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Youth Advocacy for Obesity Prevention: Measurement Evaluation, Mediators of Advocacy Readiness and Receptivity, and Processes of Policy Change

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy

in

Clinical Psychology

by

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The Dissertation of Rachel Anne Millstein is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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Aim 1, in part, is being prepared for publication. Aims 2 and 3 together are being prepared for publication. Both publications based on this dissertation will be co-authored by Susan I. Woodruff, Christine C. Edwards, Leslie S. Linton, and James F. Sallis. The dissertation author was the primary investigator and author of this material.

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ABSTRACT OF THE DISSERTATION

Youth Advocacy for Obesity Prevention: Measurement Evaluation, Mediators of Advocacy Readiness and Receptivity, and Processes of Policy Change

by

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Doctor of Philosophy in Clinical Psychology

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Advocacy can create a social paradigm shift surrounding responsibility for obesity prevention. Youth advocacy for obesity prevention is a promising intervention with potential for political, environmental, social, and individual changes, but has not been studied in a systematic, theory-driven way.

Youth advocacy training groups were recruited for the present study. Groups chose community audits of modifiable health environment factors (parks, fast food outlets, school, stores, outdoor advertising). Youth (baseline n=136, matched pre-post pairs n=92) and adult group leaders (baseline n=47, follow-up n=45) completed surveys

to assess advocacy experiences. Aim 1: Create advocacy readiness and receptivity subscales using confirmatory factor analysis (CFA) and describe the psychometric properties of the four surveys to evaluate youth advocacy programs. Aim 2: Assess youth changes on behavioral/attitudinal subscales pre- and post-advocacy, using paired t-tests. Aim 3: Create an advocacy readiness/receptivity index and evaluate roles of group, youth, and leadership factors on readiness/receptivity using generalized linear mixed models (GLMM). Aim 4: Conduct a preliminary analysis of advocacy success based on adult leadership variables and group-level processes using GLMM.

Youth came from 21 groups, ranged in age from 9-22, and 2/3 were female. Aim 1: The proposed factor structure held for most youth subscales. Aim 2: Two of the six attitudes/beliefs subscale scores, and four of the five knowledge/skills subscale scores increased significantly. Aim 3: GLMM indicated that four of the youth attitude/behavior subscales were significantly positively associated with advocacy readiness/receptivity. Aim 4: The only significant association was adults' prior experience with nutrition/physical activity.

These analyses represent the first theory-driven, systematic study of measures and outcomes for youth advocacy for obesity prevention. The proposed factor structure was upheld or modified, and the resulting scales can be used in future studies. Significant improvements on six youth subscales indicated youth involvement in advocacy led to multiple positive psychosocial and knowledge-based changes. There were methodological limitations: multivariate analyses require larger sample sizes, so future studies should confirm these findings. Positive youth changes, adult leader experiences,

and several successful advocacy projects point to an important role for well-designed and controlled future advocacy studies.

INTRODUCTION

"Knowing is not enough, we must apply. Willing is not enough, we must do."

-Johann von Goethe

"Widespread support for changes in nutrition and physical activity requires alternative framing- that is, engaging interest groups not traditionally focused on childhood obesity- to achieve the critical mass necessary for a social movement."

-Klein & Dietz, 2010; p. 389

Obesity's burden and history

Overweight and obesity continue to represent important global public health, financial, and clinical challenges. The prevalence of overweight and obesity among adults and youth has increased over the past three decades (Ogden & Carroll, 2010). Current United States estimates are that about two-thirds of adults and one-fifth of children are overweight or obese, and specifically one-third of adults and 17% of youth are classified as obese (Flegal, Carroll, Kit, & Ogden, 2012; Kettel Khan et al., 2009; Ogden, Carroll, Kit, & Flegal, 2012). Recent evidence suggests that these prevalences are reaching a plateau for adults and some youth sub-groups (Ogden et al., 2010, Ogden, Carroll, Kit, & Flegal, 2012). Obesity carries with it many widely known detrimental physiological and psychological consequences (AAP, 2003; Koplan, Liverman, & Kraak, 2005). Not only is it associated with health problems among youth, but it is also a predictor of adult morbidity and mortality (Freedman, Dietz, Srinivasan, & Berenson, 1999). Of the associated conditions, heart disease, type 2 diabetes, hypertension, low

self-esteem, stigmatization, and depression are some of the most concerning consequences of obesity, particularly among youth (AAP, 2003).

The youth obesity prevention literature includes many sophisticated analyses, methods, and conclusions, yet the problem persists (Oude Luttikhuis et al., 2009; Waters et al., 2011). Obesity prevention strategies to-date have involved individual (Sallis et al., 2006), social (Sallis et al., 2006), and more recently, environment and policy interventions (Mello, Studdert, & Brennan, 2006; Sallis & Glanz, 2009; Sallis et al., 2006; Sallis, Bauman, & Pratt, 1998; Schmid, Pratt, & Howze, 1995). The scope of the obesity problem is large enough that it requires new, larger-scale strategies in addition to those that have been implemented thus far (Millstein & Sallis, 2011).

Knowledge about the perils and disheartening statistics surrounding obesity in the US and elsewhere is widely available. However, as Goethe pointed out in the 18th century, the knowledge that individuals and societies have is not an effective enough tool to bring about changes in the epidemic. While knowing and willing can be the impetus for the processes of change, the solutions for obesity prevention rely on broad-based actions for social, environmental, and political changes that can affect whole populations (Koplan, Liverman, & Kraak, 2005; WHO, 2004).

Advocacy's possibilities

One promising, though under-studied and under-evaluated intervention, is advocacy for nutrition/physical activity environment and policy changes. Advocacy refers to the process of increasing support for, recommending, and arguing to promote a cause or policy (Carlisle, 2000; Martin, 2010; WHO, 1995). Advocacy has the potential to involve wide swaths of different populations and is at its core a grassroots, community

change-based set of actions. Constructs such as perceived incentive value, outcome expectancies, perceived self-efficacy, perceived policy control, leadership competence, and sense of community can influence individual attitudes (Winkleby et al., 2001), as well as skills and behaviors that include media contact, public participation, and vocalizing one's beliefs (Winkelby et al., 2004). In the political, health, and social justice fields (among others), advocacy has become successful and commonly-used to bring about changes at multiple levels of influence (Balsano, 2005; Dalrymple, 2005; Kim, Crutchfield, Williams, & Hepler, 1998). Advocacy includes components of empowerment, which involves enabling people to gain control, power, and authority over their environments to enact changes through active participation and collaboration (Chinman & Linney, 1998; Kieffer, 1984; Rappaport, 1987; Zimmerman, 1990). Successful advocacy depends on the empowerment of the people and groups involved.

In their article, "Childhood Obesity: The New Tobacco," Klein and Dietz (2010) suggest that it will take a social movement-type change to bring about the next phase of obesity prevention: the phase in which it becomes a grassroots social norm with widespread consequences. The authors note that, "…there is a need for sustained community innovations to improve nutrition and increase physical activity in medical, child care, school, and community settings. Coordinated, comprehensive, and complementary efforts at multiple levels are likely to be required" (Klein & Dietz, 2010, p. 391). These statements echo an earlier call for population level changes in chronic disease risk factors: "A contemporary public health revolution must respond to chronic diseases such as cardiovascular disease and cancer that have complex and multiple causes" (Schmid, Pratt, & Howze, 1995, p. 1207). The American Academy of Pediatrics

and Institute of Medicine also recognize the need for advocacy and collaboration across sectors in order to combat obesity (Davis et al., 2007; Parker, Burns, & Sanchez, 2009). Advocacy is a multi-level intervention that can integrate diverse constituents and stake-holders who can influence obesity. Advocacy (or civic engagement) can act as a centralized mechanism to channel initiatives across levels (Minkoff, 1997; Putnam, 1993), including policy, environmental, social, and individual levels (Millstein & Sallis, 2011).

Advocacy and tobacco control

The analogues for obesity prevention's next direction and the tobacco control movement's successes in creating a social paradigm shift are clear (Brownell & Warner, 2009; Klein & Dietz, 2010; Mello, Studdert, & Brennan, 2006). Political changes, as seen in the tobacco, alcohol, and drug control histories, tend to follow when a social health condition has an established research and science background and social stigma (Mello, Studdert, & Brennan, 2006). While the tobacco control history benefitted from a common opposition source (the tobacco industry) and a clearly-identifiable source problem (tobacco use), the social changes that took place from the 1960's through the present day bear striking similarity to what needs to happen to quell the current global chronic disease threats related to obesity.

Advocacy, tobacco control, and youth. Why are youth a meaningful target for advocacy and prevention efforts? First, as with tobacco, health habits that can prevent obesity develop primarily in childhood and adolescence (Davis et al., 2007). Involving and engaging youth in the advocacy process may represent a particularly powerful strategy to effect environmental and policy change. As Mello, Studdert, and Brennan

pointed out in their 2006 article on obesity and public health law, "…initiatives are most likely to gain acceptance if they focus on children and adolescents" and "…there is a greater political tolerance for legal interventions on their [youth's] behalf-this is a clear lesson from the history of tobacco control" (Mello, Studdert, & Brennan, 2006, p. 2607). Third, not only can youth advocacy benefit society, but the benefits are bidirectional. Advocacy engagement efforts can improve a variety of psychosocial processes including self-esteem, self-efficacy, and feelings of empowerment (Chinman & Linney, 1998, Wallerstein & Sanchez-Merki, 1994). Finally, young people tend to possess enthusiasm and optimism that can be harnessed to promote community-based changes. For example, "…our findings indicate that when teens are given the opportunity to become actively involved in addressing the advertising, availability, and use of tobacco, alcohol, and other drugs, they can effect change in their schools and communities. The changes achieved by the teens demonstrate that they were successful in persuading policy makers at both the school and community levels to modify environmental influences on substance use." (Winkelby et al. 2001, p. 436).

There are several examples in the literature of successful youth advocacy programs for tobacco and substance control; however, the scientific base of evidence and evaluation of such methods is still small (Altman & Feighery, 2004). Even the definitions and programs of advocacy and empowerment often differ across studies (Altman & Feighery, 2004). One after-school advocacy program worked with at-risk high school students to reduce substance use and increase community advocacy and policy-level substance control measures (Tencati et al., 2002; Winkleby et al., 2001). While this program did not reduce individual alcohol, tobacco, and marijuana use, the

teens did increase their advocacy skills and engage in more community advocacy practices following the intervention, leading to policy changes (Winkleby et al., 2001). A similar advocacy and education intervention produced a reduction in regular smoking among high school students, as well as increased social and community advocacy (Winkleby et al., 2004). Another set of studies (American Legacy Foundation's Statewide Youth Movement Against Tobacco Use (SYMATU)) examined the conceptual and practical factors involved in successful youth empowerment and advocacy programs in tobacco control. The Holden et al. (2004a) conceptual framework for youth empowerment included the following domains: predisposing youth characteristics, collective participation, group structure, adult and institutional involvement, and group climate. Their outcomes were conceptualized at the individual, group, community, and society-wide levels. A related study found that the following components of individual participation were associated with youth empowerment: counter-industry and interpersonal confidence, perceived sociopolitical control, participatory competence, knowledge of resources, assertiveness, and advocacy (Holden et al., 2004b, 2005). Another program designed to combat alcohol, drugs, and tobacco use contributed to the field's knowledge of designing effective youth engagement, empowerment, and advocacy programs (Ribisl et al., 2004; Wilson et al., 2006).

Advocacy, obesity, and youth

While the primary diseases related to tobacco was cancer and cardiovascular disease, obesity is associated with broader consequences, now well established: type II diabetes, cardiovascular disease, hypertension, cancers, musculoskeletal problems, mental health disorders, and others (AAP 2003; Barlow et al., 2007). Obesity is

recognized to have multiple contributors, from genetics to the epidemiologic level, including those from the food environment to individual eating behaviors, social group preferences, as well as the physical activity neighborhood environment to individual physical activity behaviors (Koplan, Liverman, & Kraak, 2005; Sallis & Glanz, 2009). Thus, obesity prevention advocacy can have many different and simultaneous targets for change. Youth advocacy can be a potentially powerful tool to influence changes to nutrition and physical activity environments and policies as well as produce co-benefits for youths' well-being. Many obesity prevention efforts have focused on youth (Koplan, Liverman, & Kraak, 2005), however, youth advocacy for obesity prevention has not yet been established as a widely used strategy.

As part of the movement to bring youth advocacy to obesity prevention in a scientific and measurable way, a conceptual model was developed (by this author and advisor) to describe the inputs, outputs, and advocacy processes that may act together to bring about multi-level changes needed to achieve obesity prevention (Millstein & Sallis, 2011).

Elements of youth advocacy

Figure 1 presents a model for understanding the multiple and overlapping influences on youth advocacy and the health behaviors related to childhood obesity prevention (e.g., nutrition and physical activity). Though the model focuses on the processes and factors involved with youth advocacy, much of its content can be generalized to non-youth advocacy groups.

Model Structure

The boxes in the model represent levels of presumed influence or outcome, ranging from individual to policy. The boxes at the top are inputs, which can be mediators and moderators of advocacy actions and elements of advocacy training. At the center are characteristics of advocacy programs and behaviors. The bottom boxes are the desired outcomes of advocacy efforts at the multiple levels. The structure of the model is such that both inputs and outcomes are conceptualized in multiple levels. The levels of the model overlap to indicate that each domain, while separate in many ways, also interacts with other levels to produce changes. For example, individual self-efficacy for advocacy behavior can interact with group norms about advocacy. Also, neighborhood SES may interact with legislative representation and power. The present model draws on models from a variety of literatures: tobacco youth advocacy (Holden et al., 2004), policy and environmental change for obesity prevention (Samuels & Associates, 2008), youth empowerment (Chinman & Linney, 1998), physical activity policy (Schmid, Pratt, & Witmer, 2006), and ecological models of health behavior/active living (Booth et al., 2001; Sallis et al., 2006). Advocacy can be a central, unifying, and energizing process that channels the various levels of inputs into the corresponding output goals.

The skills and goals that combine to form the advocacy core, or "engine," include the factors described in Table 1 (Also see Martin, 2010 for summary). The core refers to process of training and implementing advocacy behaviors. The training can be applied to both changing advocacy behaviors and the nutrition and physical activity behaviors so the youth can speak from experience and derive multiple benefits. The education and skills development elements refer to the training program. The behavior and informed public

participation/broad engagement elements refer to the implementation of advocacy projects.

The education goals encompass a range of topics and provide the necessary background and context for building successful advocacy behaviors. Advocates need to have or develop a variety of skills to be effective in both changing their health behaviors and in being effective advocates. Those listed in Table 1 are often considered to be core skills for successful advocates (Martin, 2010; WHO, 1995; Winkleby et al., 2001). Skill development should build self-efficacy to engage in the core advocacy behaviors. The behavior and informed public participation/broad engagement elements refer to the implementation of advocacy projects. The important communication, assessment, and presentation behaviors listed in Table 1 may be influenced by behavioral models such as the Social Cognitive Theory (Bandura, 1977) and the Transtheoretical Model (Prochaska & DiClemente, 1983), but other models could also be applied. A more distal goal is for youth to participate in groups and programs beyond the initial advocacy training. By becoming advocates, they will be able to join forces with other groups and policy makers to have a broader effect and signal that the advocacy behavior is being sustained.

The following sections describe the key elements of each of the levels of influence and outcomes. The main distinction between influences and outcomes is usually timing. The pre-training elements provide the context for training and may modify the content of training and how it is received by the youth. The purpose of the training is to empower youth to use the available resources to change outcomes. Therefore, youth may experience changes through this process, as may policies that are

intended to change the built and social environments. In the sections below, the influence and outcome aspects of each element are described together.

Individual factors. The individual level domain includes personal attributes, most of which are relevant to advocacy and nutrition and physical activity behaviors. Most of the individual factors refer to psychological processes of change. The goal of training should be to facilitate change in both categories of outcomes (nutrition and physical activity and advocacy), as the goal is healthier children who are also effective advocates. Some of these individual attributes are expected to change through the training and process of advocacy (e.g., feelings of empowerment and self-efficacy), and others are immutable in the short-term (e.g. metabolic phenotype and SES). The skills and perceived barriers that youth bring to an advocacy project will inherently influence the training process and are likely to change in important ways following an advocacy intervention (Holden et al., 2004). Given the breadth and complexity of the individual level inputs and outcomes, not all of them will be discussed.

Individual level dimensions include self-efficacy (Bandura, 1977), self-esteem (Rosenberg, 1965), empowerment (Zimmerman & Rappaport, 1988; Zimmerman, 1995), attitudes, behaviors/skills, and barriers, all of which influence nutrition, physical activity, and advocacy behaviors (Bandura, 1977; Prochaska & DiClemente, 1983). Feelings of self-efficacy and empowerment are expected to be central in the advocacy process, both as inputs and outcomes (Chinman & Linney, 1998; Holden et al., 2004; Holden et al., 2005; Zimmerman & Rappaport, 1988). Empowerment includes feelings of leadership, feelings of alienation (inverse), mastery, sense of competence, desire/willingness to take action, and perceived control or desire for control (Zimmerman & Rappaport, 1988). The

attitudes of interest include a sense of community and civic duty (Lakin & Mahoney, 2006), perceived policy control, perceived incentive value (Winkelby et al., 2001), confidence in the group and in oneself, and intentions or motivation for involvement (Holden et al., 2004). Other factors related to nutrition, physical activity, and advocacy behaviors include outcome expectancies, stage of change, enjoyment, and knowledge of resources (Holden et al., 2005). For most of these elements, there is additional complexity, included in important interactions with demographics, SES, personality, and family structure.

Social level. The social level of influence incorporates the individual in the context of multiple groups. Baseline social environments are shaped by family, peer, and school groups. The advocacy training group is another social context designed to improved youths' ability to participate in and change group interactions. Group norms are widely acknowledged to influence behaviors and attitudes (Terry & Hogg, 1996). Therefore, group norms and expectations are expected to play an important role in advocacy and health behavior change processes in the present model. In fact, the Task Force on Community Preventive Services (Kahn et al. 2002) found strong evidence for community-wide informational campaigns and social support interventions as effective for increasing physical activity, recommendations which are also supported by the Centers for Disease Control and Prevention's (CDC) most recent recommendations (Brown, Heath, & Martin, 2010). The community SES factors that surround people's lives can not be underestimated when considering their opportunities, motivations, and resources to engage in advocacy and health behaviors (Booth et al., 2001). Thus, social-level factors can also be an important mediator of advocacy outcomes.

For most of the social elements in the model, such as social support, social capital, and group norms, there are several levels of influence, including peer, family, and neighborhood. Ideally, there are training opportunities that can complement the advocacy training and relate to nutrition and physical activity. Youth group characteristics include group structure and climate, group cohesion, collective efficacy, group resiliency, sense of purpose, levels of and opportunities for responsibility, commitment to the group, length of time the group has been in existence, outcome efficacy, and decision-making processes (for definitions see Evans, Ulasevich, & Blahut, 2004; Holden et al., 2004). The adult group leaders' influences include personality, the intensity of their participation, their funding and support climate, and level of experience (Evans, Ulasevich, & Blahut, 2004; Holden et al., 2004). Some social level elements are likely to weigh more heavily on the advocacy and nutrition and physical activity outcomes than others, but those relationships remain to be clarified within this field.

Built Environment Level. The built environment level encompasses neighborhood characteristics and broader contexts of organizations, communities, states, and countries (Sallis, Owen, & Fisher, 2008). There is a strong and growing literature about the influence of the built environment on health (Sallis, Millstein, & Carlson, 2011). There are recommendations from authoritative groups like the Institute of Medicine (IOM), World Health Organization (WHO), CDC, the American Medical Association (AMA), International Obesity Task Force (IOTF), and the US Surgeon General, emphasizing that environmental change is essential for obesity prevention (Barlow and the Expert Committee, 2007; Koplan & Dietz, 2000; Koplan, Liverman,

Kraak, 2005; Kumanyika, et al., 2008; US Surgeon General, 2001; WHO 2004). The elements in the model are some of the key targets for advocacy actions.

