). Community interventions that apply the socio-ecological perspective (Bronfenbrenner, 1979; McLeroy, Bibeau, Steckler, & Glanz, 1988) and emphasize the role of

the environment on multiple levels (Swinburn, Gill, & Kumanyika, 2005) have become more widespread in the last decade (Egger & Swinburn, 1997; Kumanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002). Public health and nonprofit community organizations have thus been called upon to promote environmental changes that support healthy eating and physical activity for community residents. Examples include incorporating more fruits and vegetables into school menus and modifying wellness policies to increase exercise opportunities for children. Furthermore, since multi-level changes involve multiple organizations and the community as a whole, funding agencies have increasingly mandated collaboration among stakeholders or partnering agencies as a requisite for support of community-based programs (Wandersman, Goodman, & Butterfoss, 2005), such as those making environmental changes to target obesity.

However, during a time of global economic crisis, budget cuts on the state and county levels have directly limited the resources available for the public health and social services systems and local community-based organizations like Cornell Cooperative Extension (CCE) to engage in programs that target obesity. This issue is particularly critical to agencies serving low-income audiences because of the burden of obesity in this group as compared to more affluent segments of the population (Levi et al., 2011; Paeratakul et al., 2002). In addition, for practitioner, such as Extension Nutrition Managers (ENM) who work in CCE, beliefs are associated with implementation of environmental approaches to address obesity. In previous research, professionals working in the obesity field felt more confident about education-based strategies than those aimed at modifying environments (Antipatis, Kumanyika, Jeffery, Morabia, & Ritenbaugh, 1999). A disconnect has existed where even if nutrition professionals believed the environment was largely responsible for the rise in obesity, a majority still suggested the solution of nutrition education or methods that aimed to change individuals' behaviors as the solution

(Woodruff, Dorfman, Berends, & Agron, 2003). Working toward environmental change is still a fairly new concept for most public health departments and the Extension system. In a recent report, health department personnel claimed a lack of knowledge and skills necessary to participate in activities for making environmental changes to prevent obesity (Schwarte et al., 2010). Other studies of community-based interventions targeting obesity with an environmental approach have focused primarily on the formative evaluation of program outcomes and effectiveness (Economos et al., 2007; Sanigorski, Bell, Kremer, Cutler, & Swinburn, 2008).

An abundance of literature describes and recommends strategies that community nutritionists and other public health personnel can use to change environments to support healthy eating and physical activity for program participants. However, these strategies are often multidimensional and require a series of actions for implementation (Chapter 2); it is rare to find literature that suggests practical ways to put the strategies into action. Since successfully using environmental strategies in community settings requires practitioners to collaborate, they can refer to literature on collaborations to learn about group development and functioning, and enhancement of performance in general (e.g. Dowling, Powell, & Glendinning, 2004; Mattessich, Murray-Close, & Monsey, 2001) and in the field of nutrition/nutrition education specifically (Potapchuk, 1998; Rosenthal, 1998). While the Centers for Disease Control and Prevention (CDC, 2009) has published the *Recommended Community Strategies and Measurements to Prevent Obesity in the United States* to guide practitioners' work in this area, detailed procedures for making environmental changes for obesity prevention are limited.

The behaviors of members in organizations, like ENMs using environmental strategies working within CCE, can be studied from an organizational culture perspective to reveal the factors underlying their actions and ways to change them. Components of culture are the

“interrelated sets of emotionally charged beliefs, values, and norms that bind some people together and help them to make sense of their worlds” (Trice & Beyer, 1993, p. 33). Culture is reflected by the organization’s mission (Schein, 2004) that lets its members know what they can/should do and what they cannot/should not do (Feldman, 1990; Hansen, Kahnweiler, & Wilensky, 1994; Meyer, 1995; Schein, 2004; Trice & Beyer, 1993). Norms display the culturally acceptable behaviors that are expected in the organization (Trice & Beyer, 1993).

Martin (1992) suggests three perspectives by which the culture of an organization or occupation can be analyzed. The Integration perspective views culture as something that is shared and enacted by *all* members in the organization. What members can or should do is *clearly* defined. However, the Integration view is inadequate to understand comprehensively the myriad of reasons that underlie organizational members’ actions; thus the Differentiation and Fragmentation perspectives should also be adopted to more fully comprehend culture (Martin, 1992). The Differentiation view often uses “dichotomous thinking” to define subcultural differences, for example, between management and workers or between any two departments in an organization (Martin, 1992, p. 84). From this perspective, consistency and clarity in values, beliefs, and norms exist only within the subcultures. Yet, this view often overemphasizes the power differentials between groups, oversimplifies the perceptions of the ones with lower status, and overlooks individual differences within each group (Martin, 1992). To best understand variations within groups, the Fragmentation perspective characterizes culture as a loosely defined system full of ambiguities, multiplicities, and constant flux (Martin, 1992). It focuses on the inconsistencies and lack of clarity that pervade organizational life. It is through these different lenses that members’ existing behaviors can begin to be explained and then modified by revealing the underlying, often unrecognized and taken-for-granted reasons behind their current

actions (Schein, 2004; Seidman, 1988).

As applied to ENMs' work, the Integration perspective assumes that CCE nutrition programs have a cohesive culture with well-established norms in which all ENMs know how to perform direct nutrition education. ENMs collectively believe that directly educating program participants improves the quality of their lives. As a community nutritionist and often a registered dietitian, ENMs have traditionally managed and are most familiar with programs that focus on modifying individuals' behaviors, including the Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program–Education (SNAP-Ed). These federally-funded programs allow CCE to meet its mission as an “educational system enabling people to improve their lives and communities through partnerships that put experience and research-based knowledge to work” (Cornell Cooperative Extension [CCE], 2010). As a system, including Cornell University and 57 county associations and New York City office, CCE addresses local, state, and national needs through teaching, research, and extension by “connecting research-based knowledge of Cornell to individuals, families, businesses, and communities.” These statements evidence CCE's purpose. They contain significant concepts of partnerships and community; CCE does not work alone, but functions in collaboration with local residents and organizations. Thus, the expected ways of behaving in this organization include being knowledgeable as an expert, being able to work with many different stakeholders, and meeting the needs of community residents and requirements of programs and grants that support the organization's functions.

In the recent years, ENMs along with other community health practitioners, have begun delivering programs, such as the multi-component Collaboration for Health, Activity, and Nutrition in Children's Environments (CHANCE, 2011) and the state-funded Eat Well Play Hard

(EWPH; NYSDOH, 2010), aimed to halt the rising rate of obesity by making environmental changes that facilitate healthy dietary and exercise behaviors of individuals in organizations and the community (e.g. in daycare centers, schools, and worksites). The shift in obesity prevention efforts from the personal to the socio-ecological has demanded that ENMs balance between maintaining the “old” (i.e. direct nutrition education of individual participants) and developing the “new” (i.e. efforts that promote environmental changes in organizations and communities). While SNAP-Ed included “systems and environmental change” as a core element prior to 2004, its removal in 2005 (California Association of Nutrition and Activity Programs, 2009) restricted the use of its funding for activities on the environmental level. Community health practitioners’ use of environmental strategies remains a novel job activity, such that norms of action have not been established to guide their work in this area. Within a cohesive culture that values and specializes in direct nutrition education, this study focused on the component of making changes in the food and physical activity environments to support healthy lifestyles, that is currently fragmented and under development.

Research Objectives

This study examined and explicated the evolving behaviors of ENMs from agents who deliver direct nutrition education programs targeting individuals to those who incorporate the use of environmental strategies to change organizational and community structures and practices to support healthy eating and physical activity. The four environmental strategies used by staff in this study were to 1) educate agency leaders and staff to improve their organizations’ environments related to food and physical activity; 2) collaborate with schools and/or youth-serving agencies to develop and implement action plans to improve their environment related to children’s food and physical activity; 3) develop and implement worksite wellness

policies related to food and physical activity in local CCE organizations; and 4) serve on committees and/or coalitions that make environmental changes related to food and physical activity in the community (Chapter 2). Applying the Fragmentation perspective (Martin, 1992) revealed the ambiguities that ENMs encountered in doing environmental change work by applying the four strategies, and the methods they used to manage those ambiguities in the context of their jobs. The purpose of this study was to identify ways that ENMs engaged themselves in making environmental changes in their communities for obesity prevention. The organizational norms by which they use environmental strategies in order to provide clarity and foster new practices in their work were identified by addressing the following objectives:

1. To identify how ENMs' decide to become involved in obesity prevention efforts and in using environmental strategies; and
2. To describe the various perspectives and practices that facilitate ENMs' incorporation of environmental strategies into their existing job structure.

Methods

Sample Selection

Seven ENMs were selected using the maximum variation purposeful sampling technique (Patton, 2002) and the procedures suggested by Trost (1986). Interviewing a heterogeneous mix of ENMs was intended to generate a more comprehensive list of strategies and varied perceptions of associated factors that exemplify the diverse population of ENMs. This type of sampling also led to the identification of common patterns that cut across variations (Patton, 2002).

ENMs were chosen based on two dimensions that were relevant to the study: 1) whether or not the ENM was already involved in using environmental strategies to address obesity (i.e.

beyond usual direct nutrition education programming) and 2) whether the ENM worked in a rural or urban setting. The first dimension represented the continuum of ENMs who were mostly focused on direct nutrition education on the individual level to those who were most actively using environmental strategies. The second dimension of geographical location diversified the factors associated with ENMs' work because urban and rural areas differed in culture, government, structure, and resources that could ultimately impact ENMs' funding, networking, and effectiveness of using of environmental strategies. Of the four ENMs who were more extensively using environmental strategies, two were from an urban area. Of the three ENMs who were more involved in direct nutrition education programming, only one was selected from an urban setting, because adequate data were already gathered from previous interviews. This unbalanced design with more ENMs from the rural county focusing on direct nutrition education could lead to more contextual data reflecting the rural conditions. However, differences in strategy use and associated factors between ENMs from the two areas were not observed.

Data Collection

Two in-depth, semi-structured interviews, each lasting on average 1.5 hours were conducted with each ENM in person. Interviews were recorded and transcribed verbatim. In the first interview, after obtaining informed consent, ENMs were asked to describe their job responsibilities in their position and what they were doing to address obesity, both in general and specifically in collaboration with agency partners and their community to make environmental changes. ENMs were prompted to discuss the details of their work including the process by which they occurred. Various barriers and facilitators to ENMs using environmental strategies to address obesity were identified. Interview guides for the second interviews were individually tailored during the iterative process of data analysis in order to capture the details and emphasize

the uniqueness of each ENM's job context.

At the second interview, two specific questions elicited ENMs' views toward using each of the specific environmental strategies identified from the first interviews. The first question was about whether they were expected to use the strategy; the other was about whether they perceived the strategies to be within their job scope. If ENMs were involved in using a strategy, they were asked to elaborate on their involvement since the first interview and recall their initial motivation and sequence of events that led to its use. Additional job-related information (e.g. salary sources, programs managed) was gathered. (Refer to Appendix A and B for the complete interview guides.)

To enhance the study's credibility (Appendix C), second interviews included member checks with ENMs to verify the accuracy of data and their interpretation (Miles & Huberman, 1994). Additionally, the researcher presented study results to the group of ENMs at a campus-sponsored statewide conference and received their written feedback about the accuracy of the presentation. Brief interviews, each lasting around 30-60 minutes, were also conducted with the immediate supervisors of the seven ENMs. Although they were not transcribed nor analyzed in detail, they served as a source for triangulating data gathered from ENMs (Lincoln & Guba, 1985). Furthermore, reflective field notes were written immediately after interviews and between interviews to record ideas and insights. Additional information was gathered for triangulation purposes through attending various types of meetings with ENMs that occurred on the day of the interviews; these included CCE organization-wide, program staff, and committee meetings, as well as county obesity task force/coalitions.

Data Analysis

After transcription of the interviews, ATLAS ti (2006) was used to manage interview data. Approximately 338 single-spaced pages of transcripts were generated from all interviews with ENMs (41 to 54 pages for each ENM). Throughout the study period, data were analyzed using the constant comparative method (Strauss & Corbin, 1990). Themes were extracted from ENMs' interviews when at least four out of the seven ENMs explicitly mentioned them or described their presence or application in their jobs to represent the majority view. As part of a larger study that conceptualized ENMs' use of environmental strategies and its association with various factors according to the Theory of Planned Behavior (TPB) (Ajzen, 2001; Ajzen & Albarracín, 2007), this study focused specifically on the means by which ENMs implemented environmental approaches to address obesity within their existing work context. In the first step, a priori codes based on the TPB, including attitude toward the behavior (ATB), perceived social norms (PSN), and perceived behavioral control (PBC) were applied to segments of interview text. In the second step, the open coding technique (Strauss & Corbin, 1990) was used to apply inductive codes to the same text segment to reveal facilitators and barriers related to ENMs' strategy use and the specific reasons that motivated ENMs to first become engaged in environmental change projects, including program objectives, agency requests, job scope/expectations, and personal interests. Additional inductive codes represented the norms of behavior in ENMs' job as the process by which they put the strategies to use: existing relationships, one opportunity leads to another, and think holistically.

The general coding technique was more desirable than line-by-line analysis because interview content reflected detailed and extensive descriptions about their job. Keeping the data intact maintained the richness of the extracted information. Each time a segment was examined

within one interview, it was compared with the previous categories to determine the appropriateness of applying the same code or whether it needed to be renamed or revised in order to maintain consistency of its meaning.

After coding, the various factors associated with ENMs' use of strategies and means of applying the strategies were extracted and displayed in a role-ordered matrix (Miles & Huberman, 1994) for comparison purposes. The content of these categories were examined to compare both within and among ENMs, based on their involvement with using environmental strategies, to identify patterns of regularities (Miles & Huberman, 1994). Similarities and differences between ENMs who were considered to be more engaged in environmental work vs. those less involved were emphasized.

Coding was performed only by the researcher and could be biased by the researcher's own professional and personal experiences and perceptions. However, throughout this phase of the study, the researcher discussed findings and interpretations with six members of her research team, including the New York EFNEP State Director, EFNEP State Coordinator, two research associates, and two Extension associates, one of whom coordinates a program with an environmental focus. Another source of credibility stemmed from the researcher's prolonged engagement (Lincoln & Guba, 1985) with the ENMs since 2007 to conduct five pilot interviews that served both to guide and corroborate this study.

Results

The results of this study depicted ENMs as a group of well-trained nutrition experts and committed leaders in their communities who understand the significance of addressing obesity on multiple levels, including conducting direct nutrition education with individuals and making environmental changes. In obesity prevention, they are motivated individuals who have actively

developed creative ways to use environmental strategies within their existing, often constricting, job context. Limitations, including target audiences and scope of work, were often imposed by the funded programs through which they provided nutrition education. Norms of using environmental strategies have not been established and the content and goals of ENMs' work in this area is ambiguous. However, in order to become engaged in environmental change work, ENMs proactively considered and managed around program guidelines, requests from community agencies, their job scope, and personal interests. Having authority in their jobs, ENMs overcame hindrances posed by other people and situations. They also proactively sought opportunities to use environmental strategies through their extensive networks of community partners and existing projects. Once identified, ENMs capitalized on valuable opportunities by applying existing skills in nutrition education and networking to extend their environmental strategy use. The following sections describe in detail the norms that emerged in this study of how ENMs dynamically interacted with and shaped their existing culture to use environmental strategies to address obesity.

Results are presented in three sections to explicate the process of ENMs' involvement in using environmental strategies within their work context (Figure 4.1). The first describes the factors that ENMs identified as the reasons they initially became engaged in using environmental strategies. The second illustrates how existing opportunities that stemmed from various sources led to their use of environmental strategies. The third section focuses on the core elements of nutrition education that ENMs adapted and incorporated into their use of environmental strategies.

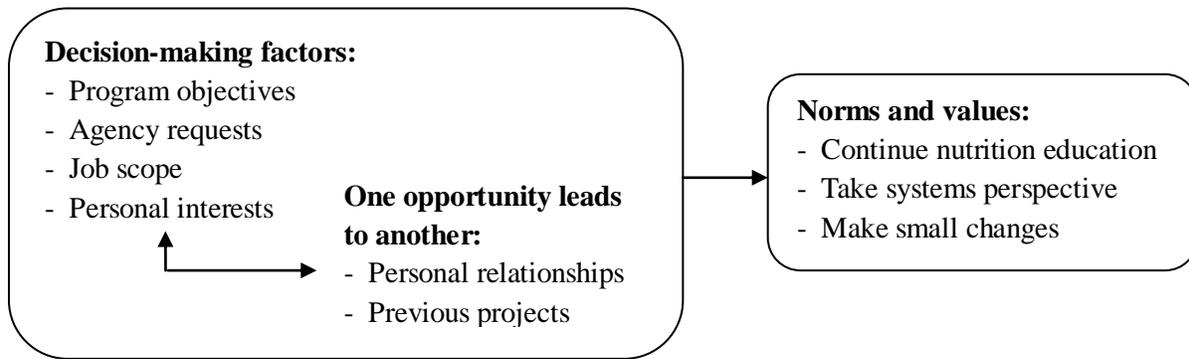


Figure 4.1: Process of ENMs' decision-making and involvement in using environmental strategies to address obesity

ENMs' decision-making for using environmental strategies

The decision to participate in certain projects required ENMs to consider multiple factors, a process that is subjective and filled with ambiguities. ENMs identified the factors that posed limits to their participation in environmental projects as 1) program objectives, 2) agency requests, 3) job scope, and 4) personal interests. Because ENMs' use of environmental strategies is novel in their scope of work, norms related to this work has not yet been clearly defined. ENMs' stories revealed the means by which they managed around the factors that contributed to their decision-making. At times ENMs considered each factor individually, but complicated processes involving multiple factors were more common.

Program objectives

As employees of nonprofit organizations funded by numerous private and public monies, CCE staff strived to meet the objectives defined by the programs they delivered. Their management role defined most explicitly and specifically what ENMs could and should do. One ENM stated her job expectations for using environmental strategies to address obesity: "It is through EWPH, for obvious reasons. It's all scripted that way. Other than that, no, it's not clear. EWPH is sort of guiding us in broader areas." While program objectives define what ENMs

should do, the boundaries of action are still subject to their own interpretations, which is related to the inconsistency and multiplicity that characterizes the Fragmentation perspective (Martin, 1992). An ENM described how it was possible to manage around the limits of EFNEP/SNAP-Ed guidelines and actively participate in environmental change work:

Part of it has to do with the rules and regulations, policies and procedures of [SNAP-Ed] and EFNEP. We have to be true to the funding. The funding says that the funders very much determine how we do our job. We play by their rules. It's just the way it is.... It's fair to say that what's not in the procedures and policies is often not fair game. If it's written, we do it; if it's not written, with rare exception, we don't do it.... We can under the guise of EFNEP and [SNAP-Ed] do one time presentations that would be marketing opportunities, recruiting opportunities that are also very much educational opportunities where we hope to affect the decision-making of the community at large.

