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Physical Activity in Elementary School Girls: Implementation and Theory-Based Evaluation of Girls on the Run

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Physical Activity in Elementary School Girls:
Implementation and Theory-Based Evaluation of *Girls on the Run*

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University.

by

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Dedication

This dissertation is dedicated to my advisor and mentor, Dr. Elizabeth A. Fries. Even in her absence, she lights my path ahead, providing me with wisdom and guidance. Her spirit lives on, and the ways she has touched my life will never be forgotten.

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Abstract

PHYSICAL ACTIVITY IN ELEMENTARY SCHOOL GIRLS: IMPLEMENTATION AND THEORY-BASED EVALUATION OF *GIRLS ON THE RUN*

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

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Rates of obesity in children are rising at an alarming rate, particularly among girls and ethnic minorities. Engaging in regular physical activity can help reduce this risk. Little is known about factors associated with physical activity (PA) in preadolescent populations, an age when intervention is ideal. Guided by Social Cognitive Theory, this study used a repeated-measures design to examine PA and its correlates, including PA self-efficacy, outcome expectations, and social influences (from parents and peers), among participants ($N = 57$) in *Girls on the Run*, an innovative PA intervention for elementary school girls. Participants (M age = 9.4) predominately include girls from ethnic groups at highest risk for obesity, with 74% African American and 18% Hispanic. Multiple regressions indicated that, at baseline, girls with higher self-efficacy were significantly more likely to report greater intentions to be physically active ($\beta = .40, p < .05$). Further, although no mean changes in study outcomes were found, an examination

of factors associated with the variance in PA behaviors and intentions at post-test can further understanding of PA in this age and ethnic group. Processes of change regressions suggested that, after adjusting for baseline levels, increases in both self-efficacy and social influences were significantly associated with higher physical activity behaviors and intentions at post-test ($ps < .05$). Outcome expectations, or belief in the benefits of physical activity, was not a significant variable in the models ($p > .05$). Overall, findings suggest the importance of targeting physical activity self-efficacy and fostering high levels of peer and parental support for physical activity to help girls meet recommended guidelines. Implications for future interventions are discussed.

Introduction

The World Health Organization (WHO) has acknowledged obesity as one of the most important worldwide health problems (WHO, 1998). Within the United States, obesity and overweight have been labeled an epidemic (Stein & Colditz, 2004). Overweight and obesity result from the interaction of many factors, including genetic, metabolic, behavioral, and environmental influences. Because of the rapid rise in obesity, it is thought that behavioral and environmental influences, specifically increases in physical inactivity, strongly contribute to the epidemic (Bauman, 2004). A great need exists to increase physical activity to reduce health risks associated with obesity, such as cardiovascular disease, cancer, diabetes, and high blood pressure. Understanding determinants of physical activity is essential to inform interventions.

The proportion of overweight children and adolescents has dramatically increased in the past decade (Ogden, Flegal, Carroll, & Johnson, 2002). Although the prevalence of overweight has increased in all adolescent racial groups, the greatest increases are found in non-Hispanic blacks and Mexican Americans (Hedley et al., 2004; Ogden et al., 2002). Moreover, African American girls are more likely to be overweight than Caucasian or Mexican-American girls (Ogden et al., 2002).

Evidence continues to mount supporting the physiological and psychological benefits of physical activity and the health risks of physical inactivity across age groups (Bauman, 2004). However, youth are not meeting exercise guidelines, and girls, ethnic

minorities, and disadvantaged youth are even less likely to engage in the recommended amount of exercise (Grunbaum et al., 2004). Sedentary behaviors, particularly television viewing, have been consistently related to overweight in youth (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998; Eisenmann, Barteel, & Wang, 2002). It is well understood that energy balance is important to maintain healthy weight (Stein & Colditz, 2004). However, current energy consumption is greater than current levels of energy expenditure (Stein & Colditz, 2004). Thus, the implementation and evaluation of innovative interventions to help youth maintain energy balance is an important area of research.

Intervention in adult populations is necessary; however changing ingrained habits is difficult. Increasing emphasis has thus been placed on the development of positive health habits, such as exercise, early in life. One innovative program for increasing physical activity and healthy living in youth is *Girls on the Run* (GOTR; Barker, 2002). GOTR is an experiential learning program for eight to 12 year old girls that combines running with curriculum-based activities that encourage emotional, social, mental, and physical health in addition to character development. GOTR has been evaluated with a pre-post design measuring self esteem, eating attitudes, and body size satisfaction (DeBate & Thompson, 2005) and showed significant improvements on all study outcomes. However, this program likely has effects on numerous other psychosocial and behavioral factors related to physical activity. Further, the study sample was overwhelmingly Caucasian, and its impact on a predominately African American and Hispanic population is unknown.

Understanding determinants of physical activity is essential to inform intervention efforts. The use of theory to guide interventions and evaluations has significantly increased understanding of exercise adherence, thus increasing the effectiveness of intervention (Godin, 1994). Theories guide the search for modifiable risk factors, such as knowledge, attitudes, self-efficacy, or social support (Glanz, Lewis, & Rimer, 1997). Further studies based on or guided by theoretical frameworks are needed to examine the psychosocial determinants of exercise and thus inform health promotion efforts. Social Cognitive Theory (SCT; Bandura, 1986) addresses both the psychosocial factors influencing health behavior and the methods of promoting behavioral change (Baranowski, Perry, & Parcel, 1997). It is also the most frequently cited theory used in physical activity interventions with children (Pender, 1998).

The current study implemented and evaluated GOTR in a predominately African American and Hispanic population with a comprehensive survey instrument, guided by Social Cognitive Theory (Bandura, 1986). This study examined previously established psychosocial predictors of exercise, including self-efficacy for physical activity, social influences (parent and peer) for physical activity, outcome expectations/beliefs about exercise, and physical activity behaviors and intentions, both before and after participation in *Girls on the Run*.

Obesity

Overweight and obesity have become major public health concerns in the United States. Healthy People 2010 identified overweight and obesity as one of the ten leading health indicators (US Department of Health and Human Services [USDHHS], 2000).

Obesity is a measure of health that is determined by calculating body mass index (BMI), or weight in kilograms divided by the square of height in meters, and comparing one's BMI to age and sex-specific norms. For children and adolescents, the Center for Disease Control and Prevention (CDC) uses the term "overweight," defined as greater than or equal to the 95th percentile of the sex-specific BMI for age; at risk for overweight is defined as at or above the 85th percentile, but below the 95th percentile (Ogden et al., 2002). The healthy height and weight range for children is defined as greater than the 5th percentile but less than the 85th percentile of sex-specific BMI for age. As prevalence rates of overweight continue to rise (Hedley et al., 2004; Ogden et al., 2002), need for intervention is increasingly evident.

The proportion of overweight children and adolescents has dramatically increased in the past decade (Hedley et al., 2004; Ogden et al., 2002). From the 1960's until the 1988-1994 National Health and Nutrition Examination Surveys (NHANES), the prevalence of overweight among six to 11 year-olds increased from four to 11%. During this same period, the prevalence among 12-19 year-olds increased from five to 11% (Ogden et al., 2002). The 1999-2000 NHANES data show that approximately 15% of six to 11 year-olds and 12-19 year-olds are overweight, with another 30% in each age group considered at risk for overweight (Ogden et al., 2002). Trends are similar in the 1999-2002 data, with nearly one-third (31%) of children between the ages of six and 19 either at risk for overweight or overweight (Hedley et al., 2004).

Ethnic and gender differences exist in overweight and obesity (Cossrow & Falkner, 2004). African American women are at particularly high risk for obesity

(Flegal, Carroll, Ogden, Johnson, 2002) and African American girls between the ages of six to 11 are more likely to be overweight than Caucasian or Mexican-American girls (Ogden et al., 2002). Data from NHANES demonstrate that the prevalence of overweight increased in each adolescent racial group between the 1988-1994 and the 1999-2000 surveys, with the greatest increases found in non-Hispanic blacks (13.4% to 23.6%) and Mexican Americans (13.3% to 23.4%). Among girls aged six to 11, significantly more non-Hispanic blacks (22.8%) and Mexican Americans (17.1%) are overweight compared to non-Hispanic whites (13.1%; Hedley et al., 2004). These data indicate the need for obesity prevention efforts, specifically those that target youth at higher risk due to gender or ethnicity.

Physiological and Psychological Effects of Obesity. Childhood obesity is a serious health issue, with both physiological and psychological effects. Adolescent obesity increases the long-term risk of adult morbidity and mortality, independent of adult obesity status (Must et al., 1992). Further, obese children over the age of six have a 50% greater risk of becoming obese adults, and 70% of obese 10- to 13-year olds become obese adults, adding to the increased risk of morbidity and early mortality (Whittaker et al., 1997).

Stein and Colditz (2004) reviewed recent trends in overweight and obesity and their health impacts. They summarized findings about the health consequences, stating that close to 300,000 deaths each year in the United States may be attributable to obesity, making obesity the second leading cause of preventable death in this country. Obesity

has been linked to increases in cardiovascular disease (CVD), hypertension, Type 2 diabetes, and some cancers.

While certain physical health risks may not materialize until adulthood, childhood overweight and obesity have been linked to numerous psychosocial consequences. These problems are associated with negative verbal feedback from peers, parents, and teachers, thus increasing the risk of developing low self-esteem, body image disturbances, and eating disorders (Heinberg, 1996; Thompson, Coovert, Richards, Johnson, & Cattarin, 1995). In a recent study of treatment seeking overweight youth, adolescents appeared to be vulnerable to stigmatization, regardless of gender or ethnicity (Stern et al., *in press*). Further, Stein and Colditz (2004) note that obesity is related to depression and social discrimination, and negatively affects general quality of life. One recent study (Schwimmer, Burwinkle, & Varni, 2003) found that quality of life (QOL) among severely overweight children was similar to that of children with cancer undergoing chemotherapy.

It is clear that both the physiological and psychological impact of obesity are great, and that efforts to stop this epidemic are needed. Although there are a multitude of negative consequences associated with obesity, many may be reversible with weight loss, or preventable with weight control and health promotion efforts (Stein & Colditz, 2004).

Physical Activity

National recommendations state that youth should engage in either 20 minutes of vigorous exercise three days per week or 30 minutes of moderate exercise five days per week (USDHHS, 2000). Vigorous physical activity includes exercise or activities that

make one sweat and breathe hard, such as running, basketball, soccer, or similar aerobic activities. Moderate physical activity includes activities that do not make one sweat and breathe hard, such as fast walking, slow bicycling, or skating.

Physical Activity and Health. Bauman (2004) conducted an epidemiological review of the evidence that physical activity is beneficial to health. Overall, Lee & Skerrett (as cited in Bauman) found a dose response relationship between physical activity and all causes of death, with approximately 30% risk reduction for those achieving the recommended levels of at least moderate intensity physical activity. In reviewing trends in energy expenditure and energy consumption, Bauman concludes that increasing total inactivity has been an important contributor to the obesity epidemic. Engaging in sufficient daily physical activity is essential for preventing obesity.

Bauman (2004) notes that maintaining consistent physical activity levels has also been linked to reductions in CVD, as well as hypertension, a risk factor for CVD. Physically inactive people are almost twice as likely to develop CVD as people who engage in regular physical activity (USDHHS, 2000). There is also a wealth of evidence supporting the benefits of physical activity in diabetes prevention (Bauman, 2004). Although physical activity and cancer prevention is a relatively new area of research, a review by Thune (as cited in Bauman, 2004) noted that there was an overall risk reduction relationship between physical activity and all cancer deaths, but that this relationship was strongest for colon cancer and breast cancer, which are leading causes of cancer deaths. This review, combined with statements by the American Cancer Society

(2004) supporting the benefits of physical activity in cancer risk reduction, suggest the importance of regular physical activity for reducing cancer risk.

Physical Activity and Mental Health. Physical activity has been linked to numerous mental health benefits, including increased self-esteem, reduction in depression and anxiety, and overall well-being (Bauman, 2004). Bauman's review of this literature notes the need for further research on the mental health benefits of physical activity. The President's Council on Physical Fitness and Sports (1997) concluded that because of the physical health and emotional benefits of physical activity, it should have an increasingly important role in the lives of girls. However, girls' rate of physical activity declines as the progress through adolescence (Cohen et al., 1990).

Physical Inactivity. Physical inactivity and poor diet are thought to account for approximately 17 percent, or 400,000 deaths in the United States in 2000 (USDHHS, 2004). This combination of poor diet and lack of exercise was the second leading actual cause of death in 2000. Patrick and colleagues (2004) examined how diet, physical activity, and sedentary behaviors relate to overweight status in adolescents. Results indicated that insufficient vigorous physical activity was the only risk factor for higher body mass index for adolescent boys and girls, stressing the effect of physical inactivity on weight gain.

In a longitudinal study of over 10,000 adolescents between the ages of nine to 14, Berkey and colleagues (2000) found that boys and girls who spent more time watching television and playing video and computer games had larger increases in BMI over a one-year period. Andersen et al. (1998) examined results from NHANES and found that boys

and girls who watched four or more hours of television per day had the highest BMIs. Similarly, Eisenmann et al. (2002) found a pronounced relationship between television watching and overweight status in youth ages 14 to 18. These data stress the dangers of physical inactivity and the need for effective youth programming.

Youth and Physical Activity. According to the national Youth Risk Behavior Survey (YRBS), current rates of youth moderate and vigorous activity are below the recommended amounts, with females and ethnic minorities reporting the lowest rates of physical activity (Grunbaum et al., 2004). Nationwide, 62.6% of high school students report engaging in vigorous physical activity at least three times a week. This rate was higher for males (70%) than females (55%). Among females, white students (58.1%) reported higher rates of vigorous physical activity than both black (44.9%) and Hispanic (51.8%) students. Only about one-fourth of high school students report engaging in sufficient moderate physical activity (i.e., five days a week for 30 minutes or more each time). Again, gender and ethnic disparities are evident, with higher rates among males (27.2%) than females (22.1%); and among females, white students (23%) are more likely to meet the recommended rates for moderate physical activity than black students (17.5%). Although YRBS data are useful as a national index of physical activity levels, they are self-report and thus do not provide an objective measure of physical activity, such as that provided by accelerometers. Objective measures suggest that, as few as 3% of students across grade groups (1st through 12th) are meeting recommended vigorous physical activity guidelines, with girls, older adolescents, and ethnic minorities even less

likely to meet this recommendation (Pate et al., 2002), again stressing the need for health promotion efforts in youth, particularly girls and ethnic minorities.