Several built environmental features have been identified for promoting physical activity and nutrition behaviors (Ding et al., 2011; Sallis & Glanz, 2009). For instance, neighborhood walkability includes elements such as residential density, street connectivity, and mixed land use (Saelens, Sallis, & Frank, 2003), and these factors have been associated with increased physical activity among youth (Ding et al., 2011). Other features of activity-friendly neighborhoods include positive aesthetics, transit opportunities, and proximity to parks (Saelens, Sallis, Black, & Chen, 2003). High walkable neighborhoods are associated with increased walking and physical activity among residents (Saelens & Handy, 2008; Sallis et al., 2009). For youth especially, Safe Routes to School programs have been recommended for increasing active transportation and can be enhanced by safe walking infrastructure (Boarnet et al., 2005). Proximity and condition of recreation facilities such as parks and trails are also associated with increased physical activity (Kaczynski & Henderson, 2007), particularly among youth (Davison & Lawson, 2006; Ding et al., 2011). Traffic speed and volume also appear to be associated with physical activity among youth (Ding et al., 2011).

In terms of nutrition environments, local food resources can impact peoples' eating habits. For instance, the presence of supermarkets in neighborhoods tends to be associated with lower BMI and higher intake of fruits and vegetables, while the presence of fast food restaurants is associated with poorer dietary quality (Morland, Diez Roux, & Wing, 2006; Morland, Wing, Diez Roux, 2002; Sallis & Glanz, 2009; Schmidt et al., 2005). The cost of healthy versus less-healthy foods in neighborhoods is also related to

weight status (Sturm & Datar, 2005). From the food advertising literatures, it is clear that the promotional environment, including sign salience, location, and size, and in-store food marketing can have strong impacts on attitudes and behaviors (Glanz, Bader, & Iyer, 2012; Story & French, 2004). In the school environment, physical education classes, supervision, recreation facilities on school grounds, school lunch quality, and vending machines have been targeted for changes to improve nutrition and physical activity outcomes (Kain, Gao, Doak, & Murphy, 2010; Prosser, Visscher, Doak, & Moreno, 2010).

Policy level. Policy and regulatory factors that influence advocacy and health behaviors including obesity are powerful and diverse. Laws and policies constrain or incentivize many of the daily choices that can contribute to obesity (Mermin & Graff, 2009). Laws "refer to formal legal structures established at the local, state, or federal levels of government" (King et al., 1995), and policies are broader "statements of intent" that may exist at a formal or informal level (Lawrence & Swinburn, 2010; Schmidt, Pratt, & Howze, 1995). Policies guide the rules and structure for organizations, from government to community groups to families (King et al., 1995; Lawrence & Swinburn, 2010). It is commonly agreed among health organizations that policy changes are necessary for obesity prevention (Barlow and the Expert Committee, 2007; Koplan, Liverman, Kraak, 2005; Koplan & Dietz, 2000; Kumanyika et al., 2008; McGinnis, Williams-Russo, & Knickman, 2002; WHO 2004). However, policies do not always -or often- follow from evidence in public health or prevention (Brownson et al., 2006; Lawrence & Swinburn, 2010).

Policy inputs involve the baseline conditions of the policy arena, such as levels of government, representation, and the political climate/opposition forces (Mermin & Graff, 2009). The policy level can be thought of as having two large sub-levels: legislative and organizational. The legislative level includes federal, state, and local government representation and political will, whereas the organizational level involves smaller groups like workplaces, corporations, schools (which is also affected by the legislative level), and community groups (Lawrence & Swinburn, 2010; Schmidt, Pratt, & Howze, 1995). Legislative elements of influence include policy and regulatory elements such as strength of policy, specificity of policy, policy adoption, policy implementation, and policy sustainability (Birkland, 2005; Brownson et al., 2006; McGinnis, Williams-Russo, & Knickman, 2002).

Within the legislative level, many policy targets have been proposed for combating obesity, which represent the desired outcomes of youth advocacy. Several such targets on the nutrition side are improving school lunch quality, increasing taxation of minimally nutritious foods, (e.g., sugar-sweetened beverages), subsidizing fruits and vegetables, promoting nutrition information in restaurants, and limiting food advertising toward children (Kettel Khan et al., 2009; Mello, Studdert, & Brennan, 2006; Nestle & Jacobson, 2000; Parker, Burns, & Sanchez, 2009). On the physical activity side, policy targets include improving school physical education, funding for youth recreation programs, physical activity infrastructure in communities (e.g., parks, trails, sidewalks), support for pedestrian- and bicycle-friendly transit options, and improving public safety in neighborhoods (Brown, Heath, & Martin, 2010; Koplan, Liverman, Kraak, 2005; Kettel Khan et al., 2009; Mello, Studdert, & Brennan, 2006; Parker, Burns, & Sanchez,

2009). At the organizational policy level, advocacy can impact programs to increase physical activity and nutrition behaviors, alter food and physical activity environments, and change incentives for the organization's members.

Challenges and Next Steps

Several challenges are inherent in the youth advocacy process that research, including this study, can help address. In terms of specific evaluation questions, much has been written on program and process evaluation in health (Centers for Disease Control and Prevention, 2009; Linnan & Steckler, 2002; Samuels & Associates, 2008; University of Kansas, 2010). However, as Linnan and Steckler (2002) note, "The lack of a systematic approach to guiding process evaluation efforts causes another serious gap in current knowledge about process evaluation… Thus, a gap in current knowledge about process evaluation results from the lack of a stepwise approach to creating and implementing a process evaluation effort" (p. 9). Not surprisingly, best practices for evaluating youth advocacy for obesity prevention are as yet unknown. Research needs to evaluate not only process measures (context, reach, dose delivered, dose received, fidelity, implementation, and recruitment) (Steckler & Linnan, 2002), but measures of actual change (individual, social, built environment, and policy). The goal of advocacy evaluation is to find out what elements of the intervention work, for whom, under what conditions, and at what levels of influence (Linnan & Steckler, 2002). Analysis of advocacy activities, and environmental and policy programs is inherently difficult, due to few objective or quantifiable factors and the wide variety of inputs, outcomes, and timelines of multiple levels of change (Hurley, 1982). It can be difficult to quantify objectives, and so clear objectives are one key determinant for such research (Linnan &

Steckler, 2002). It is, as always, important to document the steps involved in achieving successful advocacy intervention efforts.

Youth advocacy for obesity prevention is a promising avenue for future action and research. It has the potential to make broad-based changes to physical activity and nutrition environments and policies that can impact youth overweight and obesity on a permanent basis (Millstein & Sallis, 2011). Advocacy will likely best be used as one of many tools in the fight against weight gain. Individuals and communities feeling empowered to take small steps toward action is the surest way to initiate changes that can benefit all.

There are several youth advocacy initiatives for obesity prevention emerging across the United States (California Department of Public Health, 2012; San Diego Childhood Obesity Initiative, 2012; University of Nebraska, 2011; Youth Activism Against Obesity, 2010). There is reason to believe that they can be effective, but the next step is to evaluate the programs. The model presented here can be a guide to selecting indicators of process and outcome. Conducting process and outcome evaluations of youth advocacy for obesity prevention can generate evidence to add or delete elements each level of influence and more specifically define the critical advocacy training and behaviors.

It is time that the policy sector and decision makers catch up with the evidence on obesity prevention, which necessitates increased policy research, inter-sector communication and translation, collaborative media use, and citizen participation (Brownson et al., 2006; Glasgow et al., 2003; Lawrence & Swinburn, 2010; McGinnis, Williams-Russo, & Knickman, 2002). There are questions about how widespread and

effective youth obesity prevention advocacy will become. This and other important questions will depend on organizational support for training, funding, and sources of effective leaders. Expanding upon tobacco prevention's successes and harnessing the energy and conviction of youth, has the potential to prevent increases in youth overweight and obesity.

Study Aims

This study sought to evaluate multiple outcomes the YEAH! youth childhood obesity prevention advocacy program, as well as potential mediators, based on a conceptual model. The following specific aims were proposed:

1) Create subscales and describe their psychometric properties for the four primary surveys used to evaluate YEAH! programs (youth and adult baseline and follow-up). Hypothesis 1: The constructed subscales will demonstrate acceptable internal reliability, fit, and factor loadings in CFA.

2) Assess youth changes, before and after completing advocacy projects, on the constructed measures of hypothesized psychosocial mediators and advocacy attitudes and behaviors. Hypothesis 2: Youth who participate in YEAH! projects will show significant improvements in the advocacy attitudes and psychosocial subscales (hypothesized mediators), but not on the nutrition and physical activity behavior subscales.

3) Create an index for youth advocacy readiness/receptivity competence consisting of multiple subscales created in Aim 1 and evaluate the role of group, youth, and leadership factors in explaining youth advocacy readiness following participation in YEAH! Hypothesis 3: The knowledge and attitude-based subscales created in Aim 1 will be associated with youth advocacy readiness/receptivity.

4) The original Aim 4 was to conduct a preliminary evaluation of a proposed project/policy change score for ranking strength/comprehensiveness of advocacy project change targets, thereby demonstrating concurrent validity of scores. However, that was not possible due to the data structure, so an alternate exploratory Aim 4 was conducted. This aim was to assess adult and group factors leading to an adult-rated advocacy success outcome. Hypothesis 4: Adult and group factors, such as having a paid leader, prior adult experience, and high group cohesion and participation will be associated with higher advocacy success.

As no published data focus on youth advocacy in the obesity context, this study represented a new field of research, and analyses were considered exploratory.

Method

Procedures

Background, initial training, and recruitment. Youth Engagement and Action for Health (YEAH!) is a program of the San Diego County Childhood Obesity Initiative (SDCCOI) designed to engage youth and adult group leaders in community advocacy for school and neighborhood improvement projects that can impact nutrition and physical activity environments (www.yeahsandiego.org). The SDCCOI holds biannual half-day "train-the-trainer" seminars for adult leaders of youth groups in San Diego County that have an interest in working on healthy community advocacy projects. These adults can lead groups from new or existing community organizations, non-profit branches, after-school programs, religious organizations, teen centers, and school classrooms, among others. During these trainings, the adults are introduced to the YEAH! manual, which

includes instructions on how to recruit youth and adults, gather resources, find funding (if necessary), and do community audits of modifiable health environment factors (parks, fast food outlets, school, stores, and outdoor advertising). There is an audit checklist for each of the five topics, as well as information on how to choose a meaningful project, how to use assessment tools, and how to choose appropriate decision makers and advocate for changes. The adult leaders are expected to take these lessons learned and apply them to their youth groups.

Participants in the evaluation study were recruited through these trainings. The Robert Wood Johnson Foundation's Active Living Research program funded a two-year grant to evaluate the YEAH! program: eYEAH! Evaluation of youth advocacy programs to promote active living in vulnerable communities (ALR grant # 68508, 01/11-01/13, Susan Woodruff (PI)). Following training, attendees were informed of the opportunity to be part of the evaluation and asked to give contact information, group details, and their proposed timeline if interested.

Group participation and procedures. Once the research team identified an eligible group, a team member met with the group leader(s) to explain the evaluation study and their expected participation. The leader was consented at that point and given a link to the online baseline survey. If consented, the group leader received $150 to spend on any group-related costs.

The research team came to the first group meeting to hand out parental consent and youth assent forms. Youth were instructed to bring the signed parental consent form to the next group meeting. Upon receiving the signed forms, youth were given the baseline survey, and once completed, they were given a choice of a $10 gift card to

Jamba Juice or iTunes. The adult group leaders also received a gift card after completing their first online survey. If the group leader or group members did not wish to participate at any time, they were free to stop with no adverse consequences.

A comparison group was not included in the proposed study. There are few other types of youth groups that can be used as appropriate controls. The advocacy groups are quite diverse in their origins, timelines, and target projects, so it would not have been feasible to define suitable comparisons.

Intervention and advocacy projects. The research team stayed in touch with the group leader throughout their assessment and advocacy project. Advocacy projects were designed to be conducted in the following sequence, which can also be seen in the YEAH! manual table of contents in Appendix A. First the leader introduced the youth to the concepts of the built environment's role in health behaviors. Then, the leader took the group on one or more of five environmental audits (school, parks, fast food, stores, or outdoor food advertising). The youth took the checklist and cameras out on their selected audit(s) to document potential environmental problems. Examples of targets of change were: high prevalence of fast food restaurants around a school, broken or non-existent sidewalks in a neighborhood or around a school, litter/graffiti in local parks, and schools with unhealthy food/beverage vending machines. Once the youth finished their audits, they were expected to compile their findings into an advocacy presentation. The group selected a relevant decision maker(s) for whom to target their presentation. Examples included school boards, the school principal, school nutrition staff, and city council members. The advocacy presentations included the youth's photovoice documentation of the relevant problems, suggested solutions, and a proposed timeline for changes to occur.

Youth could also choose to write letters to the editor of their local newspaper, hold a press conference, or get signatures on a petition to make these desired changes.

During the process of the group audits and advocacy projects, the groups built rapport, cohesion, and different decision making policies. There were resources in the manual for teamwork, conflict resolution, working with youth, educating youth on healthy food and activity choices, and conducting meetings (Appendix A). Table 2 identifies sections of the YEAH! manual that address the measured mediators, including group and individual psychosocial and behavioral components. The YEAH! manual does not specify training time requirements, but there are general recommendations about "dose" of intervention: have two training sessions a week apart, schedule regular (2-4 hours/week) meetings during the 4-6 week audit assessment period, have an advocacy planning meeting following the audit(s), and have regular meetings (2-4 hours/week) during the 6-8 week advocacy period (p. 8). Leaders were free to guide and teach the groups however they best saw fit, without additional input or oversight on leadership styles. The SDCCOI was available on an ongoing basis for technical assistance and consultation on issues related to conducting the audits, finding audits not listed in the manual (if desired), using available mapping resources, or creating advocacy presentations.

Regardless of the outcome of actual changes resulting from these advocacy efforts, youth and adult leaders were surveyed at the conclusion of their advocacy presentations. The decision maker interviews took place as soon after the presentation as possible, but due to their complicated and time-constrained schedules, the research team

aimed to complete these interviews within a maximum of 6 weeks later. Figure 2 presents a summary of the study's timeline.

Inclusion Criteria and Informed Consent

The requirement for participating in this study was membership in an active, newly-formed, or ongoing youth group that focused on advocacy for nutrition or physical activity environment change. The groups were selected based on their leader's attendance at an SDCCOI-led training and their interest in participating in this study. Groups could be located in any settings (schools, clubs, religious, military, or other community groups). Inclusion criteria were as follows: boys and girls of all ethnicities between 10 and 18 years old involved with nutrition or physical activity-related youth advocacy groups in San Diego County, plus adult leaders of youth advocacy groups. The youth, leader, and a parent must have provided informed consent (adult leader and parent) or assent (youth). Confidentiality was explained and participants were reminded that they could withdraw at any stage. If a participant was interested, the need for informed consent was explained and consent and assent forms were sent to the family. The consent and assent forms must have been returned before the survey took place. The surveyor verified that the consent form was signed, and if the consent form was not returned, the survey was rescheduled. Consent forms were distributed for the adult leaders as well. All consent forms were available in English and Spanish.

Each group was assigned an anonymous numeric code. Within groups, participants were not identified by name, but by a code number provided by the participants (birth month and day, i.e., 1026) in order to match pre- and post-surveys.

Participants were asked to volunteer information about their age, race, gender, and school. All study materials were locked securely in the project offices.

Theory, Measures, and Instrumentation

No validated youth obesity prevention advocacy evaluation tools designed specifically for youth and their leaders existed before this study began. Thus, several surveys were developed (largely by this investigator and colleagues) based on relevant published measures, when available. The Social Cognitive Theory was applied to guide the survey development, given that its emphases on modeling, outcome expectancy, collective- and self-efficacy, and motivation are well-matched with the expected mediators of advocacy behaviors (Bandura, 1977). Parts of the survey measures were adapted from tobacco control measures from SYMATU (Evans, Ulasevich, & Blahut, 2004; Holden et al 2004b; Holden et al. 2005). The SYMATU group based its measures largely on Empowerment Theory, including the psychological empowerment constructs of *intrapersonal components* (domain-specific perceived control, domain-specific self-efficacy, motivation to control, perceived competence, and mastery), *interactional components* (critical awareness, understanding causal agents, skill development, skill transfer across life domains, and resource mobilization), and *behavioral components* (community involvement, organizational participation, and coping behaviors) (Holden et al., 2005; Rappaport, 1987; Zimmerman, 1995). When relevant from SYMATU, we used or adapted items that assessed attitudes and beliefs (e.g., self-efficacy, perceived socio-political control, knowledge/skills (e.g. assertiveness, advocacy experience, decision-making skills, participatory competence, perceived advocacy barriers), collective participation (e.g., reason for joining, level of involvement with other organizations) and

group characteristics (e.g., outcome efficacy, group resiliency). Many of the factors included in Social Cognitive and Empowerment Theories such as modeling, outcome expectancies, collective efficacy, self-efficacy, skill building, participation/awareness are expected to lead to youth health behavior change. Self- and collective- efficacy coupled with increased engagement and understanding of one's environment are thought to increase advocacy behaviors (as defined in Table 1).

Nutrition and physical activity behaviors are addressed in the YEAH! manual (see Table 2), and given the program's overarching goal of awareness of obesity prevention , these outcomes were included. We added measures of current levels of physical activity (Prochaska, Sallis, & Long, 2001) and food and beverage consumption (Prochaska & Sallis, 2004) using previously validated measures. Additional measures important to obesity were included, such as availability of fast food within a 10-minute walk from home or school, food store access, school vending machine access, school lunch options, and outdoor food/beverage advertising. These were drawn, as appropriate, from validated instruments developed by colleagues including M-SPAN (McKenzie, Marshall, Sallis, & Conway, 2000; McKenzie et al., 2004), PACE (Patrick et al., 2004; 2006), and Active Where (Grow et al., 2008; Forman et al., 2008; see sallis.ucsd.edu/measures.html for measures and psychometrics).

Tables 3 and 4 summarize the following measures used in the present analyses.

Youth Baseline Survey. The baseline youth survey (paper and pencil) inquired about participants' current physical activity and nutrition behaviors, attitudes toward advocacy, current advocacy behaviors, and psychosocial variables related to advocacy outcomes (e.g., self-efficacy, leadership confidence, perceived socio-political control).

The main aims of the survey were to obtain information about what characteristics are common to participants in these types of groups, as well as qualities (attitudes, behaviors) that might be influenced by participation in advocacy projects. This survey took 15-20 minutes to complete.

Youth Follow-Up Survey. The follow-up youth survey (also paper and pencil) was given to those who completed the baseline survey, at the conclusion of their advocacy projects. This survey was somewhat more involved, inquiring about the constructs listed above, but also perceptions of group dynamics, their leader's style, ratings for their level of group participation, and follow-up about what they learned or gained from their project. The follow-up survey took no more than 30 minutes to complete.

Adult Baseline Survey. Adult group leaders were given online surveys (about 20 minutes each). The first was the baseline survey, which asked about their leadership experiences, knowledge, attitudes, behaviors surrounding nutrition, physical activity, and advocacy, how many hours per week they expected to devote to this project, and whether they were being paid or volunteering for this role.

Adult Follow-Up Survey. The adult group leaders took a follow-up survey at the conclusion of their advocacy projects. This survey was more involved than the previous one. It asked about any changes in behaviors, attitudes, and knowledge of the aforementioned target outcomes. It also went into more depth with questions about their level of participation in the group decision-making processes, their leadership style, perceptions of group dynamics, issues and problems encountered, and narrative sections

to describe what they learned, wished they could do differently, and/or perceived contributors to success.

Data Analyses

All analyses were conducted in SPSS version 19 (SPSS Inc., Chicago, IL) and MPlus version 6.1 (Muthen & Muthen, Los Angeles, CA).

Aim 1: Create subscales and describe their psychometric properties for the four primary surveys used to evaluate YEAH! programs (youth and adult baseline and follow-up).

Hypothesis 1: The constructed subscales will demonstrate acceptable internal reliability, fit, and factor loadings.