Recognizing that the content of current program objectives was the most direct reason ENMs' used specific environmental strategies does not suggest that it is the only trigger. Other sources of motivation, most likely intrinsic to ENMs (e.g. personal interest as described below), were necessary in order for ENMs to seek funding that could be allocated to environmental change work in the first place.

Agency requests

Another factor by which ENMs determined what to do in their jobs was based on the needs and requests of partnering organizations, including local health and social services departments, Head Start programs, schools, day care centers, and community centers. ENMs explained that it was due to CCE's reputation that they were first approached by community institutions and agencies for assistance or collaboration on specific projects and to participate in local committees and coalitions, some of which were toward making environmental changes. By actively fulfilling others' needs, ENMs are addressing CCE's mission which they iterated as "to build strong and vibrant New York communities," "to improve lives of county residents," "to

help people lead active, healthy, rich lives,” and “to help people put research knowledge to work.”

This mission-driven focus was supported by executive directors.

One reason ENMs respond to agency requests is their salary support from county funds.

While ENMs accepted agency requests, they actively determined the content of their work based on their program scope, as one ENM explicated,

That’s usually not a decision. That’s usually, “Okay, *how* am I going to accommodate this request,” not whether or not I can. Given the 50% of my pay that’s county dollars, I’m under pressure to *find* a way to make it fit. So the considerations are how can I do this within the constraints of, like the Dietary Guidelines, and I try to follow the EFNEP procedures even though that is not really...part of the county funding.

ENMs also recognized that obesity is a prevalent issue affecting their communities, and decisions to engage in local obesity prevention projects contributed to their organizations’ goals.

ENMs described their responsibility to address obesity as follows:

As much as obesity work is out there, I think it has to be part of our work.

Given the fact that childhood obesity and obesity generally is such a ubiquitous problem across the board, I would say that our nutrition education programs certainly focus on healthy living and physical activity to help prevent obesity.

Job scope

“Scope” was a term ENMs used to describe whether a certain activity was within their range of work. Thus in second interviews ENMs were asked whether they perceived each environmental strategy to be within their job scope. A majority of ENMs considered environmental strategies, such as educating legislators about obesity prevention, promoting worksite wellness, serving on committees/coalitions, and improving menus/recipes in youth-serving agencies, as within their job scope. While ENMs considered program requirements and requests from others in defining the scope of their work, they also considered their position

descriptions, none of which mentioned obesity or obesity prevention. This ENM used environmental strategies to address obesity because she perceived obesity prevention to include components of nutrition and physical activity, which is her job scope:

There's nothing in my description specifically about obesity, so the easy answer to your question is *nothing* is expected of me to address *obesity* specifically. What I address is nutrition concerns of the folks at large and trying to promote healthy lifestyles that lead to healthy bodies through combined nutrition and physical activity.

When determining whether to engage in certain actions based on their job scope, multiple ambiguities existed. The lack of clarity likely stemmed from ENMs' interpretation; some defined their job scope more rigidly, others' views were more expansive. For example, while most ENMs claimed working with youth-serving agencies to improve menus was a part of their jobs and have been doing such work, some ENMs did not agree. An ENM who continually worked with some Head Start programs on menu planning and revision indicated that it was "a bit of a stretch" to say that such work was part of her job unless the partner offered some type of in-kind resource. Another simply did not perceive the strategy to be within her scope of work. She claimed,

We'll sit on the health advisory committee and be supportive in that way and if there is something that we can do within the agency that's within our scope, then we will.... We can give ideas and suggestions like, "Okay, at this daycare maybe you want to try brown rice instead of white rice," but in terms of the nitty gritty, we don't provide that service.

Another source of ambiguity stemmed from the perception of ENMs' organizational role. An ENM emphasized her role as an educator, not a lobbyist, when explaining whether educating local legislators to increase their understanding about obesity prevention was within her job scope. Because interpretation plays into defining their job scope, ENMs may experience a lack of guidance in their work. This seemingly negative attribute actually allowed ENMs to freely engage themselves in environmental change work. The following quote came from an ENM who revealed that her perceived job scope is expansive and its limits are self-imposed:

I don't see my scope as being very small. I mean if it needs to happen, I think there's always a way to make it happen... I would say that what I'm expected to do is absolutely as much as I can humanly do. What that is, as far as like a work plan, is pretty vague. I know what I'm supposed to be doing, which is whatever I could do. In our roles, in our jobs, it's not that task-oriented; it's more conceptual in defining the priorities.

Personal interests

Personal interests was the most subjective factor that contributed to ENMs' decision to be involved in environmental change work that often requires inter-organizational collaborations. For example, an ENM who was highly involved in environmental change work expressed her interest in developing collegial relationships with other agency leaders in order to mutually enhance their programming to benefit their community residents. She was thus inclined to network with others on the organizational level to effect changes in their environments. Another ENM's awareness toward food issues and proactive nature led her to pioneer and further develop the farmer's market and CSA (community supported agriculture) system in her county nearly 18 years ago. A third ENM described her long-term interest and experience in obesity prevention, which happened to be in accord with CCE's mission to meet local needs.

Sometimes you know what's important to me. I didn't get into working on obesity by accident. It's a personal interest to me as opposed to working on diabetes. I guess I could've just as easily done that, but obesity happened to be my own personal area of concern and that I know impacts [this part of] New York quite a bit, so it just seems like a good fit.

While personal interest was a strong internal motivator that drove ENMs' behaviors, it is likely that additional intrinsic (e.g. self-efficacy, proactive personality) and extrinsic factors were simultaneously present. For instance, ENMs mentioned research and resources from Cornell, such as information presented at the semi-annual managers' conference, Professor Brian Wansink's book, *Mindless Eating* (2006) and Cornell NutritionWorks' online professional

training course, *Preventing Childhood Obesity: An Ecological Approach* (2010), as motivators to incorporate the environmental perspective into their programming. One ENM said,

I tend to just go by my own interests. Obesity prevention was my own interest.... I took the course because I saw [Cornell] NutritionWorks being offered at a conference and someone was promoting it for free. I said, "Okay, I'll sign up for NutritionWorks." And when I did then, this course became visible to me. I said, "All right, why not!" It fits with nutrition education for certain. It's a way of thinking about things that I don't think we think enough of. I was also reading Dr. Brian Wansink's *Mindless Eating* book at the time, which is *very* much about an ecological approach to eating. Those were things that got me thinking about things in an ecological mindset at least.

Although personal interest was a strong motivating factor, ENMs did not act entirely according to their interests. One ENM stated, "Well, I haven't been told to make environmental changes. I think a lot of us are interested in teaching and maybe not so much interested in making big changes which takes a different kind of effort." Despite her lack of interest, the ENM still applied for a grant to deliver a worksite walking program because the opportunity to obtain the grant became available.

Decision-making based on multiple factors

While ENMs considered each of the four decision-making factors (Figure 4.1) independently when deciding to be involved in using the strategies, they often considered and managed around multiple factors simultaneously. This interaction among factors increased the multiplicity and ambiguity associated with defining what ENMs can and should do in their work.

I'm not sure that we are expected necessarily to address obesity. Our role in [SNAP-Ed] is to improve the nutrition and the physical activity, so if that reduces obesity, that's great. As far as outside of [SNAP-Ed], it's just whatever the person in the county wants to do; there is really no directive.... Either it has to tie into [SNAP-Ed] somehow or you justify it some way. Or you just do it, because it needs to be done or whatever. It depends so much on the circumstances. It's hard to say...if that [educating and supporting parents in making environmental changes] took up 50% of your time, then I don't think that would be appropriate.

The following exchange between the ENM and the researcher evidenced the breadth of job scope and additional determinants of action, such as others' requests and program/grant objectives.

ENM: It's not that we haven't thought about it, but haven't had a reason to do worksite wellness. In other words, nobody's knocking on the door asking us and I don't have a grant or program area that's driving that. It's not something that's landed in our lap. So it's not that it's not out there; it's not we couldn't do work in that area; it's just hasn't...

Researcher: Is it within your scope?

ENM: Oh absolutely, yeah.

One opportunity leads to another

Data indicated that ENMs' participation in environmental strategies stemmed from 1) an existing relationship with one partner leading to another partner and 2) participation in one project leading to another project with the same partner. Partnerships evolve from simply cooperating with each other to becoming more collaborative in developing more long-term relationships and striving toward common goals, including those involving environmental changes to support healthy eating and physical activity. It is noteworthy that these instances were not exclusive to ENMs who had funding specifically devoted to making environmental changes for obesity prevention. All ENMs, including those who were less extensively involved in using environmental strategies were able to identify at least one example of how they became involved in projects that led to environmental changes.

One relationship leads to another

ENMs perceived networking and relationship-building to be one of the most essential components of their job. They provided numerous examples to illustrate how they actively capitalized on pre-established relationships that led to their use of environmental strategies.

These relationships often resulted from their persistent development or those formed by others such as Cornell faculty, staff, colleagues, supervisors (often the executive director, ED), partners, or community member, as shown by the next two quotes.

The Assistant Dean from [a local university] is the [program] Director and she contacted, she went directly to [CCE Director] and said, “Hey, what do you have available for me here?” And then the Dean met our ED here.... At that particular time things didn’t fly. It wasn’t until later when there was another reference made when someone spoke highly of my work...

I reached out to a specific school because one of my staff lives in that community and works from home. And so she spends a lot of time in that community and already has ties with that school district. So that made it easy to choose *that* specific school. I think that might have made it easier for them to be okay with my doing the programming because I already have a bond.

Often, seemingly straightforward relationships that facilitated ENMs’ work actually resulted from a much more convoluted process that involved both internal (e.g. ENMs’ personal interest) and external factors (e.g. multiple relationships, available resources). For example, an ENM initiated action based on her personal interest in obesity that motivated her to participate in the Cornell NutritionWorks’ course, *Preventing Childhood Obesity: An Ecological Approach* (2010). As the course required teamwork, the ENM requested that a member of her association’s 4-H advisory committee participate. This member was also the director of the special services at the school where the ENM’s staff worked, so the ENM was ultimately able to work with the school’s food service director to improve snack options sold in the cafeteria. Without such effective working relationships, this ENM was not able to network with other schools. Further, this ENMs’ immediate supervisor revealed her relationship with other schools that had not been readily shared with the ENM. Missing links like these probably prevented future programming opportunities where environmental strategies could be employed to target obesity. It is thus

important that ENMs continue to comprehensively develop their networks and identify new opportunities through their existing relationships.

One project leads to another

In addition to personal relationships being the link to ENMs' working on the environmental level, they described instances where their use of environmental strategies was due to a prior project with a partner or one that targeted the same audience. One ENM began working with a faith-based organization providing direct nutrition education. This evolved to working with the deacons and cooks of the churches to improve the nutrition of the food they served. The multiple ways that these opportunities could lead to others were apparent in another instance where the subcontract with the county health department stemmed from CCE's reputation and the ENM's previous engagement in other projects.

Extension is viewed at as a key partner for any of these kinds of community initiatives, so I think we are always invited. It's a good thing. I think we have a pretty good reputation out there.... My work with the county health department school wellness came from my role working with EWPH and them knowing about me and what I bring to the table. So then they contracted with me specifically to help them with some of their other deliverables. So that's where those two grants kind of inter-mesh.

Another ENM showed how direct nutrition education could evolve to environmental change work. She had a staff who conducted workshops with child care and Head Start providers, teaching them to use a curriculum that teaches kids about nutrition. After obtaining the EWPH grant, the ENM continued to work with existing partners by offering them Nutrition and Physical Activity Self-Assessment for Child Care (NAPSACC; UNC Center for Health Promotion and Disease Prevention, 2009) to work on policy changes. With a daycare center where the collaboration started with using the NAPSACC and making environmental changes, the ENM's plan was to have her staff teach the care providers to use the children's nutrition curriculum.

Next steps in these situations are often unclear, i.e. an existing opportunity may or may not lead to another if, for instance, the partner did not continue the relationship due to lack of resources. For example, an ENM was requested to collaborate with a local agency first to develop a healthy snack guide for after school programs. At the time of the interview, they were working on their next project applying for a grant that would help support the ENM's position as an advisor to the committee. However, because of the uncertainty of the grant funding, the ENM was unclear what exactly her subsequent role would be.

Values and norms that facilitate ENMs' use of environmental strategies

This section presents examples from interviews that depict ENMs' attitudes and practices toward their use of environmental strategies. It also displays the dynamic process of defining a set of norms for this area of work. Although some ENMs perceived using environmental strategies to be a new practice, results showed that most had actively engaged in this work by adapting existing nutrition education practices. The examples below illustrate how ENMs have stretched the limits of their work to incorporate new practices. The main difference was the target of their actions; instead of directly effecting changes in individuals' behaviors, the ENMs acted to modify environments on the organizational and community levels. The three practices ENMs employed included 1) continuing to do nutrition education; 2) taking a systems perspective; and 3) making small incremental changes.

Continue to do nutrition education

Education has been CCE's longstanding tradition and mission and continues to be the main responsibility of staff. An ENM strongly believed that "if you really know that this is probably the direction that things need to be, you just have to educate others around you and slowly bring their opinion around." This ENM's supervisor also demonstrated his firm belief in

“empowering people with knowledge.” He illustrated that working toward environmental and policy changes is still about education: “Law’s never going to get made until enough people have enough understanding of the problem in order to get ten people on the city council or whatever it is to vote yes. How are they going to know that—through education!” This statement corroborated another ENM’s belief that educating leaders of agencies and communities that may ultimately lead to environmental change is “nutrition education to the decision-makers instead of to the consumers.” Specifying the audience and purpose of education defines the action as an environmental strategy.

ENMs emphasized their role as nutrition experts/leaders among other agencies in their communities in different ways. Some had been invited to provide training to other agency partners on how to effectively facilitate a nutrition class. Another described the deeply ingrained value for education and learning in CCE:

A lot of people stay with this work because it isn’t stagnant. It’s constantly evolving and changing, sometimes maybe too much, but there’s always new opportunities, new partners, and there’s a system respect for learning and growing and the value of education in that process.... I would say that the basis for the system is non-formal education, bringing the research base from the college, land grants, Cornell and others into the community through partnerships that help create change. That’s very broad, but it’s that system respect for learning and nurturing and working with others to help reach goals. It’s such a dynamic flowing process that it allows us each to grow with it.

The strongly held values toward providing nutrition education may be in conflict with ENMs’ work to use environmental strategies depending on how they define nutrition education and how they perceive its relationship to their jobs. Interviews with both ENMs and their supervisors revealed perceived limitations related to EFNEP/SNAP-Ed guidelines to address obesity on the environmental level, mainly that they focus on individuals and families and the low income population. One executive director said, “Obesity is not a problem that’s confined in

any one socioeconomic class. It's found across all classes, all social strata. And those two programs are restricted to a narrow socioeconomic segment." When the ENMs' salary is 100% supported by SNAP-Ed, they are thus not allowed to perform tasks outside of the program's objectives. However, ENMs have identified ways to incorporate environmental change into their existing education framework, making them fit without violating the rules of the programs and without losing the perspective of their role as educators.

The goal of achieving environmental changes is novel to nutrition education. The differences between direct nutrition education of individuals to make behavior changes and education for environmental changes lie within 1) the content, 2) the audience, and 3) the purpose of education. Instead of only focusing on the individual's relationship to the food s/he eats, the *content* of nutrition education now emphasizes the relationship between the environment and individuals' dietary and exercise behaviors. ENMs described how they integrated this new content. One ENM claimed, "I have modified my entire education style when I'm teaching nutrition education. I've modified it to try to encourage the changing of an environment." Another stated how she now reviews issues from an environmental perspective:

When an educator has a problem with a family, we no longer deal with it like "her child's doing this." We now will look at it from what influences those decisions, what environment does she live in, what behaviors can she impact in her child.... We are much more global about how we address an individual scenario than what we've ever been before and seeing how EFNEP is much more about dealing with the families. We are dealing with the families but we're now including the whole community as the context of that family's life and the whole community in which they live.

This ENM continued to explain how she incorporated environmental change into her work. The next quote illustrates well that the *content* of nutrition education is the link between individual behavior and environmental influences and the *target* of education is community organizations.

I really have a hard time teaching anything nutrition without involving environment in the conversation anymore.... I always have people look at the environment, look at what needs to be changed, talk about... what's around us that shapes our dietary practices... where extra calories or poor dietary choices comes in and what kinds of changes they could make to affect that. It might be... at [participants'] homes. It might be a group I'm addressing in their workplace. So if I'm talking to a health care group, I might talk to them about their practice, "How would you affect this with your people that you touch?"

As the quote shows, instead of educating only the children and their caregivers, the *audience* now encompassed staff and leaders of community agencies, institutions and even local government officials. In addition to marketing CCE, the purpose also included increasing their understanding of the role of the environment on individuals' nutrition and physical activity behaviors. The following quote shows how ENMs' EFNEP and SNAP-Ed marketing and programming with agency staff led to environmental changes in their organizations:

We have seen opportunities where organizations change because, depending on how you work with these families, we work through agency contracts and agreements. And so some of those agencies, because they've hosted our programs and their contact people are involved in the program, they make some environmental changes within their agency based on what they've learned from our programs... so we're able to influence at least ideas and sometimes even policies within the ways organizations or agencies operate because of the influence of our programs, because people see the value.

Instead of only achieving changes in dietary and physical activity behaviors of program participants, the *purpose* now is to make environmental changes in organizations and the community at large. Even some ENMs who had focused more on direct education described how EFNEP and SNAP-Ed can teach parents to make environmental changes by directly modifying the home environment or becoming models and advocates for healthier children's environments outside of homes.

An example I can think of is if we were to enroll a group of parents who, as they learned about good eating/health/obesity, might clamor for more access to the outdoors. It would work best if the group were already linked somehow... all members of a neighborhood association or all of them had their kids in the same daycare program.

