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THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND PSYCHOSOCIAL
HEALTH IN ADOLESCENT GIRLS AND THEIR MOTHERS

A Dissertation
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy
Parks, Recreation and Tourism Management

by
Kellie Walters
May 2017

Accepted by:
Dr. Denise Anderson, Committee Chair
Dr. Dorothy Schmalz
Dr. Ellen Granberg
Dr. Sarah Griffin

ABSTRACT

In most western countries, obesity and sedentary behavior are a major health concern. Research demonstrates a clear connection between one's physical and emotional health (e.g., body image) and as such, many community programs now focus on the "whole person" rather than just physical wellbeing. When looking at the population as a whole, the most health disparate group is adolescent girls. Compared to any other cohort, adolescent girls are the most sedentary, obese, and likely to suffer from psychosocial distress such as anxiety and/or depression. As a result, there is a need for further research into adolescent girls' physical and emotional health. The primary purpose of this study was to evaluate Smart Fit Girls, a program aimed at improving adolescent girls' health. A secondary purpose of this study was to better understand how social comparison and mother/daughter relationships influence adolescent girls' health. Quantitative (surveys), qualitative (focus groups), and mixed-methods (embedded design) methodologies were used in this study. Findings indicate that 1) the Smart Fit Girls program was successful in improving participants' body image, 2) mothers have a strong influence over their daughters' health and while they recognize this, they do not know how to best discuss health concerns with their daughters, and 3) physical activity prototypes influence adolescent girls' willingness to be physically active but social comparison does not influence this relationship. This study demonstrates that intentional programming can positively influence the health of adolescent girls.

DEDICATION

This dissertation is dedicated to the girls, parents, staff and coaches of Smart Fit Girls.

Together, we will build a generation of smart, fit girls.

ACKNOWLEDGEMENTS

This dissertation could not have been completed without the support and guidance of my dear friends, family, and colleagues. There have been so many people helping me along my journey and for that I am incredibly grateful. There are a few individuals I would like to thank individually.

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Fourth, thanks to the PRTM faculty and staff for changing my perspective on health and teaching me a whole new discipline. I have learned so much from you all and am forever grateful for that. A particular thanks to my PRTM graduate student friends. We have shared so many wonderful memories discussing our experiences with Dr.

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CHAPTER ONE

INTRODUCTION

Background

Worldwide, the prevalence of overweight (body mass index, BMI between 25-29 kg/m²) and obese (BMI > 30 kg/m²) individuals has increased from 857 million to 2.1 billion between 1980 and 2013 (Ng et al., 2014). In America, the prevalence of obesity exceeds 30% across most age and sex groups (Flegal, Carroll, Ogden, & Johnson, 2002). Even more concerning, approximately 32% of American youth are overweight or obese, with minority adolescents (non-Hispanic black and Hispanic youth) having the highest incidence of overweight or obesity (Ogden, Carroll, Kit, & Flegal, 2014).

In response to this health crisis, a number of governing bodies have made health and wellness a priority in their outreach and research interests. For instance, both the Office of Disease Prevention and Health Promotion (through their report, Healthy People 2020) and the National Parks and Recreation Association (NRPA) aim to improve nutrition, increase physical activity, and decrease obesity in America. According to the NRPA position statement, “public parks and recreation are the gateways to a healthier America, and they ensure that communities are truly livable” (“Role of Parks and Recreation on Health and Wellness,” 2015). Although recent data have demonstrated an attenuation of overweight and obesity development, Ng and colleagues (2014) argue that “...no national success stories have been reported in the past 33 years [and] urgent global action and leadership is needed to help countries to more effectively intervene” (p. 766).

Adolescence is recognized as a stressful and difficult period of life, during which many factors (biological, environmental, psychological included) influence physical activity participation (Garcia, Pender, Antonakos, & Ronis, 1998). Intuitively, how these factors influence adolescent health depends on the sex of the adolescent. While youth development seems to be an ever-expanding field, very little is known about the implications recreation, leisure, and physical activity have on adolescent girls' perceived physical and emotional health.