Method: Items were first screened for variability. Confirmatory Factor Analysis (CFA) was used to determine if the *a priori* factor structure held and create the subscales for the four surveys. MPlus was used for the proposed scales with three-or more items (code: MODEL: [latentvar1] BY [observedvar1]-[observedvar3]; selfeff1 BY se1-se3). SPSS was used for factor analysis (Analyze-Dimension Reduction-Factor) for the two-item subscales. Dimensions (factors) were created in an iterative manner, using fit indices, subscale internal reliability and intra-item correlations, factor loadings (λ), and theory as guides. For the MPlus analyses, model fit was determined using the recommendations of Bentler (2007) and checked using two types of fit indices. First, a χ^2 test was used to compare the model to the actual data to see if it significantly differed (desired *p*-value >.05). Second, descriptive fit indices were used to determine factor structure: the comparative fit index (CFI) should be >.93 (Bentler, 1990), and root mean squared error of approximation (RMSEA) and standardized root mean residual (SRMR;

Hu & Bentler, 1999), absolute indexes of overall model fit, should be <.08 (Steiger, 1990). If the model fit based on these statistical criteria, practical significance of the factor loadings was examined using the generally accepted standard of $\lambda \geq .30$, that the factor was at least moderately correlated with the latent variable as proposed.

Subscale scores from the factors (Tables 3 and 4, e.g., self-efficacy for health and advocacy behaviors, assertiveness, participatory competence and decision making, knowledge of resources, perceived sociopolitical control, fruit and vegetable servings, group structure and climate, and collective participation) were computed, and their internal reliability checked using Cronbach's alpha or intra-item correlations (for two-item subscales). Descriptive statistics (means/SDs, frequency distributions) were run on all baseline and post-test subscales to examine demographics and distributions on the created subscales.

Aim 2: Assess youth changes before and after completing advocacy projects on the constructed measures of interpersonal and interactional domains, as well as nutrition and physical activity behaviors. As there was no control group, any pre-post changes were interpreted as intent-to-treat changes within the groups.

Hypothesis 2: Youth who participate in YEAH! projects will show significant improvements in attitudes and beliefs subscales (self-efficacy for health and advocacy behaviors, perceived sociopolitical control, advocacy outcome efficacy, group resiliency) and knowledge and skills subscales (knowledge of resources, assertiveness, health advocacy history, and participatory competence/decision making) but not on the nutrition and physical activity behavior subscales (with the exception of fast food, as that is one of the YEAH! audits).

Method: Baseline measures were linked with post-program measures to assess youth changes in the created interpersonal and interactional measures described above. Nutrition and physical activity changes were considered secondary analyses. Paired t-tests for continuous data (Compare Means-Paired Samples T-Test) were conducted to assess these individual-level changes in youth by determining significant mean subscale score changes.

Aim 3. Create an index for advocacy readiness/receptivity consisting of multiple subscales created in Aim 1 and evaluate the role of group, youth, and leadership factors on youth advocacy readiness/receptivity following participation in YEAH! projects.

Hypothesis 3: The subscales created in Aim 1 will be associated with youth advocacy readiness/receptivity.

Method: Standardized residualized change values were computed by linear regression for each of the six significant Aim 2 subscales. The post-test score was the dependent variable and the pre-test score was the independent variable. The youth subscales included in the outcome index were: self-efficacy for health and advocacy behaviors, active participation, assertiveness, knowledge of resources, health advocacy history, and social support for health behaviors. The standardized residualized change score approach yields a quantifiable amount of variance in the post-test score unexplained by the baseline value. It is also less sensitive to measurement error than raw (post-pre) change values (Woodruff & Conway, 1992). Standardized residualized change scores were summed for those six subscales with significant t-test changes to create the youth advocacy readiness/receptivity index.

Bivariate correlations were run between the index score outcome variable and each of the hypothesized independent variables (the remaining attitudinal, knowledge-based, and behavioral subscales). If a baseline and follow-up version of the same subscale were both significantly correlated with the outcome, the variable (timepoint) with the higher correlation was entered into the regression. Variables with significant correlations ($p<.15$ to be inclusive given the small sample size) were included in the full generalized linear mixed model (GLMM) regression.

Given that there were 21 groups and 136 youth at baseline, clustering was assumed, and analyses were conducted to account for clustering. GLMM was used to analyze the demographic factors and significantly correlated covariates' associations with youth changes on the advocacy index. The GLMM approach is a multivariate version of generalized linear models to include random effects in addition to fixed effects. It has the flexibility to handle dependency in the data due to clustering within groups (Hedeker, 2005). The group was entered as the random effect variable to account for clustering of youth within groups. The youth demographics were forced to enter as covariates likely to be associated with the groups and the advocacy outcome: age (continuous), gender (girl=0, boy=1), race/ethnicity (Black or Hispanic vs. all others), and relative self-rated school performance (continuous).

Aim 4. Originally proposed: Conduct a preliminary evaluation of a proposed policy change score for ranking strength/comprehensiveness of projects, thereby demonstrating concurrent validity of scores. The construct validity of the policy score change score will be assessed by comparison to expert ratings of policy strength/effectiveness.

Alternate, exploratory Aim 4

As the proposed policy change score was not possible due to the heterogeneity of group structures and project types/timelines, an alternate Aim 4 was conducted. Keeping with the goal of analyzing policy change, the alternate Aim 4 sought to determine adult leader and group-level factors associated with adult-rated policy change. The advocacy success outcome scale was created from one adult follow-up variable: "More specifically, have you seen any results of your group's advocacy efforts to date?" The response choices were recoded into a continuous scale so the options were as follows: policy or environmental change/improvement (3 points), policy change/improvement is under consideration (2 points), no change for now, but decision makers have indicated greater understanding, and change may be possible in the future (1 point), and no change/no apparent impact (0 points). For the advocacy success outcome variable, the four "other" responses were eliminated.

Correlations were run between the advocacy success outcome score and the adult and group level factors (i.e., leader paid vs. volunteer, total number of hours spent on YEAH! project, group cohesion and participation, group efficacy) to select the variables to input into the multilevel regression models. Bivariate correlations were run for the continuous variables and point biserial correlations were run to select the dichotomous variables. For the dichotomous variables (i.e, group was funded or not, prior experience or not), a no response was coded 0 and a yes was coded as 1. GLMM analysis was also used for this aim. The group was entered as the random effect variable to account for clustering of adults within groups. The adult demographics were entered into the GLMMs as covariates likely to be associated with the groups and the advocacy outcome:

age (continuous) and race/ethnicity (non-Hispanic White=1, all others=0). Gender was not collected as part of the surveys, though based on observation the majority of leaders were women. Two GLMM regressions were run. All adult and group level independent variables and covariates were included in the first regression, and only the significantly correlated variables were entered into a second model, given the low sample size.

Sample Size and Power Calculation

Data collection for the larger evaluation study (eYEAH! evaluation study funded by Active Living Research) was completed in March 2013. A power calculation done before data collection indicated that with a sample of 100 youth, we would have 80% power (α=0.05) to detect changes in psychosocial variables of the magnitude suggested in other youth advocacy studies (.2-.4 points on 1-8 point scales; Winkleby et al., 2004). Thus, the goal was to recruit 100 youth (from about 15-20 youth groups) for this study. We surpassed this number at baseline (n=136) but not in matched pre-post pairs (n=92). We aimed to include 40-50 adult leaders of youth groups, which we achieved (n=47 at baseline, 45 at follow-up, 38 pre-post matched pairs).

Results

Youth baseline demographic and advocacy group characteristics are presented in Table 5. The youth came from 21 different groups, ranged in age from 9-22 (grades 4-12), and about two-thirds were female. Most youth rated themselves as performing at about a low average level in school (2.13 out of 5). A majority of youth were non-White, with the largest ethnic group being Hispanic/Latino (35.6%). Most of the youth's groups focused on schools as their advocacy target (67.0%), with outdoor advertising and parks

being the next most common project types (11.6 and 10.7%, respectively). Most of the youth reported having done at least one type of advocacy prior to joining their group (27.9% reported no advocacy experience), and of those who completed the follow-up assessment, 60.3% reported having met with a decision maker.

Aim 1. Confirmatory factor analyses of proposed advocacy subscales among youth and adults

1. Youth subscales assessed at baseline and follow-up

All proposed youth subscales with three or more items were analyzed using confirmatory factor analysis in MPlus from the baseline survey (n=136). While initially assessed in MPlus, the confirmatory factor analysis results were determined to be unstable for two-item scales, given the low sample size. For the two-item scales, SPSS was used to obtain item correlations and factor loadings, using varimax rotation. When the two items formed one component, principal component analysis was extracted and reported. Table 6 presents the factor analysis and item correlation results for each subscale, as well as items included and dropped. The checklist items were not factor analyzed (subscales: reasons for joining, level/history of prior involvement, group advocacy, roles and participation, and benefits of participating). The single-item scales were: knowledge of resources, social support for health behaviors, opportunities for involvement in group, and collective efficacy toward group goals.

A. Subscales initially proposed with three or more items

1. Self-efficacy for health and advocacy behaviors

A one-factor self-efficacy for health and advocacy behaviors model was tested using confirmatory factor analysis. The self-efficacy latent variable was indicated by three observed variables. This one-factor model did not fit well statistically (χ^2 [3, N = 136] = 100.36, $p < .001$, but it did fit well descriptively (CFI = 1.0, RMSEA < .01, SRMR < .01). All standardized factor loadings were generally large and statistically significant for the self-efficacy factor (values were .390, .801, .840).

2. a. Perceived sociopolitical control

A one-factor perceived sociopolitical control model was tested using confirmatory factor analysis. The latent variable was initially indicated by four observed variables. This one-factor model did not fit well statistically (χ^2 [3, N = 136] = 100.36, $p < .001$) or descriptively (CFI = 1.0, RMSEA <.01, SRMR < .01). The standardized factor loadings were low and not statistically significant (values were .090, .227, -.289, -1.08). Given the poor fit, modification indices were added but the suggested changes did not significantly improve fit. This proposed factor was split based on factor loadings, into two two-item subscales: active participation and optimism for change, which were then assessed in SPSS.

2.b. Active participation and Optimism for change

The one-factor active participation model was tested for fit, and the loading values were large (.755, .787). The intra-item correlation was 1.0. The one-factor optimism for change model was tested for fit, and the loadings were large (.763, .834). The intra-item correlation was .311.

3. Openness to healthy behaviors (formerly “Readiness/openness”)

A one-factor openness to healthy behaviors model was tested using confirmatory factor analysis. The readiness/openness latent variable was first indicated by three observed variables. This one-factor model did not fit well statistically (χ^2 [3, N = 136] = 43.28, p < .001), but it did fit well descriptively (CFI = .971, RMSEA <.01, SRMR < .01). Two of the standardized factor loadings were large but one was small and all were statistically significant (values were .270, .683, .731). The "readiness" variable had a factor loading below .30 and was dropped and the model was run again. The resulting two item one-factor model had large factor loadings (.820, .822). The intra-item correlation was .491.

4. Assertiveness

A one-factor assertiveness model was tested using confirmatory factor analysis. The assertiveness latent variable was indicated by four observed variables. This one-factor model fit well statistically (χ^2 [2, N = 136] = 2.66, p = .26) and descriptively (CFI = .99, RMSEA =.05, SRMR =.02). The standardized factor loadings for three of the items were large and statistically significant for the assertiveness factor (values were .889, .764, .589). The item that did not load highly enough (below the .30 cut-off) was "I am a leader" (loading value: .203), however, it was statistically significant (p<.05).

The confirmatory factor analysis model was re-run without the leadership variable. This three item model did not fit well statistically (χ^2 [3, N = 136] = 129.06, p <.001, but it did fit well descriptively (CFI = 1.0, RMSEA <.01, SRMR <.01). The standardized factor loadings for the three items remained large and statistically significant (values were .867, .770, .601). The three-item factor was determined to be a better fit and used subsequently.

5. a. Sports and active transportation

A one-factor sports and active transportation model was tested using confirmatory factor analysis. The latent variable was indicated by four observed variables, but the model was not able to run in MPlus due to lack of convergence. This one-factor model was then run in SPSS, resulting in the proposed factor being split based on factor loadings, into two two-item subscales: sports/physical activity enjoyment and active transportation, which were then further assessed as follows.

5. b. Sports/enjoyment of physical activity and Active transportation

The one-factor sports/activity enjoyment model was tested for fit, and the loading values were large (.699, .739). The intra-item correlation was .036. The one-factor active transportation model was tested for fit, and the loadings were large (.938, .940). The intra-item correlation was .765.

B. Subscales as initially proposed with two items

1. Advocacy outcome efficacy

A two –item one-factor advocacy outcome efficacy model was tested using confirmatory factor analysis. The one-factor advocacy outcome efficacy model was tested for fit, and the loading/principal component extraction was large (.828). The intra-item correlation was .765.

2. Health advocacy history

A two-item one-factor health advocacy history model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.817). The intra-item correlation was .335.

3. Participatory competence and decision making

A two-item one-factor participatory competence and decision making model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.796). The intra-item correlation was .268.

4. Meeting physical activity recommendations

This scale has previously been evaluated for reliability and validity (Prochaska, Sallis, & Long, 2001). In the current sample, this scale also performed well. A two-item one-factor model was tested using confirmatory factor analysis. The loading/principal component extraction was large (.927) and the intra-item correlation was .717.

5. Servings of fruits and vegetables

This scale has also previously been evaluated for reliability and validity (Prochaska & Sallis, 2004). In the current sample, this scale also performed well. A two-item one-factor model was tested using confirmatory factor analysis. The loading/principal component extraction was large (.847) and the intra-item correlation was .434.

2. Youth follow-up only subscales

1. Pride in group work

A two-item one-factor pride in group work model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.953). The intra-item correlation was .818.

2. Roles and participation (likert scale, versus checklist items)

A two-item one-factor roles and participation model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.836). The intra-item correlation was .389.

3. Intent to remain involved

A two-item one-factor intent to remain involved model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.884). The intra-item correlation was .562.

4. Opportunities for control in group work

A two-item one-factor opportunities for control model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.860). The intra-item correlation was .481.

5. Group outcome efficacy

A two-item one-factor group outcome efficacy model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.905). The intra-item correlation was .638.

6. Group cohesion

A one-factor group cohesion model was tested using confirmatory factor analysis. The group cohesion factor was indicated by three variables. The one-factor model was tested for fit, and the loadings/principal component extractions were moderate to large

(.597, 611, .765). The intra-item correlations were .062, .195, and .202. The item with the lowest correlation and loading was dropped and a two-item scale was formed. When the two-item model was tested, the loading was large (.775), and the intra-item correlation was .202.

7. Group advocacy

A one-factor group advocacy model was tested using confirmatory factor analysis. The group advocacy factor was indicated by seven variables. The one-factor model was tested for fit, but two factors emerged. The intra-item correlations ranged from -.086 to .509. Six items loaded on one factor, and the loading values ranged from moderate to large (.421 to .836). One item ("The decision makers listened to us more because we were youth rather than adults.") loaded on a second factor (value: .820). This was also the variable with the negative correlation with the other six, and so this item was dropped, resulting in a 6-item subscale.

The six-item one-factor group advocacy subscale was then tested for fit. The loading/principal component extractions were mostly large, with one item loading moderately (.424 to .838). The intra-item correlations ranged from .157 to .717.

8. Follow-up group resiliency

A two-item one-factor follow-up group resiliency model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.811). The intra-item correlation was .317.

9. Coordinator/leader characteristics

A three-item one-factor coordinator/leader characteristics model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extractions were large (.703 to .819). The intra-item correlations were .253 to .424.

10. Personal advocacy activities since starting YEAH!

A two-item one-factor personal advocacy activities model was tested using confirmatory factor analysis. The one-factor model was tested for fit, and the loading/principal component extraction was large (.920). The intra-item correlation was .620.

3. Adult group leader group leader demographics and group characteristics

The adult group leader characteristics and their groups' characteristics are presented in Table 7. Most of the adult group leader items did not form calculable subscales, as many were qualitative or involved single-item responses.

The leaders ranged in age from college and graduate students through older adults (22-64), and about two-thirds were non-Hispanic White. There were between one and thirteen leaders per group, most commonly one through five (about 75%). Most of the leaders were volunteers (68%), though almost all of the groups received some form of funding, including the $150 provided for participating in this evaluation study. According to these adult group leaders, schools were the most common project type (40.8%), which is lower than the percent of school projects reported by the youth (67.0%). Most of the groups met weekly (78.8%) for 1-2 hours (53.2%). The mean number of meetings was 8.4 (SD: 4.3).

Qualitative group characteristics findings

1. Adult involvement

Adult leaders rated communication as the most important characteristic of successful leaders, followed by leadership skills, motivation, enthusiasm, patience, and flexibility.

2. Group resilience

This domain included an open-ended question about barriers encountered. Attendance and low youth commitment were the most frequent barriers reported, with scheduling/time constraints, group and leader communication, and maintaining motivation also mentioned. Various solutions were named for these problems, such as communicating through the school administration, trying to move meeting times, "over communicating," and rushing to finish projects in the timeframe.

3. Group decision making

A large majority of leaders (80%) felt that decision making was shared between adults and youth (Table 7). Ten leaders reported youth only and 4 said adult only for deciding on group rules. The open-ended question about group decision making processes yielded a variety of answers. Among the more common responses were that adults typically suggested rules and then youth modified them as appropriate. Also, adults would guide discussions but let youth have leeway in deciding processes and project directions. Democratic voting processes were also noted, along with groups coming to a consensus on rules and decisions.

4. Youth motivation

Adults rated several youth motivations highly: interest in nutrition/physical activity/obesity and contributing to a healthy community were most common (both

ranked by 28 out of 47 adults), followed by learning new skills (16 adults), social/be with friends (14), community service hours (14), and looks good on college application (12), also see Table 7.

5. Advocacy efforts

The primary advocacy outcome was assessed by the question, "Have you seen any results of your group's advocacy efforts to date?" This item's responses followed a normal distribution. Many of the adults were still working on their groups' projects and advocacy efforts at the time of the follow-up survey, so responses may have reflected that time barrier. The most common response, with just over half (55.6%) of the adult group leaders endorsing this option was that no change had been seen, but they were optimistic that it might happen in the future, or that there was increased awareness of the issue among decision makers (Table 8). Seven (15.6%) of the leaders reported that their groups had seen changes as a result of their advocacy, six leaders (13.3%) reported changes under consideration, and six reported no changes.

Groups advocated for a variety of changes and with many different types of decision makers. The majority of adults (91%) reported that their group made in-person presentations to decision makers about their advocacy issues (Table 8). Just under half (46.8%) reported writing letters or making phone calls, and 4.4% worked with the media. School principals or vice principals were the most common advocacy targets for the YEAH! groups (82.2%). Food service personnel and school boards were the next most common advocacy targets for the groups (46.7% and 37.7%, respectively).

Along with programmatic changes resulting from advocacy efforts, the adults reported that the youth had greater awareness of obesity, positive feedback from parents

and community members, and ongoing/continuing efforts to improve their communities as a result of the initial advocacy projects.

4. Factor analysis of adult group leader follow-up scales

The factor analyses of the two multi-item scales are as follows, both from the follow-up survey time point (Table 6).

1. Group efficacy (leader perspective)

A one-factor group efficacy model was tested using confirmatory factor analysis. The latent variable was indicated by eight observed variables. This one-factor model fit well statistically (χ^2 [20, N = 42] = 14.66, p =.79 and descriptively (CFI = 1.0, RMSEA <.01, SRMR =.055). The standardized factor loadings were high or moderate and statistically significant (values were .43 to .87).

2. Group cohesion and participation

A one-factor group cohesion model and participationwas tested using confirmatory factor analysis. The latent variable was indicated by five observed variables. This one-factor model fit well statistically (χ^2 [5, N = 43] = 5.65, p =.34) and descriptively on two out of three indices (CFI = .98, RMSEA =.05, SRMR =.09). Two standardized factor loadings were high or acceptable (values: .31, .67) but three loadings were below acceptable (values were -.04 to .13). None of the factor loading values were statistically significant. Modification indices were added but none were available to improve model fit.