The following quote shows the spill-over effect of direct nutrition education that resulted in environmental changes:

She [ENM's staff] was doing a youth group with a 3 year-old class and a 4 year-old class doing [direct nutrition education] activities. She enrolled the teachers, two teachers, as adult participants; two teachers, the food service person, and the director were interested, so she got four graduates out of this. But the reason it was environmental change, what happened was they started serving a lot more fruits and vegetables. It was *so* cool.... [ENM's staff] was working with the cook because they were willing to finance whatever snacks she planned, purchase the blueberries, purchase the strawberries, so she was working closely with the cook to plan the sessions.

Take a systems perspective

ENMs mentioned or implied making “systems change” and taking a “systems perspective” toward various aspects of their jobs. This view was more holistic, more in depth and breadth, and implied sustainability. Taking a systems perspective was consistent with CCE’s mission to address community needs, being able to locate relevant partners and view ways they could work together as a whole. Data indicated that ENMs’ practice of applying a systems perspective was related to their view of 1) food and nutrition and 2) collaborations with CCE colleagues and community partners for various projects.

One way an ENM applied this perspective was to establish a farmer’s market to increase people’s access to fresh foods. She reported that this effort was sustained and evolved over time into a CSA program that intersected with the emergency food system. The ENM strived to effect “infrastructure change” and alter the way the community operated. Further, as part of staff development, she required her staff to read books about nutrition from a food systems

perspective, such as the *Omnivore's Dilemma* (Pollan, 2007) and *Food Politics* (Nestle, 2002). She also assigned them to tend farmer's market booth and their CCE organization's garden. She stated, "I think we're much more purposeful about trying to get our educators to understand that there's a whole system out there." She spoke about how CHANCE influenced her and her staff, colleagues, and supervisor.

CHANCE has changed our mindsets [and] the way we approach problems. So on a systems perspective, we've already changed how we look at the world and how we interpret [it]. We're now including the context of that family's life and the whole community in which they live.

ENMs also applied the systems perspective when they collaborated with others in their organization and community. Being able to adopt this perspective contributed to their use of environmental strategies because they required multiple partners working together. One ENM said, "Although I personally am in a position to determine program directions, staffing and resource utilization (including funding) independently, I feel it is important to consider the reaches and limitations of my organization, collaborators, staff, funders and clients in decisions." Another ENM echoed the same perspective as she described her role in intra-organizational functions to think inclusively and comprehensively.

If you were to ask our HR person something about me, what she would say...is that I will often think about things as it might help or impact something that's not part of my job or not my area. I'll think association-wide.... Each person has to be really aware of what's going on in the organization because if we are applying for a grant or applying for funding or applying to implement a program, we might want to think about all those different factors that go into it that's not necessarily our area.... There are a lot of details that we don't, as a programming person, always think about...you're dumping a lot of workload on other areas. You have to make sure that they're ok with it.

ENMs also tend to think broadly about how their program and other agencies are interconnected in order to accurately situate themselves and efficiently deliver their services. An

ENM implied the systems perspective by describing CCE's mission and how a part of it is put into practice.

A very necessary part of that is being rooted in the community and having those partnerships and relationships. It's almost like a sub-mission of Extension, I think, to be very locally focused and attuned to what our community very specifically needs. It is not just my own judgment, but the judgment of the team and my supervisor and people who are based in Extension, what's the best fit between competing needs, what the community is looking for, and what's right for the community.

Given their position representing an educational organization integral to the community and its residents, ENMs were aware of the need to know about the various local institutions and agencies within the community. Knowing what other people are doing allowed ENMs to view their community as an integrated system of services functioning to meet the needs of community residents. Two ENMs explicitly mentioned that soon after they came into the job, they made an effort to introduce themselves to and began networking with other agencies. The ENMs' orientation manual corroborated their statements about the importance of networking and taking a holistic view toward the functions of their community. They are expected to know about their community and other organizations within one month of being hired. They are asked to attend workshops to develop their skills in coalition building, group leadership, and team building within the first 18 to 36 months into their job.

Although networking in their communities may not be specifically toward making environmental changes, and frequently only involved exchanging information and making recommendations, networking still served as a fundamental skill and job responsibility for ENMs to shift beyond direct nutrition education. For example, an ENM with limited experience working with agency leaders on the environmental level recognized the need to know the community and take a systems approach. When we asked her what would better enable her to

work on the environmental level, the ENM stated,

What I'd need is a better view of the county, a view that was comprehensive enough to know where those changes are.... What I'd need is input from many different stakeholders as to where they see the causes are for childhood obesity in particular. And then with the help of perhaps the tried and true folk, the staff I work with here, the WIC, the Head Start, the folks who have been doing nutrition education and working in homes, who would be able to weed through the presented concerns.

Make small incremental changes

Interviews indicated that some ENMs seemed to think that using environmental strategies to address obesity is a daunting task that requires extra funding and additional staff before it can be performed. This perspective applied to both ENMs who had and did not have funding allocated to strategy use. One ENM who was more focused on direct nutrition education programming did not recognize that her work with youth programs, reviewing and signing off on menus, could be seen as contributing to changes in the children's food environments. This work was a "taken-for-granted" task that some ENMs have normally performed as part of their everyday jobs. In fact, this norm of connection to environmental change work was unrealized even later in the interview when the ENM stated that she did not believe environmental change work can be easily incorporated into her current job. She stated, "It would take a lot a time or even hiring a separate staff person to really be dedicated to that.... In an ideal world, I would love to hire someone...who could really represent us in the community, start up that obesity task force, and apply the environmental approach." This again evidenced the ambiguity associated with defining environmental strategies and illustrated that environmental strategies ranged on a continuum from simple to more multifaceted approaches.

Another ENM who had long been involved in making changes in her community described how work to modify environments was actually different from how she first imagined

it to be. After describing an instance where program participants left more donuts than apples uneaten at an event, she commented,

Where it surprises me about this whole institutional change, is that it's catching me in places I never anticipated it. I always think like we're going to do something big...I'm going to make this really major. But the way we've done it has snuck in lots of different ways.

While these ENMs were surprised by small changes, others deliberately emphasized keeping the changes small and achievable. One ENM explicated how the Cornell NutritionWorks' (2010) online course encouraged this method: "Part of the course that I took talked about keeping the focus small and trying to make changes in one specific area so you can actually measure them. So I'm trying to be true to that." As part of her assignment for the course, this ENM chose to work with a school to first make a change in only one snack item that the cafeteria offered, which led to an increase in sales.

Other ENMs mentioned themselves or their colleagues making small environmental changes such as replacing a sugar-sweetened drink with apple juice and eliminating "artificial syrup" from children's menus. They also recognized that these were "kind of small changes" and "not everything," but "it all sort of adds up." Another ENM described how working with cooks in the churches was a "minor change approach," slowly replacing fried foods with lower fat cooking methods. Her perspective of making small changes was also evident in working with collaborators for obesity prevention.

I think the challenge is to try not to do too much. Try to make sure that you identify what the common goals and the mission and purpose and what resources you have so that you can actually move something forward and you don't get all tangled up in the process. I think that's what happens way too often.

Discussion

ENMs, as “community practitioners,” deal with relevant public health and nutrition issues through program planning, implementation, and evaluation (Julian, 2006). In recent years, ENMs began to participate with numerous community-based organizations and institutions in projects that aimed to make environmental changes. Relative to direct nutrition education in traditional Cooperative Extension programs, using environmental strategies could be considered an innovation in program delivery, defined as a novel set of behaviors, routines, and ways of working targeted at improving health outcomes, administrative efficiency, cost effectiveness, or users' experience and that are implemented by planned and coordinated actions (Greenhalgh, Robert, MacFarlane, Bate, & Kyriakidou, 2004). Due to its novelty, standards of practice have not yet been established to clearly define what extension educators should do to address obesity on the environmental level.

While the culture of an organization determines the behaviors of its members (Schein, 2004) and guides its members in managing uncertainties and ambiguities in their organization (Trice & Beyer, 1993), this study revealed how ENMs dynamically interacted with their existing culture, shaping it for using environmental strategies to prevent obesity. It describes ENMs' achievements in assuming their new organizational role as environmental change agents using numerous quotations extracted from interviews with them. At a time when using environmental strategies was not yet an established practice in ENMs' work, they told stories from the field about how they creatively managed around various boundaries to incorporate environmental change work into their jobs. ENMs, both with and without funding that could be dedicated to using environmental strategies, demonstrated that they were doing variations of this work. This implies that use of environmental strategies varies on a continuum; simple tasks can be

performed without additional funding, but more extensive involvement would require additional resources. Content of this study could serve as stories to be told and retold to ENMs and other people engaged in using environmental strategies to guide their practice.

Results of this study revealed three overarching themes. First, there is currently a lack of clarity in what is expected of ENMs in using environmental strategies to address obesity. It is often unclear to them what environmental strategies are and how to go about implementing them in their existing job context. However, the lack of clarity provides opportunities for ENMs to expand their work to include making environmental changes to address obesity. Second, ENMs' decision to engage in job-related activities or programs is an act of negotiation among program objectives, agency requests, their job scope, and personal interests. Each presents some degree of ambiguity in their definition. Third, ENMs' use of environmental strategies stems from various types of pre-existing conditions and involves the application of norms similar to those emphasized in direct nutrition education. ENM manage around the bounds of their job scope, continuously and actively shaping their work culture to achieve their program goals. Thus, the process of ENMs' use of environmental strategies associated with multiple sources of ambiguities is consistent with the Fragmentation perspective (Martin, 1992).

Using environmental strategies: a Fragmentation perspective

In studies of human behavior, scientists have developed or applied various theories from fields of biology, psychology, and sociology. This study adopted a “culture-centered approach” (Dutta-Bergman, 2009, p. 116) in identifying the organizational values and norms that ENM's applied in their use of environmental strategies to address obesity. As viewed from Martin's Fragmentation perspective (1992) in analyzing ENMs perspectives and practices, results indicated multiplicities and ambiguities stemming from the various considerations on which they

base their decision-making to engage in certain activities (e.g. accept an agency request to participate in an environmental project); the diverse pre-existing conditions from which they extend their actions; and the varied values and norms they applied to nutrition education. Specifically related to obesity prevention, the definition of environmental strategies is also unclear and can range on a continuum from simple tasks to multicomponent strategies (CDC, 2009).

Ambiguities and uncertainties in ENMs' jobs are numerous and perhaps expected because it is the nature of nonprofit organizations to mainly deal with "soft" human issues, loosely defined goals, volunteer staff, and inconsistent funding sources (Wilensky & Hansen, 2001). Because networking and collaboration are essential elements of ENMs' jobs, much of what they do depends on the perspectives and behaviors of others, including their interest, willingness, and available resources, which are beyond ENMs' control. These ambiguities lead ENMs to learn about how best to accomplish their work through processes of trial and error. Their knowledge and skills about using environmental strategies thus do not necessarily precede their behaviors; but are often developed from actual practice in the job. As this occurs, the norms of using environmental strategies are slowly established to more clearly define ENMs' work in this area.

Although ambiguity is often perceived to be a negative characteristic associated with an individual's organizational role because it contributes to job stress and subsequent job dissatisfaction (Beehr & Newman, 1978; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Pearce, 1981; Yousef, 2000), a few ENMs implied their neutral or positive reactions toward it. Ambiguity was perceived to be a natural aspect of their jobs due to the job's changing nature. This constant flux, a characteristic of the Fragmentation perspective (Martin, 1992), was even considered to be an important reason that attracted some ENMs to their jobs. Because there is no

right or wrong outcome associated with ambiguity, it can positively contribute to staff's job autonomy (Martin, 1992). ENMs often claimed to have great latitude in determining their job scope and means of action, which likely contributed to their job satisfaction and commitment (Fine, 1984).

ENMs' decision to engage in environmental change efforts to address obesity

ENMs identified the decision-making factors related to their participation in projects, including those aimed at making environmental change to support healthy eating and physical activity, as program objectives, agency requests, job scope, and personal interest. These are consistent with the findings in the quantitative phase of the larger study that identified the significant factors associated with ENMs' use of environmental strategies (Chapter 3). Results indicated that although each factor could independently limit ENMs' involvement in environmental change work to address obesity, ENMs more often exercised their authority to manage around the multiple influences simultaneously while making a decision to act or not. Their decision-making reflected the content and interactions among CCE mission (i.e. regarding meeting community needs and requests), partners' requests, content of ENMs' position descriptions, program objectives, and availability of resources, including salary, time, and support from others. In one respect, these elements served as boundaries within ENMs' job to guide their actions, but ENMs often stretched the limits based on their own interpretation of the established guidelines. Results of the present study indicated that multiple interpretations and reactions are possible with each of these sources, as consistent with the multiplicities and ambiguities related to the Fragmentation perspective (Martin, 1992). This process is also a display of ENMs' active negotiation that takes into account contextual constraints in different situations (Fine, 1984). When ENMs are more capable and skillful in finding creative ways to

overcome the limits of their job and extend their work, they would be more involved in using environmental strategies.

Each of the four decision-making factors, program objectives, agency requests, job scope, and personal interest, can be analyzed on two dimensions: locus and clarity. Locus is the source of motivation, whether external or internal to the ENM. Clarity is associated with the extent of definition of what ENMs should do to address obesity, whether clear or ambiguous. Figure 4.2 shows the placement of these four sources on each continuum with personal interests being internally motivated and the most ambiguous, and program objectives being externally motivated and the most clearly defined.

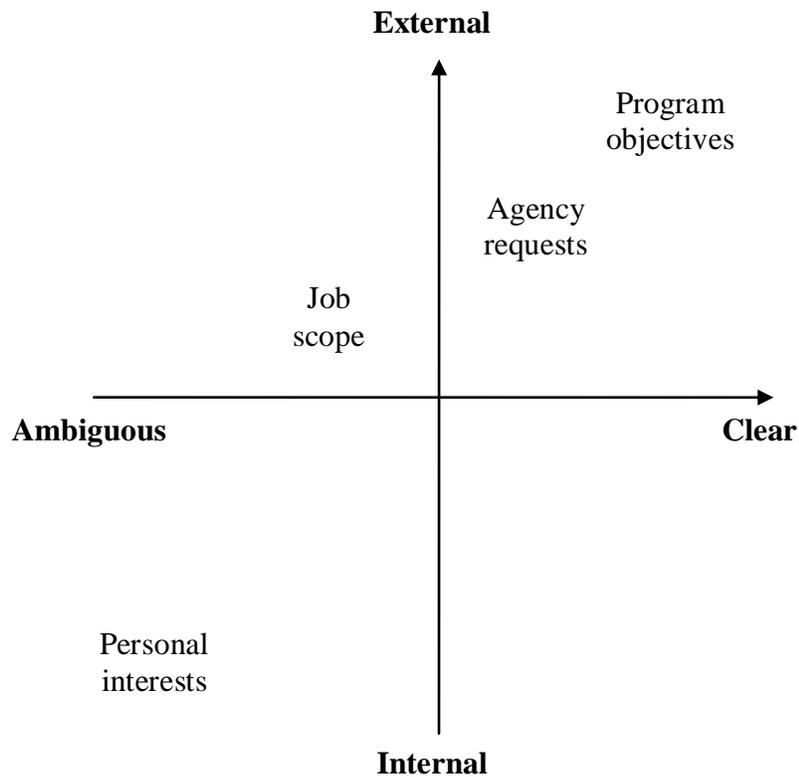


Figure 4.2: The two dimensions of the characteristics of the decision-making factors associated with ENMs' actions

Program objectives as an external source of motivation was undoubtedly the most direct reason that prompted ENMs to use environmental strategies. ENMs tend to be committed people who are open to change and collaborations, but as part of a nonprofit organization that depends heavily on grant support, their work is simultaneously constrained and complicated by legislation and funding control (Wilensky & Hansen, 2001). Being motivated by program objectives is not necessarily the cause of ENMs' use of strategies because other conditions were necessary for ENMs to initiate a grant application in the first place. However, because program objectives are a strong motivating factor, there is a need to expand the availability of grants that require practitioners to include environmental changes in their work to support individuals' dietary and physical activity behaviors. Existing policies and funding streams, like EFNEP and SNAP-Ed, could be applied more effectively to clearly address obesity on the environmental level (Baxter, 2010). For example, recommended strategies for increasing SNAP-Ed effectiveness include "systems and environmental approaches that increase access to healthy foods and physical activity opportunities" and "policy changes that support healthy eating and physical activity behaviors" (California Association of Nutrition and Activity Programs, 2009). With these stated guidelines, ENMs would have more explicit reasons and support in adopting an environmental approach in the work, so ambiguity would be reduced.

Agency requests also stem from external sources and were relatively clear in defining what ENMs reported being required to do. ENMs were clear about their mission to serve community residents through education, which is consistent with nonprofit organizations' missions to serve the community and address societal problems by offering quality services to empower and change people's lives (Wilensky & Hansen, 2001). They were also committed to fulfilling other agencies' requests. However, the requests of their agency partners are subject to ENMs'

interpretation of whether the work is consistent with their organization's mission, within their job scope, and supported by adequate resources.

Job scope was mostly defined by external guidelines such as position description and ENMs' own interpretations, thus it is nearer the center of the continuum (Figure 4.2). According to ENMs, position descriptions provide generally-defined responsibilities, such as marketing CCE, program planning and coordinating, and networking, and do not specifically direct them to target obesity or use environmental approaches. This ambiguity, perceived positively, allows ENMs to exercise autonomy in deciding what and how to do their work depending on competing demands. These factors differed depending on the environmental strategy. It is apparent that ambiguity could stem not only from the position description, but also from the individuals' interpretation of the bounds of their job scope. When the scope is as broad as whatever the ENMs could possibly handle in their jobs, it is likely that they would then consider the other decision-making factors in their motivation to act.

While the three previously described decision-making factors stemmed from external sources, personal interest also impacted ENMs' decisions to participate in projects. These personal interests do not objectively define what ENMs as a collective will or should do to address obesity on the environmental level; they are related to individuals' emotional or feeling states that could readily change according to given circumstances (Lavidge & Steiner, 1961). Because of the changing nature of personal interests, study results illustrated that interests could develop over time through actual experiences and thus positively contribute to ENMs' use of environmental strategies. This reverse causality is supported by Bandura's self-efficacy theory (1997) where mastery experiences contribute to individuals' level of confidence in executing the behavior of focus.