Research demonstrates that compared to adolescent boys, girls are more likely to be obese (Ogden et al., 2014) and sedentary (Tudor-Locke, Lee, Morgan, Beighle, & Pangrazi, 2006). Adolescent girls are also more likely to suffer from psychosocial distress, such as anxiety and depression (Ivarsson, Svalander, Litlere, & Nevonen, 2006). According to Martikainen, Bartley, and Lahelma (2002), "psychosocial factors can be best seen as and operationalized in terms of influences acting primarily between the fully social and the fully individual level-that is being neither one nor the other" (p. 1091). Commonly studied psychosocial factors, such as self-esteem, body image, and self-efficacy are highly associated with physical activity. Individuals who are highly physically active are more likely to have a greater self-esteem, better body image, and increased physical activity self-efficacy (Campbell & Hausenblas, 2009; McAuley et al., 1999; Robbins, Pis, Pender, & Kazanis, 2004; Schmalz, Deane, Birch, & Davison, 2007). Despite this fact, a majority of adolescent girls continue to struggle with poor body image/body dissatisfaction.

There are many factors that contribute to body dissatisfaction with exposure to media (e.g., television, movies, magazines) being the most frequently studied. Additional socio-cultural factors that influence one's body image include one's peers and the family unit (McCabe & Ricciardelli, 2001; Rodriguez & Moreno, 2010). However, a growing body of evidence suggests that mothers are the primary agent by which young girls learn about their body and body image (Clarke & Griffin, 2007; McCabe & Ricciardelli, 2001; McKinley, 1999). A mother's body image is socially constructed and often consists of beauty standards that are unattainable (Fredrickson & Roberts, 1997). Through years of observation, it is likely that adolescent girls learn the "normalcy" of social comparison through their mothers. Evidence demonstrates that those who engage in social comparison more frequently are more likely to struggle with their body image as well (Jones, Vigfusdottir, & Lee, 2004). Thus, there is a clear need to better understand the relationship between physical activity and emotional health in adolescent girls and adult women.

As a result of the poor physical and mental state of many adolescent girls, a few programs have been developed to improve the health of this population (e.g., Girls Get Going (GGG) and Girls on The Run, (GOTR)). Unfortunately, most of these programs have not been empirically studied. GGG is a school and community based physical activity program that incorporates the expertise of physical education teachers as well as community trainers and coaches. While GGG is one of the few empirically studied girls' health programs, the focus was primarily on physical activity without any insight into the impact GGG may have had on the participants' mental health. Another more well known

health program for adolescent girls is GOTR (a program aimed at improving girls' emotional, social, mental, and physical wellbeing). Only a few studies have examined the impact of GOTR, but most evidence suggests that participating in GOTR leads to greater self-esteem, more body size satisfaction, and healthier eating attitudes/behaviors (DeBate & Thompson, 2005; Martin, Waldron, McCabe, & Choi, 2009). While there is some research to suggest longitudinal impacts of GOTR, (Petee Gabriel, DiGiacchino DeBate, High, & Racine, 2011), more data are necessary to corroborate such findings. Due to continued differences in adolescent boys' and girls' health, adolescent girls have been identified as a priority population for health promotion programs with a call for interventions that are specifically designed to address the unique needs of this population (Camacho-Minano, LaVoi, & Barr-Anderson, 2011).

Purpose of the Study

The primary purpose of this study was to explore the effectiveness of an after-school program focused on improving adolescent girls' perceived physical and emotional wellbeing and to better understand how physical activity and mother/daughter relationships affect adolescent girls' perceived physical and emotional health. A secondary purpose was to explore how comparing oneself to individuals who are physically active impacts physical activity enjoyment. To achieve this purpose, three aims were proposed: 1) to test the success of a novel after school program at improving body image in adolescent girls, 2) to gain insight into the relationships between mothers'

and daughters' perceived physical and emotional health and 3) to better understand how the degree of social comparison impacts physical activity enjoyment.

Program Description

Smart Fit Girls (SFG) is a 10-week after school program aimed at improving the physical and mental wellbeing of adolescent girls (age 10-14). Participants meet for two hours, twice a week, and each session is led by a trained Smart Fit Girl Coach. In order to ensure a safe and effective environment, the ratio of students to coaches is set at a maximum of 14 to 2. During each meeting, the participants spend half of their time participating in activities specifically created to increase self-esteem and body image in adolescent girls (e.g., “take what you need” – an activity where participants create post-it notes with positive, encouraging comments and place them on a large poster board that they hang up in their school for their peers to “take what they need”). In the second half of each session, participants are engaged in various forms of physical activity, with a focus on resistance training. While there are likely other secondary outcomes that will occur as a result of SFG, the primary program outcomes include 1) increased global self-esteem, 2) improved body-esteem, 3) increased physical activity levels, 4) increased physical activity enjoyment, and 5) decreased levels of social comparison.