The five-item one-factor model was then tested for fit in SPSS, and two factors emerged. The intra-item correlations ranged from -.128 to .701.

a. Group cohesion and participation

Three items loaded on one factor, named group cohesion and participation: strong attendance, group members enthusiastically participated, and a few youth leaders emerged. These items' loadings were large (values: .619 to .892), and the correlations were: .295, .348, .701.

b. Two items (adult-driven decision making and the youth did not know each other before joining the group-reverse coded) loaded on a second factor (values: .879, .501). However these items were virtually un-correlated (.053), and so it was not justifiable to make a scale. Therefore, the final scale consisted of the three items in part (a) above.

Aim 2: Youth subscale scores changes before and after advocacy

Youth subscales scores were hypothesized to change significantly before and after advocacy on the attitudes and beliefs subscales (self-efficacy for health and advocacy behaviors, perceived sociopolitical control (active participation, optimism for change), openness to healthy behaviors, outcome efficacy, and group resiliency) and knowledge and skills subscales (assertiveness, health advocacy history, knowledge of resources, participatory competence and decision making, knowledge of resources, and social support for health behaviors). As there were only 92 youth with complete pre- and post-advocacy surveys, the t-tests were run using this smaller sample because it is only possible to create the Aim 3 change scores when there are pre- and post- matched subjects. Though the reasons for the lack of completed data were varied, many were likely unrelated to the intervention and thus excluded from the t-test analyses. Table 9 presents the youth pre-post subscale data from the whole sample (n=131-136 pre-test, 101-104 post-test) for comparison purposes. Table 10 presents the subscale descriptive

statistics from those who did not complete both surveys, and the descriptives and paired t-tests results for the 92 matched pairs. The following results describe the 92 matched pairs. T-scores are presented as absolute values.

Attitudes and beliefs subscales

Two of the six attitudes and beliefs subscales increased significantly following advocacy (Table 10). The mean self-efficacy for health behaviors subscale score increased significantly 8.3% from baseline (paired $t(90)=4.22$, $p<.001$). Figure 3 displays the self-efficacy for health and advocacy behaviors baseline and follow-up mean scores by group. Graphs are not shown for each subscale. Rather, this graph is intended to show a generalizable pattern across the other significant subscales that there was an overall increasing trend from pre- to post-test. For more than half of the groups in Figure 3, the mean score increased from baseline to follow-up, with little variability across groups. One of the perceived sociopolitical control subscales increased significantly: the active participation mean score increased 11.1% (paired $t(91)=2.93$, $p<.01$). However, the other perceived sociopolitical control subscale, optimism for change, did not change significantly (1.7% change). The other three attitudes and beliefs subscales did not change significantly: openness to health behaviors (6.1% change), advocacy outcome efficacy (-2.5% change), and group resiliency (.44% change). However, the advocacy outcome efficacy subscale score mean decreased was marginally significant ($p=.09$).

Knowledge and skills subscales

Four out of the five knowledge and skills subscale mean scores increased significantly following advocacy (Table 10). The assertiveness subscale mean score increased 6.9% from baseline to follow-up (paired $t(89)=3.23$, $p<.01$). The health

advocacy history subscale mean score increased 19.3% (paired t(90)=3.52, $p<.001$). The knowledge of resources mean score increased 10.4% (paired t(89)=3.24, $p<.01$). The social support for health behaviors subscale mean score also increased significantly, by 13.9% (paired t(91)=3.84, $p<.001$). The participatory competence and decision making score was not significantly different (2.3% change). Though not originally included in the hypotheses, the level/history of prior involvement checklist sum increased significantly 85.0% (paired t(91)=3.97, $p<.001$).

Nutrition and physical activity subscales

The nutrition and physical activity behavior subscales were not hypothesized to change significantly before and after advocacy, with the possible exception of fast food, as that was one of the YEAH! audits. These behavior changes were considered secondary analyses. One of the six nutrition and physical activity subscales changed significantly, however. Meeting physical activity recommendations increased from 3.62 (1.87) to 4.0 (1.57) days per week, a 10.5% change from baseline (paired t(91)=2.28, $p<.05$). The other subscales in this domain did not significantly change, as hypothesized. The sports/physical activity enjoyment subscale increased 5.0%, the active transport subscale decreased by 3.7%, fruit and vegetable servings increased 3.3%, fast food consumption per week increased 20.0%, and consumption per month decreased by 53.0%.

Non-completers

There were 43 youth who did not complete the YEAH! program or the follow-up survey. There was a group of 10 youth who joined the study after they had started their advocacy project, and were therefore unable to take the pre-test. So 10 of the non-

completers have follow-up only data (Table 10). Paired t-tests are presented in Table 9 for on the whole samples at each time point for the sake of completeness and comparison. The patterns of change were the same as for the 92 matched pairs, with the exception that the history of prior involvement checklist sum was significant among the matched pairs but not the whole sample.

Youth follow-up only subscales

Several of the subscales constructed in Aim 1 were assessed only at the follow-up time point, including multiple checklists. These subscales' descriptive statistics can be found in Table 11. Included among these subscales were the youth's attitudes and feelings about their participation (e.g., roles and participation, benefits of participating), group processes (e.g., opportunities for control in group work, opportunities for involvement in group), and group characteristics (e.g., group cohesion, coordinator characteristics). Most of the follow-up only subscales displayed high levels of agreement: youth felt strongly and positively about their experiences. For instance, most of the subscales were rated on 1 (low agreement) -5 (high agreement) likert scales, and almost all of the scores are above 4.0, indicating positive reflection on their groups and participation.

Aim 3: Assessing youth readiness/receptivity for advocacy

Creating the outcome index and selecting independent variables for the regression

The six subscales with significant pre-post advocacy changes were used to create the youth advocacy readiness/receptivity outcome index (Table 10). These subscales were: self-efficacy for health and advocacy behaviors, confidence in group participation,

assertiveness, health advocacy history, knowledge of resources, and social support for health behaviors. The youth advocacy readiness/receptivity index was created by summing the residualized change scores. Its distribution was checked and found to be normal (n=83, mean: .054, SD: 3.13, range: -8.83 – 6.05).

Bivariate correlations between youth advocacy readiness/receptivity index and each proposed independent variable (subscales) were used to select the youth subscales to enter into the full model. Variables with correlations of $p<0.15$ were initially going to be included in the GLMM regression models. This *p*-value was set to be inclusive, given the small sample size. However, none of the variables were correlated between .10 and .15, so the maximum included correlation value was $p<.10$. Table 12 displays the correlation results.

Adult demographics and subscales were excluded from the Aim 3 analyses for several reasons. There was complicated youth-adult-group clustering. With multiple leaders per group and multiple groups per leader, the overlap made it difficult to combine the data sets in a meaningful way. These cluster problems led to too much missing data for the models to run when initially attempted. However, the primary reason the adult variables were excluded was that with the small sample size and large number of correlated youth variables, there would be too many independent variables for the model to produce robust estimates (assuming 10-15 cases per variable is preferable) (Meyers, Gamst, & Guarino, 2006). Given that limitation, the youth variables were given priority and included in the GLMM models.

Twenty of the 38 youth subscale variables were significantly correlated with the youth advocacy readiness/receptivity outcome at at least the $p<.10$ level. Optimism for change, group resiliency, and sports/physical activity enjoyment were the only three variables in which the baseline and follow-up values were both significantly correlated. For the other pairs with a significant baseline or follow-up variable, only the follow-up score was significant. Similarly, of the 14 follow-up-only subscales, 11 were significantly correlated with the outcome. The overall pattern of correlations indicated that the follow-up scores and subscales were generally more highly correlated with the outcome.

Full multilevel regression model

For the goal of determining the associations between different youth psychosocial and attitudinal characteristics and the youth advocacy readiness/receptivity index outcome, a generalized linear mixed regression model (GLMM) was conducted. The methods have been previously described. The independent variables were the subscales selected based on the significant correlations: optimism for change (follow-up), advocacy outcome efficacy (follow-up), group resiliency (follow-up), participatory competence and decision making (follow-up), sports/physical activity enjoyment (follow-up), servings of fruits and vegetables (follow-up), roles and participation (likert), intent to remain involved, opportunities for control, opportunities for involvement, collective efficacy, group outcome efficacy, group cohesion, follow-up group resiliency, coordinator characteristics, and personal advocacy activities since starting YEAH!. Though significantly correlated, the group advocacy variable was left out of the GLMM

regressions due to the smaller number of youth who advocated with a decision maker. It was omitted in order to maximize sample size and variability. Unstandardized regression coefficients (Bs) with 95% confidence intervals (CIs) were reported to represent the change in the youth advocacy readiness/receptivity outcome for every one unit change in continuous IVs or the reference level of the dichotomous IVs. The full model GLMM results are presented in Table 13.

The mixed regression model results indicated that four of the youth subscales were significantly positively associated with the advocacy readiness/receptivity outcome: optimism for change at follow-up (B=1.46, 95% CI= .49, 2.44), sports and physical activity enjoyment (B=.55, 95% CI=.05, 1.05), roles and participation (B=1.81, 95% CI=.60, 3.02), and personal advocacy activities since starting YEAH! (B=1.49, 95% CI=.64, 2.32). Two variables were marginally significantly positively associated with the youth advocacy outcome: being Black or Hispanic (B=1.07, 95% CI=-.14, 2.29) and group cohesion (B=.72, 95% CI=.00, 1.43). None of the other demographic factors were significantly associated with the outcome.

Individual independent variable GLMMs

In response to the large number of variables in the overall model, given the small sample size, a secondary set of analyses was run. Sixteen individual GLMM regressions were run, each including the youth advocacy readiness/receptivity outcome, the same youth demographics, and only one of the proposed IVs. These GLMM results are reported in Table 14. The individual variable models produced many more significant findings than in the full model. The variables that were significant in the full model became more significant in the individual models. Five of the variables switched signs

between the two types of models. In those cases, the variables were negative and not significant in the full model, but became positive and significant in the individual models.

Aim 4: Adult and group-level variables and advocacy success

Selecting independent variables for the regression

There were fewer adult covariates and subscales than for the youth in Aim 3, so all were included in the first multilevel regression model. In the bivariate and point biserial correlations, only one adult subscale was significantly correlated at $p<.15$: the leader's perspective of group efficacy (Table 15).

Multilevel regression model

For the goal of determining the associations between adult leader and group characteristics and the advocacy "success" outcome, two GLMM regressions were conducted. In the first (full) model, independent variables were the subscale selected based on the significant correlation presented above (group efficacy-leader's perception) plus theory, to maximize explained variance: group cohesion and participation, a continuous variable for whether youth/ adults/both made group rules, leaders' prior experience with relevant topics, number of leaders per group, and total number of adult hours spent on the YEAH! project. The GLMM results are presented in Table 16.

The mixed regression model results indicated that one of the adult subscales was significantly positively associated with the advocacy success outcome: prior experience with nutrition/physical activity (B=1.21, 95% CI=.295, 2.12). Two adult group leader subscales were marginally significantly associated with the advocacy success outcome: group efficacy was positively associated (B=.459, 95% CI=-.133, 1.05) and group

cohesion and participation was negatively associated (B=-4.83, 95% CI=-.966, -.001). Neither of the demographic factors was significantly associated with the outcome.

Parsimony-driven mixed model

In the second GLMM model, only the demographics and the one significantly correlated variable were included, for the sake of parsimony (Table 17). The second, restricted model showed that neither the adult demographics nor the group efficacy subscale were significantly associated with the advocacy success outcome. However, the group efficacy subscale was marginally significantly positively associated with the outcome (B=.296, 95% CI=-.054, .646). In this smaller model, the group efficacy subscale had virtually the same significance as that found in the larger model (*p*=.093 and .098, respectively). Neither of the demographic factors was significantly associated with the outcome in this model either.

To further describe and specify these results, Table 18 displays each of the 21 YEAH! groups' sites, advocacy targets, advocacy strategies used, and the outcomes, at various stages of implementation. The groups are presented by setting: high schools, middle schools, community centers, and a church. This table presents the qualitative results and processes of each group, which aligns with the quantitative results presented in the previous adult and group process tables.

Discussion

This is the first study to systematically develop and evaluate a theoretically based set of measures to assess youth advocacy for obesity prevention and adult group leader influence.

Aim 1

There were several notable findings from the youth baseline characteristics. First, our majority female (67.1%) sample is consistent with comparable youth substance prevention advocacy studies' gender divisions (Holden et al., 2005; Ribisl et al., 2004; Winkelby et al., 2001, 2004). While it is not clear why girls make up most of these participants, it might have long-ranging positive effects for girls' empowerment and confidence at important social development stages. Next, it was surprising that only 28% of youth reported having done no prior advocacy activities. This result may suggest that these youth represent a self-selective group of young advocates. Or perhaps they interpreted the question broadly. This question was framed as a checklist, and they were instructed to select all the responses that applied. Responses included: signed a petition, written or called news media, written a letter to the editor, be part of meetings with school or community officials, and attended a rally or demonstration. These responses were adapted from the SYMATU response scale, which was only assessed after advocacy, so they are specifically advocacy-related (Holden et al., 2004). It would be beneficial to do follow-up focus groups with the youth to determine if they were answering in socially desirable ways, or were already very civically-minded. Another important youth finding is that 60.3% reported having met with a decision maker to advocate for change. This is an encouraging finding, indicating that the groups, when possible, followed through with the advocacy component of the project. It supports the feasibility of the groups and the potential to facilitate change.

Youth factor analysis, subscale creation, and sample size

There were varying degrees of success in the youth factor analyses. The proposed factor structure held for most of the youth subscales. Modifications were necessary for five of the originally proposed 19 multi-item subscales. The modifications involved splitting a larger subscale into two components, or dropping one low-performing item to improve model fit to an acceptable level.

For some of the subscales, items were retained despite lower correlations; this tended to happen more with the two-item scales. Retaining items even with a low correlation is justifiable because they were built based on theory (Meyers, Gamst, & Guarino, 2006). Correlations and their significance can be influenced by sample size (Bates et al., 1996). Further, we only kept the items when their factor loadings were sufficiently high (≥.30). A larger sample size would have helped increase confidence in these Aim 1 factor analysis results. However, given the exploratory nature of this study and its grounding in strong theory, the derived scales can be used for research and evaluation purposes, with some caution and need for replication.

The surveys' designs were based as much as possible, on similar constructs from the tobacco youth advocacy literature (i.e., Holden et al., 2004, 2005; Winkleby et al., 2001), supporting both content validity and ability to compare results across health behaviors. However, we had a small sample size, and this work can be considered pilot or exploratory. In particular, it is not certain that the results of the factor analyses are robust. To improve the factor analysis interpretation, we would have benefitted from a larger youth sample size. With approximately 10 to 15 youth per baseline variable, we would have the suggested sample size to support robust and well-powered CFA results

(Meyers, Gamst, & Guarino, 2006). Future studies should increase sample size accordingly.

Adult group leader findings

Findings from the adult group leader baseline and follow-up surveys yielded several notable patterns and pointed to common factors among groups, but also unique aspects of groups. One anecdotal finding from the evaluation team was that leaders who were paid tended to show more of a commitment to their groups and advocacy projects. However, only 32% of the leaders were paid. This is a clear implication for future program planning. Even with that in mind, almost three-quarters of the adult leaders said they would work on a project like this again in the future. The adults tended to rate their group's efficacy and cohesion highly, indicating positive group experiences. These evaluations matched the youth's high self-rated perceptions of group processes and their experiences. From the youth and adult perspective, participating in YEAH! groups appears to have been a positive experience.

The advocacy outcome variable was a "snapshot" of project progress as of the end of the YEAH! project. Hence, we might expect the distribution of that outcome variable to change over time. Advocacy often took longer than the leaders expected, and while some projects did see changes in the survey timeframe, others were still waiting or working with decision makers. The study evaluation team made several recommendations to the sponsoring agency (SDCCOI). First, they should coach leaders to plan an advocacy strategy as early as possible. This includes structuring the group's timeline and expectations to reflect that advocacy takes a long time. Often, simply identifying and scheduling with an appropriate decision maker is time-consuming. As

these groups had a mean timeframe of 8 sessions (2 months), expecting advocacy outcomes near the end may be unrealistic, and starting earlier would be beneficial. Second, the sponsoring agency should find successors for groups and leaders with projects that are in the process of change after the group ends. For example, if an afterschool group finishes their YEAH! project at the end of the school year, having continuity or restarting in the fall with new students would increase the chances of an advocacy project being successful. In the present study, a high school group advocated with school district food/nutrition cafeteria manager for healthier options and succeeded. However, workers in those positions were replaced the following semester and the students had graduated. As a result, the school food reverted to less healthy options.

Aim 1, in part, is being prepared for publication and will be co-authored by Susan I. Woodruff, Christine C. Edwards, Leslie S. Linton, and James F. Sallis. The dissertation author was the primary investigator and author of this material.

Aim 2

Youth subscale findings and pre-post changes

The youth advocacy subscales showed a wide range of agreement and experiences. The youth appear to have answered honestly, as there were several low-scoring subscales in addition to more positive ones. There were also generally high ratings on the follow-up only subscales that assessed participants' evaluation of the groups, indicating positive experiences among those who finished the YEAH! program. These high ratings at follow-up are in agreement with the overall positive perceptions the leaders reported of the youth’s experiences in their groups and projects.

The subscale changes generally showed a pattern of youth confidence and improvements following the completion of YEAH!. Two of the six attitudes and beliefs subscales increased significantly: self-efficacy for health and advocacy behaviors and active participation. Though fewer of the attitudes and beliefs subscales changed than hypothesized, not all are of equal importance, and these two are among the most important. The self-efficacy improvement is particularly useful because of its central role in the Social Cognitive Theory and good evidence of its relation to behavioral outcomes. The Social Cognitive Theory's emphasis on self-efficacy is well-matched with the expected mediators of advocacy behaviors (Bandura, 1977). Self-efficacy in the context of the Social Cognitive Theory and the youth advocacy model (Figure 1) was expected to lead to youth health and advocacy behavior change. Self- and collective- efficacy (i.e., several of the high scoring follow-up subscales), coupled with increased engagement (i.e., active participation) and understanding of the environment, were thought to increase advocacy behaviors. These pre-post changes are indications that these theoretical underpinnings were supported by the data in the present study.

Those subscales that did not change (optimism for group change, openness to healthy behaviors, outcome efficacy, group resiliency) may have been related to groups that were not as successful with the actual advocacy outcomes. Based on the content of the scales, these constructs all appear to be more dependent on group processes, rather than just individual-level feelings or control. Further, the optimism for change scale had a high initial mean (4.04), so it would have been difficult to improve, and a high initial mean can be considered an important finding of its own right. Though the outcome efficacy subscale mean decreased (marginally significantly), this may indicate that the

youth were more realistic about what they and advocacy can achieve after going through the process.

In contrast, most of the knowledge and skills subscales did improve, and those tended to be more related to individual behaviors and feelings, less tied to group outcomes. Four of the five knowledge and skills subscales increased significantly: assertiveness, health advocacy history, knowledge of resources, and social support for health behaviors. These findings supported the hypothesis that most of the attitudes and beliefs and knowledge and skills subscales would improve following YEAH! participation. The fact that most of these scores did increase indicates that the youth were participating, paying attention, and learning. In particular, the social support for health behaviors subscale increase suggests that the groups were able to add support for healthy behaviors- or at least their perception of it. The level/history of prior involvement checklist increase can be explained in that after participating, the youth were easily able to check off more responses about what types of advocacy history they had done.

The nutrition and physical activity behavior subscales were considered secondary analyses, and as such, were not hypothesized to change. These subscales were initially included to see if there were positive youth externalities of participating in this process. YEAH! did not specifically focus on changing these behaviors among the youth, though there was a health education component of the manual (Table 2, Appendix A). The exception to this hypothesis was fast food consumption frequency if groups worked on the fast food YEAH! audit. Only one group (4% of youth) worked on a fast food audit, so we would not necessarily hypothesize that consumption would change over time for the entire sample. The only subscale that did significantly improve was days of meeting

physical activity recommendations. Though a positive finding, this would need to be replicated in a larger sample and controlled design before drawing conclusions that YEAH! or youth advocacy consistently improves physical activity participation. Even then, the increase was to 4 days per week, which is still below the recommended amount for youth: 60 minutes of daily moderate-vigorous physical activity (Strong et al., 2005; USDHHS, 2008).