The amount of time children and adolescents spend in sedentary activities is increasing at an alarming rate. Overall, 26% of American children report watching four or more hours of television per day (Anderson et al., 1998). This trend is dangerous, as time spent in sedentary activities, particularly television time and computer time, has been found to be inversely correlated with physical activity (Strauss, Rodzilsky, Burack, & Colin, 2001), and positively correlated with body mass index (Andersen et al., 1998; Berkey et al., 2000; Eisenmann et al., 2002).

In a study exploring physical activity levels in children ages ten to 16, children were found to spend more than ten hours each day in sedentary activities, and only 12 to 13 minutes involved in vigorous physical activity each day (Strauss et al., 2001). Both boys and girls younger than age 13 had similar activity levels, but after age 13, boys were significantly more active than girls. Further, among both sexes between ages ten and 16, both moderate and vigorous activity levels significantly decreased, with 35% more time spent engaged in physical activity in preteen compared to teenage girls.

It is often assumed that physical education classes meet the physical activity needs for youth. However, most schools do not require physical education, and even when required, studies have indicated that children are provided, on average, with only three minutes of moderate or vigorous activity per class (Simons-Morton, Taylor, Snider, Huang & Fulton, 1994). YRBS data indicate that only 55.7% of students report attending at least one physical education class in an average school week (Grunbaum et al., 2004).

McGuiness (as cited in Pender, 1998) noted that more than 80% of a child's physical activity takes place outside the school. For this reason, and because many children attend after school day care, after school programs become an essential location for promoting youth physical activity.

Childhood and Health Behaviors. Childhood and adolescence are critical developmental periods for youth to adopt positive health practices that can become integral aspects of ongoing behavioral patterns and emerging self-identity (Cohen, Brownell & Felix, 1990; Pender, 1998). Childhood is typically considered to be the best age for socialization into physical activity, and attitudes and skills acquired in childhood are regarded as important for establishing habitual physical activity in adulthood (Telama, Yang, Laakso, & Viikari, 1997). Bandura (1994) speaks to the vast amount of social learning that occurs among peers, and notes that children are especially sensitive to their relative standing among peers in activities that determine prestige and popularity. Because adolescence is a time when independence is established, and unhealthy dietary and activity patterns may be adopted (Berkey et al., 2000), intervention in preadolescence is important to prevent the trend of acquiring unhealthy behavior patterns and foster the development of healthy attitudes and beliefs about exercise.

Cohen et al. (1990) examined age and sex differences in health habits among school children, and found that boys consistently report higher levels of exercise than girls and that by grade eight, this gap widens as girls report even less exercise than in earlier grades. Unhealthy trends in health habits begin to emerge in junior high and continue throughout the older grades, with the healthiest habits reported in elementary

school students. These data emphasize the importance of intervention in elementary school, before healthy habits begin to decline, to create and strengthen healthy attitudes, beliefs, and behaviors that will carry over throughout adolescence.

Theoretical Frameworks

The use of theories and models as frameworks for studying physical activity is superior to atheoretical approaches and has significantly increased the understanding of exercise adherence, thus enhancing the effectiveness of intervention (Godin, 1994). Theories help investigators in the various stages of intervention, from planning and implementation to evaluation (Glanz et al., 1997).

Numerous theoretical models have been used in the study of health behavior and health behavior change (Glanz et al., 1997). Few of the most frequently cited theories in health behavior change, however, have been applied to children, and Pender (1998) outlines that most theories may not be applicable to children. The Health Belief Model (Janz & Becker, 1984), for example, focuses on susceptibility to disease and seriousness of disease as motivation for health behavior. Avoidance of disease in the future is too distant to be an important motivator for children (Pender, 1998). Likewise, Pender noted that the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) makes two critical assumptions that limit its applicability to children. First is the assumption that youth engage in deliberate, rational thinking before deciding whether or not to engage in a behavior; however, the critical thinking skills of youth are not yet well developed (Pender, 1998). Second is the assumption that children are independent agents, and are under control of all of their behaviors. Dependence on others for transportation and other

needs is more characteristic of youth, and thus children cannot always make the choice to engage in activities of their choosing. Thus the TRA also may not be appropriate for youth (Pender, 1998). Prochaska and DiClemente's transtheoretical model (1984), based on the stages of behavioral change (precontemplation, contemplation, preparation, action, and maintenance), is frequently applied to studies of adult exercise. This model has not been applied to studies of children's physical activity, and it has not been determined whether children pass through similar stages of behavior change when adopting a health behavior, such as exercise. (Pender, 1998)

Social Cognitive Theory

One theory that has been shown to be useful when applied to youth physical activity is Bandura's (1986) Social Cognitive Theory (SCT). SCT addresses both the psychosocial factors influencing health behavior and the methods of promoting behavioral change (Baranowski et al., 1997). In a recent review of physical activity interventions for children, SCT was the most common theoretical basis cited (Pender, 1998). SCT is appropriate for health promotion efforts because it addresses the sociostructural determinants of health as well as the personal determinants (Bandura, 1998). According to SCT, human behavior is explained by triadic reciprocal determinism with cognition, prior behavior, and the environment operating interactively to influence current behavior (Bandura, 1986). SCT constructs most often measured in youth physical activity research are self-efficacy, outcome expectations (or beliefs), environmental, and social factors (Pender, 1998). The current study used SCT as a guiding theoretical framework to evaluate youth physical activity with the constructs described below.

Self-Efficacy. Self-efficacy is the confidence a person feels about performing a particular activity, including confidence in overcoming barriers to performing that behavior (Baranowski et al., 1997). Bandura (1986) proposed that self-efficacy is the most important prerequisite for behavioral change, and that efficacious individuals are likely to expend more effort and persist longer in attempts to execute a desired behavior.

People's beliefs about their efficacy can be affected by four main sources of influence: performance accomplishments (or mastery experiences), vicarious experiences, verbal persuasive messages, and physiological signals (Bandura, 1986). The most effective way of creating a strong sense of efficacy is through mastery experiences, or successful attempts at performing the behavior (Bandura, 1998). Mastery experiences should each build on previous experience, with each success contributing to building robust beliefs in personal efficacy. Failures should be met with encouragement, thus preventing early failures from inhibiting self-efficacy formation.

The second way of creating and strengthening self-efficacy beliefs is through vicarious experiences provided by social models (Bandura, 1998). Efficacy is strengthened by observing similar others successfully perform a behavior. Seeing people similar to oneself succeed by sustained effort increases the observers' beliefs that they, too, are capable and can succeed. Capable peer models transmit knowledge and teach effective skills and strategies for increasing abilities. By watching similar peers succeed, less efficacious individuals may learn vicariously and feel more efficacious to try to increase their own skills.

Third, social persuasion can strengthen people's beliefs in their personal self-efficacy (Bandura, 1998). People who are persuaded verbally that they possess the capabilities to master an activity are likely to put forth greater sustained effort than those who are not verbally persuaded and thus dwell in self-doubt.

Lastly, efficacy beliefs can be built by reducing people's stress and negative emotional and physiological reactions (Bandura, 1998). People rely in part on their somatic and emotional states in judging their capabilities, and often interpret stress reactions, physical soreness, increased heart rate, and negative mood states as indicators of personal inefficacy. However, if these signs are taught to be interpreted as signs of positive skill building, efficacy formation may be fostered.

Outcome Expectations. Outcome expectations are the anticipatory aspects of a behavior, or the pre-existing beliefs that one has about what the effects of a behavior will be (Bandura, 1986). A person learns that certain outcomes are likely to occur in response to his or her behavior and then expects them to occur when the situation arises again (Baranowski et al., 1997). People develop expectations for outcomes of their behavior before they actually encounter the situation. This anticipatory behavior reduces their anxiety and increases their ability to handle the situation. Outcome expectations can be taught, such as teaching that physical activity gives you more energy, so that people are more accurate in their expectations, and recognize the outcomes when they try out the behavior. (Baranowski, et al., 1997)

Environment. Other key components to SCT are the environmental influences on behavior (Bandura, 1986). The environment refers to all that factors that can affect a

person's behavior that are external to him/her (Baranowski et al., 1997). The physical environment includes things such as the home environment, classroom, availability of resources, and numerous other physical factors. Social influences are another type of environmental influence. Environmental influences are important in health promotion efforts, as aspects in the environment, such as parental and peer influences, provide opportunities and support for behaviors.

Research (e.g., Saunders et al., 1997) has shown that the theoretical constructs in SCT outlined above are important to examine in studies of youth physical activity. The current study used SCT as a guiding theory, as supported by research examining the significance of these constructs in understanding physical activity in children.

Social Cognitive Theory Constructs and Physical Activity.

Many studies have investigated correlates of physical activity in youth. These studies have been primarily cross-sectional, and most focus on youth in middle school or older. Because research on predictors of preadolescents' physical activity is not as well-developed as that of adolescents and older youth, other age groups are included in this review to help clarify what psychosocial constructs may be important to study as predictors of physical activity in elementary school youth.

Numerous psychosocial constructs, primarily based in Social Cognitive Theory, have been examined as predictors of physical activity in children, including self-efficacy, social influences, health beliefs (or outcome expectations) and environmental influences. Sallis, Prochaska, and Taylor (2000) reviewed studies examining correlates of physical activity in children and adolescents. Of the fifteen studies with children (ages four to 12),

the most consistent negative correlate was perceived barriers to physical activity. Intention to be physically active was consistently, positively related to physical activity. Self-efficacy and attitudes towards physical activity had indeterminate relationships with physical activity. This review stressed the need to further examine psychosocial correlates of physical activity in children, particularly ones whose relationship could not be determined using the existing literature. The current study, guided by SCT, aimed to clarify some of the indeterminate relationships, as well as examine correlates of preadolescent physical activity and intentions to be physically active: self-efficacy, beliefs about physical activity, and social influences on physical activity.

Self-Efficacy and Physical Activity. Strauss and colleagues (2001) explored the relationship between health beliefs, self-efficacy, social influences, and sedentary and physical activity levels in children aged ten to 16. Self-efficacy was measured in three domains related to physical activity: support seeking, barriers, and positive alternatives. All three measures of self-efficacy were significantly correlated with high physical activity levels. Overall, children with high levels of self-efficacy were significantly more likely to engage in high levels of physical activity. Reynolds and colleagues (1990) also found that self-efficacy was associated with physical activity levels in adolescents. Further, a recent review found some support for the mediating role of self-efficacy in physical activity interventions with children (Lewis, Marcus, Pate, & Dunn, 2002).

Ryan and Dzewaltowski (2002) compared the relationships between different types of self-efficacy and physical activity in two samples of youth. They measured self-efficacy for overcoming barriers to physical activity, task-related physical activity self-

efficacy, asking self-efficacy, or self-efficacy for asking others to be physically active with them, and environmental change efficacy, which was based on support seeking efficacy. Results showed that asking efficacy was positively related to moderate and vigorous physical activity in one sample, but not in the other sample. Environmental change efficacy (which was only measured on one of the samples) was related to both moderate and vigorous physical activity, and physical activity efficacy was related to physical activity in one of the two samples. The authors concluded from their inconsistent results that more research must be conducted on self-efficacy for physical activity.

Trost, Pate, Ward, Saunders, and Riner (1999) used accelerometers to directly assess moderate and vigorous physical activity over seven days in a sample of 213 sixth grade students. These researchers sought to identify psychosocial and environmental determinants of physical activity in this age group, including physical activity self-efficacy, social norms regarding physical activity, beliefs about physical activity outcomes, hours spent watching television or playing video games, and participation on sports teams. Results for girls indicated that physical activity self-efficacy and beliefs were significantly correlated with vigorous physical activity, with physical activity self-efficacy the strongest independent predictor of daily participation in moderate and vigorous physical activity.

Similar results were found in Motl et al. (2002), in which self-efficacy was positively correlated with physical activity in adolescent girls. These authors reported that self-efficacy was the primary correlate of physical activity in a large sample of

adolescent girls and accounted for their intention to be physically active. In the same study, self-efficacy partially mediated the effect of a physical activity intervention on physical activity in adolescent girls (Dishman et al., 2004). In sum, self-efficacy appears to be an important predictor of physical activity, and thus should be targeted in interventions and examined in evaluations. The current study examined self-efficacy for physical activity as a predictor of physical activity.

Outcome Expectations/Health Beliefs and Physical Activity. Another component of SCT that has been investigated in studies examining youth and adolescent physical activity is outcome expectations, or health beliefs. In the above-mentioned intervention with adolescent girls, Dishman and colleagues (2004) did not find a consistent, direct effect of outcome-expectations on physical activity, and noted that imagined incentives, such as possible future gains (e.g., If I exercise regularly, I will have more energy), might be weak determinants for being physically active among girls. Strauss et al. (2001) also failed to find an association between health beliefs and physical activity levels in ten to 16 year-old youth. However, Trost et al. (1999), in their study examining psychosocial and environmental determinants of physical activity in sixth grade students, found that health beliefs were significantly correlated with objectively measured vigorous physical activity levels in girls. Trost et al. noted that their results suggest the importance of cultivating positive beliefs about physical activity for girls by educating them about the benefits associated with physical activity and by providing them with physical activity experiences that meet their needs and interests. The conflicting reports, and the absence of studies with elementary school youth, suggest that the influence of health beliefs on

physical activity in youth needs to be further examined. The current study examined the association between elementary school girls' health beliefs and physical activity behavior.

Social Influences and Physical Activity. Social influences from peers and parents are likely to be important predictors of youth physical activity. As noted in Garcia et al. (1995) in their examination of gender differences in exercise beliefs and behaviors of youth, exposure to role models that are physically active, that set norms for exercise, and that provide emotional and instrumental support to be active may be an effective strategy for encouraging increased exercise among females throughout childhood and adolescence. A recent review of parental influences on children's health beliefs and behaviors showed that positive parental modeling and involvement in exercise strongly influence children's health beliefs and behaviors (Norton, Froelicher, Waters, & Carrieri-Kohlman, 2003). Further, the authors noted that parental influence on children's health behaviors has been shown to last past the adolescent years. Conflicting findings were reported in a review by Sallis et al (2000), such that social variables, primarily parent influences, had indeterminate or no relationship with physical activity in children. However, social factors, other than parent modeling (e.g., peer support), have not been widely studied (Sallis, Taylor, Dowda, Freeson, & Pate, 2002).

Peers are potentially an important source of social support for physical activity (Pender, Sallis, Long, & Calfas, 1994). The support of peers may serve a number of different functions, including social companionship, emotional support, informational support, and instrumental support. Despite the apparent importance of peers in

influencing child and adolescent physical activity, few studies have examined peer influences, particularly those of children. Strauss and colleagues (2001) found that social influences from parents and peers were significantly associated with high levels of physical activity in children aged ten to 16. Social influences were also found to be predictive of physical activity in adolescents in a study by Reynolds and colleagues (1990). Conflicting reports were found by Trost et al. (1999), in which social influences were significantly correlated with boys', but not girls', moderate and vigorous physical activity levels. In a study of fifth grade students, however, Saunders et al. (1997) found small but significant correlations between social influences and both intentions to be physically active and moderate to vigorous physical activity. Most recently, Duncan, Duncan, and Strycker (2005) found that youth who perceive greater social support from friends have higher levels of physical activity than those who do not.