ENMs' use of environmental strategies stemmed from pre-existing opportunities

ENMs' narratives about their use of environmental strategies indicated the sequence of events that occurred in the past as having begun from multiple pre-existing conditions, including personal relationships and previous projects. Utilizing these opportunities contributes to the cyclical development of collaborations (Potapchuk, 1998; Rosenthal, 1998). While most ENMs claimed to collaborate for recruiting participants for direct nutrition education programs, as ENMs networked more extensively in their communities, marketing CCE and nutrition programs, they became more visible to community agencies and leaders. This in turn increased the likelihood that they were requested to collaborate on various projects, many of which resulted in working to make environmental changes. This stage in early collaboration development is an example of cooperation where the relationships are still informal, each party retains their own authority without common mission, structure, or planning effort (Mattessich et al., 2001).

Interviews revealed that once they began to develop a more formal relationship working on one project, they continued the partnership on subsequent projects when resources became available. ENMs thus were able to expand the scope of their work beyond direct nutrition education. When projects became more formal, ENMs proceeded along to the planning, implementation, and evaluation stages of using environmental strategies. Compatible missions along with planning and division of responsibility are characteristic of the coordination stage (Mattessich et al., 2001). Collaboration literature also suggests building upon existing assets and connecting with and supporting partners who share similar missions (Huberty, Balluff, O'Dell, & Peterson, 2010). This contributes to people's commitment to the collaborative as they enhance their own mission and develop their programs, professional skills, and networks.

ENMs' use of environmental strategies involved applying the values and norms of conducting individual nutrition education

As public issues education has long been a part of Extension's mission (Patton & Blaine, 2001), CCE exists to provide education to communities in order to improve the lives of their residents. Traditional nutrition education for program participants to motivate individual behavior change is the usual way of doing business for ENMs while making environmental changes in organizations and the community is the *innovation* described by Wandersman and colleagues (2008) as new knowledge or information, such as programs, policies, processes, and principles that could be useful to prevention efforts. The norms that ENMs apply to direct nutrition education are developed from the curricula and techniques emphasized in training. Soon after ENMs are hired in CCE, they are trained to use dialogue-based, learner-centered approach that focuses on meeting participants' needs in the context of their life situation and encouraging them to make small achievements in food and exercise behaviors. Beyond these direct education techniques, ENMs claimed that it was unclear to them what they were expected to do in using environmental approaches in their jobs. This study identified the commonalities in ENMs' perspectives and norms in conducting direct nutrition education and making environmental changes by illustrating that using the strategies still involves a great deal of nutrition education, requires applying a systems perspective, and happens by making small changes incrementally. In addition to lack of norms and experiences to guide ENMs' use of environmental strategies, ambiguities stemmed from the multitude of possible techniques that can be applied to nutrition education and environmental change and the range of partners with whom ENMs could collaborate. However, ENMs were able to handle the ambiguities and use environmental strategies within existing program guidelines.

Nutrition education

Although using environmental strategies is a novel practice within ENMs' job, this study revealed that a large part of it is still nutrition education as defined by Contento, 2007:

Nutrition education [is] any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and well-being. Nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy level. (p.15)

Study results indicated that in educating for environmental change to address obesity, ENMs redefined *what* they were educating people about; *whom* they were educating; and *for what purpose* they were educating. As ENMs became more aware of environmental influences on people's food intake, some began incorporating content issues beyond the traditional topics covered by the EFNEP/SNAP-Ed curriculum such as healthful eating practices, food safety, and eating on a budget. ENMs educating for environmental change to prevent obesity have incorporated the socio-ecological perspective (Bronfenbrenner, 1979; McLeroy et al., 1988) and agriculture to focus on the origins of food and issues of social justice and sustainability (Gussow, 2006) that are currently emphasized in CCE programming. Obesity interventions should be linked to the settings and circumstances, as exemplified in the socio-ecological model, that contribute to individuals' decision-making about food choices and exercise (Dorfman & Wallack, 2007). The 2010 Dietary Guidelines also urge a system-wide approach and explicitly connect nutrition education to the socio-ecological model (USDA Center for Nutrition Policy and Promotion, 2011). Gussow (2006) iterated the importance of having nutrition educators teach people to consider "how, where, and by whom particular foods were grown, processed, and transported" (p. 4), as obesity is associated with the food environment surrounding individuals. Contento (2007) also suggested an approach in which people analyze the causes of a food-related

issue and take action to address it.

ENMs reported that they conducted nutrition education with staff and leaders of community organizations/institutions and at times made presentations to county leaders like health commissioners and legislators. This activity is considered important in public health promotion where practitioners not only provide education to the public, but are also being encouraged to provide training and capacity building in partnership with other community organizations (Heath, 2009; Wendel, Prochaska, Clark, Sackett, & Perkins, 2010). ENMs stated one purpose of educating partners was to promote environmental change in their organizations or the community at large. Even if they do not immediately achieve changes on those levels, they have likely spurred their partners' awareness of the connection between obesity and environmental change.

Systems perspective

ENMs learn and apply a holistic, client-centered focus in their direct nutrition education programming that encompasses economic, social, and psychological factors that impact on food and physical activity behaviors. It is part of their organizational culture to be comprehensive. ENMs applied the systems perspective to describe the relationship between their program participants' behaviors and the environment in which they live in the context of obesity, obesity prevention, and dietary and physical activity behaviors. They also implied the multiplicity that exists in their work that involves numerous partners and layers of leadership in their communities on various topics/projects related to nutrition and physical activity. ENMs contributed positively to numerous collaborative projects in their communities because as community nutrition professionals, they can think about their work in creative, holistic, and practical ways (Lasker, Weiss, & Miller, 2001).

The systems perspective is currently being widely advocated in obesity prevention as the causes span the socio-ecological continuum thus requiring solutions on multiple levels with a wide range of stakeholders. It captures the intricacy and interdependencies associated with the multiple linkages and interactions within layers of influence on the individual, family, organizational, community, and society levels (Best et al., 2003; Foster-Fishman & Behrens, 2007). This view is consistent with Lewin's Field Theory (Burnes, 2004) and the socio-ecological model (Bronfenbrenner, 1979; McLeroy et al., 1988). It is comprehensive, holistic, multisectoral, and inclusive, making this perspective consistent with comprehensive community initiatives used to deal with urgent social and economic problems (Torjman & Leviten-Reid, 2003). In general, the systems perspective strives to promote integration and collaboration. Huang and colleagues (2009) suggest framing obesity as a multicomponent systems problem and building capacity for multilevel research and action. Economos and Irish-Hauser (2007) urged people who work on community interventions to take a holistic view of each "community as a unit of identity" (p. 133) to understand its unique needs, resources, and strengths. These actions serve to create systems change, defined as "change efforts that strive to shift the underlying infrastructure within a community or targeted context to support a desired outcome, including shifting existing policies and practices, resource allocations, relational structures, community norms and values, and skills and attitudes" (Foster-Fishman & Behrens, 2007, p. 192).

Small incremental changes

When ENMs initially set out to achieve difficult goals such as forming a community obesity coalition or establishing a worksite wellness program, they observed numerous unexpected outcomes in individuals' food choices that resulted from modifications in dietary

practices on the organizational level. Encouraging individuals to take small steps, making changes gradually and steadily, can be considered a normative practice for nutrition educators working with individual participants to make dietary behavior changes (Kieselhorst, Skates, & Pritchett, 2005; Snetselaar, 1997). This perspective was also applied to other aspects of the ENMs' job as they focused on the development and maintenance of relationships with their partners. Emphasizing building partners' confidence and taking on small projects that would provide fast feedback serve as a means of establishing a collaborative culture (Kelly, Schaan, & Joncas, 2002) that would enhance ENMs' work on the organizational and community levels to prevent obesity. In making environmental changes, Drummond and colleagues (2009) documented how a program to implement changes to dietary and physical activity practices and policies in child care settings in one community spread to the local and state early childhood development and health systems. It also brought awareness of childhood obesity to a wider range of community stakeholders in addition to its unintended beneficial effects on the personal lives of day care staff. Small changes like the ones ENMs described cannot be overlooked because of their potential "ripple effects" to result in greater environmental and policy changes (Gregson et al., 2001). Building upon the multitude of relationships and achievements over time will create momentum and perpetuate to larger changes on the environmental level in the future.

Implications for Research and Practice

Additional research should be conducted to examine additional norms of action that community nutritionists like ENMs practice to make environmental changes to support healthy eating and physical activity. This includes the details of how practitioners can educate others, including local government officials, agency partners, and program participants about the relationship between individuals' behaviors and their environment in order to get buy-in and

support for making environmental changes in their organizations and the community. Details of how to conduct environmental assessments, and plan, implement, and evaluate projects should also be explored. Furthermore, process evaluation of interventions that use environmental approaches should be conducted to inform practitioners of what norms truly work and how and why they work in their respective settings.

The results have significant implications especially for practitioners and nutritionists who promote the health and wellness of the low-income population in their communities as these residents tend to live in neighborhoods with limited availability of healthy affordable foods (Larson, Story, & Nelson, 2009) and fewer resources for physical activity (Moore, Davis, Baxter, Lewis, & Yin, 2008; Powell, Slater, & Chaloupka, 2004). Because ENMs are currently unclear about what exactly they should do in using environmental strategies, it is necessary for them to be trained and coached (e.g. onsite assistance) on how to perform work in this area. Since much environmental change work involves collaborations, in order for training to be more effective, it needs to include both cognitive and interpersonal skills and tasks (Arthur, Bennett, Edens, & Bell, 2003). Content of training needs to incorporate cases/stories of successful environmental change work to motivate ENMs to become aware of and incorporate the different views and practices in their work as they learn through stories about what others do (Meyer, 1995).

Additionally, it is necessary for ENMs to explore existing direct or indirect (through their staff, colleagues, supervisors, and partners) relationships to find out where they can take initial steps to become involved in environmental change projects. ENMs should expand the purpose of their collaborations beyond recruitment and marketing of their programs to include educating others on the relationship between food, physical activity, and the environment in order to increase people's awareness and become ready to take action. Seeing the similarities between

direct nutrition education and making environmental changes would contribute to ENMs' confidence in using environmental strategies in their jobs.

Researchers have recommended accounting for organizational capacity and characteristics that are related to the implementation of new interventions (Wandersman et al., 2008) and staff performance (Hoge, Tondora, & Marrelli, 2005). They include leadership, goals/vision/culture, climate, and information, skills, and support for the innovation, among many others.

Organizational level factors that could directly impact ENMs' decision-making to be engaged in environmental projects, for example, their position descriptions, should be updated to urge ENMs to collaborate with partners to make environmental changes to address obesity. Funding authorities should increase grant opportunities for environmental projects not only for the ENMs or communities that are already doing this work, but also the ones who show interest, but have not had the chance to be involved. These organizational policy modifications would give ENMs the "permission" to be more engaged in environmental change efforts that will be crucial in addressing the challenges of the obesity epidemic.

Conclusion

Due to the variety of decision-making factors, relationships, opportunities, and the multidimensional aspects of nutrition education and environmental change, a great deal of latitude exists in ENMs' use of environmental strategies. Since norms for ENMs to use environmental strategies have not yet been established as clearly as they have for conducting direct nutrition education, the multiple sources of influence on ENMs' decision-making and application of environmental strategies can be perceived as ambiguities that ENMs can only elucidate for themselves through trial and error as they learn from their experiences. This study revealed numerous instances where ENMs actively engaged in environmental change work to

address obesity by creatively and authoritatively extending their work scope.

Although it is possible that health educators and nutritionists may not have had adequate training or believe they do not have the credibility, authority, or community-organizing skills to use environmental approaches (Woodruff et al., 2003), it is likely that they have not recognized the similarities between conducting direct nutrition education and utilizing environmental strategies. Because ENMs are well-positioned in their jobs and communities to begin using environmental approaches to address obesity, it is time to establish a new set of norms to be incorporated permanently into their jobs that are consistent with their organizational culture. Stretching the limits of their work beyond direct nutrition education will ultimately contribute to obesity prevention.

References

- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27–58.
- Ajzen, I. & Albarracín, D. (2007). Predicting and changing behavior: a reasoned action approach. In I. Ajzen, D. Albarracín, and R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Antipatis, V.J., Kumanyika, S.K., Jeffery, R.W., Morabia, A., & Ritenbaugh, C. (1999). Confidence of health professionals in public health approaches to obesity prevention. *International Journal of Obesity*, 23, 1004-1007.
- Arthur, W., Bennett, W., Edens, P.S., & Bell, S.T. (2003). Effectiveness of training in organizations: A meta-analysis of design and evaluation features. *Journal of Applied Psychology*, 88(2), 234–245.
- ATLAS.ti. (2006). Version 5.2. Berlin, Germany: Scientific Software Development.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman and Company.
- Baxter, R.J. (2010). Making better use of the policies and funding we already have. *Preventing Chronic Disease*, 7(5). Retrieved January 27, 2010, from http://www.cdc.gov/pcd/issues/2010/sep/10_0055.htm
- Beehr, T.A. & Newman, J.E. (1978). Job stress, employee health, and organizational effectiveness: a facet analysis, model, and literature review. *Personnel Psychology*, 31(4), 665-699.
- Best, A., Stokols, D., Green, L.W., Leischow, S., Holmes, B., & Buchholz, K., (2003). An integrative framework for community partnering to translate theory into effective health promotion strategy. *American Journal of Health Promotion*, 18(2), 168-176.
- Bray, G.A. & Champagne, C.M. (2005). Beyond energy balance: there is more to obesity than kilocalories. *Journal of the American Dietetic Association*, 105(5 Suppl 1), S17-S23.

- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Brownell, K.D. (2005). The chronicling of obesity: growing awareness of its social, economic, and political contexts. *Journal of Health Politics, Policy, and Law*, 30(5), 955-964.
- Burnes, B. (2004). Kurt Lewin and the planned approach to change: a re-appraisal. *Journal of Management Studies*, 41(6), 977-1002.
- California Association of Nutrition and Activity Programs. (2009). Implementing congressional guidance from the 2008 Farm Bill Report. Retrieved January 27, 2010 from http://www.can-act.net/files/snap-ed_doing_more_of_what_matters2.pdf
- Centers for Disease Control and Prevention. (2009). Recommended Community Strategies and Measurements to Prevent Obesity in the United States, *Morbidity and Mortality Weekly Report*, 58, No. RR-7, 1-29.
- Collaboration for Health, Activity, and Nutrition in Children's Environments. (2011). CHANCE. Retrieved November 5, 2011, from http://www.fnec.cornell.edu/Our_Initiatives/CHANCE.cfm
- Contento, I.R. (2007). *Nutrition education: linking research, theory, and practice*. Sudbury, MA: Jones and Bartlett Publishers.
- Cornell Cooperative Extension (2010). Land grant mission. Retrieved July 11, 2010, from <http://sp.cce.cornell.edu/learnAbout/Pages/landgrant.aspx>
- Cornell NutritionWorks. (2010). Cornell NutritionWorks. Retrieved September 6, 2010 from <http://www.nutritionworks.cornell.edu/home/>
- Dorfman, L. & Wallack, L. (2007). Moving nutrition upstream: the case for reframing obesity. *Journal of Nutrition Education and Behavior*, 39(2 Suppl), S45-S50.
- Dowling, B., Powell, M., & Glendinning, C. (2004). Conceptualising successful partnerships. *Health and Social Care in the Community*, 12(4), 309-317.
- Drewnowski, A. & Spector, S.E. (2004). Poverty and obesity: the role of energy density and energy costs. *American Journal of Clinical Nutrition*, 79(1), 6-16.

- Drummond, R.L., Staten, L.K., Sanford, M.R., Davidson, C.L., Ciocazan, M.M., Khor, K.N., and Kaplan, F. (2009). Steps to a Healthier Arizona: A pebble in the pond: the ripple effect of an obesity prevention intervention targeting the child care environment. *Health Promotion Practice, 10*(2), 156S-167S.
- Dutta-Bergman, M.J. (2005). Theory and practice in health communication campaigns: a critical interrogation. *Health Communication, 18*(2), 103-122.
- Economos, C.D., Hyatt, R.R., Goldberg, J.P., Must, A., Naumova, E.N., Collins, J.J., & Nelson, M.E. (2007). A community intervention reduces BMI z-score in children: Shape Up Somerville first year results. *Obesity, 15*(5), 1325-1336.
- Economos, C.D. & Irish-Hauser, S. (2007). Community interventions: a brief overview and their application to the obesity epidemic. *Journal of Law, Medicine, and Ethics, Spring*, 131-137.
- Egger, G. & Swinburn, B. (1997). An “ecological” approach to the obesity pandemic. *British Medical Journal, 315*, 477-480.
- Feldman, S.P. (1990). Stories as cultural creativity: on the relation between symbolism and politics in organizational change. *Human Relations, 43*(9), 809-828.
- Field, A.E., Coakley, E.H., Must, A., Spadano, J.L., Laird, N., Dietz, W.H., Rimm, E., & Colditz, G.A. (2001). Impact of overweight on the risk of developing common chronic diseases during a 10-year period. *Archives of Internal Medicine, 161*(13), 1581-1586.
- Fine, G.A. (1984). Negotiated orders and organizational cultures. *Annual Review of Sociology, 10*, 239-262.
- Foster-Fishman, P.G. & Behrens, T.R. (2007). Systems change reborn: rethinking our theories, methods, and efforts in human services reform and community-based change. *American Journal of Community Psychology, 39*(3/4), 191–196.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., and Kyriakidou, O. (2004). Diffusion of innovations in service organizations: systematic review and recommendations. *The Milbank Quarterly, 82*(4), 581-629.