In trying to contextualize these youth pre-post attitude, behavior, and knowledge changes, again it would make sense to look to the tobacco control youth advocacy literature. The large SYMATU studies (Evans et al., 2005; Holden et al., 2004, 2005) did not administer youth or adult pre-tests, making it impossible to compare changes. Winkelby et al., (2001, 2004) found that perceived self-efficacy significantly increased among youth, following community tobacco control advocacy activities. In one study, the youth outcome expectancy, leadership competence, and perceived policy control findings did not change significantly, similar to the present study's findings (Winkleby et al., 2001). However, in a follow-up study, outcome expectancy did significantly increase (Winkelby et al., 2004). This may have had to do with the success and organization of the advocacy programs which took place within a school program, compared to an after school elective. The 2001study found that leadership competence significantly increased for boys but not girls. While the present study did not directly assess this construct, it is embedded in several of our subscales (i.e., optimism for change, assertiveness, participatory competence and decision making), and one of these indicators, assertiveness, significantly increased in the present study.

There was a relatively high drop-out or non-completion rate in this study, from 136 youth who began a YEAH! project to 93 who completed one (31.6% lost). Based on feedback from the evaluation team, there are several common reasons that youth may not have completed the study. First, community group (i.e., churches, Boys and Girls clubs, YMCA) participation was not as consistent or regular as groups that were organized in schools. In classroom or afterschool groups, participation was often mandatory, but in community groups, this was less often the case. Similarly, in school or after-school groups, teachers were regularly present, but in community groups the leadership was often more transitional, often based on shifting funds. Community groups also tended to have more heterogeneity of membership, with respect to age in particular. These differences may have made the groups feel less cohesive, had fluctuating participation, leading to more drop-outs and/or projects not taking hold. Some of the non-completers were youth who moved away, some switched after school activities when sports seasons changes, and others were from youth who simply did not want to continue for no specified reason. However, the youth who did complete projects appeared to be a core, self-selected, motivated and proud group, based on the positive scores on the post-tests.

Aim 3

More of the follow-up subscales were significantly correlated with the youth advocacy readiness/receptivity outcome than their baseline counterparts. The constructed outcome represents the aggregate of the factors that the YEAH! program changed within the youth. This finding may suggest improved attitudes and knowledge following advocacy training, beyond results found in the pre-post t-tests. These correlation results are also the first place in these analyses where the scales measured at follow-up only

were tested in relation to an outcome. It is notable that most of the follow-up only subscales were significantly correlated with the advocacy outcome. This finding is in agreement with those subscales' descriptive statistics, which were generally quite high (most were >4 out of 5), demonstrating an overall positive impression of the advocacy and group experiences.

The optimism for change subscale showed a significant positive association with the outcome index in the full model. This subscale was originally part of the perceived sociopolitical control scale, derived from the SYMATU survey. However, the factor analysis of that larger scale in the present data set determined two distinct factors, of which optimism for change was one. The other that was derived, active participation, became part of the outcome index. The SYMATU study found that perceived sociopolitical control was significantly associated with group participation, leadership roles, and encouraging others to participate (a correlate of advocacy) (Holden et al., 2004). The present findings of association with youth advocacy appear to align with those of the previous research on this specific construct, modified to fit the current data. Optimism for change would be expected to be positively associated with advocacy readiness/receptivity. Its component items are "If I tell someone "in charge," […] about my opinions, they will listen to me," and "I enjoy participation because I want to have as much say as possible in my school or community." High self-ratings on these statements should not only be highly correlated with the outcome index -which was seen- but also appeared to be an independent predictor of the outcome, remaining significant after controlling for the demographics and other IVs. This optimism for change subscale

appears to be a strong component of youth's perception of their advocacy experiences and perceived success or empowerment.

The roles and participation subscale was also significantly positively associated with the outcome index. This subscale was also adapted from the SYMATU studies, in which quantity and quality of participation were hypothesized to be a primary driver of their outcome, youth empowerment (Holden et al., 2004). The items in the present subscale reflected the quality of participation: "When I attended meetings, I took part in the discussions," and "I took responsibility for the things that the group needed to have done." In the SYMATU findings, roles were associated with industry and interpersonal confidence, perceived sociopolitical control, advocacy, assertiveness, and overall youth empowerment (Holden et al., 2004). Advocacy, assertiveness, self-efficacy, and perceived sociopolitical control (one part) were four of the six components of the youth advocacy readiness/receptivity outcome. It is important that this subscale was found to be associated with the youth advocacy outcome, providing encouraging evidence that the present analyses agree with the "gold standard" tobacco advocacy results. We would also expect that youth who took on more active roles within their groups would be more likely to be ready and receptive advocates, and vice-versa.

Another significantly associated subscale was personal advocacy activities since starting YEAH!, a follow-up subscale assessing youth's attempts at advocating with their families or friends to make healthier schools or communities. It follows logically that those youth who rated these items more strongly, would be more ready for and receptive to advocacy. This finding also can be understood in considering the intention formation and perceived behavioral control components of the Theory of Planned Behavior (Ajzen,

1991; Godin & Kok, 1996). In this context, those youth who did more advocating at follow-up scored more highly on the advocacy readiness/receptivity outcome, and those youth who held those higher advocacy readiness/receptivity beliefs appear to have done more advocacy behavior in their personal lives.

The sports and physical activity enjoyment subscale significant association with the advocacy outcome was somewhat surprising. The nutrition and physical activity behavior subscales were not hypothesized to change or be affected by the advocacy intervention, per se. Rather, they were included to see if there might be an extra benefit of participating in YEAH! This association was strong, even after controlling for the covariates. This subscale was composed of two items, assessing how often the youth participated in sports or physical activity classes, and how much they enjoyed physical activity. Youth who participated in YEAH! and felt positively about their experiences appear to be those who either are more active or enjoy activity. In the correlations, this baseline subscale was marginally significantly correlated with the outcome, while the follow-up subscale was highly significantly correlated. There may have been some measurement reactivity, such as the Hawthorne effect; perhaps youth increased their self-ratings due to the fact that they were being measured and in a study (Adair, 1984; McCarney et al., 2007). Or perhaps this is part of a general trend that youth who are more active either tend to join these types of groups more readily or may get more out of them. While there are no studies that directly examine the relationship of youth physical activity and advocacy, one study examined characteristics of high- and low-active middle school girls. This study found that high-active girls tended to display higher self-efficacy, self-rated enjoyment of physical activity, better self-management strategies, and

higher outcome expectancies (Taverno Ross et al., 2013). In another analysis of the same data, girls with higher self-efficacy and greater enjoyment of PE classes were more likely to be part of structured physical activity programs (Barr-Anderson et al., 2007). The present physical activity participation and enjoyment association with advocacy falls in line with these findings, suggesting that youth (girls) who are more physically active, may also have more of the qualities of successful and eager advocates or group members.

It was unexpected that the youth demographics were not significantly associated with the advocacy outcome. One previous tobacco advocacy study found that gender was associated with advocacy outcomes. However, the previous study stratified by gender, rather than looking at it as a covariate or moderator (Winkleby et al., 2001), so it is difficult to compare conclusions with the present findings. While race/ethnicity was not significantly associated with the outcome, its marginal significance offers an indication that with a larger sample size, this finding might become more pronounced. As of now, being Black or Hispanic appeared to be associated positively with the advocacy outcome. A high school-based youth empowerment for heart health study also showed that being Black (vs. White) was significantly associated with community participation (Altman et al., 1998). This is an encouraging trend for empowering future groups of youth who may come from underrepresented groups or neighborhoods with greater health disparities.

The individual independent variable models produced many more significant findings than the full model, suggesting over-specification of the full model, that the small sample size to item ratio was having an effect in the full model. The finding that most of the individual variables were significantly associated with the youth advocacy outcome is useful. It shows that the intervention made a difference and that many of the

hypothesized theoretically-based factors were related to the outcome. However, this finding does not help narrow down the pool of variables that might be affecting change. Another possible explanation for the multiple individual associations is that many of the factors measured in these surveys were likely novel for the youth. Most of them were starting from a baseline of no advocacy-related knowledge or experience with being asked about these types of factors. From the many correlates, it seems that the training made an impact on a wide variety of advocacy-related psychosocial, attitudinal, and behavioral factors. Overall, from the individual IV models, we may conclude that there is "signal" here: some component(s) of the advocacy training and process made impacts. These findings justify larger, well-controlled studies to parse out different effects.

It was unexpected that more of the follow-up-only subscales were not significantly associated with the outcome in the full model, given their consistent correlations. However, in the individual variable regressions, most of them became significant. This pattern and the sign switching again suggest that the original full model was over-specified and underpowered. Another possibility for understanding the discrepancy between the two types of models is multicollinearity among these subscales. Subsequent tests were run, and it appeared that two variables were multicollinear: advocacy outcome efficacy and follow-up group outcome efficacy. Te rest of the IVs did not display multicollinearity. The subscales were based, when possible, on the SYMATU factor structure (Holden et al., 2004, 2005), and coupled with the factor analysis and multicollinearity results, we believe that they represented distinct constructs. Many of them related to perceptions of group processes, however, which could have been dependent on groups' advocacy successes or experiences.

Though interesting, these results must be considered preliminary and interpreted with caution given the small final sample size. As with other multivariate techniques, GLMM is best run with a large sample size, including sufficient numbers of subjects per group and number of groups. There is not a clear ideal number of subjects per group or number of clusters, as this also depends on number of covariates and target effect sizes. However, when the average cluster size is low, power to detect individual differences in between-group effects is limited (Snijders, 2005). In this case, our low average cluster size may have led to false negatives in the full model, as our power to detect youth effects between groups was low. Future analyses should again consider a much larger sample size of youth who complete the study in each group, or having a minimum starting group size (i.e., 10-12 youth), knowing that attrition in this type of study is large.

Another goal for future studies, dependent on increased sample size, would be to link the adult leader and youth data for analyses. Several challenges -beyond sample size- were encountered when trying to merge the two datasets. When there are multiple leaders per group, a consensus must be reached about how best to represent their data. An average adult leader score could be used for each group. However, usually not all the leaders were involved to the same degree, and an average might misrepresent the whole group experience. An informant could judge who the primary or the most influential leader was, and carry those scores through for the entire group. Linking the youth and adult data would be beneficial, as many of the SYMATU findings (Evans et al., 2005; Holden et al., 2005) were focused at the group characteristic level, which in our study design, were reported by the adult leaders.

Aims 2 and 3 together are being prepared for publication. The publications based on this dissertation will be co-authored by Susan I. Woodruff, Christine C. Edwards, Leslie S. Linton, and James F. Sallis. The dissertation author was the primary investigator and author of this material.

Aim 4

The Aim 4 exploratory analyses used the adult-rated advocacy success outcome. Two models were run, one with all of the hypothesized IVs and the second parsimonious model, with only the significantly correlated IV, so as not to overspecify the model in a small sample. From the full adult group leader model, it was found that adults' prior experience with nutrition or physical activity was positively associated with advocacy success. This suggests that prior experience was beneficial, and moving forward, that leaders may do better by being trained in nutrition and physical activity skills and other relevant advocacy skills. Given the small sample size, the marginally significant findings bear note for exploring in future studies. In both the full and restricted models, group efficacy was marginally significant. In the full model, the other adult-rated subscale, group cohesion and participation, was also marginally significant. These two subscales were adapted from the SYMATU adult and group leader survey (Evans et al., 2005). While it is somewhat surprising that there were not more significant group or adult-level correlates of the advocacy outcome, the limited previous literature shows similar themes. In the Evans et al. (2005) study, their hypotheses that more adult involvement would lead to greater youth empowerment and participation, were disconfirmed by their model. However, the Evans et al. study did find that group structure and climate were mediators between adult involvement and youth participation. In this respect, the present findings

of the group-level factors influencing the advocacy outcome, appear to align with the literature. However, the SYMATU outcomes were youth empowerment and collective participation, whereas the present outcome was advocacy success. Advocacy outcomes are not fully under the control of the leader or group, which could help explain the few significant correlates. Further, many of the group structure and climate variables were also rated by the youth. Once again, the challenge for future studies will be to link the clustered data sets in a meaningful way and to have a larger sample size to accommodate both types of data.

Anecdotal evidence from the eYEAH! measurement team was that leaders who were paid (vs. volunteers) tended to run groups that were more cohesive, more consistently attended, and often had more organized and successful advocacy presentations. However, the paid versus volunteer variable was not significant in any of the Aim 4 models. In a tobacco youth advocacy study, a majority of adults were paid or filled the group leader role as part of their jobs (Ribisl et al., 2004). This study effectively summed up several key reasons that youth advocacy adult leaders should be well trained and ideally paid: "Adequate training and resources for youth policy advocacy is key. Whether it is performed by youths or adults, policy advocacy is often an exhausting, lengthy, and sometimes frustrating process. Moreover, policy advocates must possess unique and specific skills, such as strategy development, team building, negotiation, and media advocacy" (Ribisl et al., 2004, p. 611). Another qualitative, non-experimental study of adults' roles in community youth empowerment programs found several important factors leading to best practices: putting youth first, having high youth expectations, building youth-adult relationships, exerting influence/control/authority, and

communication with the community of interest (Messias, Fore, McLoughlin, & Parra-Medina, 2005). The composite of these recommendations plus the present adult leader findings suggest that adults who have prior experience, and groups with high cohesion and participation, tend have better youth outcomes. Of note, none of the studies in the literature looked directly at adult or group factors on a health-related advocacy outcome. This could also be because quantifying advocacy outcomes can be very difficult.

Strengths and limitations

This study represents the first theory-driven, systematic study of measures and outcomes for youth advocacy for obesity prevention. It is an important step forward in the field of youth advocacy for obesity prevention for several reasons. First, we present measure validation and systematic subscale development. It will be useful for future studies to have useable, statistically- and theoretically-driven subscales and surveys for youth and adults. The literature will also benefit from having a consistent set of measures with which to compare studies and advocacy interventions. The improvements on six of the youth pre-post subscales suggest positive changes among the participants in YEAH!. The youth advocacy readiness/receptivity outcome is an innovative way to capture the constructs of interest. However, it is not measured in an inherently interpretable unit, nor is it the only way to have measured advocacy and empowerment-related changes. Future studies could look at modifying the index or using a single-item measure.

The richness of the adult leader data are also a strength of this study. While this study gathered qualitative survey data, much of it was not analyzed herein, but could be useful in future studies. The amount of quantitative leader and group-level data captured in this study was instructive of several areas of improvement that will be discussed in the

subsequent sections. Though unused in these analyses, the eYEAH! study also interviewed 13 of the decision makers to whom the youth advocated. Again, this rich qualitative data from those in a position of making changes, will be very valuable for designing studies and improving the intervention in the future.

This study's power was limited by sample size and retention and it should be considered exploratory. The original eYEAH! study was powered to detect pre-post changes with 100 youth. With 92 matched pairs, this goal was nearly achieved. However, the subsequent multilevel models do require far more youth, and the models presented here need to be interpreted with caution and replicated in future studies. Youth and groups dropped out for various reasons, as previously discussed. This is a common problem with advocacy and community studies, suggesting a need to build in large enough recruitment targets to handle low retention rates.

Regarding the YEAH! intervention and advocacy process, consulting with the evaluation team led to several concluding thoughts. One large limitation of this evaluation project was the inability to control the fidelity of intervention implementation. It was impossible to know if results would have been different if the implementation had been more uniform and consistent. As it happened, the groups were free to proceed however they saw fit, and leaders did not have much structure to base their activities on. Having more structure likely would have impacted the effectiveness of the groups' ability to advocate for changes. This problem is a design limitation of the YEAH! program, not the evaluation study. From observation, groups need much more training and education about advocacy, how to be an advocate and what that means in actuality. The other study limitation was not having enough time to truly measure the

effects of advocacy efforts because timing of policy changes is unpredictable. It would have been interesting to have another year to follow these groups and observe what happened with their advocacy attempts.

Future Research Directions

One clear goal emerging from these analyses is the need for a larger sample size for future studies. In addition, having a control group with youth in other clubs or activities besides advocacy would be useful for assessing the impacts of YEAH! or other advocacy programs. The observations of the evaluation team strongly suggested that the leaders' variability in experience, availability, pay status, and interest were clear challenges in the way YEAH! was implemented. There was little uniformity of program delivery and execution across groups. Such variability did allow us to study leader predictors of group outcomes, however. Having a committed leader to persevere through the often trying advocacy process can make the difference between a successful group and one that fails to launch. Future studies should consider having one or two well-trained and involved paid leaders who are committed to the group's success. The leaders need guidance and support throughout the advocacy process as well. Engaging in advocacy requires a substantial level of knowledge and confidence to navigate generally unfamiliar political processes. Leaders likely needed more knowledge and assistance than they received in the initial half-day YEAH! training session. Longer-term training of leaders has the potential to support impressive advocacy work, so future studies should design trainings that truly support and enhance the leaders' abilities. Further, advocacy work has a long timeline. It would have been interesting to have more time to follow these groups and observe what happened with their advocacy attempts. This has

implications for future studies. While it is beneficial to look at youth changes, funding for these types of studies needs to be long enough to actually be able to measure results of the advocacy, which can take a long time.

An interesting potential for future research would be exploring the role of social networks for youth recruiting their peers, sharing their advocacy stories, or for perpetuating and maintaining groups. One of the only published papers on social networks for youth advocacy provides a conceptual framework (Thackeray & Hunter, 2010). In addition to those ideas presented above, that paper notes that social media and technology can help youth organize collective action, change attitudes, and even raise money and interact with decision makers. Their definition of social networks includes websites, blogs, mobile phones, and podcasts (Thackeray & Hunter, 2010). There is arguably much potential research in any of these avenues, though nothing yet has been studied in relation to youth obesity advocacy.

Perhaps one of the largest areas of need in the advocacy research field is a quantifiable measure of policy change as an outcome. The initially proposed Aim 4 of this study sought to develop and pilot test such a score. However, due to the heterogeneity of group structures and timelines, aggregating meaningful scores was not possible. The proposed methods can serve future studies that have more defined group parameters. A policy change score (index) can be created by assigning a weighted score (0 (non-existent) - 3 (fully complete or successful); Riis et al., 2012; Schwartz et al., 2012) for each advocacy groups on each of the five RE-AIM framework dimensions: reach, efficacy, adoption, implementation, and maintenance (Glasgow, Klesges, Dzewaltowski, Estabrooks, & Vogt, 2006; Glasgow, Vogt, & Boles, 1999; Jilcott,

Ammerman, Sommers, & Glasgow, 2007). Though RE-AIM originated to evaluate public health intervention impact, it has also been applied to health policy change impact (Jilcott, Ammerman, Sommers, & Glasgow, 2007). Jilcott et al. (2007) propose four questions to guide policy evaluation using RE-AIM: Whose health is to be improved as a result of the policy? What organization is responsible for passing or adopting the policy? Who is responsible for compliance? What organization is responsible for enforcement? In addition, the level of impact (legislative/organizational) and policy characteristics (active/passive) are also taken into consideration (Jilcott et al., 2007). The RE-AIM domain definitions as they apply to policy change evaluation have been modified as well. Reach takes into account the number of people affected by the policy, effectiveness is the change in outcomes in an appropriate timeframe, adoption refers to the organizational uptake and enactment of the policy, implementation involves the application of the policy, consistent enforcement, and ongoing compliance, and finally, maintenance is applied at two levels: individual and organizational (Jilcott et al., 2007). While reach and setting factors can be difficult to accurately assess, qualitative data are often used to infer and fill in quantitative gaps. The parent eYEAH! study included decision maker interviews, but the present study did not make use of the qualitative data, to limit the scope of the dissertation. The total policy change score would be computed by summing each RE-AIM policy dimension's score, resulting in a theoretical range of 0-15.