Saunders and colleagues (1997) note that in the preadolescent age group, family and peer influences may be comparable, and thus it is appropriate to combine them. As youth progress to middle and high school, normative expectations shift, and influence from peers dominates (Godin & Shephard, 1984). Further investigation into peer and parental influences on children's physical activity is warranted and was conducted in the current study.

Physical Activity Interventions

In order to reach physical activity goals set forth by the CDC in Healthy People 2010 (USDHHS, 2000), it is essential that innovative youth programs are developed, implemented, and evaluated to increase physical activity rates. Numerous interventions

have been implemented with youth, both school-based and non-curricular (i.e., not part of the school curriculum), but few studies target healthy elementary school children (3rd, 4th, and 5th grades), particularly the youngest students. Pender (1998) reviewed physical activity interventions for children and adolescents. Of the twenty interventions that were focused on changing physical activity behaviors in youth, she reviewed the thirteen that provided measurable physical activity outcomes, most of which are school-based. Eight of these studies target elementary school-aged youth, with two of these eight targeting only obese children. A similar review by Stone, McKenzie, Welk, and Booth (1998) examined the effects of physical activity interventions in youth. This review included 22 school-based and seven community-based studies. All of the studies targeting elementary school children (3rd through 5th grades) were school-based.

School-Based Programs. Many school-based programs have been successful in increasing physical activity levels of youth (Pender, 1998; Stone et al., 1998). These programs are typically offered during health and physical education class, and include programs such as Sports, Play, and Active Recreation for Kids (SPARK; Sallis et al., 1997), the Cardiovascular Health in Children study (CHIC; Harrell et al., 1996), Go for Health (Simons-Morton et al., as cited in Pender), and the Child and Adolescent Trial for Cardiovascular Health (CATCH Trial; Sallis et al., 1996). The CATCH Trial, for example, was a multicenter randomized trial investigating the efficacy of a school-based cardiovascular health promotion intervention for 3rd, 4th, and 5th grade students. The program was offered during the school day at times such as lunch, during classroom hours, and in physical education classes, and resulted in increased moderate and vigorous

physical activity (Stone et al., 1998). These programs should continue to be implemented and evaluated to increase youth physical activity.

Non-School-Based Programs. Jago and Baranowski (2004) recently reviewed non-curricular approaches for increasing physical activity in youth that were published between 1970 and 2002. They note that although many intervention studies have attempted to increase children's physical activity during the school day in physical education classes, this approach may not be the most fruitful. As schools face pressure to pass standardized tests, time for physical education during the school day has decreased, thus highlighting the need for non-curricular approaches to be developed and implemented. As noted earlier, physical education classes do not meet moderate or vigorous physical activity requirements for youth (Simons-Morton et al., 1994), thus non-curricular approaches are important to pursue. In their review, non-curricular approaches included school breaks (i.e., lunch and recess), active travel to school, extracurricular activities, and summer school or camps.

Of those included in the review, only two after-school physical activity programs were offered to elementary school aged girls, and thus are relevant to the current study. A study by Treuth, Hunter, Figueroa-Colon, and Goran (as cited in Jago & Baranowski, 2004) involved an after-school program for 12 obese seven to twelve year-olds and did not result in increases in physical activity. However, these youth differ from those in the current study in that obese status was required for participation. The sample size was also very small and could have affected the ability to detect change. The Active Winners Trial (as cited in Jago & Baranowski, 2004) was offered in summer camps and after

school to 436 fifth grade children. This trial also proved unsuccessful in increasing physical activity, reportedly due to low attendance rates. Other than the Active Winners Trial, there were no other after school physical activity programs for elementary school children included in the review by Stone et al. (1998), highlighting the need for more research in this young age group.

Future Fit was a program for third and fourth grade students developed to provide a heart health education and fitness program that could be incorporated into existing after-school programs (Connor et al., 1986). Physical activity levels were not measured, however. Heart rate monitoring after exercise was used as a measure of effectiveness of the exercise sessions, with a target of 160-175 beats per minute for twenty minutes. Participants reported increases in knowledge about heart health, but did not reach satisfactory heart rates during aerobic exercise, nor did they change their attitudes towards taking care of their bodies. Although this study was successful at increasing youth knowledge, it is unknown if participants increased physical activity levels, as time spent engaged in physical activity was not measured. Implementing and evaluating physical activity programs in after school settings is an area that can be further developed, particularly for elementary school children. After school programs do not compete with learning for standardized testing and provide an opportunity for flexibility and activities beyond what can be offered during the school day.

At the conclusion of their review, Stone et al. (1998) provide recommendations for future research. Relevant recommendations are: 1) conduct more studies on increasing out-of-school activity levels; 2) conduct studies on the effectiveness of

interventions to prevent the decline in physical activity in females and adolescents; 3) conduct studies on the effectiveness of intervention approaches for diverse ethnic/racial groups and economically disadvantaged populations; 4) increase attention to the special needs of preadolescent and adolescent girls; and 5) provide more school-community linked physical activity programs that meet the needs and interests of girls as well as boys. These recommendations highlight gaps in physical activity research that must be pursued. The current study heeds these recommendations with the implementation and evaluation of *Girls on the Run*.

Girls on the Run

One innovative non-school-based program that has been implemented with girls and meets the above recommendations by Stone et al. (1998) is *Girls on the Run* (GOTR; Barker, 2002). GOTR is a curriculum-based running program, developed by Molly Barker, targeting health behaviors in elementary school girls. It was designed as an after school or summer camp program. The mission of GOTR is “to prepare girls for a lifetime of self-respect and healthy living” (GOTR Manual). GOTR is unique in that the program targets the whole child, focusing on physical, emotional, and spiritual well-being. It was developed specifically for girls during the critical developmental age of emerging self-identity (i.e., ages 8-12), to encourage girls to develop self-respect and healthy lifestyles. Through the running games and workouts, the program addresses the specific concerns of girls in this age group, including lack of self-identity, lack of connectedness, and lack of voice in their lives (Fantini, 1986). Further, the focus on girls

is unique and appropriate, as girls' physical activity rates are lower than boys', and continue to remain lower as they progress through adolescence (Pate et al., 2002).

The overall GOTR objective is to “reduce the potential display of at-risk behaviors among its participants” (GOTR Manual). Short-term goals include increasing self-esteem, decreasing body image dissatisfaction, increasing healthy eating attitudes and behaviors, increasing positive attitudes towards exercise, and increasing physical activity. Longer-term goals include reducing risky behaviors among girls (e.g., smoking and alcohol), increasing positive healthy lifestyle behaviors, and reducing overweight and obesity.

The Curriculum. The GOTR curriculum has a total of 24 one-hour lessons that teach life skills through running games and workouts over a 12-week period (sessions meet twice per week). Each lesson involves experiential learning that combines running with curriculum-based activities that encourage emotional, social, mental, and physical health, as well as character development. The curriculum is divided into three parts, each with eight lessons. *Part I: Who am I? What are my values?* These lessons are centered on the girls getting to know themselves, examining their values, their likes and dislikes, and who they envision themselves to be. *Part II: Team Building: what does it mean to be supportive and supported?* These next eight lessons concentrate on team building, being supportive, and learning to listen and cooperate with others. *Part III: Finding my place and my voice in the community.* The final eight lessons concentrate on how the girls can relate to the world at large. Part of this section involves the participants making a contribution to the community that they select. This section also deals with the negative

messages girls receive from the world, and focuses on topics such as media awareness and negative peer pressure. Finally, the girls have the opportunity to complete a five-kilometer (5K), running event. See Appendix A for curriculum details.

Each lesson follows a general structure. First there is a “Getting on Board” activity, in which the coaches check in with girls and introduce the topic of the day. Second there is a warm-up game (e.g., a short relay) and stretching. The topic of the day is incorporated into the game. Last, there is the workout, which involves actual running and also incorporates the daily topic. The amount of running builds as the coaches assess the girls’ abilities and pace.

GOTR and Social Cognitive Theory. Theoretical concepts from Social Cognitive Theory are targeted by GOTR. This program builds girls’ self-efficacy beliefs using the four methods described by Bandura (1998). First, GOTR provides 12 weeks of mastery experiences, each building on the previous experience. Each successful lesson contributes to building robust beliefs in personal efficacy for running. Girls are encouraged to perform at their own level of ability, and each girl is encouraged to build on that level throughout the program. Failures are met with encouragement, thus preventing early failures from inhibiting self-efficacy formation.

Second, the peer group format of *Girls on the Run* increases opportunities for observational learning and vicarious experiences for participants. It is expected that girls of various abilities participate in the program, thus providing opportunities for more capable peers to act as models. Both the peer models and the coaches transmit knowledge and teach effective skills and strategies for increasing running abilities. By

watching similar peers running, less efficacious participants may learn vicariously and feel more efficacious to try to increase their running skills. Further, women who serve as coaches must maintain core values of *Girls on the Run*, and serve as healthy role models for youth.

Third, verbal persuasion is used to build self-efficacy in GOTR. Participants are immediately rewarded for positive behavior, through cheers, group support, and positive appraisal by coaches. Coaches and peer participants act as efficacy builders in GOTR. In addition, the program structure provides situations for participants that bring successes and avoids placing participants in situations prematurely where they are likely to fail. GOTR supports each girl in working at her own level of ability, and allows for individualized goals for lessons (e.g., when participants attempt their first practice 5K, each is asked what she thinks she can do and that effort is supported: walk a 5K, run a 5K, walk half and run half, etc.).

Lastly, coaches in *Girls on the Run* educate participants about the potential for muscle soreness as an indicator of successful use of muscles to build running skill. Bodily signals, such as increased heart and respiratory rates, are taught to be interpreted as indicators of impending achievement, thus limiting the misinterpretation of physical symptoms as indicators of inefficacy. Further, after each lesson, there is time to process the emotions the girls are feeling. All emotions are acceptable, and coaches are instructed to be alert to girls who seem to be distressed and provide individual attention to them. In these ways, GOTR builds efficacy beliefs and provides ample opportunity for girls to feel confident in their ability to participate in running activities.

The lessons and the running activities foster the development of healthy attitudes and beliefs about running and physical activity in general. Through their own personal successes and increases in self-efficacy, girls' attitudes towards exercise increase and they learn the benefits of physical activity.

Previous Evaluation. GOTR has been previously evaluated with a pre-test/post-test design on 322 program participants from 28 program sites (DeBate & Thompson, 2005). Program participants were 81.1% Caucasian, 3.7% African American, 2.8% Asian, 11.8% Latino, and .6% other ethnicity. Findings of this evaluation indicate that girls who participate in GOTR showed significant increases in self-esteem, increases in body size satisfaction, and improvements in eating attitudes and behaviors. Although this study provided promising results regarding the utility of GOTR, there remains a need to examine behavioral and other psychosocial predictors of physical activity, to determine if GOTR is effective at improving known and suspected correlates of physical activity, and increase physical activity behavior. Identification of social-cognitive variables that correlate with physical activity in GOTR can help determine if GOTR helps participants reach and maintain physical activity habits associated with improved health and reduced risk of obesity. The prevalence of physical inactivity among girls, especially African American girls, underscores the need for developing and evaluating interventions to increase physical activity (Sallis et al., 1992).

Further, interventions must be culturally appropriate and sensitive to the concerns of preadolescent girls from a variety of ethnic backgrounds. DeBate and Thompson's evaluation was conducted with primarily (81%) Caucasian participants. It is unknown if

GOTR is effective in a primarily African American population, whose beliefs about PA, body ideals, and health behaviors may differ from those of Caucasian girls (Cullen et al., 2002; Taylor et al., 1999; Wilson, Sargent, & Dias, 1994). For example, research has shown that among adolescent females ages 14-17 with similar BMI's, African Americans prefer a significantly larger ideal body size than Caucasians (Wilson et al., 1994). Ethnic differences have also been found in barriers associated with physical activity (Taylor et al.). Although the present study does not specifically test cultural factors, further evaluation of the cultural appropriateness of GOTR with ethnic minorities may be warranted.

The Present Study

The present study implemented and evaluated GOTR in a predominately African American and Hispanic population using a comprehensive survey instrument. Because physically active youth are more likely to be physically active as adults (Stone et al., 1998), it is important to understand and promote physical activity behavior in children. There are few theoretically derived tools to measure determinants of physical activity among preadolescents. A better understanding of psychosocial influences of physical activity during this period could inform program development. The current study used a pre-post, single school design to evaluate an innovative physical activity program for girls. Previously validated measures were used to assess physical activity and known and suspected correlates of physical activity in children. Guided by Social Cognitive Theory and based on past research, theory-derived constructs were measured at both time-points (before and after the intervention), including self-efficacy for physical activity, parent and peer support for physical activity (referred to as social influences), outcome expectations/beliefs of benefits of physical activity (referred to as outcome expectations), and physical activity behaviors and intentions.

Hypotheses: Nine hypotheses were postulated for this study. They are grouped in three categories: 1) Cross-sectional hypotheses, 2) Longitudinal hypotheses, and 3) Processes of change hypotheses.

Cross-sectional Hypotheses:

- 1) Baseline self-efficacy for physical activity (SE) will significantly contribute to the variance in baseline physical activity, such that higher SE will be associated with:
 - a.) higher baseline PA levels
 - b.) higher baseline PA intentions
 - c.) greater likelihood of meeting PA guidelines at baseline.
- 2) Baseline social influences for physical activity (SI) will significantly contribute to the variance in baseline physical activity, such that higher SI will be associated with:
 - a.) higher baseline PA levels
 - b.) higher baseline PA intentions
 - c.) greater likelihood of meeting PA guidelines at baseline.
- 3) Baseline outcome expectations about physical activity will significantly contribute to the variance in baseline physical activity, such that more positive outcome expectations will be associated with:
 - a.) higher baseline PA levels
 - b.) higher baseline PA intentions
 - c.) greater likelihood of meeting PA guidelines at baseline

Pre-Post Change Hypotheses:

- 4) Compared to baseline, participants at post-test will report significant increases in PA levels (days, guidelines, intentions).
- 5) Compared to baseline, participants at post-test will report significant increases in:
 - a.) physical activity self-efficacy and

- b.) positive outcome expectations about physical activity.