- Gregson, J., Foerster, S.B., Orr, R., Jones, L., Benedict, J., Clarke, B., Hersey, J., Lewis, J., & Zotz, K. (2001). System, environmental, and policy changes: using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of Nutrition Education*, 33(Suppl. 1), S1-S15.
- Gussow, J.D. (2006). Reflections on nutritional health and the environment: the journey to sustainability. *Journal of Hunger and Environmental Nutrition*, 1(1), 3-25.
- Hansen, C.D., Kahnweiler, W.M., & Wilensky, A.S. (1994). Human resource development as an occupational culture through organizational stories. *Human Resource Development Quarterly*, 5(3), 253-268.
- Heath, G.W. (2009). The role of the public health sector in promoting physical activity: national, state, and local applications. *Journal of Physical Activity and Health*, 6(Suppl 2), S159–S167.
- Hoge, M.A., Tondora, J., & Marrelli, A.F. (2005). The fundamentals of workforce competency: implications for behavioral health. *Administration and Policy in Mental Health*, 32(5/6), 509-531.
- Huang, T.T., Drewnowski, A., Kumanyika, S.K., & Glass, T.A. (2009). A systems-oriented multi-level framework for addressing obesity in the 21st century. *Preventing Chronic Disease*, 6(3). Retrieved on October 1, 2010, from http://www.cdc.gov/pcd/issues/2009/jul/09_0013.htm
- Huberty, J.L., Balluff, M., O'Dell, M., & Peterson, K. (2010). From good ideas to actions: a model-driven community collaborative to prevent childhood obesity. *Preventive Medicine*, 50(Suppl 1), S36–S43.
- Institute of Medicine. (2005). *Preventing childhood obesity: health in the balance*. Jeffrey P. Koplan, Catharyn T. Liverman, Vivica I. Kraak (Eds.). Washington, D.C.: The National Academies Press.
- Julian, D. A. (2006). A community practice model for community psychologists and some examples from the Partnerships for Success initiative in Ohio. *American Journal of Community Psychology*, 37(1/2), 21–28.
- Kahn, R.L., Wolfe, D.M., Quinn, R.P., Snoek, J.D., & Rosenthal, R.A. (1964). *Organizational stress: studies in role conflict and ambiguity*. New York, NY: John Wiley and Sons.

- Kelly, M.J., Schaan, J-L., & Joncas, H. (2002). Managing alliance relationships: key challenges in the early stages of collaboration. *R&D Management*, 32(1), 11-22.
- Kieselhorst, K.J., Skates, J., & Pritchett, E. (2005). American Dietetic Association: Standards of practice in nutrition care and updated standards of professional performance. *Journal of the American Dietetic Association*, 105(4), 641-645.
- Kumanyika, S., Jeffery, R.W., Morabia, A., Ritenbaugh, C., & Antipatis, V.J. (2002). Obesity prevention: the case for action. *International Journal of Obesity*, 26(3), 425-436.
- Larson, N.I., Story, M.T., & Nelson, M.C. (2009). Neighborhood environments: disparities in access to healthy foods in the U.S. *American Journal of Preventive Medicine*, 36(1), 74-81.
- Lasker, R.D., Weiss, E.S., & Miller, R. (2001). Partnership synergy: a practical framework for studying and strengthening the collaborative advantage. *Milbank Quarterly*, 79(2), 179-205.
- Lavidge, R.J. & Steiner, G.A. (1961). A model for predictive measurements of advertising effectiveness. *Journal of Marketing*, 25(6), 59-62.
- Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Martin, J. (1992). *Cultures in organizations: Three perspectives*. New York, NY: Oxford University Press.
- Mattessich, P.W., Murray-Close, M., & Monsey, B.R. (2001). *Collaboration: What makes it work*. St. Paul, MN: Amherst H. Wilder Foundation.
- McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, 15(4), 351-378.
- McTigue, K.M., Harris, R., Hemphill, B., Lux, L., Sutton, S., Bunton, A.J., & Lohr, K.N. (2003). Screening and interventions for obesity in adults: Summary of the evidence of the U.S. Preventive Services Task Force. *Annals of Internal Medicine*, 139(11), 933-949.
- Meyer, J.C. (1995). Tell me a story: eliciting organizational values from narratives. *Communication Quarterly*, 43(2), 210-224.

- Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Moore, J.B., Davis, C.L., Baxter, S.D., Lew, R.D., & Yin, Z. (2008). Physical activity, metabolic syndrome, and overweight in rural youth. *Journal of Rural Health, 24*(2), 136-142.
- Morland, K., Wing, S., Diez Roux, A., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American Journal of Preventive Medicine, 22*(1), 23-29.
- Nestle, M. (2002). *Food politics: How the food industry influences nutrition and health*. Berkeley, CA: University of California Press.
- New York State Department of Health. (2010). Eat Well Play Hard. Retrieved May 13, 2011, from http://www.health.state.ny.us/prevention/nutrition/resources/eat_well_play_hard/
- Paeratakul, S., Lovejoy, J.C., Ryan, D.H., & Bray, G.A. (2002). The relation of gender, race and socioeconomic status to obesity and obesity comorbidities in a sample of US adults. *International Journal of Obesity, 26*(9), 1205-1210.
- Patton, D.B. & Blaine, T.W. (2001). Public issues education: exploring Extension's role. *Journal of Extension, 39*(4). Retrieved June 9, 2010, from <http://joe.org/joe/2001august/a2.html>
- Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Beverly Hills, CA: Sage Publications.
- Pearce, J.L. (1981). Bringing some clarity to role ambiguity research. *The Academy of Management Review, 6*(4), 665-674. doi:10.1016/0030-5073(84)90044-8
- Pollan, M. (2007). *The omnivore's dilemma: A natural history of four meals*. New York, NY: Penguin Press.
- Potapchuk, W.R. (1998). Collaborative approach to nutrition education in schools and communities: exploring the lessons. *Journal of Nutrition Education, 30*(5), 332-339.
- Powell, L.M., Slater, S., & Chaloupka, F.J. (2004). The relationship between community physical activity settings and race, ethnicity, and socioeconomic status. *Evidence-Based Preventive Medicine, 1*(2), 135-144.

- Rosenthal, B.B. (1998). Collaboration for the nutrition field: synthesis of selected literature. *Journal of Nutrition Education*, 30(5), 246-267.
- Sanigorski, A.M., Bell, A.C., Kremer, P.J., Cutler, R. & Swinburn, B.A. (2008). Reducing unhealthy weight gain in children through community capacity-building: results of a quasi-experimental intervention program, Be Active Eat Well. *International Journal of Obesity*, 32(7), 1060–1067.
- Schein, E.H. (2004). *Organizational culture and leadership* (3rd ed.). San Francisco, CA: John Wiley and Sons.
- Schwartz, L., Samuels, S.E., Boyle, M., Clark, S.E., Flores, G., & Prentice, B. (2010). Local public health departments in California: changing nutrition and physical activity environments for obesity prevention. *Journal of Public Health Management and Practice*, 16(2), E17–E28.
- Schwartz, M.B. & Brownell, K.D. (2007). Action necessary to prevent childhood obesity: creating the climate for change. *Journal of Law, Medicine, and Ethics*, Spring, 78-89.
- Seidman, E. (1988). Back to the future, community psychology: unfolding a theory of social intervention. *American Journal of Community Psychology*. 16(1), 3–24.
- Snetselaar, L.G. (1997). *Nutrition counseling skills for medical nutrition therapy*. Frederick, MD: Aspen Publishers.
- Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association*, 102(3 Suppl), S40-S51.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: grounded theory procedures and techniques*. Newbury Park, CA: SAGE Publications.
- Swinburn, B., Gill, T., & Kumanyika, S. (2005). Obesity prevention: a proposed framework for translating evidence into action. *Obesity Reviews*, 6(1), 23–33.
- Torjman, S. & Leviten-Reid, E. (2003). *Comprehensive Community Initiatives*. Ottawa, Ontario: The Caledon Institute of Social Policy. Retrieved April 18, 2011, from <http://www.caledoninst.org/PDF/55382041X.pdf>

- Trice, H.M. & Beyer, J.M. (1993). *The cultures of work organizations*. Upper Saddle River, NJ: Prentice Hall.
- Trost, J.E. (1986). Statistically nonrepresentative stratified sampling: a sampling technique for qualitative studies. *Qualitative Sociology*, 9(1), 54-57.
- Trust for America's Health. (2011). *F As in Fat: How Obesity Threatens America's Future 2011*. Washington DC: Trust for America's Health. Retrieved August 30, 2011, from <http://www.rwjf.org/files/research/fasinfat2011.pdf>
- UNC Center for Health Promotion and Disease Prevention. (2009). *Nutrition and Physical Activity Self-Assessment for Child-Care*. Retrieved May 13, 2011, from http://www.center-trt.org/downloads/obesity_prevention/interventions/napsacc/NAPSACC_Template.pdf
- USDA Center for Nutrition Policy and Promotion. (2011). *Dietary Guideline for Americans*. Retrieved November 29, 2011, from <http://www.cnpp.usda.gov/DietaryGuidelines.htm>
- Wandersman, A., Duffy, J., Flaspohler, P., Noonan, R., Lubell, K., Stillman, L., Blachman, M., Dunville, R., & Saul, J. (2008). Bridging the gap between prevention research and practice: the interactive systems framework for dissemination and implementation. *American Journal of Community Psychology*, 41(3/4), 171–181.
- Wandersman, A., Goodman, R.M., & Butterfoss, F.D. (2005). Understanding coalitions and how they operate. In M. Minkler (Ed.) *Community organizing and community building for health* (2nd ed., pp. 261-277). New Brunswick, N.J.: Rutgers University Press.
- Wansink, B. (2006). *Mindless eating: Why we eat more than we think*. New York, NY: Bantam Books.
- Wendel, M.L., Prochaska, J.D., Clark, H.R., Sackett, S., & Perkins, K. (2010). Interorganizational network changes among health organizations in the Brazos Valley, Texas. *Journal of Primary Prevention*, 31(1/2):59–68.
- Wilensky, A.S. & Hansen, C.D. (2001) Understanding the work beliefs of nonprofit executives through organizational stories. *Human Resource Development Quarterly*, 12(3), 223-239.
- Wolf, A.M. & Colditz, G.A. (1998). Current estimates of the economic cost of obesity in the United States. *Obesity Research*, 6(2), 97–106.

Woodruff, K., Dorfman, L., Berends, V., & Agron, P. (2003). Coverage of childhood nutrition policies in California newspapers. *Journal of Public Health Policy*, 24(2), 150-158.

Yousef, D.A. (2000). The interactive effects of role conflict and role ambiguity on job satisfaction and attitudes toward organizational change: a moderated multiple regression approach. *International Journal of Stress Management*, 7(4), 289-303.

Chapter 5

Conclusion

In response to the rising rate of obesity in the US, community health practitioners like Extension Nutrition Managers (ENM) working in Cooperative Extension are being urged by some professionals in obesity prevention to adopt a socio-ecological approach, emphasizing environmental changes to support healthy eating and physical activity in their communities. This perspective is evidenced in recommendations from the Centers for Disease Control and Prevention (2009), numerous state strategic plans, and other local success stories (Robert Wood Johnson Foundation, 2011; New York State Department of Health [NYSDOH], 2008).

ENMs are experts well-versed in nutrition and behavior change techniques. Their traditional focus has been delivering programs, such as the Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program–Education (SNAP-Ed), that teach low-income audiences how to eat well and live healthier lives. The research reported here found that ENMs also collaborate with various agency partners in their communities to improve the environments of their target audiences, thereby beginning to expand beyond direct nutrition education to a socio-ecological approach. Since the low-income population is particularly at risk for obesity, partly due to the obesogenic environment where healthy options for food and physical activity are limited (Larson, Story, & Nelson, 2009; Morland, Wing, Diez Roux, & Poole, 2002; Moore, Davis, Baxter, Lewis, & Yin, 2008), ENMs should be integral partners in environmentally-focused community efforts to target obesity. Their ability to be both nutrition educators and environmental change agents qualifies them as leaders in applying the socio-ecological perspective to obesity prevention in their communities.

The purpose of this descriptive, sequential mixed methods study was to understand ENMs' current involvement in using environmental approaches in order to identify ways to expand their strategy use within their existing work context. The study explored the multiple aspects of ENMs' use of environmental strategies, the association of their strategy use with various factors, and the feasibility of incorporating the strategies into ENMs' existing work context. Chapter 2 illustrated that ENMs spent a minimal amount of time on environmental change work and used the strategies (i.e. in the four settings) in a limited way. ENMs were most likely to be collaborating with partners in committees/coalitions to make environmental changes in their community, followed by collaborating with other organizations serving adult audiences and within their own workplace. Fewest ENMs collaborated with schools and youth-serving agencies to make environmental changes. In each setting, ENMs performed various tasks (i.e. providing information and making recommendations, and developing, implementing, and evaluating action plans) aimed at modifying the environments. In community committees/coalitions, ENMs were more likely to work in supportive rather than leadership roles. Their use of environmental strategies tended to be informal and involved providing information and making recommendations. Only a few ENMs reported developing, implementing, and evaluating formal action plans to guide environmental projects that aimed to modify food and physical activity practices and policies in various settings. The ENMs who engaged at this level had funds that could be allocated to doing environmental change work.

Chapter 3 used quantitative methods to describe the intrinsic factors and extrinsic opportunities and resources that were related to ENMs' use of environmental strategies. Intrinsically, ENMs were prompted by their positive beliefs toward using environmental strategies for obesity prevention and their perception that strategy use was within their job scope.

Extrinsically, ENMs were guided and/or supported by funding that could be dedicated to environmental change work, their own and partners' organizational structures and resources, agency requests, and perceived community readiness to do work in this area. While ENMs who had funds available for making environmental changes had an explicit reason and resources to do this work, these were not necessary conditions for ENMs shifting to a more ecological approach. Both with and without such financial sources, the more important contributing factors to their strategy use were having a proactive personality and effective networking and collaborative relationships with partners in their community that they could utilize to advance the work.

Chapter 4 depicted ENMs as skillful nutrition experts who managed around the ambiguities and various constraints associated with their work to incorporate environmental change strategies into their existing job context. These challenges included unclear expectations for them to use environmental strategies and lack of knowledge, skills, supervisor support, agency interest and resources, and community readiness of partners to be involved in this work. ENMs capitalize on previous and current relationships with partners often led to projects that targeted obesity on the environmental level. They considered their own interests and actively managed within their job scope, requests from agency partners, and program objectives to become involved in making environmental changes. Furthermore, ENMs, both with and without funds available for using environmental strategies, adapted their values and practices for conducting direct nutrition education with individuals and applied them to the use of environmental strategies. They promoted environmental changes by redefining the content of nutrition education to include environmental change, the target of nutrition education to include community stakeholders, and the purpose of nutrition education to support changes in environments. They also expanded their view of nutrition to include the entire food system as

related to individuals' food and exercise behaviors and their collaboration with partners to make environmental changes in their organizations and community. Instead of focusing only on individual participants' health behaviors, ENMs considered the relevant environmental influences that facilitate or hinder adoption of healthier habits.

In summary, this study found ENMs to be motivated nutrition experts who are well-prepared to continue their work delivering direct nutrition education programs (i.e. EFNEP and SNAP-Ed) to low-income participants and well-positioned in the community to collaborate and lead environmental change efforts. While personal characteristics such as interest, confidence, knowledge, and skills prevented some ENMs from using environmental strategies, factors on the organizational, community, state, and national levels simultaneously restricted their engagement. This study thus has implications for practice to modify the barriers posed by these multiple layers of influence on ENMs' practice in order to facilitate their use of environmental strategies. Since ENMs' strategy use often required extensive collaboration among various stakeholders, additional research is necessary to better understand other practitioners' strategy use and the community's collective capacity to prevent obesity in order to identify where the opportunities for collaborating and making environmental changes lie.

Study Strengths

In this study, mixed qualitative and quantitative methods provided the opportunity to triangulate findings from the in-depth, semi-structured interviews and survey to validate the content and extent of ENMs' use of environmental strategies. Interviews with both ENMs and their supervisors also served as a means of ensuring validity. The results from the pilot study provided preliminary data that uncovered theoretical insights into how various factors on the personal, organizational, and community levels were associated with ENMs' use of

environmental strategies. Those results also confirmed the appropriateness of applying the Theory of Planned Behavior (TPB) to guide the current study. The study was grounded in current programming with practitioners in the field providing their perceptions and practices in using environmental strategies that reflect local realities. Such practice-based evidence will provide more feasible ways for community health practitioners like ENMs to become engaged in environmental change work in the future.

The quantitative portion of this study was guided by the TPB that framed ENMs' perceptions of the barriers and facilitators related to their strategy use. Furthermore, the development of the quantitative survey involved the use of items from validated instruments to the extent possible and included additional items developed from the semi-structured interviews. Content validity was enhanced by input from the investigator's research team which included state EFNEP and SNAP-Ed leadership. Because the group worked extensively and regularly with ENMs, each member provided insights related to ENMs' work important in the development of the survey, e.g. related to the appropriateness of survey items. To further establish content validity, three former managers of EFNEP/SNAP-Ed pilot tested the draft survey. They recorded the time required to complete the survey and commented on item clarity, conciseness (DeVellis, 2003), and ease or difficulty of completion. The final dataset included 100% of the ENMs who managed EFNEP and/or SNAP-Ed in Cornell Cooperative Extension (CCE).

The qualitative portion of this study used member checks and peer-debriefing (Lincoln & Guba, 1985) to establish the credibility of the results. Data presentation uniquely applied the organizational cultures perspective in examining ENMs' behaviors, a bottom-up process that revealed ways to guide community nutritionists and practitioners in applying the environmental perspective in their work to address obesity. The details of qualitative interviews indicated

possible mechanisms by which the various factors were related to ENMs' use of environmental strategies and provided alternative explanations to the quantitative results based on the TPB.

Study Limitations

This study presented cross-sectional data; thus study results do not imply causality. Qualitative interviews illustrated alternative means by which the variables could be related to each other. The study was conducted in New York with a group of community nutritionists who worked in CCE, so the results may not be generalizable to other populations of health practitioners in other settings. However, because environmental change work happens in community groups with multiple partners, the conditions faced by other practitioners may well be similar to those of ENMs. In particular, the current findings are likely to apply to other community practitioners who work in nonprofit organizations with similar missions and job context as CCE.

Data on ENMs' behaviors in this study were self-reported. They are thus subject to recall and estimation errors and the possibility of social desirability bias. The study used an extensive, complex, multi-component survey that required a significant amount of time (i.e. nearly one hour) and mental energy to complete. It was evident from some ENMs' comments that "survey fatigue" occurred. However, ENMs indicated a moderately high level of thoughtfulness in responding to the survey based on their answers to the question, "How thoughtfully did you respond to the questions in this survey?"

Coding of interview data was conducted only by the primary researcher so results may include interpretation errors based on her beliefs and perceptions. However, peer-debriefing (Lincoln & Guba, 1985) with the six-member research team, and member checks with the ENMs during second interviews and at a statewide meeting with all ENMs were conducted. This

allowed the investigator to confirm the validity of her data and interpretations with others who continually interacted with ENMs in the field (Appendix C).