Implications for Policy and Practice

There is a great deal of current policy and practice interest in the potential for youth advocacy, and this study builds evidence that it is a successful process for

achieving multilevel health-related change. Perhaps the most important implication of this study is that youth advocacy for environment and policy change can be effective. In particular, groups based in under-resourced communities and schools were successful. If future validation studies of the present results are also successful, youth advocacy could be institutionalized in these settings. How can an advocacy group become established at a school, church, or after school programs and pass on the skills and knowledge to new youth as they enter the group? Sustainability will be key to continued implementation.

The next important implication is that advocacy is difficult and requires much time and effort on the part of leaders, youth, and trainers. The field of policy and environmental change to support healthy eating and active living is often complex. Understanding the role of the built environment is not always intuitive for everyone and requires adequate training. To the extent possible, programs should try to control and create more uniformity in the way the youth advocacy program is delivered to youth, perhaps through a limited number of leaders. Many of the youth advocacy groups' work could have been even more effective if the groups had run longer or had successor groups who would continue the work of the initial groups. Other policymakers indicated that the issues (e.g., advocating for joint use of school grounds) were complex and needed continued advocacy, even though the initial work did successfully raise awareness.

Another research implication is that the measures presented are ready to be used in future studies. Having a set of measures used by forthcoming advocacy studies will allow this field of research to move forward efficiently and methodically. There are

many implications for policy, practice, and future research, and the present findings underscore the need to expand, modify, and streamline the advocacy training process to harness the power and potential of youth advocacy for nutrition and physical activity environment and policy change. The present findings also demonstrate that youth advocacy such as the YEAH! program, can have meaningful impacts on youth and their communities.

Overall Conclusions

As successful obesity prevention strategies rely on multiple levels of intervention, advocacy is a promising strategy that can influence targets at the individual, social, environmental, and policy levels. Environmental change targets include increasing walkability and food availability of schools and neighborhoods, and social perceptions of healthy eating and physical activity. Youth advocacy for obesity prevention is a promising community-based intervention that has potential for large-scale political, environmental, social, and individual changes and requires larger sample sizes and a more uniform training and implementation structure in future studies.

FIGURES

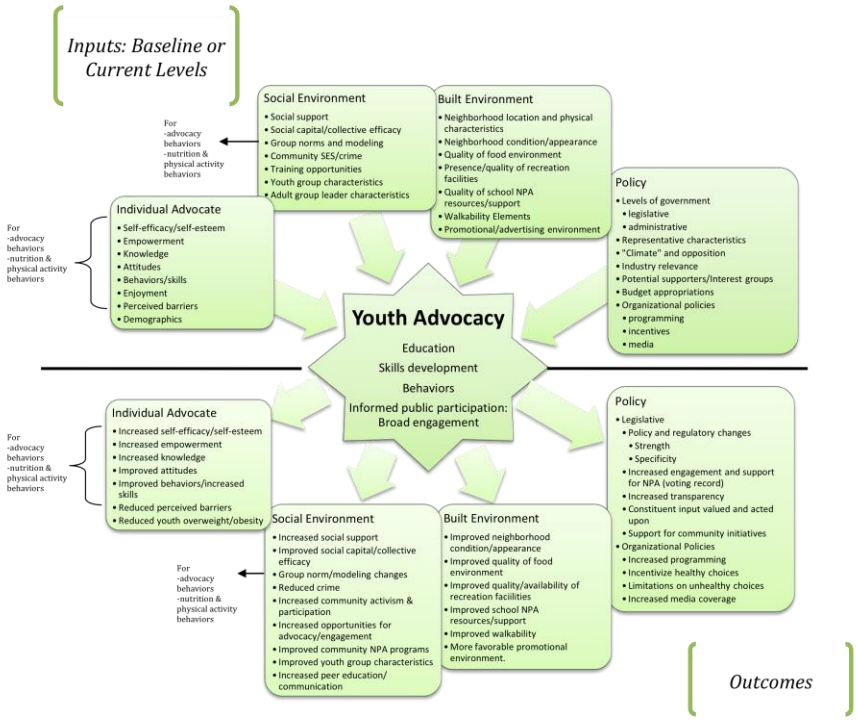

Figure 1: A multi-level conceptual model of inputs, processes, and outcomes of youth advocacy for obesity prevention.

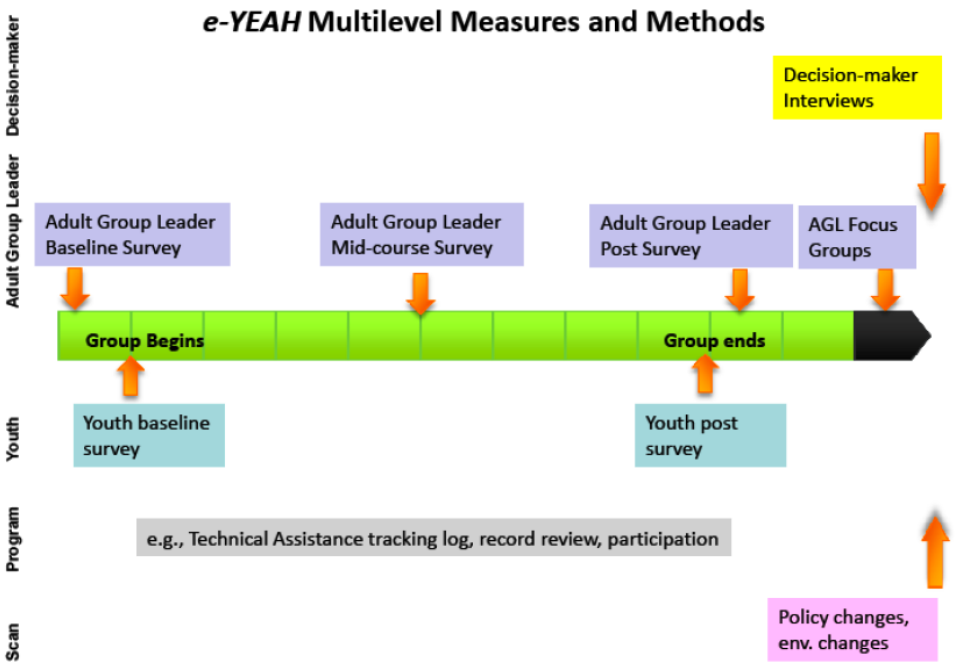

Figure 2: General timeline for eYEAH! measures. Each group project was expected to take about 2-4 months.

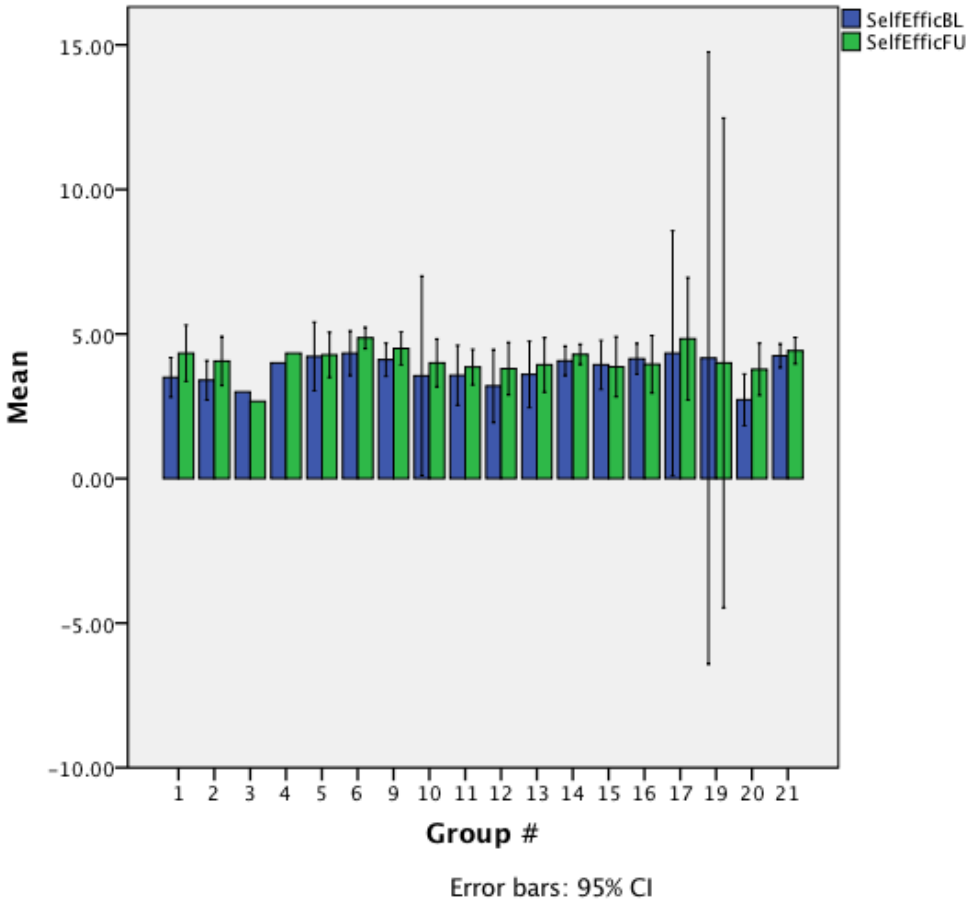

Figure 3*:* Self-efficacy for health and advocacy behaviors subscale measured at baseline and follow-up, displayed by group. Most of the group means increased between the two measurement time points.

TABLES

Table 1: Summary of the advocacy core of the conceptual framework for youth advocacy. Most of these processes and skills can be applied to both advocacy behaviors and the nutrition and physical activity target behaviors.

Advocacy	Skill or goal
Education	Knowledge of nutrition and physical activity benefits and recommendations
	Empowerment
	Political structure and opposition
	Legislative processes
	Program development
	Understanding of specific policy goals
Skills development	Self-efficacy to perform skills
	Goal setting
	Leadership
	Communication
	Networking
	Assertiveness
	Peer education
	Mediation/negotiation
	Team-building
	Understanding budgets
	Program/strategy evaluation
	Media contact strategies
Behaviors	Peer communication/education
	Speaking with decision makers
	Contacting media
	Signing petitions
	Holding/attending press conferences
	Attending youth conferences
	Conducting participatory research
	Conducting environmental assessments
Informed public participation and broad engagement	Participate in advocacy actions with other group or to achieve other outcomes

.

Table 2: YEAH! manual content as matched with measured mediators on youth and adult surveys.

YEAH! manual component	Measure on survey
Introduction and background (why change your neighborhood, obesity, neighborhood environment)	Youth: reasons for joining, self-efficacy, perceived sociopolitical control, readiness/openness Adult: background and role
Gathering resources, identifying a project coordinator and partners	Adult: group meetings and logistics, about the group, adult involvement
Retain the participation of youth, logistics of working with youth, teamwork, conflict resolution	Youth: coordinator characteristics, group resiliency, group cohesion, collective efficacy, opportunities for control and involvement Adult: group cohesion, group resiliency, group efficacy
Training youth and adults on healthy eating and physical activity	Youth: meeting physical activity recommendations, sports and active transport, fast food, servings of fruit/vegetables, social support for health behaviors
Conducting the audits (schools, parks, fast food outlets, outdoor advertising, stores)	Adult: YEAH! manual and training process, process evaluation
Advocating for change in neighborhood, playing the "policy game"	Youth: roles and participation, group advocacy, advocacy, assertiveness, Adult: advocacy efforts
Problems and recommended solutions, sample action plan, sample itinerary	Youth: group outcome efficacy, knowledge of resources Adult: youth motivation, leader growth

Table 3: Description, scoring, and internal reliability of youth baseline and follow-up measures used to evaluate eYEAH! programs (items originally proposed).

Domains, and subscales	# items (response scale, range)	Sample items	Baseline	Follow-up
Attitudes and Beliefs				
Reason for joining	17 (checklist)	What is the one main reason you wanted to be part of this group project? Because a friend asked me, To try and make a difference, Incentives/free stuff, etc.	x	
Self-efficacy for health and advocacy behaviors	3 (1: strongly disagree to 5: strongly agree)	I am sure that I can tell my friends to eat healthy. I am confident that I can work to make my school or home neighborhood better for being physically active and eating healthy.	x	x
Perceived socio-political control (2 subscales): Active participation, Optimism for change	4 (1: strongly disagree to 5: strongly agree)	I like to wait and see if someone else is going to solve a problem. I enjoy participation because I want to have as much say as possible in my school or community.	x	
	1 additional (1: strongly disagree to 5: strongly agree)	Since I started this project, I am more confident in my ability to communicate with decision makers about the kinds of changes we need to make our school or community a better place for being physically active and eating healthy.		x
Openness to healthy behaviors	3 (1: strongly disagree to 5: strongly agree; 0-5 friends)	I am ready to work on making my school or community a better place for being physically active and eating healthy. How many of your five closest friends are physically active at least 5 days a week?	x	x
Advocacy outcome efficacy	2 (1: strongly disagree to 5: strongly agree)	This project can make a difference in making our school or community a better place for being physically active and eating healthy.	x	x
Group resiliency	1 (1: strongly disagree to 5: strongly agree)	I am confident that this group can work through problems.	x	

Table 3: Description, scoring, and internal reliability of youth baseline and follow-up measures used to evaluate eYEAH! programs (items originally proposed), continued.

Domains, and subscales	# items (response scale, range)	Sample items	Baseline	Follow-up
Pride in group work	2 (1: strongly disagree to 5: strongly agree)	I am proud of the work our group did. Our work was worth the time and effort we put into it.		x
Knowledge and Skills				
Knowledge of resources	1 (1: strongly disagree to 5: strongly agree)	I know how to get information about ways to make my school or community a better place for being physically active and eating healthy.	x	
	1 additional (1: strongly disagree to 5: strongly agree)	Since I started this project, I understand a lot more about what changes are needed to make my school or community a better place for being physically active and eating healthy.		x
Assertiveness	4 (1: strongly disagree to 5: strongly agree)	I can talk with adults about issues I believe in. I can ask others to help work on making our school or community healthier.	x	x
Health advocacy history	2 (0: never to 4: 6+ times)	In the last year, how many times have you tried to tell other students, your family, or friends, to think more about eating healthy or being physically active?	x	
Personal advocacy activities since starting YEAH!	3 (1: strongly disagree to 5: strongly agree)	Since I started this project, I have talked to my parents or family members about changes needed to make my school or community a better place for being physically active and eating healthy.		x
Participatory competence and decision-making	2 (1: strongly disagree to 5: strongly agree)	If I have a problem when working towards a goal, I usually do not give up. I can influence the decisions my group makes.	x	x
Level/history of prior involvement	9 and 13 (checklists); 1 open-ended	Have you ever done any of these things? Signed a petition to change a school or community policy or law, Written or called a government official, etc.	x	x
Group advocacy (if applicable)	7 (1: strongly disagree to 5: strongly agree); 1 (yes/no)	The decision maker(s) listened carefully to our group. The decision maker(s) seemed to understand what we were asking for.		x
Physical Activity and Nutrition				
Meeting physical activity recommendations	2 (0-7 days)	Over the past seven days/typical or usual week, how many days were you physically active for a total of at least 60 minutes per day?	x	x
Sports and active transport (2 subscales): Sports/ physical activity enjoyment, Active transport	4 (0-5 days); 1 checklist (8 response options)	Not counting PE classes, how many days per week do you play or practice a team sport or take a physical activity class? In a typical week, how many days do you walk or bike to school?	x	x

Table 3: Description, scoring, and internal reliability of youth baseline and follow-up measures used to evaluate eYEAH! programs (items originally proposed), continued.

Domains, and subscales	# items (response scale, range)	Sample items	Baseline	Follow-up
Fast food times per week and month	2 (# times/week and month)	Outside of school, in a typical week, how many times do you eat fast food?	x	x
Servings of fruit and vegetables	2 (0-4+ days)	In a typical day how many servings of fruit do you eat? In a typical day how many servings of vegetables do you eat?	x	x
Social support for health behaviors	5 (1: strongly disagree to 5: strongly agree; 0-5 friends)	My friends think it is cool that I am participating in this project. I often tell my friends and family to be physically active and/or eat healthy.	x	
Collective Participation				
Roles and participation	8 (checklist); 2 (1: very often to 5: never)	What roles have you played in this group? Active member through meeting attendance, Decision maker in designing activities, etc. When I attended meetings, I took part in the discussions.		x
Benefits of participating	12 (checklist); 1 open-ended	What are some of the benefits you got from being a member of this group? Learned new skills, Made a difference, educated others, created change, Community service hours, etc.		x
Intent to remain involved	2 (1: strongly disagree to 5: strongly agree)	I plan to continue to work for change in my school or community after this project is over. If I had a chance to join a similar group in the future, I would.		x
Group Characteristics				
Opportunities for control in group work	2 (1: strongly disagree to 5: strongly agree)	This group allowed me to have a say in planning events or activities. This group had specific leadership roles for youth.		x
Opportunities for involvement in group	1 (1: strongly disagree to 5: strongly agree)	The group meetings or events were held at times when it was easy for me to attend.		x
Group Climate				
Collective efficacy toward group goals	1 (1: strongly disagree to 5: strongly agree)	Members of this group worked well together to accomplish our goals.		x
Group outcome efficacy	2 (1: strongly disagree to 5: strongly agree)	This group can influence how adults in this community /people my age who are not in this group feel about nutrition and physical activity.		x
Group cohesion	3 (1: strongly disagree to 5: strongly agree)	Our group is united to make our school and community a better place for being physically active and eating healthy.		x

Table 3: Description, scoring, and internal reliability of youth baseline and follow-up measures used to evaluate eYEAH! programs (items originally proposed), continued.

Domains, and subscales	# items (response scale, range)	Sample items	Baseline	Follow-up
Follow-up group resiliency	2 (1: strongly disagree to 5: strongly agree)	This group does not give up during tough times. If this group failed to accomplish one of our goals, we kept trying to find a way to reach it.		x
Coordinator characteristics	3 (1: strongly disagree to 5: strongly agree)	Our leader(s) provided help whenever we needed it. Our leader(s) let us work through our disagreements to decide what was best for the group.		x
Demographics	6	Age, grade, ethnicity, relative school performance	x	x
Type of project	6	What type of project will/did your group focus on? School, Parks, Fast food outlets, Outdoor advertising, Stores, Don't know	x	x

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Table 4: Description, scoring, and internal reliability of adult group leader baseline and follow-up measures used to evaluate eYEAH! programs.

Domains, and subscales	# items (response scale, range)	Sample items	Baseline	Follow-up
General Information				
Contact information*	4 (response scales varied)	Organization/affiliation, number of groups worked with	x	x
Group meetings/logistics*	11 (1: yes, 2: no, and open-ended questions)	How frequently does/will your group meet? Is there a source of funding for this YEAH! group? How are decisions made in this group? Is there a defined set of rules?	x	x
Adult leader background and role*	10 (1: yes, 2: no, and open-ended questions)	Is your position as a group leader volunteer or paid? Have you been involved with youth advocacy before this project? What attracted you to the possibility of leading a YEAH! group?	x	x
About the group	7 (varied response scales and open-ended)	Age range of youth, number of youth beginning and ending program, voluntary or mandated		x
Adult involvement	5 (varied response scales)	How many adults participated in leading/supporting your youth advocacy group? What do you think are the most (up to 5) important characteristics of successful YEAH! leaders?		x
Group climate				
Group cohesion and participation	5 (1: disagree strongly to 5: agree strongly)	How would you rate the interactions among the youth members of your YEAH! group? All group members participated enthusiastically, A few leaders emerged among youth members, etc.		x
Group resiliency	1 (open-ended)	What, if any, barriers did you encounter in leading your group and how did you overcome them?		x
Group efficacy (leader perspective)	8 (1: no success to 5: excellent success)	Overall, how would you rate the success of your group's youth advocacy project on the youth who participated in the YEAH! project… in the following areas: Building leadership skills, Engaging the youth in their communities/neighborhoods, etc.		x

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Table 4: Description, scoring, and internal reliability of adult group leader baseline and follow-up measures used to evaluate eYEAH! programs, continued.