Processes of Change Hypotheses:

- 6) Participants with greater baseline social influences from parents and peers will report:
 - a.) participating in a greater number of days of PA at post-test
 - b.) higher PA intentions at post-test and
 - c.) greater likelihood of meeting PA guidelines at post-test
- 7) Participants with greater baseline self-efficacy will report:
 - a.) participating in a greater number of days of PA at post-test
 - b.) higher PA intentions at post-test and
 - c.) greater likelihood of meeting PA guidelines at post-test
- 8) Participants with greater pre-post change in self-efficacy will report:
 - a.) participating in a greater number of days of PA at post-test
 - b.) higher PA intentions at post-test and
 - c.) greater likelihood of meeting PA guidelines at post-test
- 9) Participants who report more favorable opinions of GOTR will report greater increases in self-efficacy and endorse higher PA intentions at post-test.

Methods

Participants

Participants ($N = 57$) were 3rd-5th grade female students from a Title 1 elementary school in Chesterfield, VA who were participating in GOTR. Schools meet Title 1 criteria if greater than 40% of students come from impoverished backgrounds and are thus eligible for free or reduced lunch. Eligibility criteria for participation were that the student: 1) was female, 2) was in 3rd, 4th, or 5th grade, 3) had no medical condition preventing her from engaging in physical activity, 4) had transportation from the program, 5) had obtained parental consent, and 6) had not previously participated in GOTR. Only participants who completed surveys at both time points are included in these analyses.

Instructors (Coaches). Each group was led by one head coach and one or more assistant coaches or volunteers. The two head coaches attended a two-day training and all coaches were CPR certified. Requirements for coaches were that they are female, over age 21, and maintain the core values of GOTR. Background checks were performed on all coaches and assistant coaches.

Measures

Demographics. Demographic items included participant age, grade, ethnicity (baseline only), and living arrangement (baseline only). All items were on both the

baseline and follow-up surveys unless otherwise noted. Please see Appendix B for the baseline and follow-up measures.

Psychosocial Measures. Participants completed three scales that were modified by Saunders et al. (1997) and validated for use in a predominately African American preadolescent population of girls. Scales assessed social cognitive constructs associated with physical activity: self-efficacy, social influences, and outcome expectations. These scales have also been used in other studies of physical activity with similar age groups (e.g., Strauss et al., 2001; Trost et al., 1999).

Self-Efficacy. The self-efficacy scale measures confidence in one's ability to be physically active. This 17-item scale has been found to have three factors: support seeking (e.g., "I think I can ask my best friend to be physically active with me); barriers (e.g., "I think I can be physically active even if it is hot or cold outside); and positive alternatives (e.g., "I think I can be physically active after school even if my friends want me to do something else"), each with adequate internal and test-retest reliability (Saunders et al., 1997). In the current study, one item was modified to make it more appropriate for the length of the program (i.e., 2 weeks was changed to 12 weeks). Response options are yes = 1, no = 0. The current study used the full-scale only, with good internal reliability at baseline ($\alpha = .81$) and follow-up ($\alpha = .85$), which is similar to previous findings (Saunders et al., 1997). Items were summed to create a total score at each time point, with higher scores indicating higher physical activity self-efficacy; the possible range was 0 to 17.

Social Influences. The Social Influences scale was used to measure peer and parent support for physical activity. It contains eight items, and was based on work by Reynolds et al. (1990) and Sallis et al. (1992). The current version of the scale is from Saunders et al. (1997) and has been found to yield internally consistent, with alphas ranging from .72 to .75. In the current sample, Cronbach's alpha was .73 at baseline and .80 at post-test. Social influences from friends (e.g., "My friends think I should be physically active") and from family (e.g., "Someone in my family has encouraged me to be physically active in the past 2 weeks") were measured. Factor analysis by Saunders et al. identified one factor, with a test-retest correlation coefficient of .78. Responses were recorded on a dichotomous yes = 1, no = 0 scale, and items were summed to create a total score at each time point; the possible range was from 0 (low) to 8 (high).

Beliefs/Outcome Expectations. The third scale from Saunders et al. (1997) contains 16 items and was used to measure beliefs about the consequences of being physically active. One item was slightly modified for this sample. A sample item is, "Exercising on most days would help me control my weight." Response options were 1 (Disagree), 2 (Not Sure) and 3 (Agree), with five items reverse scored. Factor analysis by Saunders et al. (1997) determined two factors, social beliefs and physical outcomes, and internal consistencies were .75 and .58, respectively. In the current sample, internal reliability for the full scale was .67. Total scores were computed (after reverse coding the appropriate items) at each time point, and ranged from 16 to 32, with higher scores indicating more positive beliefs about the benefits of physical activity.

Physical Activity. Three items slightly modified from the Youth Risk Behavior Survey (1993), assessed level of physical activity. Frequency was assessed with the YRBS item, “On how many of the past seven days did you exercise that made you sweat and breathe hard, such as playing outside, basketball, soccer, running, swimming, fast bicycling, fast dancing, or similar activities?” Participants select the number of days (0-7). Duration of exercise was assessed with the item, “About how much time do you usually spend being physically active each time?” Categorical responses ranged from “less than 20 minutes” to “more than 60 minutes.” A third item was asked to assess physical activity in total hours per week, with responses ranging from “0 hours” to “7 hours or more.” This item was examined for its correlation with PA guidelines, as a brief validity check. These items were positively, but weak to moderately correlated ($r = .40$); thus only the guideline variable was used, because it factored in both days and time per session.

Thus, two indices of physical activity behaviors, in addition to intentions (discussed below) were used as outcomes of the current study: 1) number of days of physical activity in the past seven days, and 2) whether or not the participants were meeting PA guidelines. This latter construct was created to identify participants who were meeting physical activity guidelines for moderate physical activity (i.e., at least 5 days a week for 30 minutes or more each time) at baseline and at post-test, based on responses to previous items. Participants who exercised on ≥ 5 of previous 7 days and who engage in ≥ 30 minutes of physical activity each time were coded at 1, indicating

they met the PA guidelines. Students not meeting these parameters were coded as 0, indicating they were not meeting PA guidelines.

Physical Activity Intentions. Participant's intentions to engage in physical activity were assessed with two items beginning with the stem, "I plan to be active... a) at least two times per week for the next three months," and b) "for 30 minutes or more each time." Response options were no = 1, maybe = 2, yes = 3. These items were added to form an intention score ranging between 2 and 6, with higher scores indicating greater intentions.

Additional Health Behaviors. For descriptive purposes, additional health behaviors were also assessed. Sedentary behaviors were assessed with two items: one item assessed the amount of time spent watching television/playing video games on an average school day and the second item assessed the amount of time spent on a computer on an average school day. Participants selected the number of hours per school day that they engaged in each behavior. These items are similar to those used in Gordon-Alrsen, Adair, and Popkin (2002), as well as the Youth Risk Behavior Survey (Eisenman et al., 2002). Participants reported the number of fruits and vegetables they eat each day, number of days in the previous week they ate breakfast, and number of days in the previous week they ate dinner with their parents.

Process Items. Four variables, adapted for this study from Goals for Health (Myers, Nicholson, Danish, Fries, & Polk, 2000), assessed participants' opinions of GOTR. Items assessed how much participants liked the program, how much fun they had, how much they learned, and how important program lessons were to them.

Response options were: 1 (not at all), 2 (a little bit), and 3 (a lot). In addition to the individual responses, these items were totaled to create an overall opinion of GOTR score, with a possible range of 4 to 12; higher scores indicated more favorable responses.

Design

A repeated measures, single school, pre-post evaluation design was used. Participants completed a survey before the program started (T1) and immediately after completing all program sessions (T2).

Recruitment Design and Procedures

Overview. Recruitment for each season was the same, with the exception of presentations to students before the initial season of GOTR only (see below). Girls who could not participate in the first season due to group size constraints were put on a waiting list for fall groups. Parental consent was obtained for all participants for both the program and the evaluation.

Recruitment. All participants who consented to participate in GOTR were eligible for the proposed evaluation, thus recruitment for the evaluation was not separate from program recruitment. Recruitment for GOTR consisted of presentations and mailings through the school. During the initial season only, the coaches made lunchtime presentations to all girls in the 3rd, 4th, and 5th grades to present an overview of the program to the students. During the same week, flyers and program brochures were sent home to all parents of girls in eligible grades. Interested parents completed a form and returned it to their child's teacher, who then gave the forms to study personnel. In

subsequent seasons, flyers and program brochures were sent home, but presentations were not made.

In the first (spring) season, 36/57 students who returned interest forms were randomly selected for participation. Of note, all interested 5th grade students in the first season were enrolled, because they would not be able to participate next season due to transitioning to middle school. The remaining students' names were placed on a wait list. Two students moved before the program started, leaving 34 girls as the participants in the first season of GOTR. Of these program participants, two did not complete the baseline survey due to being absent, and four students did not complete the post-test for the same reason, leaving $n = 29$ participants in the current sample from the first season. Of note, one participant missed the evaluation at both times.

In the second (fall) season, 40 students returned interest forms. Of these students, those who participated in the first season of GOTR ($n = 6$) were not selected for participation, leaving 34 participants in the fall season of GOTR. Before the program began, three students (triplets) withdrew due to transportation issues, and one student withdrew due to family health problems, leaving $n = 30$ students as the participants in the second season, all of whom completed the baseline survey. One student who moved during the school year did not complete the post-test. Thus, 29 participants from the second season are included in these analyses; for a total sample of $N = 58$ in the current study. With respect to program participation and attrition, 92.9% (64/70) of students who were accepted into the program, participated in GOTR; and of the participants who began the program, 98.5% (63/64) completed GOTR.

In both seasons, the selected students were contacted by the coaches in a letter sent home in school to inform them of an information meeting to be held at the school. Parents who did not attend this meeting were called to discuss the program, and a time was arranged for parents to complete consent before the first day of the program (i.e., the student took the consent form home or the parent met the instructors at school). At the information meeting, an overview of program procedures and goals was presented, and all questions were answered. Parents then signed consent forms for both the program and the evaluation, completed a health history/medical information form, and signed a commitment statement. A set fee of \$10 was charged for program participation, and scholarships (i.e., no fee) as offered on an as-needed basis. Of note, no parents requested scholarships, but two parents paid the program fee in installments. New Balance shoe scholarships, arranged through GOTR International, were available to girls who did not have, and could not afford, appropriate running shoes. Shoe scholarships were awarded to three participants in the current sample.

Program Procedures. All program sessions were held at Chalkley Elementary School. Lessons were implemented for one hour twice a week for twelve weeks. Two groups were held each season, each with a head coach and one or more assistant coaches. Coaches coordinated activities and snacks/incentives so that both group sessions were identical. All participants received a *Girls on the Run* t-shirt and a New Balance water bottle. Each season, the teams conducted a community service project; the first season they made teacher appreciation gifts, which included a poem they wrote to thank their community of teachers and bags of Hershey's kisses and hugs. The second season they

conducted a school-wide toy drive for the Salvation Army, which resulted in the donation of more than 65 new toys. These toys became their entry fees for the Toy Run (see below). At the end of each season, girls and their families were invited to participate in a five kilometer run/walk. Girls from the first season participated in the First Annual Chalkley Elementary School 5K (with over 250 participants from the school and community). This race was directed by a Chalkley teacher who began this now-annual race. The second season of participants completed the Toy Run 5K, a local running event. Both seasons ended with a banquet celebration, in which each participant received a certificate of completion and an individualized award to signify something unique to that participant's involvement in GOTR (e.g., Determination Award, Butterfly Award, etc.).

Informed Consent and Assent Procedures. Informed consent and assent procedures were approved by the Virginia Commonwealth University's Institutional Review Board. Informed parental consent for the evaluation was conducted at the information session held at the school. Study personnel read the consent form to parents and answered any questions about the study; parents who consented (100%) signed the consent form. The consent procedure was conducted individually with any parents of participants who signed up after the information session was held or for any parents who did not attend this information session.

Youth assent procedures occurred at the time of survey administration. The first page of the survey was an assent statement that was read aloud by the coach/study personnel to the participants. Study personnel then answered any questions the

participants had about the study. To indicate consent, participants signed the form, detached it (to ensure no names were on the surveys), and continued with the survey, with 100% of eligible participants (i.e., students who were present on the evaluation days) assenting in the current study. See Appendix C for consent and assent materials.

Survey Procedures. Baseline surveys were completed in a classroom setting prior to the first session. In a few rare cases, the baseline survey was completed on the first day of the program if a student was absent on the administration day. Each survey was coded so that they could be linked from baseline to follow-up. Names and codes were listed on a separate sheet of paper and kept in a locked file cabinet to which only study personnel have access. No names are on the surveys.

Because of the young age of the participants, the coaches followed a script to guide survey completion (See Appendix D). This method is similar to administration procedures by Saunders et al. (1997). The purpose of the script was to facilitate completion of survey items, specifically items assessing amount of physical activity performed. Coaches were available to respond to participants' questions. On the last day in the program, participants completed a post-test, administered in the same manner as the baseline survey.

Results

Sample Characteristics

Participants were all female, with a mean age of 9.4 ($SD = .97$, Range 8 - 12). Most (73.7%) were African American, with Hispanics as the next largest ethnic group (17.5%). In these analyses, ethnicity was recoded into African American (73.7%) and Non-African American (26.3%). Most (63.2%) participants indicated that they lived with two parents, with 29.8% living with one parent only (28.1% mother only); about 7% reported other living arrangements (e.g., friends or other relatives). See Table 1 for sample characteristics.

Table 1

Sample Characteristics (N = 57)

<i>Variable</i>	<i>n</i>	<i>%</i>
Mean age = 9.4		
Grade		
3 rd	16	28.1
4 th	24	42.1
5 th	17	29.8
Ethnicity		
African American	42	73.7
Hispanic	10	17.5
Caucasian/Other	5	8.8
Household Structure		
One parent	17	29.8
Two-parents	36	63.2
Other	4	7.0

Additional items, not included in the main hypotheses, further describe this sample. Participants reported eating a mean of 2.8 servings of fruit ($SD = 1.5$) and 2.3 ($SD = 1.5$) servings of vegetables. They indicated eating with their parents/guardians on an average of 5.6 ($SD = 2.1$) of the previous 7 days, and ate breakfast an average of 5.9 days ($SD = 2.1$) during the previous week. Further, while about 23% of participants indicated they do not watch television or play video games on an average school day, 42% watched up to 2 hours per day, and another 35% reported watching 3 or more hours of television/video games per day. Lastly, most (56%) participants did not use a computer after school; 35% reported up to two hours of use per day and 9% reported 3-4 hours of computer per day use.