Implications for Research

This study has several implications for future research. Since working on the environmental level for obesity prevention involves the collaboration of multiple stakeholders, more research is needed to unveil their various perspectives and practices in using environmental strategies. Important stakeholders include health care providers, public health and social services staff, and other members of community-based organizations (e.g. churches, community centers, childcare programs, emergency care centers) whose work contributes directly to the well-being of community residents, especially those with limited resources who live in more obesogenic environments. Research also needs to be conducted in other state Cooperative Extension systems to understand whether practices on the environmental level are consistent across states and how the larger system can collaborate as a whole for promoting environmental work. Since obesity is an issue that will require the collective effort of many individuals and groups on all levels of the society to use multiple means to change the relevant environments, understanding the roles and values of all stakeholders in other localities will enhance the use of environmental strategies by ENMs and their community partners.

The associations between strategy use and the various factors were examined only according to the Theory of Planned Behavior (Ajzen, 2001; Ajzen & Albarracín, 2007) based on interview and survey data. Future research may apply the Theory using the Q-methodology (Brown, 1996) to emphasize the subjective viewpoints of public health and community professionals toward using environmental approaches to address obesity. This technique would lead to a better understanding of the intrinsic factors that motivate their actions and more

effective ways to promote their use of environmental strategies.

More research is also necessary to understand the intricate and multifactorial processes by which community nutritionists and their partners apply specific environmental strategies, from needs assessments to evaluating environmental change. This study did not explore in depth particular aspects of strategy use (e.g. how to teach others about the link between environment and dietary behavior) because of the priority given to breadth, i.e. assessment of all strategies and associated factors. Moreover, the strategies identified in this study are not exhaustive. This study defined the strategies broadly by setting or target population; characterizing them based on other dimensions such as by their nutrition or physical activity content is possible.

Implications for Practice

Currently, community practitioners are motivated to apply the socio-ecological perspective to obesity prevention and indeed are already doing so to at least some extent. Such motivation is both intrinsic, i.e. from personal interests, confidence, knowledge, skills, and extrinsic, i.e. from the organizational, community, state, and even the national levels. The results of this study can thus be used to impact the field of nutrition and obesity prevention by delineating the practice implications for stakeholders on various levels. Those involved in obesity prevention need to seize the moment to shift from the traditional focus on individual behavior change alone, and recognize the importance of redefining strategies for obesity prevention to include the environmental focus.

Federal Leadership

In light of the important influence of expectations for practitioners and resources devoted to environmental change projects, the United States Department of Agriculture's National Institute of Food and Agriculture (NIFA, 2011) and Food and Nutrition Service (FNS, 2011)

could strengthen opportunities for community-based organizations including Cooperative Extension to use environmental strategies to address obesity. These opportunities will include both funding (grants, contracts and Federal Formula Funds) and supportive policies. The increased opportunities will then give ENMs and their partners concrete reasons to use environmental strategies in their jobs and the necessary resources for them to be more formally involved in developing, implementing, and evaluating action plans for environmental change. In particular, federal leaders can modify existing program policies (i.e. EFNEP and SNAP-Ed) to specifically include environmental change work. Simultaneously, a monitoring system to evaluate practitioners' engagement and progress in using environmental strategies should be developed. This could include keeping track of the settings, content, and processes of strategy use, along with practitioners' level of networking and extent of collaboration with their partners for promoting environmental change. Monitoring ENMs' progress also serves to enhance accountability.

State Leadership

To promote changes at the federal level, state Cooperative Extension and EFNEP leaders in the land-grant universities who are already using the socio-ecological approach could educate federal leaders about the importance and feasibility of expanding programs to include environmental strategies for obesity prevention. This approach can contribute to the shift in the discourse of obesity prevention from focusing only on the individual to including the environment. As was found for ENMs, not all EFNEP and other state leaders are equally motivated to adopt environmental strategies for obesity prevention within their existing programmatic framework. Those who are already working in this area should educate and support each other to increase the awareness and feasibility of program staff including

environmental changes as a part of their educational outreach. To clarify practitioners' roles in using environmental strategies, these leaders could contribute to the expansion of EFNEP and SNAP-Ed guidelines and objectives to span all levels of the socio-ecological continuum. This would require working with NIFA (2011) and FNS (2011), agencies that oversee nutrition assistance programs for the low-income population including the EFNEP, Supplemental Nutrition Assistance Program (including SNAP-Ed), WIC, and school meal programs.

To address practitioners' reported lack of knowledge and skills in using environmental strategies, state program leaders could provide resources and support including technical support, hands-on training and coaching opportunities for ENMs to learn to do work on the environmental level. One current example is the Cornell NutritionWorks' online professional training course, *Preventing Childhood Obesity: An Ecological Approach* (2010) designed to teach practitioners to take a socio-ecological approach in understanding the causes of obesity and developing an action plan that results in environmental changes. Furthermore, the Food and Nutrition Education in Communities program in the Division of Nutritional Sciences at Cornell University has provided in-service training to support ENMs in using environmental strategies. Additional training methods may involve the more experienced ENMs mentoring the less experienced ones and the sharing of ENMs' stories on how they work on the environmental level. As stories reveal the essential competencies for what needs to be done (Hoge, Tondora, & Marrelli, 2005), they can guide ENMs to learn to use environmental strategies from each other.

Organizational/Community Leadership

Community organizations like Cooperative Extension and their partners on the management level could provide the necessary structure and support (e.g. resources, supervisors, staff) for their staff to use environmental strategies. As ENMs indicated that their motivation to

engage in environmental change was partly based on their job scope, it will be necessary for organizations to expand their staffs' position descriptions to specifically require work on the environmental level and through collaborations to address obesity. This is likely to reduce the ambiguity associated with the practitioners' job scope. Additionally, organizations aiming to improve the health of community residents should initiate worksite wellness programs. This allows practitioners not only the chance to model healthy nutrition and physical activity practices, it also serves as an opportunity for them to learn and apply the skills they need to collaborate with others in assessing, developing, implementing, and evaluating action plans for making environmental changes. Furthermore, because networking in communities was a significant contributing factor to ENMs' use of environmental strategies, organizations could encourage and facilitate sharing of networks and relationships both within their organization and with their community partners. This will allow practitioners to expand and deepen their networks to find opportunities for using environmental strategies, including applying for collaborative grants to support work in the community.

Practitioners and Educators

Based on the findings of this study, community health practitioners like ENMs who are not yet involved in environmental change work should at least begin working on the lowest level of tasks, providing information and making recommendations to their partners on how to make their organization a healthier place to eat and be active for their own staff and the audience they serve. In order to overcome the lack of interest and readiness of their community partners, practitioners could educate the staff and leaders of other agencies on the socio-ecological perspective and the importance of environmental change. Next, to enhance the quality of working relationships, practitioners could continue to develop and capitalize on their existing partnerships toward

making environmental changes in organizations and the community, instead of only networking for marketing and recruiting participants for direct nutrition education programs and exchanging information. ENMs also could identify potential partners by examining the network of relationships outside of their own to include those of their staff, colleagues, supervisors, and agency partners in order to expand their work scope. Finding opportunities for engaging in environmental change may contribute to ENMs' personal interests and skills of working in this area. Furthermore, ENMs could share with each other, formally or informally, ways they incorporate environmental change work into their existing work context.

The results of this study are applicable to other community practitioners working in settings outside of Cooperative Extension, most directly to community health educators and practitioners in the public health system, health and human services, and anyone working in organizations promoting the health and wellness of community residents, including the low-income population. Receiving funds from federal, state, and/or local governmental sources to support their operations, these agencies experience similar economic conditions and programmatic restrictions. The result of this study can also benefit other community stakeholders, such as school administrators, teachers, and staff and leaders of child care centers, community centers, and other local, nonprofit organizations with whom ENMs partner in their communities. Because obesity prevention using environmental approaches requires multiple stakeholders (Swinburn, Gill, & Kumanyika, 2005), these agencies should collaborate to develop a common language for addressing obesity in their communities, prioritizing the environmental strategies to focus on and identifying important factors related to their strategy use. These actions will ultimately enhance their collective capacity and readiness to conduct work in this area.

References

- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27–58.
- Ajzen, I. & Albarracín, D. (2007). Predicting and changing behavior: a reasoned action approach. In I. Ajzen, D. Albarracín, and R. Hornik (Eds.), *Prediction and change of health behavior: Applying the reasoned action approach* (pp. 3-21). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Brown, S.R. (1996). Q methodology and qualitative research. *Qualitative Health Research*, 6(4), 561-567.
- Centers for Disease Control and Prevention. (2009). Recommended community strategies and measurements to prevent obesity in the United States, *Morbidity and Mortality Weekly Report*, 58, No. RR-7, 1-29.
- Cornell NutritionWorks. (2010). Cornell NutritionWorks. Retrieved September 6, 2010, from <http://www.nutritionworks.cornell.edu/home/>
- DeVellis, R.F. (2003). *Scale development: theory and applications* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Food and Nutrition Service. (2011). Nutrition Assistance Programs. Retrieved July 13, 2011 from <http://www.fns.usda.gov/fns/>
- Hoge, M.A., Tondora, J., & Marrelli, A.F. (2005). The fundamentals of workforce competency: implications for behavioral health. *Administration and Policy in Mental Health*, 32(5/6), 509-531.
- Larson, N.I., Story, M.T., & Nelson, M.C. (2009). Neighborhood environments: disparities in access to healthy foods in the U.S. *American Journal of Preventive Medicine*, 36(1), 74-81.
- Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Morland, K., Wing, S., Diez Roux, A., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American Journal of Preventive Medicine*, 22(1), 23-29.

Moore, J.B., Davis, C.L., Baxter, S.D., Lew, R.D., & Yin, Z. (2008). Physical activity, metabolic syndrome, and overweight in rural youth. *Journal of Rural Health, 24*(2), 136-142.

National Institute of Food and Agriculture. (2011). About NIFA. Retrieved July 8, 2011 from <http://www.csrees.usda.gov/about/about.html>

New York State Department of Health. (2008). Strategic plan for overweight and obesity prevention: policy and environmental changes. Retrieved May 13, 2011 from http://www.health.state.ny.us/prevention/obesity/strategic_plan/

Robert Wood Johnson Foundation. (2011). F as in fat: how obesity threatens America's future. Washington, D.C.: Trust for America's Health. Retrieved July 7, 2011, from <http://healthyamericans.org/reports/obesity2011/Obesity2011Report.pdf>

Swinburn, B., Gill, T., & Kumanyika, S. (2005). Obesity prevention: a proposed framework for translating evidence into action. *Obesity Reviews, 6*(1), 23-33.

Appendix A: Extension Nutrition Manager Interview Guide 1

1. First, I would like to understand some things about your job.
 - a) What is your job title?
 - b) How long have you been in this position?
 - c) Tell me about what you do in this position.
Prompt for securing funds, writing grants, establishing and maintaining relationships with agencies/individuals, supervising staff (hiring, performance review), etc.
 - d) What are the sources of funds for your salary?
Prompt for county funds, EFNEP funds, ESNY funds. (Note that county funds also pay for EFNEP and ESNY.)
How is your salary time divided among these funding sources?
 - e) In your own words, what is CCE's mission? How does what you do relate to CCE's mission? How do you carry out CCE's mission in your work?

2. These next few questions are about the relationship between your work and the obesity epidemic.
 - a) Tell me about what you are currently doing, if anything, to address this issue. Tell me more about each. What is the purpose?
Prompt for nutrition education and working with others (collaborations).
Prompt for how each began (initiated by self or other).
Prompt for length of involvement with each (long-term, short-term).
 - b) Tell me about what you actually do in... (fill in what was mentioned in 2a)?
 - c) What do you think are the advantages to what you do? Disadvantages? Tell me more.
 - d) What have you found to be helpful with using each strategy?
Prompt for educational background, training, involvement in CCE nutrition programs (clarify education and credentials), role of ED and management, university faculty, agency staff, etc.
Probe for examples of how the factors were helpful.
 - e) Tell me about what you have found to be challenging or difficult with doing each of these things.
Prompt for personal, organizational, and community factors.
Probe for examples of how the factors were helpful.
 - f) How did you overcome those difficulties? Tell me more.

3. These questions are about obesity.
 - a) In general, what do you think about the issue of obesity?
Prompt for cause of obesity.
 - b) How do you think other people view obesity?
Prompt for executive director, colleagues, agency staff, university faculty, family and friends.
 - c) What do you think about the way others view obesity? Do they influence what you think?
Tell me more.

4. These questions are about obesity prevention efforts.
 - a) What do you think should be done to address obesity?
Prompt for advantages and disadvantages.
 - b) You have told me already what you are currently doing to address obesity, are there other things you are planning to do? Tell me more.
 - c) How would you go about putting this plan into action? When do you expect to begin to do that? How do you think it will progress?
Prompt for facilitators and barriers.
 - d) Is it clear to you what you are expected to do to address obesity? How do you know what you are expected to do?

Extension Nutrition Manager Interview Guide 2

From my first set of interviews, I have identified various things that managers are doing to address obesity, ranging from ESNY and EFNEP, nutrition education and training with agency staff, working with schools and other youth-serving agencies like HS and day care centers to work on menus/recipes and wellness policies, to setting up a farmer's market + CSA infrastructure to improve fruit and vegetable access to low-income population and talking with county health legislators.

In this interview, for the ones that you are doing or have done, I'll ask for more details about how you made that happen and what specific challenges you had overcome and how. For the other ones, I hope to learn more about what you think about doing them in your work. There are no right and wrong answers; only what and how you think and do.

I decided not to do a summary this time, as my interpretation may still influence your answers this time around. I'll gather more information on what you think and will do a final check with you some time in the spring/early summer, also to confirm my findings from this interview.

1. Let's talk specifically about some of the things you're doing to address obesity.
 - a) How did you first get involved in...?
 - b) What factors do you consider when deciding to do it or not?
 - c) How does doing this benefit the agency staff in terms of obesity prevention?
 - d) How does doing this benefit agency's target population in terms of obesity prevention?
 - e) How did you learn to do this?
 - f) What has enabled you to do this?
 - g) What have been the challenges in doing this? How have you dealt with them?

2. Let's talk about some other things that are done to address obesity.
 - a) What do you think about...? Is it within the scope of your job?
 - b) What are the reasons you're not involved in doing...?
 - c) Are there other people or agencies doing this?
 - d) How would doing this benefit the agency staff in terms of obesity prevention?
 - e) How would doing this benefit agency's target population in terms of obesity prevention?
 - f) What would enable you to do this?
 - g) What challenges do you expect? How would you deal with them?

3. Let's talk about the socio-ecological model.
 - a) What do you know about it?
 - b) How did you first learn about it? When was that?
 - c) (Show model) Which of these levels do you consider to be the "environmental" levels?
What does "environmental change" mean to you in terms of addressing obesity?
 - d) Do you see any way possible to make environmental changes, either directly or indirectly, to address obesity through EFNEP?
 - e) In your work, what will better enable you to make environmental changes to address obesity?
Prompt for skills-training and support from upper management and campus

Appendix B: Supervisor Interview Guide

1. These questions are about your job.
 - a) What is your job title?
 - b) How long have you been in this position?
 - c) How would you describe what you do in this position?
 - d) In your own words, what is CCE's mission? How does what you do fit into CCE's mission?

2. These questions are about obesity and obesity prevention.
 - a) In general, what do you think about the issue of obesity?
Prompt for cause of obesity.
 - b) Is obesity prevention part of your association's work plan? What is actually being done to address it?
Prompt for community-level work with agencies or government.
 - c) Are you personally involved in projects or activities that specifically address obesity?
Tell me more.

3. These questions are about your nutrition program supervisor.
 - a) What do you expect your program supervisor to do to address obesity?
Prompt for worksite wellness program in association, collaboration with community agencies or government.
 - b) What challenges do you expect program supervisor to face in their work to address obesity? How do you expect her/him to do to overcome those challenges?
 - c) Do you work with your nutrition supervisor to address obesity? Tell me more.
 - d) How do you see partnerships and collaborations fitting into CCE's mission?
 - e) Tell me about what your expectations are for your nutrition supervisor in terms of collaborating with others to address obesity.
Probe for examples.

4. These questions are about worksite wellness in your organization.
 - a) Does your association have a worksite wellness program? What do you think about it? What do others in the association think about it?
 - b) Tell me about your role in the implementation of the worksite wellness program.
Prompt for facilitators and barriers. Tell me about how you dealt with those barriers.
 - c) How has worksite wellness affected your health behaviors at work? In personal life?
 - d) If your association does not have a worksite wellness program, what are the reasons?
Prompt for facilitators and barriers.

Appendix C: Establishing Credibility of Data

To strengthen the reliability and validity of this study, the primary researcher (AL) wrote memos describing codes/categories and noting similarities and differences between ENMs. She kept ongoing reflective notes during data collection and analysis on the insights and questions that evolved (Anfara, Brown, & Mangione, 2002). Additionally, the processes suggested by Lincoln and Guba (1985) were followed to establish the credibility of the qualitative data.

Prolonged engagement in the field

AL first began working with ENMs through the CHANCE project in 2007. She became acquainted with the ENMs who piloted CHANCE by attending two group meetings during the initial phase of program implementation, conducting interviews with five managers and one issue leader, and building on those relationships throughout the next three years as research progressed. Each year, AL attended one to two statewide conferences with the all ENMs to interact with them and be updated on the information they were receiving from EFNEP leadership. In July, 2010, AL attended another CHANCE meeting that was specifically focused on making environmental changes, including worksite wellness, to assess the consistency between her research findings and what staff were reporting as strategies used in CHANCE.

Persistent observation

In addition to participating in the statewide conferences for ENMs, AL attended several CCE hour long county-level meetings, both staff meetings and meetings with agency partners, during the qualitative phase of data collection (2008-2009); the objective was to learn about ENMs' jobs, including their cultures, settings, and networks. CCE organization-wide staff meetings were led by the executive director and consisted of all CCE staff present on the day of the meeting. CCE Nutrition staff meetings were led by the ENMs and attended by members of the nutrition program staff. ENMs also facilitated meetings of the local Nutrition Program Advisory Committees and obesity task forces that identified community needs and strategies. The Eat Well Play Hard (EWPH) coalition meeting was run by the EWPH project leader, a staff of the county health department, and attended by representatives of various schools and community organizations, including the ENM. In all meetings, AL focused on ENMs' responsibilities within the group, their relationship with others (their own staff, supervisor, and other community leaders/members); and factors and situations that facilitated or hindered their work. Field notes were recorded during these meetings and AL asked

questions following the meetings when clarification was needed.