Domains, and subscales	# items (response scale, range)	Sample items	Baseline	Follow-up
Youth and advocacy				
Youth motivation	9 (checklist)	For those youth that continued participation to the end, what do you think their primary motivators were? Community service hours, learn new skills or to gain knowledge, etc.		x
Advocacy efforts	3 checklists (10, 5, 4 response options); 2 (yes/no); 5 (open-ended responses)	With which decision makers did your group advocate for change? School board, city council, mayor, etc.; How did your group advocate for change? In-person presentations/meetings, media, etc. Please describe the outcomes of your group's advocacy efforts.		x
Process evaluation				
The YEAH! manual and training process	14 (varied response scales including open-ended)	How would you rate the usefulness of the YEAH! manual? If you used assistance, how important was that assistance to you? What are the most important ingredients for a successful YEAH! project?		x
Leader growth	2 (open-ended)	What do you think was the most significant impact of participating in this project- on you as a group leader? If you were going to repeat the process of leading this group, is there anything you would change? Please describe.		x
Process evaluation	1 (open-ended), 2 (yes/no/unsure)	What do you think was the most significant impact of participating in this project on the youth in your group? Would you be willing to participate in focus groups? Would you consider leading a similar group in the future?		x

*These items and subscales were asked 3 times, as many group leaders were involved with multiple groups

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Table 5: Youth baseline demographic characteristics (n=136).

Characteristic	N (%) or Mean (SD)	Range (when applicable)
Age	15.33 (2.73)	9-22
Grade	10.2 (2.54)	4-12
Gender^		
Male	36 (24.7)	
Female	98 (67.1)	
Race/ethnicity (not mutually exclusive)		
White Non-Hispanic	19 (13.0)	
Black Non-Hispanic	34 (23.3)	
Hispanic/Latino(a)	52 (35.6)	
Asian/Pacific	32 (21.9)	
Islander/Native Hawaiian		
Other	22 (15)	
How well do you think you do in school?	2.13 (.78)	1 (below average) – 5 (above average)
Number of different YEAH! groups	21	
Type of YEAH! project/group focus		
School	69 (67.0)	
Parks	11 (10.7)	
Fast food outlets	4 (3.9)	
Outdoor advertising	12 (11.6)	
Stores	4 (3.9)	
I don't know	3 (2.9)	
Never done any advocacy prior to this group	38 (27.9)	
Group met with a decision maker to advocate for change.	82 (60.3)	

^n=134, ^^n=103

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Youth pre- and post- test matched subscales					
Self-efficacy for health and advocacy behaviors	3	-I am sure that I can tell my friends to eat healthy. -I am sure that I can tell my friends to be physically active. -I am confident that I can work to make my school or community a better place for being physically active and eating healthy.	1.0, .704	1	.973, .973, .849
Perceived sociopolitical control (resulted in two factors)					
Active participation	2	-I like to wait and see if someone else is going to solve a problem. (reverse coded) -I find it very hard to talk in front of a group. (reverse coded)	1.0	1	.787, .755
Optimism for change	2	-If I tell someone "in charge", like a leader, about my opinions, they will listen to me. -I enjoy participation because I want to have as much say as possible in my school or community.	.311	1	.834, .763
Readiness/openness (as originally proposed)					

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Openness to healthy behaviors	2	-How many of your five closest friends are physically active at least 5 days a week? -How many of your five closest friends eat at least 5 servings of fruits and vegetables a day? ~~I am ready to work on making my school or community a better place for being physically active and eating healthy.~~	.491	1	.820, .822
Advocacy outcome efficacy	2	- This project can make a difference in making our school or community a better place for being physically active and eating healthy. -This group can influence how people feel about nutrition or physical activity.	.372	1	.828, .828
Assertiveness (as originally proposed)					
Assertiveness (after revision)	3	- I can talk with adults about issues I believe in. -I can ask others to help work on making our school […] healthier. -I can start discussions […]about how to change our school (sic).	.474, .524, .678	1	.776, .861, .883

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~~I am a leader.~~

Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Health advocacy history	2	- In the last year, how many times have you tried to tell other students, your family, or friends to think more about eating healthy or being physically active -In the last year, how many times have you tried to tell school leaders, people in your community […] to be more interested in making your school/community a better place for being physically active and eating healthy.	.154	1	.759, .759
Participatory competence and decision making	2	-If I have a problem when working towards a goal, I usually do not give up. -I can influence the decisions my group makes.	.268	1	.796, .796
Meeting physical activity recommendations	2	- Over the past seven days, how many days were you physically active for at least 60 minutes per day? - Over a typical week, on how many days are you physically active for at least 60 minutes per day?	.717	1	.927, .927
Sports and active transport (resulted in two factors)					

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Sports/Enjoyment of physical activity	2	-Not counting PE classes, how many days per week do you play or practice a team sport, or take a physical activity class? -I enjoy physical activity.	.036	1	.720, .720
Active transport	2	- In a typical week, how many days do you walk or bike TO school? -In a typical week, how many days do you walk or bike FROM school?	.765	1	.939, .939
Servings of fruits and vegetables	2	-In a typical day, how many servings of fruit do you eat? -In a typical day, how many servings of vegetables do you eat?	.434	1	.847, .847
Youth post-test only					
Pride in group work	2	-I am proud of the work our group did. -Our work was worth the time and effort we put into it.	.818	1	.953, .953
Roles and participation: likert	2	-When I attended meetings, I took part in the discussions. -I took responsibility for things that the group needs to have done.	.389	1	.836, .836

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Intent to remain involved	2	-I plan to continue to work for change in my school or community after this project is over. -If I had a chance to join a similar group in the future, I would do it.	.562	1	.885, .885
Opportunities for control in group work	2	-This group allowed me to have a say in planning events or activities. -This group had specific leadership roles for youth.	.481	1	.860. .860
Group outcome efficacy	2	-This group can influence how adults in the community feel about nutrition and physical activity. -This group can influence how people my age, who are not in this group, feel about nutrition and physical activity.	.638	1	.905, .905
Group cohesion (as originally proposed)					

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Group cohesion (after revision)	2	- Members of our group do not spend time together outside of meetings or events. (reverse coded) -I'm unhappy with my group's level of commitment to its goals for creating healthier communities. (reverse coded) -Our group is united to make our school and community a better place for being physically active and eating healthy.	.202	1	.775, .775
Group advocacy (Only if group met with a decision maker; n=86) (as originally proposed)					
Group advocacy (after revision)	5	-The decision maker(s) listened carefully to our group. -The decision maker(s) seemed to understand what we were asking for. -The decision maker(s) seemed to learn something new from what we were saying.	.424 to .838	1	.157 to .717

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Group advocacy (after revision, continued)	5	-The decision maker(s) would have listened to us more if we were adults instead of youth. -The decision maker(s) were impressed by our group's work. - The decision maker(s) are going to make some changes based on the information from our group. -The decision maker(s) listened to us more because we were youth (rather than adults).	.424 to .838	1	.157 to .717
Follow-up group resiliency	2	-This group does not give up during tough times. -If this group failed to accomplish one of our goals, we kept trying to find a way to reach it.	.317	1	.811, .811
Coordinator characteristics	3	-Our leader(s) provided help whenever we needed it. -Our leader(s) did not force his or her ideas and opinions on the group. -Our leader(s) let us work through our disagreements to decide what was best for the group.	.253, .317, .424	1	.703, .789, .819

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Personal advocacy activities since starting YEAH!	2	-Since I started this project, I have talked to my parents or family members about changes needed to make my school or community a better place for being physically active and eating healthy. -Since I started this project, I have talked to my friends about changes needed to make my school or community a better place for being physically active and eating healthy.	.597	1	.894, .894
Adult post-test					
Group efficacy (leader perspective)	8	How would you rate the success…on the youth? -Building leadership skills -Increasing their knowledge of physical activity and healthy environments -Increasing their knowledge of healthy eating -Increasing knowledge of the role of policy/environment in supporting healthy eating and physical activity -Building advocacy skills among the youth	.099 to .700	1	.431 to .872

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Table 6: Factor analysis and intra-item correlation results of subscales with two or more items, continued.

Subscale	# items	Items (baseline wording)	Intra-item correlations	# compo-nents	Factor loadings (rotated, or unrotated if only 1 factor)
Group efficacy (leader perspective, continued)		-Engaging the youth in their communities/neighborhoods -Building self-efficacy among the youth -Educating decision makers	.099 to .700	1	.431 to .872
Group cohesion and participation (as originally proposed)					
Group cohesion and participation (after revision)	3	-Attendance by group members was consistent and strong. -All group members participated enthusiastically. -A few leaders emerged among youth members. ~~-Decision-making was primarily driven by adult leaders.~~ ~~-The youth in the group did not know each other before joining the group.~~	.295, .348, .701	1	.619, .787, .892

Note: Strikethrough items are those that were dropped during factor analysis.

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Table 7: Adult group leader and group characteristics (n=47 baseline, n=45 follow-up).

Variable	N (%) or Mean (SD)	Range
Leader age^	30.23 (10.3)	22-64
Number of adults involved with/led the group^^		1-13
1	5 (11.6)	
2	5 (11.6)	
3	5 (11.6)	
4	6 (14.0)	
5	11 (25.6)	
6 or more	11 (25.6)	
Race/ethnicity (not mutually exclusive)^		
White Non-Hispanic	29 (64.4)	
Black Non-Hispanic	5 (11.1)	
Hispanic/Latino(a)	9 (20.0)	
Asian/Pac Islander/Native Hawaiian	4 (8.9)	
Other	1 (2.2)	
Group is funded	28 (60.9)	
Leader worked with this group previously	8 (16.7)	
Leader paid or volunteer		
Volunteer (includes graduate students required to participate)	32 (68.1)	
Paid	15 (31.9)	
Had prior experience with advocacy	11 (22.9)	
Had prior experience with nutrition/physical activity	36 (75.0)	
Had prior experience with policy, education, neighborhood design	22 (45.8)	
Type of YEAH! project completed*^		
School	11 (40.8)	
Parks	4 (14.8)	
Fast food outlets	4 (14.8)	
Outdoor advertising	5 (18.5)	
Stores	3 (11.1)	
Group meeting frequency		
Once/month or fewer	5 (10.6)	
Every other week	2 (4.2)	
Every week	37 (78.8)	
More than every week	3 (6.4)	
Duration of meetings		
< 1 hour	11 (23.4)	
1-2 hours	25 (53.2)	
>2 hours	11 (23.4)	
Total number of sessions met	8.4 (4.3)	2-24
Total number of hours met	18.6 (11.0)	5-60
Top three perceived youth motivators (not mutually exclusive)		
Interested in physical activity, healthy eating, fighting obesity	28	

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Table 7: Adult group leader and group characteristics (n=47 baseline, n=45 follow-up), continued.

Variable	N (%) or Mean (SD)	Range
Contributing to community, create a change, educate others	28	
Learn a new skill or gain knowledge	16	
Who decided on group rules? (not mutually exclusive)		
Youth	10 (22.1)	
Adult(s)	4 (8.9)	
Both	36 (80.0)	
Would you consider leading a similar group in the future? ^^		
Yes	31 (72.1)	
Unsure	8 (17.8)	
No	4 (8.9)	

^n=39, ^^n=43, *^n=27

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Table 8: Adult group leader subscale descriptive statistics and advocacy outcomes at follow-up (n=45).

Subscale or Item	# items	Frequency (%)
Advocacy efforts and outcomes		
Have you seen any results of your group's advocacy efforts to date? (not mutually exclusive, n=48) **Primary advocacy outcome*	1	
Policy or environmental change was made		7 (15.6)
Policy change or improvements are under consideration		6 (13.3)
No change for now, but decision makers have indicated greater understanding, and change may be possible in the future		25 (55.6)
No change, no apparent impact		6 (13.3)
Other		4 (8.9)
With which decision maker(s) did your group advocate for change? (not mutually exclusive)	1	
School principal or vice principal		37 (82.2)
Food service personnel		21 (46.7)
School board		17 (37.7)
PTA		4 (8.9)
City council		4 (8.9)
Other (i.e., teacher, military board)		4 (8.9)
City/county planning group		3 (6.7)
Store or business owner		2 (4.4)
State legislator or mayor		0 (0.0)
How did your group advocate for change? (not mutually exclusive)	1	
In-person presentations or meetings		41 (91.0)
Letters, emails, or phone calls		21 (46.8)
Working with the media		2 (4.4)
Perceptions of group processes		**Mean (SD) (Range)**
Group cohesion and participation	3	3.89 (.81) (1-5)
Group efficacy	8	3.98 (.56) (2.13-5)

Table 9: Youth subscale descriptive statistics and paired t-test results: Full sample.

Subscale	# items	Pre-test (n=131-136)		Post-test (n=100-104)		Paired t-test on full pre- and post sample (n=81-94)
		Mean (SD)	Range	Mean (SD)	Range	
Attitudes and beliefs						
Self-efficacy for health and advocacy behaviors	3	3.82 (.84)	1.33-5	4.19 (.72)	2.33-5	t=4.27, p<.001***
Perceived sociopolitical control						
Active participation	2	2.62 (.96)	1-5	2.85 (.92)	1-5	t=2.86, p<.001***
Optimism for change	2	4.04 (.73)	1-5	4.16 (.72)	2-5	t=.75, p=.46
Openness to healthy behaviors	2	2.67 (1.20)	0-5	2.73 (1.16)	0-5	t=1.21, p=.27
Advocacy outcome efficacy	2	4.36 (.63)	2-5	4.35 (.61)	2.67-5	t=1.50, p=.14
Group resiliency	1	4.46 (.74)	2-5	4.49 (.69)	1-5	t=.22, p=.83
Knowledge and skills						
Assertiveness	3	3.72 (.91)	1-5	4.02 (.69)	2-5	t=3.23, p<.01**
Health advocacy history	2	1.81 (1.02)	0-4	2.17 (.87)	0-4	t=3.36, p<.001***
Participatory competence and decision making	2	3.94 (.68)	2-5	4.08 (.65)	2.5-5	t=1.04, p=.30
Knowledge of resources	1	3.48 (1.15)	1-5	3,93 (.99)	1-5	t=3.39, p<.001***
Social support for health behaviors	1	3.45 (.81)	1-5	3.92 (.961)	1-5	t=3.83, p<.001***
Nutrition and physical activity behaviors						
Meeting physical activity recommendations	2	3.71 (1.91)	0-7	4.01 (1.56)	0-7	t=2.24, p<.05*
Sports and active transportation (split into two subscales):						
Sports/Enjoyment of physical activity	2	3.04 (1.20)	.5-5	3.19 (1.10)	1-5	t=1.78, p=.08
Active transport	2	1.07 (1.79)	0-5	.86 (1.67)	0-5	t=.033, p=.97
Servings of fruits and vegetables	2	2.17 (1.02)	0-4	2.19 (.94)	.5-4	t=1.09, p=.28
Fast food times per week (n=125)	1	1.69 (1.94)	0-14	1.65 (2.50)	0-15	t=1.64, p=.10

Table 9: Youth subscale descriptive statistics and paired t-test results: Full sample, continued.

Subscale	# items	Pre-test (n=131-136)		Post-test (n=100-104)		Paired t-test on full pre- and post sample (n=81-94)
		Mean (SD)	Range	Mean (SD)	Range	
Fast food times per week (n=125)	1	1.69 (1.94)	0-14	1.65 (2.50)	0-15	t=1.64, *p*=.10
Fast food times per month (n=125)	1	5.90 (6.36)	0-30	5.08 (6.91)	0-60	t=.11, *p*=.91
Pre-post checklist						
Level/history of prior involvement (sum of responses)	8	1.05 (1.17)	0-4	1.51 (1.74)	0-8	t=1.54, *p*=.13

*p<.05, **p<.01, ***p<.001

Table 10: Youth subscale descriptive statistics for matched pairs and those who did not complete the study; Pre-post advocacy changes measured by paired t-tests (matched pairs).

Subscale	Non-Completers Pre-test (n=40-43)		Non-Completers Post-test (n=10-11)		Matched Pairs Pre-test (n=90-93)		Matched Pairs Post-test (n=93)		t-test: matched pairs (n=87-92)
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	
Attitudes and beliefs									
Self-efficacy for health and advocacy behaviors	3.79 (.83)	1.67-5	4.51 (.62)	3.67-5	3.84 (.85)	1.33-5	4.16 (.72)	2.33-5	t=4.22, *p*<.001***
Perceived sociopolitical control (split into two subscales):									
Active participation	2.65 (1.07)	1-5	2.4 (.95)	1-4	2.60 (.92)	1-5	2.89 (.91)	1-5	t=2.93, *p*<.01**
Optimism for change	4.04 (.74)	2-5	4.54 (.35)	4-5	4.04 (.73)	1-5	4.11 (.74)	2-5	t=.91 , *p*=.37
Openness to healthy behaviors	2.88 (1.29)	0-5	2.50 (.95)	1-4	2.60 (1.15)	0-5	2.76 (1.19)	0-5	t=1.12 , *p*=.27
Advocacy outcome efficacy	4.16 (.74)	2-5	4.48 (.55)	3.33-5	4.45 (.56)	2.5-5	4.34 (.61)	2.67-5	t=1.72 , *p*=.09†
Group resiliency	4.24 (.79)	2-5	4.73 (.46)	4-5	4.56 (.70)	2-5	4.58 (.72)	1-5	t=.11 , *p*=.91
Knowledge and skills									
Assertiveness	3.67 (.81)	1.33-5	4.24 (.50)	3.67-5	3.74 (.95)	1-5	4.00 (.70)	2.0-5	t=3.23, *p*<.01**
Health advocacy history	1.82 (1.11)	0-4	2.23 (.61)	1.5-3.5	1.81 (.99)	0-4	2.16 (.90)	0-4	t=3.52, *p*<.001***
Participatory competence and decision making	3.93 (.71)	2-5	2.23 (.52)	3.5-5	3.94 (.67)	2-5	4.03 (.64)	2.5-5	t=1.11, *p*=.27
Knowledge of resources	3.31 (1.79)	1-5	3.91 (1.22)	1-5	3.56 (1.15)	1-5	3.93 (.96)	1-5	t=3.24, *p*<.01**
Social support for health behaviors	3.49 (.81)	2-5	3.91 (1.04)	2-5	3.44 (.82)	1-5	3.92 (.96)	1-5	t=3.84, *p*<.001***
Nutrition and physical activity behaviors									

Table 10: Youth subscale descriptive statistics for matched pairs and those who did not complete the study; Pre-post advocacy changes measured by paired t-tests (matched pairs), continued.

Subscale	Non-Completers Pre-test (n=40-43)		Non-Completers Post-test (n=10-11)		Matched Pairs Pre-test (n=90-93)		Matched Pairs Post-test (n=93)		t-test: matched pairs (n=87-92)
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	
Meeting physical activity recommendations	3.91 (2.02)	0-7	4.1 (1.60)	1-6	3.62 (1.87)	0-7	4.0 (1.57)	0-7	t=2.28, $p<.05$*
Sports and active transportation (split into two subscales):									
Sports/Enjoyment of physical activity	3.08 (1.23)	1-5	3.41 (.94)	2-5	3.02 (1.19)	.5-5	3.17 (1.12)	1-5	t=1.58 , p=.12
Active transport	1.65 (1.98)	0-5	1.59 (2.03)	0-5	.81 (1.63)	0-5	.78 (1.61)	0-5	t=.10 , p=.92
Servings of fruits and vegetables	2.29 (1.04)	0-4	2.27 (.75)	1.5-3.5	2.11 (1.01	0-4	2.18 (.97)	.5-4	t=1.16, p=.25
Fast food times per week	2.35 (2.53)	0-14^	3.40 (1.95)	0-6	1.40 (1.57)	0-7~	1.68 (2.58)	0-15	t=1.64, p=.10
Fast food times per month	7.05 (6.70)	0-30^^	3.40 (1.95)	1-7	5.38 (6.16)	0-30~~	2.38 (7.26)	0-60	t=.11 , p=.91
Pre-post checklist									
Level/history of prior involvement (sum of responses)	.97 (1.32)	0-4	.49 (1.19)	0-5	1.09 (1.08)	0-4	2.10 (1.75)	0-8	t=3.97, $p<.001$***

^n=37, ^^n=39, ~n=85, ~~n=87
†p<.10, *p<.05, **p<.01, ***p<.001

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Table 11: Youth follow-up only subscales and checklists.