Preliminary Analyses

SPSS Version 11.0 was used in all analyses. First, data were examined for univariate outliers on the independent variables (self-efficacy, social influences, and outcome expectations). One extreme outlier was identified for both the self-efficacy scale and the outcome expectations scale, both representing the same participant (with z -scores < -3.29). This participant has Autism, and thus had been flagged in the data set upon data entry because it was suspected that her responses may vary systematically from other participants. This participant was eliminated from the data set due to the likelihood that her extreme scores would alter the regression line. No multivariate outliers were found after examination of DFFITS and DFBETAS.

Next, data were examined for missing responses. Group mean substitution was used for participants with missing data on items from the self-efficacy scale ($n = 1$),

social influences scale ($n = 1$) and outcome expectations scale ($n = 1$); no differences were found between the missing and nonmissing samples, based on non-significant correlations with grade, ethnicity, family structure, and psychosocial variables ($ps > .05$). Normality diagnostics revealed that self-efficacy and social influence scales both had limited variability, evidenced by negative kurtosis (-2.3 and -3.3, respectively). These were not drastic violations and visual examination of both normal probability plots and detrended probability plots suggested adequate graphic representation of data points; however implications for this restricted variability will be addressed in the limitations section.

Change variables were computed by subtracting baseline from the follow-up scores for the following constructs: self-efficacy, social influences, and outcome expectations. Independent samples t-tests were then used to examine data for differences in coach and/or season on baseline, post-test, and change variables, with no significant differences found between seasons (spring/fall) or coaches on any study variable ($ps > .05$). Thus, neither coach nor season was controlled for in the remaining analyses. To determine if grade and/or ethnicity should be entered as covariates for potentially confounding effects, correlations were run between demographic variables (grade and ethnicity), psychosocial (self efficacy, social influences, and outcome expectations), and PA (intentions, days, and guidelines) variables; no significant associations were found ($ps > .05$). Lastly, correlations between grade, ethnicity and change variables were also examined, with no significant associations ($ps > .05$); thus grade and ethnicity were not controlled for in remaining analyses.

Table 2

Means, Standard Deviations, and Bivariate Correlations of Predictor and Outcome Variables at Baseline (T1) and Post-Test (T2)

Indicator	1	2	3	4	5	6
1. Self Efficacy	--	0.42**	0.26	0.14	0.49**	0.12
2. Outcome Expectations	0.42**	--	-0.16	0.12	0.43**	0.06
3. Social Influences	0.28*	0.38**	--	0.15	0.00	0.28*
4. PA Days ^a	0.38**	0.14	0.47**	--	0.21	0.75**
5. PA Intentions ^b	0.51**	0.31*	0.40**	0.63**	--	0.05
6. PA Guidelines ^c	0.30*	0.09	0.40**	0.83**	0.43**	--
<i>M</i> T1 ^d	14.35	24.01	5.08	4.46	5.32	--
<i>SD</i> T1 ^d	2.50	3.73	2.18	1.97	0.93	--
<i>M</i> T2 ^e	14.84	23.42	5.46	4.82	5.32	--
<i>SD</i> T2 ^e	2.72	3.76	2.31	2.13	0.97	--
% Yes T1	--	--	--	--	--	36.8
% Yes T2	--	--	--	--	--	45.6

Note. $N = 57$; Baseline sample (T1) appears above the diagonal; Post-test sample (T2) appears below the diagonal. Self Efficacy is a 17-item scale, higher scores indicate more self-efficacy. Outcome Expectations is a 16-item scale, higher scores indicate higher outcome expectations. Social Influences is an 8-item scale, higher scores indicate higher perceived social influences. ^aPA = Physical Activity; ^bIntentions represent the total score of two items, higher scores indicate higher intentions. ^cPA Guidelines are ≥ 5 days of PA for ≥ 30 minutes; 1 = yes; 0 = no. ^dDescriptives for T1. ^eDescriptives for T2. * $p < .05$; ** $p < .01$

Correlations among Psychosocial Variables and Physical Activity

Intercorrelations between predictor and outcome variables from multiple regression analyses are shown at baseline (T1) and follow-up (T2) in Table 2 (above). At baseline, girls with higher self-efficacy ($r = .49, p < .001$) and more positive outcome expectations ($r = .43, p < .05$) reported higher PA intentions. Point-biserial correlation indicated that girls with higher social influences from parents and peers were more likely to be meeting PA guidelines at baseline, although this relationship was relatively weak ($r = .28, p < .05$). Days of PA were not associated with the social cognitive variables at baseline. Among predictor variables, the only significant relationship was that self-efficacy was moderately correlated with outcome expectations ($r = .42, p < .05$).

At follow-up, girls who reported engaging in more days of PA also reported greater intentions to be active ($r = .63, p < .001$), higher self-efficacy ($r = .38, p < .001$), and higher social influences ($r = .47, p < .001$). Further, girls who were meeting the PA guidelines at post-test reported higher intentions to be physically active; these girls also reported higher self-efficacy ($r = .30, p < .05$) and higher social influences ($r = .40, p < .01$). Outcome expectations were not significantly associated with the PA measures ($p > .05$).

Hypothesis Testing

Statistical analyses of the hypotheses were conducted as follows: baseline, pre-post change, and processes of change hypotheses.

Baseline Findings. At baseline, participants reported engaging in physical activity on an average 4.5 of the previous 7 days ($SD = 1.97$, Range = 0 to 7) and

indicated high intentions to be physically active ($M = 5.32$ of 6, $SD = 0.93$). Further, 36.8% of participants reported meeting guidelines for moderate PA (i.e., PA on ≥ 5 of previous 7 days for ≥ 30 minutes), leaving most (63.2%) falling short of recommendations. Participants reported high self-efficacy ($M = 14.35$ of 17), and moderately strong social influences ($M = 5.08$ of 8), and outcome expectations for PA ($M = 24.01$ of 32). See Table 2 (above) for means and standard deviations of baseline variables.

Hypotheses 1, 2, and 3 were tested with multiple regression analyses in three models to determine psychosocial factors associated with physical activity at baseline. Social influences, self-efficacy, and outcome expectations were entered simultaneously in Step 1 for their association with days of physical activity (Model 1) and baseline intentions to be physically active (Model 2). In the third model, a logistic regression was used to examine if the above psychosocial factors helped explain the likelihood of meeting PA guidelines at baseline. Results indicated that psychosocial factors do not significantly contribute to the variance in days of PA at baseline ($F(3, 53) = .85, p = .47$), nor do they help explain factors associated with the likelihood of meeting PA guidelines at baseline ($\chi^2(3) = 5.16, p = .16$). However, when intentions were regressed on psychosocial variables, the model was significant, suggesting that social influences, self-efficacy, and outcome expectations explain 30% of the variance in PA intentions at baseline ($p < .001$; See Table 3). Tests of the individual predictors revealed that self-efficacy ($\beta = .40, p < .01$) was the variable most strongly associated with baseline PA intentions, with outcome expectations approaching significance ($\beta = .25, p = .065$).

Table 3

*Hierarchical Regression Analysis for the Association Between
Psychosocial Factors and Physical Activity Intentions at Baseline*

($N = 57$)

Variable	R^2	B	$SE B$	β	p
Model	.30***				
Self-efficacy		.15	.05	.40**	.005
Outcome Expectations		.06	.03	.25†	.065
Social Influences		-.03	.05	-.06	.625

Note. Higher scores indicate higher levels of the constructs.

$F(3, 53) = 7.67, p < .001$

† $p = .065$; ** $p < .01$; *** $p < .001$

Pre-Post Change Hypotheses. To control for Type I error, repeated-measures MANOVA with one within subjects factor (time), examined pre-post change on five study measures (PA days, intentions, self-efficacy, outcome expectations, and social influences). No significant mean changes were found from baseline to post-test, multivariate $F(5, 52) = 1.09, p = .38$. Thus, no changes in days of PA (Hypothesis 4), self-efficacy (Hypothesis 5a) or outcome expectations (Hypothesis 5b) were found. Of note, although not included in hypotheses, there was also no significant change in social influences for physical activity (determined from the same MANOVA above). Lastly, McNemar's test was used to assess change in meeting PA guidelines (dichotomous variable), with no change found from pre-post ($p > .05$).

Processes of Change. Although no mean changes were found, examining processes of change can help further understand factors associated with the variance in physical activity constructs. Thus, to test Hypotheses 6-8, multiple regression (for the continuous outcomes of post-test PA and post-test PA intentions) and logistic regression analyses (for the dichotomous outcome of meeting PA guidelines at post-test) were run. The Processes of Change models were run as follows: In Step 1, the T1 physical activity construct was entered (T1 days, T1 intentions, and T1 guidelines, in separate models). In Step 2, T1 social influences, T1 self-efficacy, and T1 outcome expectations were entered simultaneously. Change scores for self-efficacy, outcome expectations, and social influences were entered into Step 3. In three separate models, the outcomes were 1) T2 days, 2) T2 intentions, and 3) T2 PA guidelines. See Tables 4 through 6 for the final models. Results follow for each outcome.

As depicted in Table 4, after adjusting for baseline days of PA, social cognitive constructs significantly contribute to the variance in days of PA at post-test, explaining 37% of the variance. Specifically, higher baseline social influences ($\beta = .45$), greater increases in self-efficacy ($\beta = .25$), and greater perceived social influences ($\beta = .36$) were significantly associated with days of PA at post-test.

Table 5 indicates that, after adjusting for baseline intentions, the social cognitive constructs were significantly associated with the variance in post-test intentions, explaining 35% of the variance. Tests of the specific independent variables suggest that greater baseline social influences ($\beta = .14$) and greater increases in self-efficacy ($\beta = .16$) were significantly associated with higher intentions to be physically active at post-test.

Table 6 depicts the same model with a logistic regression, while controlling for baseline PA guidelines. Again, the model predicts the likelihood of meeting PA guidelines at post-test, accounting for 48% of the variance in post-test PA guidelines. Greater baseline social influences (Odds Ratio [OR] = 2.01) and greater increases in social influences (OR = 1.52) are associated with increased odds of meeting guidelines at post-test.

In sum, these data relate to each hypothesis as follows. Hypothesis 6 posited that participants with greater baseline social influences would report greater increases in a) days of PA, b) intentions, and c) likelihood of meeting PA guidelines. This hypothesis was fully supported, such that baseline social influences were associated with higher levels of each physical activity outcome. Hypothesis 7 posited that participants with greater baseline self-efficacy would report greater increases in a) days of PA, b) intentions, and c) likelihood of meeting PA guidelines. After adjusting for pre-test scores, baseline self-efficacy did not significantly contribute to the variance in the PA outcomes, thus failing to support Hypothesis 7. However, when the same model was used to test Hypothesis 8, in which it was expected that participants with greater change in self-efficacy would report significantly greater PA behaviors and intentions at post-test, results indicated that the addition of change in self-efficacy added predictive utility to the model. Specifically, greater increases in self-efficacy were significantly associated with more days of PA at post-test and higher intentions, thus supporting Hypotheses 8a and 8b. When post-test guidelines were examined as the dependent variable, however, the model was no longer significant, failing to support Hypothesis 8c.

Table 4

Hierarchical Regression Analysis of Social Cognitive Factors and Change in Social Cognitive Factors Predicting Post-Test Days of Physical Activity (N = 57)

Variable	R^2	B	$SE B$	β
Model	.37**			
PA Days T1		.15	.13	.14
Self Efficacy T1		.03	.15	.04
Social Influences T1		.45	.15	.46**
Outcome Expectations T1		.05	.11	.09
Δ Self Efficacy		.25	.11	.32*
Δ Social Influences		.36	.13	.42**
Δ Outcome Expectations		-.04	.09	-.09

Note: Dependent Variable is T2 Days of PA. Analyses adjusted for baseline days of PA (Step 1). PA = Physical Activity. Higher scores indicated higher values on all constructs. Δ scores represent difference scores of T2-T1. Final model shown.

$F(7, 49) = 4.04, p < .01$

* $p < .05$, ** $p < .01$

Table 5

Hierarchical Regression Analysis of Social Cognitive Factors and Change in Social Cognitive Factors Predicting Post-Test Intentions to be Physically Active (N = 57)

Variable	R^2	B	$SE B$	β
Model	.35**			
PA Intentions T1		.06	.15	.06
Self Efficacy T1		.11	.07	.27
Social Influences T1		.14	.07	.31*
Outcome Expectations T1		.01	.05	.04
Δ Self Efficacy		.16	.05	.45**
Δ Social Influences		.01	.06	.24
Δ Outcome Expectations		.03	.04	.12

Note: Dependent Variable is T2 Intentions to be Physically Active. Analyses adjusted for baseline intentions (Step 1). PA = Physical Activity. Higher scores indicated higher values on all constructs. Δ scores represent difference score of T2-T1. Final model shown.

$F(7, 49) = 3.80, p < .01$

* $p < .05$, ** $p < .01$

Table 6

Results of Logistic Regression Analyses with Social Cognitive Constructs and Change in Social Cognitive Constructs Predicting the Likelihood of Meeting Physical Activity Guidelines at Post-Test (N = 57)

Variable	OR	95% CI
PA Guidelines T1	5.08	.95, 27.32
Self Efficacy T1	.84	.54, 1.31
Social Influences T1	2.01**	1.25, 3.49
Outcome Expectations T1	1.27	.92, 1.75
Δ Self Efficacy	1.12	.81, 1.55
Δ Social Influences	1.52*	1.03, 2.24
Δ Outcome Expectations	.96	.75, 1.23

Note: Analyses adjusted for baseline PA Guidelines (Step 1). PA = Physical Activity. Higher scores indicated higher values on all constructs. Δ Self Efficacy represents a difference score of T2-T1. Final model shown. Model $\chi^2(7) = 25.54, p < .01$
 * $p < .05$, ** $p < .01$

Process Findings

Overall, participants indicated favorable opinions of GOTR ($M = 11.5$ of 12, $SD = 1.1$). With respect to specific process items, most (87.9%) liked GOTR “a lot,” with 10.3% liking GOTR “a little bit,” and 1.7% “not at all.” The lessons were very important to 82.8% of participants, “a little bit” important to 15.5%, and “not at all” important to 1.7% of girls. Further, almost all (94.8%) participants noted they had “a lot” of fun, and

5.2% had “a little bit” of fun. Lastly, 91.4% of participants learned “a lot,” 6.9% learned “a little bit,” and 1.7% indicated that they did not learn anything in GOTR.

To examine if overall opinions of GOTR were related to post-test intentions (Hypothesis 9), multiple regressions were conducted with the overall opinion variable included in Step 4 of the Processes of Change model above. After adjusting for baseline intentions, overall opinions of the program did not significantly contribute to the variance in intentions to be physically active ($p > .05$), likely due to lack of variance in opinions, with almost all participants reporting high overall enjoyment of the program (not shown). Change in self-efficacy and overall opinions were not correlated ($r = .10, p > .05$), thus opinions were not associated with changes in self-efficacy.