An outline of the SFG curriculum can be found in Appendix A and the program logic model in Figure 1. A logic model is commonly used by programmers to guide program activities and demonstrate to others (e.g., public officials, funders) the program's underlying theory of action and program goals. By determining the program's

outcomes prior to administering the program, practitioners are better able to intentionally design a program and make adjustments when outcomes are not met.

Figure 1.

Inputs	Activities	Outputs	Outcomes	Impacts
<ol style="list-style-type: none"> 1. Volunteer coaches 2. Weight lifting equipment 3. Food for nutrition 101 4. Plates, napkins, cups, & cutlery 5. Awards 6. Computer 7. Music 8. Internet for videos 9. Art supplies (markers, glue, pens, scissors, tape, paper, etc.) 10. Old magazines 11. Journals 12. Lesson plan 13. Program binder 14. Registration forms, pre and post questionnaires 15. T-shirts 	<ol style="list-style-type: none"> 1. Teach basic anatomy & nutrition 2. Watch videos about media manipulation, body image, & anti-bullying 3. Guest instructors teach yoga and dance 4. Teach different weight lifting exercises 5. Teachers/staff workout night 6. Family workout graduation 	<ol style="list-style-type: none"> 1. 18 workouts 2. 18 self-esteem, body image, and physical activity motivating discussions 3. 15 journals 	<ol style="list-style-type: none"> 1. 75% of the girls will have significantly improved body image, self-esteem, and physical activity enjoyment markers by the end of the program 2. 50% of the girls will have met and maintained their SMART goal(s) by the end of the program 3. 30% of the girls will decrease their level of social comparison by the end of the program 	<ol style="list-style-type: none"> 1. Girls will experience improved psychosocial and physical health 2. Girls will feel more comfortable using positive self-talk and lifting weights 3. The girls will feel more comfortable talking with their parents about physical activity, nutrition, body image, and self-esteem. 4. The girls will grow up to be strong, empowered women

In the case of SFG, self-determination theory (SDT) served as the foundational theory that guided the program activities and the management of the contextual elements of the program. The application of SDT to SFG is outlined below.

Competence

The first component of SDT, competence, depends on developing and demonstrating a mastery of skills, which is an important component of leisure experience as well as an important developmental task, especially for girls. During SFG, girls are taught introductory level anatomy and nutrition, as well as other health related concepts such as types of fitness programming (e.g., circuits versus supersets), modifications to make exercises more challenging or easier, and proper exercise form to ensure safety. At the end of the program, the girls host a family workout night where they are responsible for creating and leading their family members through a workout. SFG was designed intentionally to build competence by exposing girls to various skill sets and knowledge, providing opportunities for individualized practice with adult feedback, followed by participation in a social environment with their families.

Autonomy

Autonomy, a second pillar of SDT, is defined as a state of personal independence and self-determination. Autonomous behaviors originate from the self, as compared to behaviors that are more extrinsically driven (e.g., parents insist on participation). During adolescence, providing opportunities for youth to autonomously engage in leisure is

important to sustained leisure participation and development as being self-determined and feeling relative freedom are essential elements of leisure (Shaw, Kleiber, & Caldwell, 1995). Therefore, many of the activities within the SFG program are autonomously driven. For example, one of the SFG activities provides participants with the opportunity to create their own exercise-based game (which they will lead/teach to one another), thereby applying the knowledge gained during the SFG program in a fun, engaging manner. This is a good example of how the program can be designed to support activities that give participants the right balance of what they need (i.e., autonomy and guidance).

Relatedness

The third pillar of SDT, relatedness, is the sense of being valued by others and feeling a sense of belonging, both of which are important to adolescent development. During SFG, the coaches create an environment of “sisterhood” where girls from many different social groups learn to support one another, despite their perceived differences. For example, SFG is currently offered in Colorado and South Carolina. As part of the program the girls at each site send weekly inspirational videos or workouts to the other groups and connect on social media platforms. This network can provide the framework for participants to develop a sense of relatedness, both with the coaches as well as other SFG participants. The larger community of SFG participants, both in person and via distance, allows for social support from salient sources (e.g., their peers). Adolescents value the opinions and perceptions of their peers more than any other age group (Guyer, McClure-Tone,

Shiffrin, Pine, & Nelson, 2009; Somerville, 2013). The larger the support network of like-minded peers, the more likely a new identity of being a “smart fit girl” is confirmed.