Triangulation

The mixed methods study design with both qualitative (semi-structured, in-depth interviews) and quantitative (survey) data enhanced the credibility of study results through triangulation. Data were obtained from multiple sources through interviews with both ENMs and their immediate supervisors (i.e. the executive director of the CCE organization or the issue leader). These along with observations provided a variety of data sources (Table A.1) that were compared for convergence of results, providing a means to corroborate research findings.

Table A.1: Data sources for each of the main categories of findings

	ENM interviews	ENM surveys	Supervisor interviews	Observation of meetings
Environmental strategies	x	x	x	x
ENMs' personal characteristics	x	x		
ENMs' job-related characteristics	x	x	x	x
Beliefs/attitude toward using strategies	x	x		x
Others' expectations for strategy use	x	x	x	
Facilitating factors to strategy use	x	x	x	x

Peer debriefing

AL belonged to a research group that consisted of the New York EFNEP State Director, EFNEP State Coordinator, two research associates, two Extension associates, one of whom coordinates a program with an environmental focus, and three graduate students. The group met weekly to discuss current research projects. AL presented her data to this group one to two times each semester as analysis progressed, and sought feedback from peers/group members. She also met regularly with her adviser, committee members, and/or other research group members to discuss both specific interviews and emergent themes, thereby verifying data analyses and interpretations. To ensure the strategies that emerged from the data encompassed all strategies that ENMs used to address obesity on the environmental level, AL also met with the CHANCE coordinator and a fellow graduate student (whose research also focused on ENMs' work in making environmental changes) to discuss her research findings. Based on their experiences, both colleagues thought the strategies were comprehensive.

Member checking

The second interviews with ENMs served as opportunities to conduct member checks. AL summarized ENMs' strategy use to make environmental changes and asked informants to verify the accuracy of the content and interpretation of the data collected; she then asked ENMs for updates on their strategy use and other new information. Member checks were also conducted with the entire group of ENMs who responded to the survey during an hour-long presentation that contained qualitative and quantitative results on their perceptions and practices in using environmental approaches to address obesity. Details included the following:

- 1) Obesity beliefs,
- 2) Views toward obesity prevention,
- 3) Use of environmental approaches to address obesity,
- 4) Availability of resources (personal, organizational, campus, community), and
- 5) Implications for practice.

AL requested ENMs' feedback in writing by asking them to summarize the key findings and comment on the accuracy of the facts and interpretations presented. The results indicated that managers deemed the results and interpretations to be accurate and reflective of their work.

Negative cases

While several factors were found to be significantly related to ENMs' use of environmental strategies, individual cases indicated that some of them were not necessary conditions for environmental change to occur. For example, an ENM who preferred and was more interested in working with individuals shaping their dietary behaviors capitalized on the opportunity to participate in a worksite walking project and repeatedly sought funding to support this work. Interviews with this ENM indicated that she was aware of the need to use environmental strategies in her work and recognized the importance of changing environments to facilitate people's behavior change. Thus, when given the opportunity, the ENM was able to extend her job scope to make environmental changes. This unexpected finding illustrated that it was not necessary that an ENM developed personal interest in using environmental strategies before they became involved in doing this work. It was more important that resources, especially in the form of financial support, be available to ENMs for them to do this work.

However, as important as having funding specifically dedicated to ENMs' use of environmental strategies is to their strategy use, one ENMs' experience demonstrated that

such funding did not necessarily lead to the desired outcome of establishing a worksite wellness program within her CCE organization. Significant factors such as having her supervisor's instrumental support, dedicated colleagues, and time devoted to using environmental strategies were lacking in this ENMs' situation. Furthermore, ENMs' staff load was also a significant contributing factor to environmental strategy use. Yet, an interview with an ENM who supervised only three staff indicated that she was actively involved in using environmental strategies to shape children's and adults' environments in schools and churches. She also served on the local EWPH committee. These examples revealed that numerous factors were related to ENMs' use of environmental strategies in different ways depending on each ENM's unique work context.

References

- Anfara, V.A., Brown, K.M., & Mangione, T.L. (2002). Qualitative analysis on stage: making the research process more public. *Educational Researcher*, 31(7), 28-38.
- Lincoln, Y.S. & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.

Appendix D: Survey Instructions

Good Morning!

Please follow these steps:

- 1) Pick up survey packet from Angela.
- 2) Take out consent forms and Part 1 only.
- 3) Read and sign one copy of consent form.
- 4) Fill out Part 1.
- 5) When finished, put signed consent form and Part 1 back into envelope; keep unsigned copy for yourself.
- 6) Please leave Part 2 in envelope!

1

Environment: context & factors external to individuals

NOT home environment; NOT household level

Reminders

- Please answer thoughtfully, thoroughly, and honestly. *What you say will not affect your funding and relationship with Cornell University in any way.*
- Data will be kept confidential.
- Comment boxes throughout survey
- Raise your hand if have questions
- Survey double-sided

2

Environmental Strategies/Approaches

- Definition: Efforts to change the physical, built environment or the social, cultural environment to increase people's access to healthy foods and physical activity
- Examples:
 - Assist with worksite wellness policies in other organizations
 - Work with agency staff to change foods offered to staff and audience
 - Collaborate with youth-serving agencies to improve children's access to nutrition and physical activity
 - Implement food/physical activity policies in your association
 - Serve on committees/coalitions that aim to change the community environment
 - e.g. - develop systems to increase residents' access to healthy foods (farmers' markets, CSAs)
 - work to improve trails, open schools, etc. for residents to exercise
 - get grocery stores and restaurants to provide healthier foods

5

What this is about

- Study objectives
 - 1) understand your practices and perspectives in obesity prevention
 - 2) investigate the barriers and facilitators involved in this work
- Survey Part 2
 - Using environmental approaches to address obesity – 5 ½ pg
 - 4 specific strategies/approaches – 8 pg
 - Supervisor behavior – 1 pg
 - Job information – 3 pg
 - Background information – 1 pg

3

Once you finish, please make sure your survey packet contains the following:

- 1) Signed consent form (Keep the other copy for yourself!)
- 2) Survey Part 1
- 3) Survey Part 2

Return your packet to Angela or drop in box.

Thank you very much!

6

Appendix D: Extension Nutrition Manager Survey Part I

HEALTH AND WELLNESS VIEWS

Please indicate how serious you think the following public health issues are in the United States today. This refers to the general population, not just the low-income. (Circle ONE for each issue.)

	Not a problem at all	Not serious	Neither	Serious	Very serious
1. Cancer	1	2	3	4	5
2. AIDS	1	2	3	4	5
3. Heart disease	1	2	3	4	5
4. Diabetes	1	2	3	4	5
5. Smoking	1	2	3	4	5
6. Obesity	1	2	3	4	5
7. Depression	1	2	3	4	5

Please indicate how much you agree with each of the following being a significant contributing factor to the obesity epidemic in the United States today. (Circle ONE for each factor.)

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
1. Genetics	1	2	3	4	5
2. Hormones/slow metabolism	1	2	3	4	5
3. Low self-esteem	1	2	3	4	5
4. Lack of willpower	1	2	3	4	5
5. Low income/unemployment	1	2	3	4	5
6. Lack of nutrition knowledge/skills	1	2	3	4	5
7. TV/screen time	1	2	3	4	5
8. Perceived price of healthy food	1	2	3	4	5
9. Driving culture (i.e. automobiles)	1	2	3	4	5
10. Availability of fatty and sugary foods	1	2	3	4	5
11. Power of the media/advertising	1	2	3	4	5
12. Neighborhood safety	1	2	3	4	5

JOB ROLE

The following statements are related to your role as an Extension nutrition educator. Please indicate how much you agree with each statement. (Circle ONE for each.)

	Strongly disagree		Neither			Strongly agree	
1. No matter what the odds, if I believe in something I will make it happen.	1	2	3	4	5	6	7
2. I am constantly on the lookout for ways to expand my program area.	1	2	3	4	5	6	7
3. If I see something I don't like, I fix it.	1	2	3	4	5	6	7
4. I love being a champion for my ideas, even against others' opposition.	1	2	3	4	5	6	7
5. I excel at identifying opportunities.	1	2	3	4	5	6	7
6. I will not stop contacting an agency partner until I hear from them.	1	2	3	4	5	6	7
7. If I believe in an idea, no obstacles will prevent me from making it happen.	1	2	3	4	5	6	7
8. I am always looking for better ways to do things.	1	2	3	4	5	6	7
9. I collaborate with partners to work on initiatives that are new to my program area.	1	2	3	4	5	6	7
10. I collaborate with partners to help them achieve <u>their</u> goals regardless of how much I can gain from it.	1	2	3	4	5	6	7
11. I collaborate to access participants for my programs.	1	2	3	4	5	6	7
12. I collaborate with the specific intent of making sustainable changes in how our community operates.	1	2	3	4	5	6	7
13. I collaborate with agency partners to expand my programs beyond low-income audiences.	1	2	3	4	5	6	7
14. I have a lot of freedom to decide what agencies I will collaborate with.	1	2	3	4	5	6	7
15. I need to consult with my supervisor before I accept requests from community organizations.	1	2	3	4	5	6	7
16. I have a lot of freedom to determine how I will spend my time on the job.	1	2	3	4	5	6	7
17. I have a lot freedom to decide what funding I will apply for.	1	2	3	4	5	6	7

JOB ROLE (continued)

Please indicate how much you agree with each statement. (Circle ONE for each.)

	Strongly disagree		Neither			Strongly agree	
	1	2	3	4	5	6	7
18. I can determine who to hire without my supervisor's input.	1	2	3	4	5	6	7
19. I can decide how my grant/program money will be spent, although I may need my supervisor's final approval.	1	2	3	4	5	6	7
20. I consider myself to be more of an educator than a manager.	1	2	3	4	5	6	7
21. I have developed a large network of colleagues and agency partners whom I can call on for support when I really need to get things done.	1	2	3	4	5	6	7
22. In my job, I know and am well connected to a lot of influential leaders.	1	2	3	4	5	6	7
23. I am good at using my connections and network to make things happen in my job.	1	2	3	4	5	6	7
24. I derive personal satisfaction from collegial relationships with other agency directors or managers.	1	2	3	4	5	6	7
25. I have developed <u>informal</u> relationships with agency partners.	1	2	3	4	5	6	7
26. I am knowledgeable of the politics of our partnering agencies.	1	2	3	4	5	6	7
27. I consider my skills to be more management-oriented than education-oriented.	1	2	3	4	5	6	7

Comments (optional):

You have finished Part 1 of the survey.

Please stop working and enjoy the rest of your breakfast!

Additional instructions will be given before you continue.

(Get more coffee or tea! You may need it for Part 2 of the survey! ☺)

Extension Nutrition Manager Survey Part II

USING ENVIRONMENTAL APPROACHES TO ADDRESS OBESITY

**** Remember to refer to the slide for examples of environmental strategies and approaches.****

1. On average, how many hours each week do you spend on tasks that aim to make environmental changes to support healthy eating and active play? Do NOT include efforts to change the home environment.

None 1-5 hours 6-10 hours 11-15 hours more than 15 hours

2. Which of the following best describes your involvement in using environmental approaches to address obesity in your work? (Choose ONE.)

- I currently do not use environmental approaches to address obesity and I am not planning to start in the next year.
- I currently do not use environmental approaches to address obesity, but I plan to start in the next year.
- I currently use environmental approaches to address obesity and I intend to continue doing it in the next year.
- I currently use environmental approaches to address obesity, but I do not intend to continue doing it next year.

Comments (optional): _____

The following sections are about what you think and feel about your job in using environmental approaches to address obesity. (Circle ONE for each pair.)

In my job, using environmental approaches to address obesity is:								
	Neither							
Unimportant	1	2	3	4	5	6	7	Important
Desirable	1	2	3	4	5	6	7	Undesirable
Difficult	1	2	3	4	5	6	7	Easy
Worthless	1	2	3	4	5	6	7	Valuable
Enjoyable	1	2	3	4	5	6	7	Unenjoyable
Unnecessary	1	2	3	4	5	6	7	Necessary
Interesting	1	2	3	4	5	6	7	Uninteresting

USING ENVIRONMENTAL APPROACHES TO ADDRESS OBESITY (continued)

Please indicate how much you agree with each of the following statements. (Choose ONE for each.)

Using environmental approaches to address obesity:	Strongly disagree		Neither			Strongly agree	
1. falls within the scope of my job.	-3	-2	-1	0	+1	+2	+3
2. is a priority in my work agenda.	-3	-2	-1	0	+1	+2	+3
3. is consistent with the mission of CCE.	-3	-2	-1	0	+1	+2	+3
4. is something I am asked to do.	-3	-2	-1	0	+1	+2	+3
5. requires a skill set other than the one I use to meet EFNEP or ESNY programming goals.	-3	-2	-1	0	+1	+2	+3
6. is compatible with EFNEP and ESNY guidelines.	-3	-2	-1	0	+1	+2	+3
7. conflicts with meeting “the numbers” for EFNEP or ESNY.	-3	-2	-1	0	+1	+2	+3
8. will contribute positively to obesity prevention.	-3	-2	-1	0	+1	+2	+3
9. will increase people’s awareness of obesity and its prevention.	-3	-2	-1	0	+1	+2	+3
10. has great potential in obesity prevention.	-3	-2	-1	0	+1	+2	+3

	Strongly disagree		Neither			Strongly agree	
11. I am not given clear directions on how to use environmental approaches to address obesity.	-3	-2	-1	0	+1	+2	+3
12. I know exactly what is required of me in using environmental approaches to address obesity in my job.	-3	-2	-1	0	+1	+2	+3
13. There are planned goals and objectives in my job to guide me in using environmental approaches to address obesity.	-3	-2	-1	0	+1	+2	+3

Comments (optional):

USING ENVIRONMENTAL APPROACHES TO ADDRESS OBESITY (continued)

The following sections are about what other people think about your job and what they do in using environmental approaches to address obesity.

Please indicate whether the following people would think that you should or should not use environmental approaches to address obesity. (Circle ONE for each party.)

	Should not		Neither			Should	
1. My supervisor	-3	-2	-1	0	+1	+2	+3
2. My staff	-3	-2	-1	0	+1	+2	+3
3. Colleagues	-3	-2	-1	0	+1	+2	+3
4. Agency partners	-3	-2	-1	0	+1	+2	+3
5. Campus faculty	-3	-2	-1	0	+1	+2	+3
6. Funders	-3	-2	-1	0	+1	+2	+3

Please indicate how important it is to you what the following people think about what you should do in your work. (Circle ONE for each party.)

	Extremely unimportant			Neither			Extremely important
1. My supervisor	1	2	3	4	5	6	7
2. My staff	1	2	3	4	5	6	7
3. Colleagues	1	2	3	4	5	6	7
4. Agency partners	1	2	3	4	5	6	7
5. Campus faculty	1	2	3	4	5	6	7
6. Funders	1	2	3	4	5	6	7

Please indicate how involved you think the following people are in using environmental approaches to address obesity. This is your perception of what they are doing in their work, regardless of your involvement. (Circle ONE for each party.)

	Not at all involved	Slightly involved	Moderately involved	Very involved	Extremely involved	Don't know
1. My supervisor	1	2	3	4	5	?
2. My staff	1	2	3	4	5	?
3. Colleagues	1	2	3	4	5	?
4. Agency partners	1	2	3	4	5	?
5. Campus faculty	1	2	3	4	5	?
6. Funders	1	2	3	4	5	?

USING ENVIRONMENTAL APPROACHES TO ADDRESS OBESITY (continued)

There are many personal, organizational, and community resources that may be available to you at work to allow you to use environmental approaches to address obesity. They include your knowledge and skills, salary, support from your supervisor, staff, and agency partners, and the readiness of the local community.

Please indicate how much you agree that each of the following resources is available to support your engagement in using environmental approaches to address obesity. (Choose ONE for each.)

	Strongly disagree		Neither			Strongly agree	
Personal knowledge and skills							
1. I have the knowledge and skills to conduct a community assessment, including gathering information from community and agency leaders about their views toward obesity and its prevention	1	2	3	4	5	6	7
2. I have the knowledge and skills to develop and implement action plans to make environmental changes to target obesity	1	2	3	4	5	6	7
3. I have the knowledge and skills to incorporate other projects that involve making environmental changes into my existing programs	1	2	3	4	5	6	7
Organizational resources							
4. Sources of my salary	1	2	3	4	5	6	7
5. My work time	1	2	3	4	5	6	7
6. Help from my staff	1	2	3	4	5	6	7
Agency resources							
7. Existing relationships with agency partners	1	2	3	4	5	6	7
8. Agency partners who are committed to making environmental changes to target obesity	1	2	3	4	5	6	7
9. Agency partners who have resources (funding, staff) to make environmental changes to target obesity	1	2	3	4	5	6	7
Campus resources							
10. Technical support from campus faculty and staff	1	2	3	4	5	6	7
11. FNEC Updates that focus on using environmental approaches to address obesity	1	2	3	4	5	6	7
12. NutritionWorks' online course, "Preventing Childhood Obesity: An Ecological Approach"	1	2	3	4	5	6	7

USING ENVIRONMENTAL APPROACHES TO ADDRESS OBESITY (continued)

Please indicate how much you agree that each of the following resources is available to support your engagement in using environmental approaches to address obesity. (Choose ONE for each.)

	Strongly disagree		Neither			Strongly agree		
Community resources and readiness								
13. The political and social climate in my community seems to be “right” for starting collaborative projects that make environmental changes to target obesity	1	2	3	4	5	6	7	
14. Leaders in my community are ready to do something about obesity	1	2	3	4	5	6	7	
15. Agencies in my community have a history of working together	1	2	3	4	5	6	7	
Other								
16. Community coalitions and committees teach me to make environmental changes to target obesity	1	2	3	4	5	6	7	
17. Technical support from funders	1	2	3	4	5	6	7	

Comments (optional):

USING ENVIRONMENTAL APPROACHES TO ADDRESS OBESITY (continued)

The following section is about what you think in general about using environmental approaches to address obesity.