Although attendance was generally excellent, with 79.3% of participants missing two or fewer sessions (37.9% of girls were present on all days), the number of total days attended was as low as 12 for one participant; the mean number of days attended = 22.1 (of 24; $SD = 2.8$). Thus, the total number of sessions attended was examined for its relationship with T2 days of PA, T2 intentions, and whether participants met PA guidelines at T2, in Step 5 of regressions above. Attendance did not significantly contribute to the variance in the PA outcomes at post-test, likely because the attendance rate was generally high with little variance ($p > .05$; not shown).

Qualitative Reports

At the end of each survey, participants could write comments about the program or the survey. These comments provided overwhelming support that GOTR was a valuable experience for participants. Many girls simply wrote “Thank you for

everything,” while others stated that, “I love Girls on the Run!” or “Girls on the Run is so much fun!” A number of girls requested to participate in the next season of GOTR. One child expressed that, “Girls on the Run is the best thing that has happened to me. I met thousands of new friends,” while her teammate noted that, “I would hate to miss any of the days of Girls on the Run! I am going to miss everybody on the team. I want to [join again] this spring.” One child noted that, “I want to tell you that...you don’t have to be perfect so someone could like you.” Lastly, a statement made by an 8-year old participant shed light on her thoughts about GOTR:

GOTR is fun! I didn’t come here to have self-esteem. I came here to support girls who don’t have self-esteem. I also came because I love to run. I’ve made friends at GOTR and really enjoyed GOTR. Now I realize that TV and video games are not important. I love being physically active. Since I went to GOTR, I can run faster.

While these comments do not provide empirical data for the efficacy of GOTR, they do provide an additional level of qualitative information that, overall, the participants had a valuable experience in the program.

Discussion

The need exists to examine and promote interventions that increase physical activity in youth, particularly in girls and ethnic minorities. *Girls on the Run* has been shown to be an effective program for improving girls' self-esteem, body image, and eating attitudes. The current study sought to determine if this program also leads to increases in physical activity and its psychosocial correlates, using SCT as the guiding theoretical framework. The limited research that has been conducted with preadolescents and physical activity reports conflicting findings with respect to social cognitive determinants (Sallis et al., 2000). Thus, this study also sought to clarify some of these indeterminate relationships, particularly those that have been deemed most promising as important factors to consider in studies of PA, such as the social cognitive constructs of self-efficacy, social influences, and outcome expectations. Because GOTR is tailored for girls and the specific concerns of elementary school girls, this unique approach could greatly improve health behaviors of this at-risk population.

Baseline findings suggest that participants generally endorsed positive beliefs about exercise, had high levels of physical activity self-efficacy, and exercised about five days per week on average. Because participants self-selected into the program, these existing positive health behaviors are not surprising. In addition, the vast majority of research has found that the healthiest habits and beliefs are reported in elementary school students, with declines beginning soon after, particularly for girls and ethnic minorities

(Cohen et al. 1990; Grunbaum et al., 2004; Strauss et al., 2001). Unhealthy trends in health habits begin to emerge in junior high and continue throughout the older grades (Cohen et al., 1990). However, in the current study, when length of each exercise session was considered, it was evident that most girls were not meeting guidelines for moderate physical activity, with only 36.8% meeting this threshold at baseline, reinforcing the need for intervention to strengthen their positive health habits. Furthermore, students at this elementary school are required to participate in physical education classes and walk or run around the track most days. Although in many cases this level of activity is not sufficient to meet recommended guidelines, their self-reported PA likely includes these activities, contributing in large part to the ceiling effect evident on the measure of days of PA. In addition, girls perceived moderately high levels of social influences for physical activity, which also may reflect the parent and student self-selection into the program.

In contrast to previous studies (e.g., Saunders et al., 1997, Trost et al. 1999), cross-sectional multivariate analyses conducted with these data suggested that social cognitive variables were, in general, not significantly associated with physical activity behaviors; however, these constructs were related to intentions to be physically active. In particular, baseline self-efficacy was associated with baseline intentions. In addition, there was a marginally positive relationship between outcome expectations and intentions in the model. Similarly, previous cross-sectional research has found the most support for self-efficacy as an important correlate of both PA (Strauss et al., 2001) and intentions to be physically active (Motl et al., 2002); most researchers conclude, however, that more research is needed in this area (e.g., Ryan & Dzewaltowski, 2002). The lack of

significant associations found between social cognitive constructs and physical activity at baseline could be partially explained by differences in measurement of physical activity across studies. Alternately, the limited variance in baseline constructs may have reduced the likelihood of detecting significant associations. However, findings do suggest that self-efficacy is an important factor that is associated with higher intentions to be physically active, and thus may be an important target of intervention efforts.

No significant mean changes in either psychosocial or behavioral constructs were found after participation in GOTR. While GOTR is effective at targeting self-esteem, eating attitudes, and body satisfaction (DeBate & Thompson, 2005), perhaps this program is less useful in increasing physical activity and its correlates. Due to the limitations of study measures and self-selection bias, however, that conclusion seems unlikely, or at the very least, premature. For example, as noted previously, this lack of change could be evidence of a ceiling effect, such that there was minimal room for improvement based on high baseline scores. These high scores could in part be due to the possibility that girls who participated were already more healthy, compared to the school population. Alternately, perhaps 12 weeks is not sufficient interval to create significant change. The effects of GOTR on physical activity and its correlates may only become evident over longer periods, such as a year or two years later. For example, the Girls Health Enrichment Multisite Study (GEMS) reported changes that were or were not in the expected direction after 12 weeks, but the authors noted that 12 weeks may be too short an interval to see significant changes on behavioral and psychosocial measures; thus, they focused on the direction of the change and not the significance (Kumanyika, Obarzanek,

Robinson, & Beech, 2003). After participation in GOTR, participants reported (nonsignificant) increases in all behavioral and psychosocial measures, except for outcome expectations, which slightly decreased. This slight decrease is consistent with findings from GEMS (Kumanyika et al., 2003) and may suggest that participants gained a more realistic view of physical activity. Further, measurements used in this study may not have been sensitive to change in the 12 week interval between pre and post-test. This possibility may be particularly evident with a behavioral construct as complicated as physical activity, with complex determinants. For this reason, intentions may be a more important outcome to examine, as both theory (Fishbein & Ajzen, 1975) and research (Sallis et al., 2000) suggest that physical activity intentions are good predictors of behavior in this population.

Although mean changes on study constructs were not found after participation in GOTR, an examination of what social cognitive factors were associated with the variance in physical activity at post-test can help further our knowledge about physical activity in this age group. As noted by Sallis and colleagues (1997), identifying factors related to physical activity is an important step in determining what mediating variables should be targeted in interventions. Based on preliminary support for the mediating role of self-efficacy and both physical activity behaviors and intentions (Motl et al., 2004), increases in self-efficacy were expected to be related to higher post-test physical activity and higher intentions in this study. It was also expected that girls with higher baseline social influences would report greater pre to post change in physical activity, based on

preliminary research about the importance of social factors in youth activity levels (e.g., Strauss et al., 2001).

Overall, findings partially support the use of SCT as a guiding framework for understanding the variance in physical activity after participation in GOTR. Specifically, higher participation in days of physical activity was predicted by both baseline social influences and pre to post increases in social influences, consistent with hypotheses and previous research (Saunders et al., 1997; Strauss et al., 2001; Trost et al., 1999). Further, greater participation in days of physical activity at post-test was also predicted by greater change in self-efficacy; these findings suggest both the importance of peer and parent support for physical activity as well as one's confidence in abilities to be physically active as protective factors leading to increased frequency of exercise sessions. Whether youth are meeting the recommended guidelines for moderate physical activity, however, incorporates both the frequency and length of time of exercise sessions. When post-test guidelines were examined as the outcome, only baseline social influences and increases in social influences enhanced the likelihood of meeting PA guidelines following participation in GOTR. These findings suggest that while one's own PA self-efficacy can increase the number of days she is physically active, participating in exercise above a certain threshold may require greater perceived peer and parent support for the activity. As such, self-efficacy was not significantly associated with whether youth meet the PA guidelines at post-test.

Finally, when post-test intentions to be physically active were examined, the most important social cognitive constructs were high baseline social influences and greater pre

to post increases in self-efficacy, similar to findings with respect to days of physical activity. This combination of factors suggests that youth who believe in their abilities to be physically active, and who feel they have support from parents and friends, are more likely to report high intentions to continue with physical activity.

Overall, these findings further suggest the importance of self-efficacy as a target of interventions to increase physical activity in girls, consistent with predictions guided by SCT and the few longitudinal studies that have examined possible mediators of change (e.g., Dishman et al., 2004). Further, it is also suggested here that peer and parent support for physical activity may impact the duration of physical activity, assisting youth in meeting recommended levels of moderate exercise, further supporting the utility of SCT. The theory also posits the importance of outcome expectations or belief in the benefits of physical activity; however in both the current study and in previous research (Sallis et al, 2000), outcome expectations did not seem to be important in explaining the variance in physical activity behaviors or intentions in this study (cross-sectionally or pre-post). Outcome expectations have not frequently been examined in elementary school girls, and studies with slightly older girls have found inconsistent findings with respect to their association with physical activity (e.g., Dishman et al, 2004). It may be possible, as noted by Dishman and colleagues, that imagined incentives, or the mere possibility of future gains, may be weak motivators for this age group. The significance of this construct in explaining PA in this age group should be further examined.

With respect to the process findings, participants reported overwhelming enjoyment of the program. This fact was evident both quantitatively and qualitatively

and may have implications for future involvement in physically active endeavors. Associating positive emotions with exercise is an important process to encourage continued exercise. Many parents had noted that their children had never run before participating in GOTR; thus, providing the experience of running in a supportive environment, with activities that are tailored to the needs and interests of girls, is an optimal method of increasing girls' interest in physical activity, and likely has implications much further reaching than what can be measured here.

Because of the competing demands of schools to meet standardized testing guidelines, non-school-based programs, such as GOTR, will likely increase in importance in order to help youth reach physical activity guidelines. The assumption that physical education fulfills the physical activity needs of youth is false (Simons-Morton et al., 1994), and the majority of youth physical activity occurs outside the school. The schools, however, are an ideal avenue to link youth to extracurricular activities offered in the community or after school. In the current study, recruitment through the school was a successful method for reaching a large number of potential participants, and implementing the program on school grounds potentially reduced parents' concern with bringing children to unfamiliar locations. Excitement about the program was generated throughout the school by participants' wearing their t-shirts, talking about the program, presenting the morning announcements as a team, and promoting community service projects throughout the school (sponsored by GOTR). All of these activities further helped the program recruit new participants and increased interest in the program. It was evident that the school greatly supported the program, based on conversations with the

principal, teachers, and administrators, many of whom commented on improvements in the attitudes and behaviors of some of the GOTR participants who previously had disciplinary issues.

Limitations and Strengths

Nonetheless, limitations to this study must be noted, particularly with respect to design and measurement issues. First, there was no control group, so results could not be compared to non-participants, and causality cannot be determined. Threats to validity such as history and maturation could have occurred. For example, it is possible that non-participants reduced their health behaviors, consistent with national trends, in the same time period that GOTR participants' attitudes and behaviors remained unchanged, thus somewhat supporting the intervention. However, without a control group, this information cannot be determined.

The limited variability and the high mean scores at baseline left little room for improvement at post-test. Further, all data are self-report, which may have increased social desirability bias and decreased validity, particularly with the physical activity measures. Social desirability in this age group of girls is a particular concern, and research has shown that in eight to 10 year old African American girls, social desirability biased self-reports of physical activity (Klesges et al., 2004). However, Klesges et al. (2004) did not find significant relationships between physical activity preferences or outcome expectations and social desirability bias. It is possible, though, that the current study measures were affected by a tendency to overreport positive health behaviors and attitudes. The fact that most self-reported exercise was structured and occurred during

the school day (e.g., in physical education class), and thus, was not freely-chosen by the youth, is a limitation. Future studies should try to capture both in school and out of school activity. Further, it should also be noted that one of the coaches was the evaluator, which may have led to bias. However, no differences were found between coaches on any study variable, suggesting this bias was not a significant factor.

Due to the young age of participants, simple measures of physical activity from the YRBSS were used. This choice reflects the competing needs to balance sensitivity of the measures with accurate and reliable responses. Despite efforts to simplify measures, some items may have been difficult for some participants. For this reason, the coaches followed a script or guide to aid in administration and were available for assistance. There was limited variability in some of the constructs due to the limited range of response options, and likely due to social desirability bias as well. The responses were reduced from a 5-point scale to three-point or dichotomous yes/no responses, to reflect changes validated by Saunders et al. (1997) for use in this population. It was our hope that, although variability may be reduced, accuracy and comprehension would increase. However, the reduced number of response options likely contributed to the lack of variance in measures (with negative kurtosis) and may have reduced the ability to detect significant changes.

Because participation was voluntary, there may have been a self-selection bias, such that girls who participated were likely more motivated and healthy than those who did not participate. This possibility may be supported by the high physical activity intentions, self-efficacy, and outcome expectations that these girls endorsed. Further,

participants may come from families with greater support for physical activity. GOTR was not able to provide transportation from the program, which could have prevented some youth from participating, as previous research has found that parent provision of transportation to physical activity significantly predicts higher physical activity levels for girls (Hoefler, McKenzie, Sallis, Marshall, & Conway, 2001). Students at Chalkley Elementary School are primarily from families with low socio-economic status, who are in greater need of physical activity intervention. Because of the many challenges such families face, it was anticipated that attrition would become an issue, and thus families were asked to sign a commitment statement, stating their pledge to attend all program sessions unless extreme circumstances prevent them from coming. Fortunately, once the program started, attrition was very low (1.5%), and no students withdrew from the program due to lack of interest. Reasons for withdrawing from the program (at any point) included: a family move, a parent changed jobs which prevented him/her from picking the child up, and parental health problems.

It is possible that the present study did not have sufficient power due to the small sample size. Although power analyses indicated that this study had sufficient power (0.80) at the $p < .05$ level to detect an effect size of 0.2, it is possible that true effect size was even smaller, based on the many factors that contribute to PA in this age group, and the general limited understanding of PA in this age group. Further, this study was underpowered for the multivariate analyses, which could partially explain the lack of certain expected findings. Of note, research is currently being conducted with another

cohort of GOTR participants, and data will be reexamined with a larger sample size.

Lastly, results are only generalizable to elementary school girls at Chalkley.