Research Questions

To address the study purpose, three research questions were asked.

1. What relationship exists between mothers’ and daughters’ perceived physical and emotional health?
2. Did SFG have an effect on participants’ body image?
3. How do physical activity prototypes impact willingness to engage in physical activity?

Dissertation Format

This dissertation was written using the three peer-reviewed articles format, each representing a different chapter (chapters 2, 3, and 4). Each article was written to meet the specifications of a particular journal. The three journal articles are outlined below:

- 1) The first article focuses on mothers’ and daughters’ perceived physical and emotional health. One purpose of the overall study was to explore the relationship between mothers’ and daughters’ body image and physical activity behaviors. Focus groups were used to address this purpose and answer research question 2. This article was written for the *Journal of Adolescent Research*.

- 2) The second article focuses on the impact of SFG on body image (research question 1). The purpose of this analysis was to explore if and how Smart Fit Girls improved participants' body image. To address this purpose, intervention and comparison groups completed questionnaires before and after the intervention. This article was written for the journal *Body Image*.
- 3) The third article focuses on applying the prototype willingness model (explained in detail in chapter four) to physical activity in adolescent girls. The dual purposes of this paper were 1) to explore the effect of physical activity prototypes of adolescent girls on their willingness to engage in physical activity, and 2) to explore the possible moderating effects of adolescent girls' social comparison likelihood on physical activity behavior as predicted by willingness. A quantitative questionnaire was administered to address these purposes. This article was written for the journal *Health Psychology*.

The last chapter (chapter 5) concludes the dissertation by summarizing the results and implications of findings and outlining associated future research projects.

Summary

The aim of this study was to examine the efficacy of an after-school program for adolescent girls and to better understand the relationship between mothers' and daughters' perceived physical and emotional health. The results of this study may be generalized to an after-school program that includes (a) adolescent girls and (b) self-esteem, body image, and resistance training activities. The results of this study also

further expand the body of knowledge pertaining to women's and girls' perceived physical and emotional health.

CHAPTER TWO
A QUALITATIVE APPROACH TO UNDERSTANDING THE RELATIONSHIP
BETWEEN MOTHERS AND DAUGHTERS PERCEIVED PHYSICAL AND
EMOTIONAL HEALTH

Introduction

Compared to boys, adolescent girls have a higher prevalence of obesity (Ogden et al., 2014), are more sedentary (Tudor-Locke et al., 2006), and suffer from psychosocial distress more commonly than their male counterparts (Bearman, Martinez, Stice, & Presnell, 2006; Kling, Hyde, Showers, & Buswell, 1999; Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998). Many adolescent girls report a desire to be thinner (Clark & Tiggemann, 2006; Tatangelo & Ricciardelli, 2013), with girls as young as three reporting awareness of the thin ideal (Harriger, Calogero, Witherinton, & Smith, 2010). This is not surprising as adolescent girls tend to perceive themselves as more overweight than they actually are. Standley, Sullivan, and Wardle (2009) found that in a multi-ethnic sample of 14-15 year old adolescents living in the UK, 43% and 24% of girls and boys, respectively, described themselves as being “too fat” despite no significant difference in actual levels of obesity. Moreover, those girls who report wanting to be “fit” describe this body type as “being and looking thin” (Phares, Steinberg, & Thompson, 2004), indicating that even healthy body types are being misinterpreted by adolescent girls. Most concerning, poor body image has been associated with disordered eating symptoms (Thompson & Smolak, 2001), depression, and decreased self-esteem (Phares et al., 2004). A recent study by Kenny, O’Malley-Keighran, Molcho, and Kelly (2016) found that in a sample of adolescents living in Ireland, most report being aware of the unhealthy behaviors (e.g., suicide, self-harm, binge eating, and extreme weight loss attempts) youth

engage in as a result of body image concerns. This indicates that despite an awareness of the possible physical and mental impacts having a poor body image can have, adolescents continue to struggle with their own self-perception and body image.

Adolescents' awareness of issues related to poor body image is partially a result of conversations they have had with their peers (Kenny et al., 2016). Girls are more likely than boys to discuss appearances with their peers (Lawler & Nixon, 2011), which leads to increased attention to body image related issues, including the construction and acceptance of appearance norms (e.g., thin ideals) (Clark & Tiggemann, 2006).