Subscale	# items	Mean (SD)	Range
Pride in group work	2	4.66 (.61)	1.5-5
Roles and participation: checklist	8	1.73 (1.26)	0-5
Roles and participation: likert	2	4.22 (.67)	2-5
Benefits of participating (checklist)	10	6.28 (2.07)	0-10
Intent to remain involved	2	4.03 (.81)	2-5
Opportunities for control in group work	2	4.00 (.87)	1.5-5
Opportunities for involvement in group	1	4.19 (1.01)	1-5
Collective efficacy toward group goals	1	4.56 (.71)	2-5
Group outcome efficacy	2	4.22 (.77)	2.5-5
Group cohesion	2	3.98 (.84)	1.5-5
Group advocacy	6	4.26 (.56)	2.67-5
Follow-up group resiliency	2	4.27 (.72)	3-5
Coordinator characteristics	3	4.42 (.67)	2.67-5
Personal advocacy activities since starting YEAH!	2	3.77 (1.00)	1.5-5

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Table 12: Pearson's correlations between the youth advocacy readiness/receptivity index outcome and youth subscale variables (n=80-83).

Variable	*r*
Optimism for change (baseline)	.339**
Optimism for change (follow-up)	.506**
Openness to healthy behaviors (baseline)	-.133
Openness to healthy behaviors (follow-up)	.093
Advocacy outcome efficacy (baseline)	.019
Advocacy outcome efficacy (follow-up)	.295**
Group resiliency (baseline)	.227*
Group resiliency (follow-up)	.258*
Participatory competence and decision making (baseline)	.146
Participatory competence and decision making (follow-up)	.261*
Meeting physical activity recommendations (baseline)	.067
Meeting physical activity recommendations (follow-up)	.083
Sports/physical activity enjoyment (baseline)	.203†
Sports/physical activity enjoyment (follow-up)	.335**
Active transport (baseline)	-.027
Active transport (follow-up)	-.050
Servings of fruits and vegetables (baseline)	.124
Servings of fruits and vegetables (follow-up)	.259**
Fast food times per week (baseline)	-.080
Fast food times per week (follow-up)	-.043
Fast food times per month (baseline)	-.068
Fast food times per month (follow-up)	.109
Level/history of prior involvement (baseline)^	.071
Level/history of prior involvement (follow-up)	-.004
Pride in group work	.161
Roles and participation: checklist	-.031
Roles and participation: likert	.538**
Benefits from participating	-.131
Intent to remain involved	.394**
Opportunities for control	.332**
Opportunities for involvement	.196†
Collective efficacy	.230*
Group outcome efficacy	.279*
Group cohesion	.208†
Group advocacy (Only if group met with a decision maker; n=66)	.391**
Follow-up group resiliency	.212†
Coordinator characteristics	.325**
Personal advocacy activities since starting YEAH!	.554**

†p<.10. *p < .05. **p < .01

^n=60

.

Table 13: Relation of youth demographic factors, psychosocial subscales, and group characteristics to youth advocacy readiness/receptivity (n=80).

Variable	B	95% CI	*p*
Intercept	-11.7	-19.2, -4.2	-
Demographic covariates			
Age	-.19	-.44, .05	.123
Male (gender)	.73	-.48, 1.95	.235
Hispanic or African American (race/ethnicity)	1.07†	-.14, 2.29	.082
School performance	.17	-.65, .99	.684
Independent variable subscales			
Optimism for change (follow-up)	1.46**	.49, 2.44	.004
Advocacy outcome efficacy (follow-up)	-1.65	-4.13, .83	.188
Group resiliency (follow-up)	-.67	-1.91, .57	.282
Participatory competence and decision making (follow-up)	.64	-.34, 1.62	.198
Sports/physical activity enjoyment (follow-up)	.55*	.05, 1.05	.033
Servings of fruits and vegetables (follow-up)	.25	-.36, .86	.408
Roles and participation (likert)	1.81**	.60, 3.02	.004
Intent to remain involved	-.42	-1.45, .60	.410
Opportunities for control	-.50	-1.54, .54	.338
Opportunities for involvement	.15	-.53, .83	.654
Collective efficacy	.57	-.68, 1.81	.366
Group outcome efficacy	.56	-1.32, 2.44	.556
Group cohesion	.72†	.00, 1.43	.050
Follow-up group resiliency	-.45	-1.37, .47	.332
Coordinator characteristics	-.38	-1.40, .63	.450
Personal advocacy activities since starting YEAH!	1.49**	.64, 2.32	.001

†$p<.10$, *$p < .05$, **$p < .01$

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Table 14: Results from a separate GLMM model for each subscale IV: Relation of each proposed subscale to the youth advocacy readiness/receptivity outcome.
$^{\dagger}p<.10$. $^{*}p < .05$; $^{**}p < .01$, $^{***}p<.001$

Variable	B	95% CI	*p*	Full model B for comparison
Optimism for change (follow-up)	2.37***	1.48, 3.25	<.001	1.39*
Advocacy outcome efficacy (follow-up)	1.46*	.27, 2.64	.017	-1.85
Group resiliency (follow-up)	1.35*	.23, 2.47	.019	-.44
Participatory competence and decision making (follow-up)	1.40*	.29, 2.52	.015	.73
Sports/physical activity enjoyment (follow-up)	.93**	.33, 1.53	.003	.51†
Servings of fruits and vegetables (follow-up)	.88*	.13, 1.62	.022	.50
Roles and participation (likert)	2.59***	1.65, 3.52	<.001	1.95*
Intent to remain involved	1.59**	.69, 2.49	.001	-.56
Opportunities for control	1.30**	.41, 2.19	.005	-.78
Opportunities for involvement	.50	-.26, 1.25	.192	.53
Collective efficacy	.98†	-.11, 2.07	.076	.45
Group outcome efficacy	1.09*	.13, 2.06	.027	.93
Group cohesion	.85*	.01, 1.69	.048	.16
Follow-up group resiliency	.96†	-.01, 1.92	.052	-.49
Coordinator characteristics	1.48**	.42, 2.54	.007	-1.25†
Personal advocacy activities since starting YEAH!	2.17***	1.38, 2.95	<.001	1.15*

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Table 15: Pearson's and point biserial correlations between the advocacy success outcome and adult subscale variables (n=33-41).

Variable	*r*
Adult subscales and group factors	
Group cohesion and participation	..131
Group efficacy (leader perception)	.420**
Who made group rules? (continuous variable)	-.072
Number of adult leaders in group	-.123
Total number of adult hours spent on YEAH! project	..127
Group was funded	-.159
Leader paid (vs. volunteer)	-.078
Prior experience with advocacy (yes)	..200
Prior experience with nutrition/physical activity (yes)	..147
Prior experience with policy, education, neighborhood design (yes)	..133

†p<.10. *p < .05. **p < .01

.

Table 16: Relation of adult leader demographics and group characteristics to advocacy success (n=27).

Variable	B	95% CI	*p*
Intercept	-.082	-3.22, 3.06	-
Adult demographics			
Age	-.015	-.047, .016	.277
White non-Hispanic (race/ethnicity)	-.475	-1.13, .180	.137
Group and leader characteristics			
Group funded (yes)	.150	-.484, .784	.568
Paid leader	.911	-.733, 2.55	.240
Prior experience with advocacy (yes)	.387	-.782, 1.56	.484
Prior experience with nutrition/physical activity (yes)	1.21*	.295, 2.12	.017
Prior experience with policy, education, neighborhood design (yes)	-.002	-.689, .685	.994
Who decided on group rules? Adults, youth, or both	.289	-.303, .882	.242
Number of adult leaders in group	.154	-.131, .440	.250
Total number of adult hours spent on YEAH! project	-.031	-.104, .043	.377
Adult subscales			
Group efficacy (leader perception)	.459†	-.133, 1.05	.098
Group cohesion and participation	-.483†	-.966, -.001	.050

†*p*<.10, *p < .05, **p < .01

.

Table 17: Relation of adult leader demographics and group efficacy to advocacy success (n=28).

Variable	B	95% CI	*p*
Intercept	.026	-1.75, 1.81	-
Adult demographics			
Age	-.001	-.024, .022	.910
White non-Hispanic (race/ethnicity)	.202	-.232, .636	.343
Adult subscale			
Group efficacy (leader perception)	.296†	-.054, .646	.093

†*p*<.10, *p < .05, **p < .01

Table 18: Advocacy issues, processes, strategies, and outcomes by site (n=21 groups). Table courtesy of Health Policy Consulting Group.

San Diego County YEAH! Groups 2011-2013: Advocacy Summary

Sites	*Site Description*	*Issue(s)*	*Advocacy Strategies Implemented*	*Outcomes*
High Schools				
A	**School demographics**: 84% FRP*; 61% Hispanic/Latino, 28% black/African American **Leader**: School nurse **Youth**: Youth Health Council	Need healthier food options in school cafeteria	School food assessment, survey of fellow students, presentation to Head of School District Food Services, dieticians, principal	Salad bar added
B	**School demographics**: 43% FRP*, 49% Hispanic/Latino, 39% white **Leaders**: College nursing students **Youth**: Health Academy students, conducting senior health internship	Need: 1) continuation of nutrition education program at elementary school and 2) district policy change incorporating CA state health standards	School and food nutrition assessment, fast food outlet assessment, neighborhood assessment, presentation to Principal, Ass't Superintendent & nutrition director	Principal is writing grants to continue program, seeking ways to improve PA and nutrition environment; standards change has not gone before Board
C	**School demographics**: 88% FRP*, 93% Hispanic/Latino **Leaders**: Public Health Master's Students **Youth**: Health Sciences Pipeline Anatomy class	Need healthier offerings in school's vending machines	Principal	Support from principal, but no known change in machines' content
D	**School demographics**: 88% FRP*, 93% Hispanic/Latino **Leaders**: Public Health Master's Students **Youth**: Health Sciences Pipeline Anatomy class	Need healthier food options in cafeteria	Food Services Director, Nutrition services, cafeteria manager	Healthier items added to breakfast and lunch menus (e.g. oatmeal and fruit, wheat flour tortillas), but changes not sustained when personnel changed; new group of youth advocating again (Group F); principal supportive
E	**School demographics**: 88% FRP*, 93% Hispanic/Latino **Leader**: Non-profit youth media teacher **Youth**: Health Sciences Pipeline	Healthy fundraising for ASB	Presented to ASB and teacher liaison	No changes were made

Table 18: Advocacy issues, processes, strategies, and outcomes by site (n=21 groups), continued. Table courtesy of Health Policy Consulting Group.

Sites	***Site Description***	***Issue(s)***	***Advocacy Strategies Implemented***	***Outcomes***
F	**School demographics**: 88% FRP*, 93% Hispanic/Latino **Leader**: Non-profit youth education teacher **Youth**: Health Sciences Pipeline Anatomy class	Lack of palatable drinking water	School food / water assessment; survey of student body; assessment of costs of alternatives; presented to school principal and other school officials	Enthusiastic response from principal with promise to investigate; ultimate outcome unknown
Middle Schools				
G	**School demographics**: 92% FRP*, 96% Hispanic/Latino **Leaders**: Public Health Master's Students **Youth**: YMCA after-school program	Need for schoolyard improvements to encourage activity and reduce bullying "Peaceful playgrounds"	School assessment; letter and videotaped presentation to school principal	No known response or results; this group collaborated later with Group H)
H	**School demographics**: 92% FRP*, 96% Hispanic/Latino; **Leaders**: Public Health Master's Students **Youth**: YMCA after-school program	6th grade has just one water fountain / needs more water	School assessment, presentation to Vice-Principal, wellness coordinator, and teacher	Food services personnel added water in cafeteria / water jugs in classrooms, additional water sources under consideration
I	**School demographics**: 92% FRP*, 96% Hispanic/Latino **Leaders**: ARRA funded youth leader **Youth**: After-school program	Healthier food options in cafeteria and snack machines needed	School and neighborhood assessments; presentation to school site council and wellness council for district	Cafeteria changes made, including new food options, water stations, healthy options in carts outside cafeteria
J	**School demographics**: 49% FRP*, 72% Hispanic/Latino **Leaders**: social studies teacher and non-profit youth media teacher **Youth**: Grade 6-8 social studies class	Need for more PA space for this new school, existing field for play is too small	School assessment, photos and video; proposed joint use of adjacent city-owned field; presented to school principal and to city council member	Principal advocated with city reps; City Council member explained city land is committed for development of college, but thinks joint use could be required as part of college use; he encouraged full council presentation and ongoing youth advocacy; youth video given to mayor

Table 18: Advocacy issues, processes, strategies, and outcomes by site (n=21 groups), continued. Table courtesy of Health Policy Consulting Group.

Sites	***Site Description***	***Issue(s)***	***Advocacy Strategies Implemented***	***Outcomes***
K	**School demographics**: 34.4% FRP*, 45.6% Hispanic/Latino **Leaders**: Non-profit youth media teacher **Youth**: Grade 6-8 elective class	Adding a salad bar and offering water instead of milk with meals	School assessment, student interviews, video produced; video and presentation made to principal	Principal was receptive; however, no known response to date
L	**School demographics**: 72% FRP*, 57% Hispanic/Latino **Leaders**: YMCA after-school youth leader **Youth**: After-school leadership program	Holes in the school playground need repair / would like grass installed or a track to encourage PA and prevent injuries	School and park assessments, presented posterboard and powerpoint with photos to school vice-principal and after-school leadership	Increased understanding by administration, agreement to study potential remedies and funding sources; YEAH! group to continue and follow-up
Community Centers				
M	**Setting**: Navy Children and Youth After School Program at Boys & Girls Club **Leader**: After-school CYA leader **Youth**: High school age volunteers	Community has advertising signs promoting unhealthy foods	Outdoor advertising assessment and photos, letters written to business owners asking to have them removed	Leader believes signs were removed in response, but could not ID locations for verification
N	**Setting**: Navy Children and Youth After School Program at Boys & Girls Club **Leader**: After-school CYA leader **Youth**: High school age volunteers	Need for crosswalk between school and community center / youth are crossing busy street with no signals	Neighborhood assessment, work with Walk San Diego to take radar gun readings of traffic, present issues and data to Neighborhood planning group	Planning Group heard youth, but require more data to act; YEAH group plans to survey HS students, observe and record after school walking behavior
O	**Setting**: Community Wellness Center **Leaders**: Non-profit youth media leader and existing youth leader of group **Youth**: Muslim girls ages 12-19; sometimes collaborate with mothers group	Muslim girls' modesty requirements make it difficult to be physically active; they need women-only PA opportunities	Neighborhood and park assessments and photos; presentation to YMCA leadership with request for women-only time in pool	YMCA agreed to develop program for weekly swim session (1 hour lesson/1 hour rec time) with female lifeguard; YEAH group organized and registered community; multiple sessions have been held and attended.

Table 18: Advocacy issues, processes, strategies, and outcomes by site (n=21 groups), continued. Table courtesy of Health Policy Consulting Group.

Sites	***Site Description***	***Issue(s)***	***Advocacy Strategies Implemented***	***Outcomes***
P	**Setting**: Navy Children and Youth After School Program at Boys & Girls Club **Leader**: After-school CYA leader **Youth**: High school age volunteers	Increased lighting outside rec center would allow more walking / bicycling	Neighborhood assessment, presentation to Center managers and parent council	Agreement by manager to provide more lighting
Q	**Setting**: Job training / transition program for teens on probation **Leader**: Urban Garden Program leader **Youth**: Members participating in Urban Garden Program with an established garden	Liquor / convenience stores do not have fresh produce available for sale – could sell group's produce	Store assessment, outdoor advertising assessment, interviews of store owners / demonstration of produce to convenience store owners	Despite marketing success in farmers markets, youth could not persuade storeowners to sell their produce
R	**Setting**: Resident community center in urban affordable housing complex **Youth**: Volunteer high school aged residents	Neighborhood parks in poor condition	Park assessment;	PENDING
S	**Setting**: Resident community center in urban affordable housing complex **Youth**: Volunteer high school aged residents	Neighborhood park (Urban Village) is in poor condition; safety issues / many homeless using park	Park assessment; presentations made to local Parks and Rec Director (requesting repairs and more frequent maintenancee, and to City Police (local citizens patrol liaison) to request more patrols	Parks/rec manager agreed to repairs of drinking fountains and bathroom faucets but better lighting subject to budget and healthy vending subject to city contracts; Police acknowledged request for more oversight in park
T	**Setting**: Resident community center in urban affordable housing complex **Youth**: Volunteer high school aged residents	Neighborhood park (Teralta Park) is in poor condition; broken sidewalks, graffiti, dirty bathrooms	Park assessment; advocated with local Parks and Rec manager	Parks/rec manager welcomed direct evidence of problems (photos, etc.) and has promised action as budget permits
Churches				
U	Setting: Church in urban, low-income neighborhood Leaders: Church youth leader and grant funded healthy eating focused youth leaders Youth: Volunteer youth	Need safer walking infrastructure; crosswalk at elementary school is not visible to drivers	Neighborhood assessment and photographs; presentations made to school principal and neighborhood planning group	Crosswalk in front of school was repainted and other changes are under consideration
NOTES	*FRP: Free/Reduced Price Lunch			

APPENDIX

Appendix A: YEAH! manual background and table of contents.

YEAH!

Youth Engagement & Action for Health

Shaping Neighborhoods for Healthier Lifestyles

How to use this Manual

This manual has been created for leaders of youth groups as a guide to engage youth and adults to plan and implement projects designed to create healthier neighborhoods. These projects will improve neighborhoods so that they become places where it is easier for people to be healthy.

This manual is just a guide, so feel free to be creative when identifying and working to change neighborhood conditions to better support healthful behaviors.

While participating in this project, youth will identify and work toward a goal and they will gain valuable leadership experience. The experience may qualify as community service credit or as a senior project. Participants also may receive a thank you letter from the San Diego County Childhood Obesity Initiative acknowledging their experience and service.

A copy of this manual and supplemental materials are included on a flash drive for your convenience. For more information or if you have questions, please contact Erica Salcuni at 858-614-1549 or esalcuni@hasdic.org or visit our website at www.OurCommunityOurKids.org.

SAN DIEGO COUNTY CHILDHOOD OBESITY INITIATIVE
Working Together to Shape a Healthy Future

Background

The YEAH! manual is based on two pilot projects developed through the Government Domain of the San Diego County Childhood Obesity Initiative and two recruited cities in San Diego County, La Mesa and Chula Vista.

This youth engagement project was a hybrid of the Communities of Excellence in Nutrition, Physical Activity, and Obesity Prevention (CX³). This project utilized pilot-tested tools and methods developed to assess indicators linked to improving neighborhood food and activity environments.

In November 2006, the County of San Diego Health and Human Services Agency's Department of Public Health Services (County) pursued involvement with the state run CX³ program and was invited to participate in their trainings and utilize their tools and methods within the County's pilot project. Since the County did not receive USDA funding, they were able to modify the neighborhood assessments, which were generously provided by the California Department of Public Health's *Network for a Healthy California*. These modifications were made with assistance from WalkSanDiego, Chula Vista's Healthy Eating, Active Communities Campaign, and California Project LEAN.

The hybrid CX³ project assessed a range of indicators including walkability, different food facilities, parks, school campuses, and advertisements within the specific neighborhoods. Neighborhood assessments were conducted by teams that were recruited from each city. In Chula Vista, assessment teams were comprised of high school students and promotoras, while in La Mesa, intergenerational teams of youth and seniors were formed.

From the information gained in the assessments, the County and its partners worked with the youth and other community members to set priorities for action and develop local action plans for advocacy and community change. Please refer to the success stories of the Cities of Chula Vista and La Mesa, within this YEAH! manual, for more details.

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