Another notable limitation of the program is that GOTR does not have a structured parent component. Parents are important for children's health behaviors for several reasons, including acting as role models for physical activity (Kohl & Hobbs, 1998). Further, some studies have found that programs that exclusively target parents are more successful than those that target youth only or both youth and parents in weight management interventions (e.g., Golan & Crown, 2004). Thus, incorporating a parent component into the GOTR curriculum would likely be beneficial and may lead to greater increases in health behaviors and attitudes, leading to greater reduction in overweight among participants.

Despite these limitations, this study also has numerous strengths. First, it applied a theory-based evaluation to an existing innovative intervention, *Girls on the Run*. GOTR has been shown to increase self-esteem, body satisfaction, and eating attitudes, but has not been evaluated on other program objectives, such as its ability to improve physical activity and its correlates. This study is the first to begin to look at whether GOTR is an effective physical activity intervention, and thus can be implemented as an obesity prevention program. Because after school programs are taking on an increasingly important role in providing physical activity experiences, GOTR could be an effective program to offer on a larger scale. Second, this study targeted an underserved, ethnically diverse population, one that is at high risk for obesity. Third, GOTR targets physical activity in elementary school girls, a population in need of further investigation. Much of

what is known about children's physical activity has been studied in older youth, such as adolescents and teenagers. A clearer understanding of the exercise habits, attitudes, and beliefs of elementary school aged youth will significantly contribute to the knowledge of physical activity in this age group and can thus better inform interventions. Fourth, GOTR was developed to meet the specific needs and interests of girls, but has not been evaluated in a predominately (74%) African American population. The current study found preliminary support that these girls had favorable opinions of the program, with respect to liking the program, having fun, learning information, and finding the lessons important. However, because no ethnic differences in social cognitive or behavioral constructs could be examined due to sample constraints, future work should examine differential findings between ethnic groups. Further, because most research on the determinants of physical activity in youth is cross-sectional, the repeated measures design of this study is an additional strength.

Conclusions and Future Research

The findings of the current study further reinforce the review by Sallis et al. (2000) and multiple reports from a large scale obesity prevention investigation (Sherwood et al. 2004) about the current state of research and lack of understanding of physical activity in preadolescents, particularly among African American girls. First, the current use of theoretical frameworks in this age group may not be sufficiently advanced to understand the initiation and maintenance of physical activity. Studies should continue to examine possible mediators of physical activity, beyond those identified in current theoretical models. For example, although not assessed, self-esteem may have mediated

study outcomes and should be examined in future studies. Further, while Social Cognitive Theory appears to be an important theory to help guide interventions (Pender, 1998), and thus was the guiding theory for the current study, further development and refinement of theoretical frameworks may be needed to better understand physical activity for this age and for diverse ethnic groups (Baranowski, Klesges, Cullen, & Himes, 2004). For example, some studies have found the Theory of Planned Behavior constructs useful in understanding PA in adolescent girls (e.g., Motl et al., 2002).

Second, the need exists to examine further psychosocial correlates of physical activity in children, due to differential findings across studies. The current study provided some support for the roles of self-efficacy and social influences in increasing frequency of physical activity as well as intentions to be physically active. Further, outcome expectations have been inconsistently related to PA among youth, in previous work and in the current study, and may not be an important target of interventions. Third, there are very few longitudinal studies in elementary school youth, which are necessary to further understanding of change in PA over time. In addition, there is a particular need to assess mediators of change over time, in order to identify appropriate targets of PA interventions. Lewis and colleagues (2002) found only two studies that directly measured factors that mediated change in PA within exercise interventions targeting at children. More recently, however, Dishman et al. (2004) found that self-efficacy mediated PA change in interventions conducted with girls. These findings need to be replicated and further evaluated.

Future research should use longitudinal designs, with larger sample sizes and a control group, to determine if *Girls on the Run* has lasting effects on girls' attitudes, beliefs, and behaviors. Because many participants may not have appropriate avenues to continue to engage in physical activity (i.e., safe neighborhoods, running areas, or structured activities), long term studies should examine ways to provide continued access to safe activities. Objective measure of physical activity, such as that taken by an accelerometer (e.g., Trost et al., 1999), should be used in future research to obtain a more complete physical activity index, and reduce social desirability and self-report biases. Alternately, a more detailed exercise recall, such as a seven-day physical activity recall could improve the validity of physical activity measurement. Including a measure of social desirability would enable researchers to statistically control for its effects. Future studies should also investigate whether any change in BMI occurs after participation in GOTR. It would also be important to examine if participants in GOTR are less likely to become overweight than non-participants. Longer term follow-up could also help determine if participants in GOTR are less likely to experience the decline in health attitudes, beliefs, and behaviors that occur as youth progress through adolescence, particularly with respect to physical activity. Qualitative data from parents, school administrators, and participants were a valuable source of informal information about GOTR; future studies could include more formal qualitative assessment, to supplement quantitative measures. Lastly, it may be important to culturally tailor GOTR, specifically with respect to body size satisfaction, given previous research highlighting differences in body ideals (Wilson et al., 1994). These differences should be examined and program

changes made if necessary. While the current study represents one step towards a better understanding of youth physical activity, specifically of girls' enrolled in GOTR, much more research must be conducted and interventions must be implemented to reverse the dangerous trends of decreasing exercise levels and increasing rates of overweight children.

Final Observations

The author would like to add some additional observations about the implementation and evaluation of GOTR at Chalkley Elementary School, ones that were not captured in the survey instruments. First, an unintended consequence of our program was that parents and other family members seemed to take an interest in improving their own health along with their GOTR participant. For example, many parents and family members participated in the 5K races, and, at times, parents would come to program sessions and run with their daughters around the track. Responses from parents to the coaches were overwhelmingly positive, with one parent noting that, "this program has changed my daughter in ways no program ever has; this was the first program that was *real*." Many parents expressed that they noticed positive behavior and attitude changes in their children after participation in GOTR. For example, one mother was pleased that her daughter's grades started to improve during the program. This same mother, after watching her daughter run the 5K race, was surprised at her daughter's athletic ability and signed her up for swim team at her daughter's request. Future research should try to capture parent opinions of GOTR and how the program affected their children.

The culture of Chalkley Elementary School is changing in a positive way, although there are still many challenges to overcome. GOTR seems to have been a springboard for schoolwide efforts to promote and encourage physical activity and healthy living among students. For example, the school sponsored students' participation in local races and training activities, such as the 1 Mile Fun Run and the Kids Marathon. Further, school officials have begun to tackle the challenge of offering healthy options in the cafeteria, which has led to several economic and political barriers, but has also led to the administrators making certain compromises at the urging of Chalkley staff. For example, the county is considering offering healthier snacks in the cafeteria, despite economic concerns that these items are not purchased as often and thus do not generate comparable income to the higher calorie options. Despite these challenges, the administration in this school, and the entire county, are committed to better understanding and improving the health of their students.

Lastly, and perhaps most importantly, based on positive feedback about GOTR at Chalkley, and media attention to the program, the Chesterfield Department of Health has applied for a license from GOTR International to implement the program county-wide, starting in the fall of 2006 with six pilot schools. This large-scale implementation brings with it the opportunity to conduct a more comprehensive evaluation in the form of a randomized controlled trial, which will be pursued. Although we do not have data to suggest that GOTR caused any of these changes, we do believe that the combined efforts of many people who brought this innovative and exciting program to this underserved

population helped lead to an increase in energy, motivation, and hope that we can make changes to increase physical activity and reduce the burden of obesity in youth.

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Appendix A

Girls on the Run Curriculum Overview



OVERVIEW OF GOTR CURRICULUM OBJECTIVES

(Part One) All about Me....Getting to Know Who I am and What I Stand For!

1. GETTING TO KNOW EACH OTHER

- To provide participants with the opportunity to learn each other's names and each other's likes and dislikes, similarities and differences
- To determine running "abilities" of members of the group.
- To administer the pre-survey in order to provide pre-program participant attitudes

2. WHAT IS MEANS TO BE A *GIRL ON THE RUN* PROMISE KEEPER

- To introduce participants to the concept of respecting each other through listening, cooperating and taking time to pay attention;
- To learn what promises are important to making the group operate efficiently.

3. WHAT IS CHANGE AND HOW DO I DO IT?

- To introduce participants to the importance of assessing their current behaviors and the ways they think;
- To learn how to change those behaviors that need improvement.

4. GETTING PHYSICAL: THE IMPORTANCE OF TAKING CARE OF OUR PHYSICAL SELVES

- To introduce participants to the concept of physical fitness;
- To teach the basics of healthy nutrition, healthy habits and the importance of physical activity.

5. BEING EMOTIONAL IS HEALTHY

- To teach participants the importance of expressing their emotions;
- To teach participants the concept that uncomfortable emotions, such as anger, sorrow, and frustration are not "bad" or "unhealthy" in and of themselves. How these emotions are expressed may be unhealthy, however.
- To learn how they personally deal with and express their emotions.

6. FINDING THE SPIRIT IN ME

- To introduce participants to the concept of spirituality (as opposed to religion);
- To begin the process of finding their own spiritual basis and learning the benefits of meditation and quiet time.

7. DRUGS HURT YOUR CHANCES

- To learn the major effects of alcohol, tobacco, and marijuana;
- To gain a better understanding of why people use drugs;
- To be able to develop their individual strategy for never trying drugs.

8. VALUES ARE VALUABLE

- To explore personal values;
- To understand the importance of standing up for their values
- To discuss some behaviors that may undermine their adherence to their personal values;
- To have the girls run their first 5 km. or 5 km. run/walk.

(Part Two) Building my Team. . . Understanding the Importance of Cooperation**9. LEARNING ABOUT COOPERATION**

- To introduce participants to several key concepts regarding cooperation;
- To gain a general understanding of the importance of healthy communication (both verbal and nonverbal) in improving cooperation within a group.

10. LEARNING TO LISTEN

- To introduce participants to the key principles of good listening;
- To have participants practice good listening skills by designing a workout that will best reveal the talents and likes of their individual team members.

11. THE KEYS TO MAKING HEALTHY DECISIONS

- To learn the mechanics of healthy decision-making;
- To get an opportunity to actually use the learned “mechanics” in making decisions that will positively affect the group.

12. GOSSIPING IS A BAD HABIT

- To communicate the destructive nature of gossip;
- To understand that gossip hurts both the person about whom the gossip is being spread AND the person who is spreading it;
- To gain a better understanding of why people gossip and how not to be a part of and how to stop a gossip chain.

13. POSITIVISM: IT REALLY WORKS

- To understand the importance of maintaining a realistic but positive attitude;
- To experience the difference between negative and positive reinforcement;
- To begin to understand the impact that positive behavior and attitudes have on their behavior and self-esteem.

14. LEARNING ABOUT COMMUNITY

- To introduce participants to the concept of community;
- To start participants thinking about a *Girls on the Run* community project.

15. STANDING-UP FOR MYSELF

- To teach participants the importance of standing up for themselves using appropriate assertive behavior;
- To practice assertiveness-training skills and be able to employ them

16. DOING A 5 KM. !

- To give the girls as much time as needed to either run or walk a 5 Km. (3.1 miles).

(Part Three) Community Begins with Me. . .Learning about Community and Designing our own Community Project

17. YOU CALL IT

- To provide participants with an opportunity to make choices, review their GOTR experience and to simply PLAY! The Girls will decide what games they want to play with coach's support and provision of equipment
- To build community

18. COMMUNITY BEGINS WITH ME

- To demonstrate the importance of upholding the community;
- To begin to understand that a community is representative of the circumstances and values of the people in it;
- To gain a better understanding of discrimination and begin to consider ways to stop discrimination.

19. FINALIZING THE COMMUNITY PROJECT

- To finalize the group's community project plan

20. IT'S A GIRL THANG!

- To increase awareness of the negative ways in which the media portrays girls and women;
- Participants will learn the specific ways in which the media portrays women and girls in a manner that does not place us in high esteem;
- Participants will create their own poster that counters the typical media and uplifts them into high esteem.

21. DOING THE COMMUNITY PROJECT

- To work diligently on the community project.
- To have FUN!!

22. THE FINISHING TOUCHES

- To enjoy the last official day of *Girls on the Run* before Run for a Reason and the banquet
- To administer the attitudinal post-survey

23. RUNNING FOR A REASON

- To complete the last group workout and provide healthy closure to our *Girls on the Run* experience.
- Raise money for scholarships for other girls to participate in GOTR

24. CELEBRATION: THE BANQUET!

- To recognize and celebrate the individual spirit of each girl and the community established over the course of the twelve weeks together
- To have fun and say “good-bye”

Appendix B

Baseline and Post-Test Surveys

Baseline Survey

I. Directions: Do NOT write your name on the survey. Please answer the following questions by circling your answer or writing it on the line. Remember, all your answers are PRIVATE!!

1. How old are you? _____

2. What grade are you in?

- a. 3rd
- b. 4th
- c. 5th

3. On how many of the past 7 days did you exercise that made you sweat and breathe hard, such as playing outside, basketball, soccer, running, swimming, fast bicycling, fast dancing, or similar activities?

- a. 0 days
- b. 1 day
- c. 2 days
- d. 3 days
- e. 4 days
- f. 5 days
- g. 6 days
- h. 7 days



4. How many hours last week were you physically active? Remember to count all the times you were physically active last week.

- a. 0 hours
- b. ½ hour
- c. 1 hour
- d. 2-3 hours
- e. 4-6 hours
- f. 7 hours or more



5. About how much time do you usually spend being physically active each time?

- a. less than 20 minutes
- b. 20 minutes
- c. 30 minutes
- d. 40 minutes
- e. 1 hour
- f. more than 1 hour

6. On a school day, about how many hours do you watch TV/play video games?

- a. I do not watch TV/play video games on most school days
- b. Less than 1 hour per day
- c. 1 hour per day



- d. 2 hours per day
- e. 3 hours per day
- f. 4 hours per day
- g. 5 or more hours per day

7. **On a school day**, about how many hours do you use a computer after school?

- a. I do not use a computer after school on most school days
- b. Less than 1 hour per day
- c. 1 hour per day
- d. 2 hours per day
- e. 3 hours per day
- f. 4 hours per day
- g. 5 or more hours per day.

8. **I plan to be physically active at least two times per week for the next 3 months.**

- a. No
- b. Maybe
- c. Yes

9. I plan to be physically active for **30 minutes** or more each time.

- a. No
- b. Maybe
- c. Yes

When you get here, please stop!! The coach will tell you when to start the next part.



A **serving** of fruit is the same as:

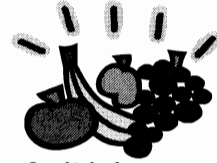
1 piece of fruit

$\frac{1}{2}$ cup of fruit salad

$\frac{1}{4}$ cup of raisins

a glass of 100% orange juice, apple juice, or grapefruit juice

(DO **NOT** count fruit punch, Kool-aid, Gatorade, or Fruit drink)



10. Now think about foods you eat each day. In a usual **school** day, how many times do you eat a **serving** of fruit? Circle the number of times you eat a serving of fruit each day.