Adolescent girls commonly compare their clothing size and weight with one another (Kenny et al., 2016) and their frequent social comparison and appearance conversations have been shown to significantly predict body dissatisfaction (Jones, Vigfusdottir, & Lee, 2004). A potentially more salient source of comparison and appearance conversations, however, occurs between adolescent girls and their mothers. Arroyo and Anderson (2015) theorize that the mother/daughter relationship has a greater impact on adolescent girls' body image due to more time spent at home observing their mothers' behavior than time spent in school observing their peers' behavior.

Literature Review

Mother/Daughter Body Image

An adult woman's body image has been socially constructed throughout her life and often consists of unattainable beauty standards (Fredrickson & Roberts, 1997). According to Bussey and Bandura (1999), people behave in ways that mimic their observations,

thereby modeling the behaviors of others (Bussey & Bandura, 1999). The cycle of body dissatisfaction behavior modeling is difficult to break, particularly since mothers often do not realize they are communicating such body ideals. Abraczinskas, Fisak, and Barnes (2012) found that mothers communicate body image ideals directly (via verbal communication) and indirectly (via behavior modeling), with indirect behavior likely the most influential. Cooley, Toray, Wang, and Valdez (2008) found that daughters' perceptions of their mothers' behavior (in comparison to their mothers' self-reported behavior) was a stronger predictor of the daughters' health outcomes. When adolescent girls believe that weight status is important to their mother, they are more likely to express a desire to be thinner and engage in dieting behaviors (Field et al., 2005). Even though some mothers do not intend to communicate body image ideals, when mothers express personal body dissatisfaction in front of their daughters, the message of body dissatisfaction is reinforced (Wertheim, Mee, & Paxton, 1999).

Despite the intuitive influence of parental modeling on adolescents' wellbeing, negative weight related conversations are common between adolescent girls' and their mothers (Berge et al., 2015; Eisenberg, Neumark-Sztainer, Haines, & Wall, 2006; Keery, Boutelle, van den Berg, & Thompson, 2005). Research indicates that mothers are more likely to encourage their daughters to lose weight when the mothers themselves are preoccupied with their weight, a trait associated with restrained eating behaviors (Francis & Birch, 2005). Keery, Boutelle, van den Berg, and Thompson (2005) found that 23% of middle school girls report receiving negative appearance-based teasing from their parents, 13% of which came from their mothers. Further evidence demonstrates that

despite a mothers “good intentions”, using negative weight based talk with their daughters is commonly experienced as weight stigma (Berge, Hanson-Bradley, Tate, & Neumark-Sztainer, 2016) and leads to poor body image and dieting behavior in daughters (Francis & Birch, 2005; Vander Wal & Thelen, 2000). Other negative health outcomes associated with negative weight talk between mothers and daughters include the daughters developing poor self-esteem, depressive symptoms (Eisenberg et al., 2006), loneliness, suicide (Eisenberg, Neumark-Sztainer, & Story, 2003), and increased risk of becoming overweight or obese (Berge et al., 2015). More importantly, the harmful impacts of negative weight based talk exists despite an adolescent girl’s weight status (Eisenberg et al., 2003; Keery et al., 2005), further exemplifying the influence that negative weight-based conversations between mothers and daughters have on adolescent girls.

Another important factor to consider when analyzing the influence of mothers’ body image and negative weight talk on their daughters’ health is the mother/daughter dyad. Smith, Erickson, Austin, Winn, Lash, and Amrhein (2016) reported that adolescent girls are more likely to have an improved body image when they perceive their relationship with their mother as positive. Conflicting studies on emerging adulthood suggest that the relationship between mothers’ and emerging adult daughters’ self-objectification is more positive when daughters identified more closely with their mothers. The mechanism through which mothers’ and daughters’ self-objectification was related was through overt discussions about weight rather than indirect observations (Arroyo & Andersen, 2016; McKinley, 1999). It may be that a positive relationship

between mothers and daughters can protect daughters from body image concerns so long as the mother refrains from discussing such concerns with her daughter directly.