Please indicate how much you agree with each of the following statements. (Choose ONE for each.)

	Strongly disagree		Neither			Strongly agree	
1. I would rather teach nutrition to people than collaborate with partners to make environmental changes to address obesity.	1	2	3	4	5	6	7
2. If I wanted to, I could use environmental approaches to address obesity.	1	2	3	4	5	6	7
3. Most people I associate with in my job are working to address obesity on the environmental level.	1	2	3	4	5	6	7
4. Using environmental approaches to address obesity is beyond my control.	1	2	3	4	5	6	7
5. In my job, I am expected to address obesity on the environmental level.	1	2	3	4	5	6	7
6. It is entirely up to me whether or not I use environmental approaches to address obesity in my work.	1	2	3	4	5	6	7

7. Most people who are important to me in my job think that I _____ address obesity on the environmental level.	Should not		Neither			Should	
	1	2	3	4	5	6	7
8. The people I associate with in my job (including supervisor, colleagues, agency partners) and whose opinions I value would _____ of my using environmental approaches to address obesity.	Strongly disapprove		Neither			Strongly approve	
	1	2	3	4	5	6	7
9. How confident are you in your ability to use environmental approaches to address obesity?	Not at all confident		Neither			Highly confident	
	1	2	3	4	5	6	7
10. For me, using environmental approaches to address obesity would be _____.	Highly impossible		Neither			Highly possible	
	1	2	3	4	5	6	7
11. How much control do you believe you have over using environmental approaches to address obesity?	No control at all		Neither			Complete control	
	1	2	3	4	5	6	7

The following section contains four specific strategies or approaches that you may use or have used to address obesity in your work. Everybody’s work context is different, so not everyone will use the same strategies or any or all of the strategies. It is okay if you are not using them! We simply want to understand your work better. Please answer frankly and thoughtfully. Thank you!

OTHER ORGANIZATIONS’ ENVIRONMENTS

Strategy 1. Educate agency leaders and staff to improve their organizations’ environments related to food and physical activity

1. Which of the following statements best describes your/your staff’s involvement in educating agency leaders and staff to improve their organizations’ environments related to food and physical activity? (Circle ONE.)
 - a. We currently do not do this and we do not plan to start in the next year.
 - b. We currently do not do this, but we plan to start in the next year.
 - c. We currently do this and we intend to continue doing it in the next year.
 - d. We currently do this, but we do not intend to continue doing it next year.

Comments (optional): _____

2. To what extent do you or your staff do the following with other organizations? (Circle ONE for each.)

	Almost never	Seldom	Sometimes	Often	Almost always
1. We make recommendations and provide information on ways to increase the organizations’ staff and audience access to healthy foods and physical activity.	1	2	3	4	5
2. We work with organizations to conduct assessments and develop and implement action plans to <u>make environmental changes</u> to increase their staff and audience access to healthy foods and physical activity.	1	2	3	4	5
3. We follow-up with organizations to evaluate their progress in <u>making environmental changes</u> to increase their staff and audience access to healthy foods and physical activity.	1	2	3	4	5

OTHER ORGANIZATIONS' ENVIRONMENTS (continued)

Strategy 1. Educate agency leaders and staff to improve their organizations' environments related to food and physical activity

3. Please indicate whether the following people would think that you should or should not educate agency leaders and staff to improve their organizations' environments related to food and physical activity. (Circle ONE for each party.)

	Should not			Neither			Should
1. My supervisor	-3	-2	-1	0	+1	+2	+3
2. My staff	-3	-2	-1	0	+1	+2	+3
3. Colleagues	-3	-2	-1	0	+1	+2	+3
4. Agency partners	-3	-2	-1	0	+1	+2	+3
5. Campus faculty	-3	-2	-1	0	+1	+2	+3
6. Funders	-3	-2	-1	0	+1	+2	+3

4. Please indicate how much you agree with each of the following statements. (Circle ONE for each.)

Educating agency leaders and staff to improve their organizations' environments related to food and physical activity:	Strongly disagree		Neither			Strongly agree	
1. falls within the scope of my job.	-3	-2	-1	0	+1	+2	+3
2. is a priority in my work agenda.	-3	-2	-1	0	+1	+2	+3
3. is something I am asked to do.	-3	-2	-1	0	+1	+2	+3
4. will contribute positively to obesity prevention.	-3	-2	-1	0	+1	+2	+3

The following resource is available to me for educating agency leaders and staff to improve their organizations' environments related to food and physical activity:	Strongly disagree		Neither			Strongly agree	
1. Sources of my salary	1	2	3	4	5	6	7
2. My work time	1	2	3	4	5	6	7
3. Help from my staff	1	2	3	4	5	6	7
4. Help from my supervisor	1	2	3	4	5	6	7
5. Help from agency partners	1	2	3	4	5	6	7
6. Technical support from campus faculty and staff	1	2	3	4	5	6	7

SCHOOLS/YOUTH-SERVING AGENCIES

Strategy 2. Collaborate with schools and/or youth-serving agencies to develop and implement action plans to improve their environment related to food and physical activity

1. Which of the following statements best describes your/your staff's involvement in collaborating with schools/youth-serving agencies to develop and implement action plans to improve their environment related to food and physical activity? (Circle ONE.)

- a. We currently do not do this and we do not plan to start in the next year.
- b. We currently do not do this, but we plan to start in the next year.
- c. We currently do this and we intend to continue doing it in the next year.
- d. We currently do this, but we do not intend to continue doing it next year.

Comments (optional): _____

2. To what extent do you or your staff do the following specifically with schools/youth-serving agencies? (Circle ONE for each.)

	Almost never	Seldom	Sometimes	Often	Almost always
1. We make recommendations (e.g. menu planning) and provide information to schools/agencies on ways to increase children's access to healthy foods and physical activity.	1	2	3	4	5
2. We work with schools/agencies to conduct assessments and develop and implement action plans to <u>make environmental changes</u> to increase children's access to healthy foods and physical activity.	1	2	3	4	5
3. We follow-up with schools/agencies to evaluate their progress in <u>making environmental changes</u> to increase children's access to healthy foods and physical activity.	1	2	3	4	5

3. Please indicate whether the following people would think that you should or should not collaborate with schools/youth-serving agencies to develop and implement action plans to improve their environment related to food and physical activity. (Circle ONE for each party.)

	Should not			Neither			Should
1. My supervisor	-3	-2	-1	0	+1	+2	+3
2. My staff	-3	-2	-1	0	+1	+2	+3
3. Colleagues	-3	-2	-1	0	+1	+2	+3
4. Schools/agency partners	-3	-2	-1	0	+1	+2	+3
5. Campus faculty	-3	-2	-1	0	+1	+2	+3
6. Funders	-3	-2	-1	0	+1	+2	+3

ASSOCIATION WORKSITE WELLNESS

Strategy 3. Develop and implement worksite wellness policies related to food and physical activity in your CCE association

1. Which of the following statements best describes your and/or your staff's involvement in developing and implementing worksite wellness policies related to food and physical activity in your association? (Circle ONE.)
 - a. We currently do not do this and we do not plan to start in the next year.
 - b. We currently do not do this, but we plan to start in the next year.
 - c. We currently do this and we intend to continue doing it in the next year.
 - d. We currently do this, but we do not intend to continue doing it next year.

Comments (optional): _____

2. To what extent do you/your staff do the following in your association? (Circle ONE for each.)

	Almost never	Seldom	Sometimes	Often	Almost always
1. We make recommendations and provide information to our colleagues on ways to increase our staff and audience access to healthy foods and physical activity.	1	2	3	4	5
2. We work with our colleagues to conduct assessments and develop and implement worksite wellness policies to increase our staff and audience access to healthy foods and physical activity.	1	2	3	4	5
3. We work with our colleagues to evaluate our progress in implementing worksite wellness policies to increase our staff and audience access to healthy foods and physical activity.	1	2	3	4	5

3. Please indicate whether the following people would think that you should or should not develop and implement worksite wellness policies related to food and physical activity in your association. (Circle ONE for each party.)

	Should not			Neither			Should
1. My supervisor	-3	-2	-1	0	+1	+2	+3
2. My staff	-3	-2	-1	0	+1	+2	+3
3. Colleagues	-3	-2	-1	0	+1	+2	+3
4. Campus faculty	-3	-2	-1	0	+1	+2	+3
5. Funders	-3	-2	-1	0	+1	+2	+3

COMMITTEES AND COMMUNITY COALITIONS

Strategy 4. Serve on committees and/or coalitions that make environmental changes related to food and physical activity in your community

1. Which of the following statements best describes your/your staff's involvement in serving on committees/coalitions that make environmental changes related to food and physical activity in your community? (Circle ONE.)
- We currently do not do this and we do not plan to start in the next year.
 - We currently do not do this, but we plan to start in the next year.
 - We currently do this and we intend to continue doing it in the next year.
 - We currently do this, but we do not intend to continue doing it next year.

Comments (optional): _____

2. To what extent do you/your staff do the following? (Circle ONE for each.)

	Almost never	Seldom	Sometimes	Often	Almost always
1. In these working groups, I/my staff make recommendations and provide information on ways to increase residents' access to healthy foods and physical activity.	1	2	3	4	5
2. In these working groups, I/my staff support others' projects that <u>make environmental changes</u> in our community to increase residents' access to healthy foods and physical activity.	1	2	3	4	5
3. In these working groups, I/my staff take the lead to work on projects that <u>make environmental changes</u> in our community to increase residents' access to healthy foods and physical activity.	1	2	3	4	5

3. Please indicate whether the following people would think that you should or should not serve on committees/coalitions that make environmental changes related to food and physical activity in your community. (Circle ONE for each party.)

	Should not			Neither			Should
1. My supervisor	-3	-2	-1	0	+1	+2	+3
2. My staff	-3	-2	-1	0	+1	+2	+3
3. Colleagues	-3	-2	-1	0	+1	+2	+3
4. Agency partners	-3	-2	-1	0	+1	+2	+3
5. Campus faculty	-3	-2	-1	0	+1	+2	+3
6. Funders	-3	-2	-1	0	+1	+2	+3

COMMITTEES AND COMMUNITY COALITIONS (continued)

Strategy 4. Serve on committees and/or coalitions that make environmental changes related to food and physical activity in your community

4. Please indicate how much you agree with each of the following statements. (Circle ONE for each.)

Serving on committees/coalitions that make environmental changes related to food and physical activity in our community:	Strongly disagree		Neither			Strongly agree	
	-3	-2	-1	0	+1	+2	+3
1. falls within the scope of my job.	-3	-2	-1	0	+1	+2	+3
2. is a priority in my work agenda.	-3	-2	-1	0	+1	+2	+3
3. is something I am asked to do.	-3	-2	-1	0	+1	+2	+3
4. will contribute positively to obesity prevention.	-3	-2	-1	0	+1	+2	+3

The following resource is available to me for serving on committees/coalitions that make environmental changes related to food and physical activity in our community:	Strongly disagree		Neither			Strongly agree	
	1	2	3	4	5	6	7
1. Sources of my salary	1	2	3	4	5	6	7
2. My work time	1	2	3	4	5	6	7
3. Help from my staff	1	2	3	4	5	6	7
4. Help from my supervisor	1	2	3	4	5	6	7
5. Help from agency partners	1	2	3	4	5	6	7
6. Technical support from campus faculty and staff	1	2	3	4	5	6	7

Comments (optional):

SUPERVISOR BEHAVIOR

1. Who is your immediate supervisor? (Circle ONE.)

Executive director

Issue leader

Other: _____

2. The following statements are about what your immediate supervisor does in relationship to your job. Please indicate how much you agree with each statement. (Circle ONE for each.)

My supervisor:	Strongly disagree		Neither			Strongly agree	
1. is always available to meet with me when I seek help from him/her.	1	2	3	4	5	6	7
2. encourages me to develop my skills and interests.	1	2	3	4	5	6	7
3. develops connections in our community that directly facilitate my work.	1	2	3	4	5	6	7
4. makes decisions that affect my program area <u>without</u> consulting me.	1	2	3	4	5	6	7
5. encourages me to speak up when I disagree with a decision.	1	2	3	4	5	6	7
6. helps me find more time to work on projects that involve using environmental approaches to address obesity.	1	2	3	4	5	6	7
7. understands what it means to use environmental approaches to address obesity.	1	2	3	4	5	6	7
8. helps me secure funding for projects that involve using environmental approaches to address obesity.	1	2	3	4	5	6	7

Comments (optional):

JOB INFORMATION

Please circle the answers that best apply to you or fill in the blanks.

1. When did you start your present job in your CCE association? Month _____ Year _____
2. Including your present job, how many years total have you been working for CCE? ____ years
3. How many years of experience do you have working in other social services / community / non-profit organizations? _____ years
4. On average, how many hours do you work each week in your CCE job? _____ hours
5. On average, how many hours each week do you spend conducting direct nutrition education in your community, including time spent on curriculum preparation and documentation? This means you are the person doing the teaching, not your staff.
 None 1-2 hours 3-4 hours 5-6 hours more than 6 hours
6. How many staff (full-time and part-time) do you currently supervise? _____
7. Please indicate the sources of your salary and % distribution for each. The numbers should add up to 100%.
 EFNEP _____% ESNY _____% County _____% Eat Well Play Hard _____%
 Other: _____, _____%; _____, _____%
8. Please circle the answers that apply to you.

	I manage this program or supervise staff who manages this program.		Although I do not manage this program, it exists in my county.		
EFNEP	Yes	No	Yes	No	Don't know
ESNY	Yes	No	Yes	No	Don't know
Farm-to-School	Yes	No	Yes	No	Don't know
Eat Well Play Hard	Yes	No	Yes	No	Don't know
Steps to a Healthier NY	Yes	No	Yes	No	Don't know
Healthy Heart	Yes	No	Yes	No	Don't know
Safe Routes to School	Yes	No	Yes	No	Don't know

JOB INFORMATION (continued)

Please indicate how each of the following statements is desirable or undesirable in your job.
(Circle ONE for each.) **Please raise your hand if you find this section confusing.**

Doing work that:	Extremely undesirable		Neither			Extremely desirable	
1. falls within the scope of my job	-3	-2	-1	0	+1	+2	+3
2. I consider a priority in my work agenda	-3	-2	-1	0	+1	+2	+3
3. is consistent with the mission of CCE	-3	-2	-1	0	+1	+2	+3
4. other people ask me to do	-3	-2	-1	0	+1	+2	+3
5. requires a skill set different from the one used in meeting EFNEP or ESNY programming goals	-3	-2	-1	0	+1	+2	+3
6. is compatible with EFNEP and ESNY guidelines	-3	-2	-1	0	+1	+2	+3
7. conflicts with meeting “the numbers” for EFNEP or ESNY	-3	-2	-1	0	+1	+2	+3
8. contributes positively to obesity prevention	-3	-2	-1	0	+1	+2	+3
9. increases people’s awareness of obesity and its prevention	-3	-2	-1	0	+1	+2	+3
10. has great potential in preventing obesity	-3	-2	-1	0	+1	+2	+3
11. saves our association money	-3	-2	-1	0	+1	+2	+3
12. benefits our CCE program participants	-3	-2	-1	0	+1	+2	+3

	Extremely undesirable		Neither			Extremely desirable	
13. Not having clear directions at work	-3	-2	-1	0	+1	+2	+3
14. Knowing exactly what is required of me in my job	-3	-2	-1	0	+1	+2	+3
15. Having planned goals and objectives in my job	-3	-2	-1	0	+1	+2	+3
16. Investing in ourselves	-3	-2	-1	0	+1	+2	+3
17. Imposing our values on other people	-3	-2	-1	0	+1	+2	+3

JOB INFORMATION (continued)

Back to the list of resources that may be available to you at work. Please indicate how likely you would be to use environmental approaches to address obesity IF you had each of the following resources. (Choose ONE for each.) ****Please raise your hand if you find this section confusing.****

	Much less likely		Neither			Much more likely	
Personal knowledge and skills							
1. Knowledge and skills to conduct a community assessment, including gathering information from community and agency leaders about their views toward obesity and its prevention	-3	-2	-1	0	+1	+2	+3
2. Knowledge and skills to develop and implement action plans to make environmental changes to target obesity	-3	-2	-1	0	+1	+2	+3
3. Knowledge and skills to incorporate other projects that involve making environmental changes into my existing programs	-3	-2	-1	0	+1	+2	+3
Organizational resources							
4. Sources of my salary	-3	-2	-1	0	+1	+2	+3
5. My work time	-3	-2	-1	0	+1	+2	+3
6. Help from my staff	-3	-2	-1	0	+1	+2	+3
Supervisor support							
7. My supervisor helps me find more time to work on projects that involve using environmental approaches to address obesity	-3	-2	-1	0	+1	+2	+3
8. My supervisor understands what it means to use environmental approaches to address obesity	-3	-2	-1	0	+1	+2	+3
9. My supervisor helps me secure funding for projects that involve using environmental approaches to address obesity	-3	-2	-1	0	+1	+2	+3
Agency resources							
10. Existing relationships with agency partners	-3	-2	-1	0	+1	+2	+3
11. Agency partners who are committed to making environmental changes to target obesity	-3	-2	-1	0	+1	+2	+3
12. Agency partners who have resources (funding, staff) to make environmental changes to target obesity	-3	-2	-1	0	+1	+2	+3

JOB INFORMATION (continued)

Please indicate how likely you would be to use environmental approaches to address obesity IF you had each of the following resources. (Choose ONE for each.)

	Much less likely		Neither			Much more likely	
Campus resources							
13. Technical support from campus faculty and staff	-3	-2	-1	0	+1	+2	+3
14. FNEC Updates that focus on using environmental approaches to address obesity	-3	-2	-1	0	+1	+2	+3
15. NutritionWorks' online course, "Preventing Childhood Obesity: An Ecological Approach"	-3	-2	-1	0	+1	+2	+3
Community resources and readiness							
16. The political and social climate in my community seems to be "right" for starting collaborative projects that make environmental changes to target obesity	-3	-2	-1	0	+1	+2	+3
17. Leaders in my community are ready to do something about obesity	-3	-2	-1	0	+1	+2	+3
18. Agencies in my community have a history of working together	-3	-2	-1	0	+1	+2	+3
Other							
19. Community coalitions and committees teach me to make environmental changes to target obesity	-3	-2	-1	0	+1	+2	+3
20. Technical support from funders	-3	-2	-1	0	+1	+2	+3

Comments (optional):