0

1

2

3

4

5 or more

A **serving** of vegetables is the same as:

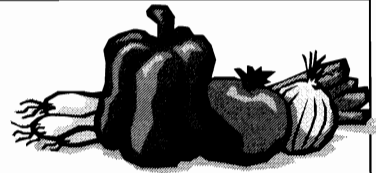
1 medium carrot or other fresh vegetable

1 small bowl of green salad

$\frac{1}{2}$ cup of cooked or fresh vegetables

a bowl of vegetable soup

(DO **NOT** count French fries, potato chips, or fried okra)



11. Think again about foods you eat each day. In a usual **school** day, how many times do you eat a **serving** of vegetables? Circle the number of times you eat a serving of vegetables each day.

0

1

2

3

4

5 or more

12. During the **past 7 days**, on how many days did you eat breakfast?

a. 0 days- none

b. 1 day

c. 2 days

d. 3 days

e. 4 days

f. 5 days

g. 6 days

h. 7 days- every day



13. During the past 7 days, on how many days did you eat dinner with your parent(s) or guardian(s)?

a. 0 days- none

e. 4 days

- b. 1 day
- c. 2 days
- d. 3 days

- f. 5 days
- g. 6 days
- h. 7 days- every day

II. The next questions ask about how much YOU think you can do the following things. Please circle YES or NO for each question. There are no right or wrong answers.

1. I think I can ask my parent or other adult to sign me up for a sport, dance, or other physical activity.

YES

NO

2. I think I can ask my parent or other adult to take me to a physical activity or sport practice.

YES

NO

3. I think I can ask my best friend to be physically active with me.

YES

NO

4. I think I can ask my parent or other adult to do physically active things with me.

YES

NO

5. I think I can ask my parent or other adult to get me the equipment I need to be physically active.

YES

NO

6. I think I have the skills I need to be physically active.

YES

NO

7. I think I can be physically active most days after school.

YES

NO

8. I think I can be physically active no matter how busy my day is.

YES

NO

9. I think I can be physically active no matter how tired I may feel.

YES

NO

10. I think I can be physically active, even if it is hot or cold outside.

YES

NO

11. I think I can be physically active, even if I have a lot of homework.

YES NO

12. I think I can be physically active after school, even if I could watch TV or play video games instead.

YES NO

13. I think I can be physically active even if I have to stay at home.

YES NO

14. I think I can be physically active even when I would rather be doing something else.

YES NO

15. I think I can be physically active even if my friends don't want me to.

YES NO

16. I think I can be physically active after school even if my friends want me to do something else.

YES NO

17. I think I can be physically active at least TWO times a week for the next 12 weeks.

YES NO

III. You are doing great! Now, please circle if you agree or disagree with the statements below. Look at the example first.

<i>Example: I like to read.</i>	<input checked="" type="radio"/> Disagree	<input type="radio"/> Not Sure	<input type="radio"/> Agree
1. Exercising on most days would keep me or get me in shape.	<input type="radio"/> Disagree	<input type="radio"/> Not Sure	<input type="radio"/> Agree
2. Exercising on most days would be boring.	<input type="radio"/> Disagree	<input type="radio"/> Not Sure	<input type="radio"/> Agree
3. Exercising on most days would make me better in sports.	<input type="radio"/> Disagree	<input type="radio"/> Not Sure	<input type="radio"/> Agree
4. Exercising on most days would be fun.	<input type="radio"/> Disagree	<input type="radio"/> Not Sure	<input type="radio"/> Agree
5. Exercising on most days would help me be healthy.	<input type="radio"/> Disagree	<input type="radio"/> Not Sure	<input type="radio"/> Agree

6. Exercising on most days would make me get hurt.	Disagree	Not Sure	Agree
7. Exercising on most days would help me control my weight.	Disagree	Not Sure	Agree
8. Exercising on most days would make me embarrassed in front of others.	Disagree	Not Sure	Agree
9. Exercising on most days would give me energy.	Disagree	Not Sure	Agree
10. Exercising on most days would make me tired.	Disagree	Not Sure	Agree
11. Exercising on most days would cause pain and muscle soreness.	Disagree	Not Sure	Agree
12. Exercising on most days would help me make new friends.	Disagree	Not Sure	Agree
13. Exercising on most days would help me spend more time with my friends.	Disagree	Not Sure	Agree
14. Exercising on most days would help me look good to others.	Disagree	Not Sure	Agree
15. Exercising on most days would make me more attractive to others.	Disagree	Not Sure	Agree
16. Exercising on most days would help me work out my anger.	Disagree	Not Sure	Agree

IV. Good job!! The next questions ask about your family and friends. Please circle YES or NO for each question.

1. A friend has offered to be physically active with me in the past 2 weeks.
YES NO
2. A friend has been physically active with me in the past 2 weeks.
YES NO
3. Someone in my family has been physically active with me in the past 2 weeks.

YES NO

4. Someone in my family has offered to be physically active with me in the past 2 weeks.
YES NO
5. A friend has encouraged me to be physically active in the past 2 weeks.
YES NO
6. My friends think I should be physically active.
YES NO
7. Someone in my family has encouraged me to be physically active in the past 2 weeks.
YES NO
8. My family thinks I should be physically active.
YES NO

V. Please answer these questions about YOU.

1. In the past 12 months, who did you live with most or all of the time? (Circle all that apply)

- | | |
|--------------------------|---------------------------------|
| a. Both parents | f. Grandparent(s) |
| b. Mother only | g. Unrelated adults |
| c. Father only | h. Other relatives |
| d. Mother and stepfather | i. Father and stepmother |
| e. Friends | j. Other (Please explain _____) |

2. Please circle the answer that best describes YOU. (You may circle all that apply)

- a. African-American/ Black
 b. Caucasian/ White
 c. Asian-American
 d. Native American
 e. Hispanic
 f. Other (please write on line)_____

Post-Test only Items

V. We want to know how you feel about Girls on the Run. Circle the answer that is right for YOU.

1. How much did you like Girls on the Run?
 - a. I did NOT like Girls on the Run at all.
 - b. I liked Girls on the Run a little bit.
 - c. I liked Girls on the Run A LOT.

2. How important to you were the lessons in Girls on the Run?
 - a. The lessons were NOT important to me at all.
 - b. The lessons were a little bit important to me.
 - c. The lessons were VERY important to me

3. How much fun was Girls on the Run?
 - a. Girls on the Run was NOT fun at all.
 - b. Girls on the Run was a little bit fun.
 - c. Girls on the Run was A LOT of fun.

4. How much did you learn from Girls on the Run?
 - a. I did NOT learn anything.
 - b. I learned a little bit.
 - c. I learned a LOT

Appendix C

Parental Consent and Youth Assent Forms

RESEARCH SUBJECT INFORMATION AND CONSENT FORM

TITLE: Evaluation of *Girls on the Run* at Chalkley Elementary School

VCU IRB NO: 4194

If there is anything you do not understand in this form, please ask the study staff to clarify. You may take home an unsigned copy of this consent form to think about or discuss with family or friends before making your decision.

Purpose of the Study:

The purpose of this research study is to find out about children's thoughts and attitudes towards exercise and see if participating in *Girls on the Run* can help form healthy behaviors and attitudes towards exercise.

Your child is being asked to participate in this study because she is a participant in *Girls on the Run*, an after school exercise program for girls at Chalkley Elementary School.

Description of the Study and Your Child's Involvement:

If you decide that your child can be in this research study, you will be asked to sign this consent form after you have had all your questions answered and understand what will happen to your child.

In this study your child will be asked to complete a survey three times: before *Girls on the Run* begins, after *Girls on the Run* ends, and three months after the program ends. This survey will ask questions about your child's exercise and diet habits, your child's confidence in her ability to exercise, support from friends and family to be active, and your child's thoughts about the importance of exercise. A copy of this survey is available for you at Chalkley. You may also contact Melanie Bean at 827-1120 and she will arrange for you to view the survey.

Risks and Discomforts:

Risks to participation in the survey are minimal. Your child may think that responses to her surveys might be shared. We will assure the children that their answers are private and that nobody except for the study staff will see their answers. Although questions are not related to sensitive areas, your child might feel uncomfortable answering some of the questions. The children will be told that they may skip any items that they do not feel comfortable answering, and that their participation is voluntary.

Benefits:

Your child may not get any direct benefit from this survey, but, the information we learn from people in this study may help us design better exercise programs for children. The information may help us understand how to help children become more active.

Costs:

There are no costs for participating in this study other than the time your child will spend filling out questionnaires.

Alternatives:

If you do not consent to your child completing the questionnaire, she will be given an alternative activity to complete with the assistant coach, such as drawing or playing a short game.

Confidentiality:

We will not tell anyone the answers your child gives us; however, information from the study and the consent form signed by you may be looked at or copied for research or legal purposes by Virginia Commonwealth University.

What we find from this study may be presented at meetings or published in papers, but your child's name will not ever be used in these presentations or papers.

Voluntary Participation and Withdrawal

Your child does not have to participate in this study. If you choose for your child to participate she may stop at any time without any penalty. Your child may also choose not to answer particular questions that are asked in the study. Your child's participation in Girls on the Run will not be affected if she does not complete the survey.

Questions

In the future, you may have questions about your child's participation in this study. If you have any questions, contact:

***Melanie Bean, Research Coordinator
612 N. Lombardy Street
PO Box 843033
Virginia Commonwealth University
Richmond, VA 23220
804-827-1120
mkbean@vcu.edu***

If you have any questions about your rights as a participant in this study, you may contact:

Office for Research Subjects Protection

Virginia Commonwealth University
 800 East Leigh Street, Suite 111
 P.O. Box 980568
 Richmond, VA 23298
 Telephone: 804-828-0868

Consent:

I have been given the chance to read this consent form. I understand the information about this study. Questions I wanted to ask about the study have been answered. My signature says that I am willing for my child to participate in this study.

Name of Child

Parent or Guardian name printed

Parent/Guardian signature

Date

Witness Signature (Required)

Date

Signature of person conducting informed consent

Date

Investigator signature (if different from above)

Date

Assent Form

Dear Chalkley Student,

This survey is part of a study to learn about Girls on the Run. We want to know your thoughts about exercise. Your answers will be used to help us learn how to make better programs for girls. You are being given this survey by professors at Virginia Commonwealth University.

DO NOT write your name on this survey. All of your answers are private. Nobody in the school, your family, or your friends will see your answers. When you are done with the survey, please put it in the envelope. Seal the envelope and the coach will collect it.

Please think about each question and answer as best you can. If you do not want to answer a question you may skip it. This is not a test. Your answers will not be graded. There are no right or wrong answers.

It is your choice if you want to fill out the survey. If you do not want to fill out the survey, please put it in the envelope and seal it. You can still be in Girls on the Run if you do not fill out the survey. Your answers are very important to us. Please let a coach know if you have questions.

Thank you for your help.

If you agree to fill out the survey, please sign your name here:

Appendix D
Survey Administration Guide

COACHES: Please use this form as a guide to help in survey administration.

- Now that you all have a survey, let's read the front page together. You read along while I read the letter out loud. (*Read assent, answer any questions*). If assented, girls may begin and answer questions 1 and 2. Ask them to raise their hands when they finish number 2.
- (*When all girls are ready*). Many questions on this survey ask about physical activity. Who can tell me what physical activity is? (*call on girls*). It is anything you do that makes you breathe hard and sweat- like biking, playing tag, running, swimming, or jumping rope. Are there other types of physical activity you can think of?
- For number 3, think about everything you did last week that made you sweat and breathe hard- all of the physical activity that you did. Remember to think about all the things you did in PE class, at recess, after school, or at home. On how many days last week did you do some sort of physical activity? Circle the number of days.
- Great! Now think about all the times again that you were physically active last week. Remember, physical activity is all the things you do that make you breathe hard and sweat, like running around or playing sports. How many hours all together do you think you were physically active last week? So if you played tag for one hour after school on Monday and had gym for one hour on Wednesday, that is 2 hours. Now do your best to answer number 4. If you need help with this question, raise your hand.
- Now, let's think about number 5. When you do something physically active, how much time do you usually spend? For example, do you usually spend 30 minutes playing after school, or do you spend an hour each time? Do your best to answer this question, and we can help you if you have questions.
- Ok, now answer the next two questions- until you get to the part that says stop!
- Ready? The next questions ask about foods you eat. We want to know how many times you eat a serving of fruit. A serving is 1 piece of fruit, like an apple, a banana, or an orange. Or $\frac{1}{2}$ cup (*show $\frac{1}{2}$ cup*) of fruit salad; or $\frac{1}{4}$ cup of dried fruit like raisins (*show $\frac{1}{4}$ cup*). A glass (*show 6 oz. glass*) of juice like orange or apple juice is also a serving of fruit. Drinks like Kool Aid or Fruit Drink (like Fruitopia) do not count. Think about what you usually eat on a school day. How many times do you think you eat a serving of fruit each day? Circle the number for question 10.
- The next question asks how many times you eat a serving of vegetables. A serving of vegetables is 1 medium carrot or other fresh vegetable, 1 small bowl of green salad (*hold up*), $\frac{1}{2}$ cup (*hold up cup*) of cooked or fresh vegetables, like green beans or collard greens, or a bowl of vegetable soup. French fries, potato chips, and fried okra do not count. Think about what you usually eat on a school day. How many times do you think you eat a serving of vegetables on a school day? Circle the number for question 11.
- Ok. Now you can keep going and finish the rest of the survey. If you have any questions or do not understand something, please raise your hand. When you are finished, put your survey in the envelope and seal it.

Vita

Melanie Kerr van Ogtrop Bean was born in Wilmington, DE, where she grew up with her parents, Dr. S. Charles Bean and Elizabeth M. Bean, and two sisters, Elsie Kumpon and Caroline Bean. Melanie graduated from Ursuline Academy Upper School in 1996 and attended the University of Virginia, where she majored in psychology and minored in Spanish. She spent one semester at the University of Sevilla, Spain, and graduated in 2000 with a Bachelor of Arts degree. Melanie then moved to Richmond, VA where she began her involvement with numerous research and clinical endeavors focused on disease prevention and health promotion, under the mentorship of Dr. Elizabeth Fries. In 2002, she enrolled in Counseling Psychology Doctoral Degree Program at Virginia Commonwealth University, where she earned her Masters degree in 2004. After completing a clinical internship with the Southwest Consortium in Albuquerque, NM, Melanie will graduate in May 2007 with her doctorate in Counseling Psychology.