Conversations about weight between mothers and daughters may lead daughters to think it is appropriate to evaluate their own bodies negatively and self-objectify since they have witnessed and participated in such conversations without any negative consequences (Arroyo & Andersen, 2016; Smith et al., 2016). Studies also show that women often receive implicit rewards (compliments) for negatively discussing their body (Nichter, 2000) which subconsciously encourages them to continue such behavior. Therefore, a mother discussing her weight with her daughter further perpetuates societal pressures, including desires to be thin.

Mother/Daughter Physical Activity

Being physically active has many health benefits, including improvements in one's physical (e.g., decreased risk of disease) and mental (e.g., improved self-esteem) health. This positive relationship has been demonstrated in adolescent girls (Janssen & Leblanc, 2010) and adult women (Eyler et al., 1997) and as such, has been the focus of many public health interventions. Early research on the relationship between mothers' and daughters' health reported greater lifelong physical activity participation in adolescent girls whose mothers were also highly physically active (Anderssen, Wold, & Torsheim 2006). In a diverse sample of older adolescent girls (mean age = 15.7), Bauer and colleagues (2011) found that after controlling for education, age, and race/ethnicity, both family support and parent physical activity levels were significantly related to their

daughters' physical activity participation. This finding suggests that parental support and physical activity levels influence their daughters' physical activity levels, despite their race, parents' education level, or age. However, more recent literature reports otherwise.

A meta-analysis on the influence of parental behaviors on children's physical activity reported that parental modeling (i.e., physical activity levels of the parents) is less influential on their daughter's physical activity levels than once thought (Yao and Rhodes, 2015). Gustafson and Rhodes (2006) suggest that parental modeling may be more influential in early childhood but as the child matures, parental modeling of physical activity becomes less important. As children transition into adolescence, parental support becomes more salient. Parental support has been shown to be more impactful when considered as an aggregate variable rather than a single support behavior (Yao & Rhodes, 2015). For example, Yao and Rhodes (2015) classified support behaviors as encouragement to be physically active, parent-child co-activity, praising the child's activity, watching the child be active, informing the child that physical activity is beneficial, and providing transportation to physical activity venues, with parental encouragement having the greatest individual effect on child's physical activity levels. The greater influence of parental support compared to parental behavior modeling has been supported by others (Trost & Loprinzi 2011; Bauman, Reis, Sallis, & Wells, 2012). Sebire, Haase, Montgomery, McNeill and Jago (2014) expanded upon this research by examining the impact of parental physical activity modeling and support on adolescent girls' (age 11-12) psychosocial health (i.e., self-efficacy, self-esteem, and physical activity intentions) as well as their physical activity levels. Similar to Yao and Rhodes,

Sebire and colleagues found that parental support was more predictive of adolescent girls' health (self-efficacy, self-esteem, and physical activity intentions) compared to parental modeling, with maternal support being the greatest predictor of adolescent girls' health. Compared to maternal modeling, maternal support requires more interaction and communication between a daughter and mother. While it seems intuitive for a parent to discuss their child's health directly with the child, it remains unclear whether these conversations are productive.

Due to the high prevalence and associated comorbidities of adolescent obesity (Ogden, 2014), understanding how parents can successfully communicate health behaviors, including physical activity participation, to their children is a public health concern. In a racially diverse sample of adolescents (mean age = 14.4), Berge and colleagues (2015) found that conversations about healthful eating and physical activity between parents and adolescents were more frequent among Hispanic/Latino and Asian/Hmong families, the highly educated, and families where the adolescent was overweight or obese. Moreover, mothers had significantly more conversations with their daughters compared to their sons about being overweight and needing to lose weight. Conversations between mothers and daughters pertaining to the daughter's health may be ill perceived, potentially being considered as nagging (Bauer, 2011). What remains unknown is the extent to which (and how) a mother can demonstrate support of her daughter's health pursuits without being perceived negatively. Research clearly conveys the importance of maternal support on daughter's physical and emotional wellbeing as well as the associated challenge of health communication between a mother and

daughter. To guide this investigation, the authors relied on concepts from the family systems theory.

Family Systems Theory

According to family systems theory, each family member's individual behavior influences the behaviors of other family members (and vice versa) through their daily interactions with one another (Minuchin, 1974). Broderick (1993) states that "the family is an example of an open, ongoing, goal-seeking, self-regulating, social system... [that] shares the features of all such systems" (p. 37). This theory posits that when mothers use negative self-talk in front of their daughters, their daughters internalize the interaction, which influences whether or not (and to what degree) the daughter herself engages in such behavior (i.e., negative self-talk). This bi-directional relationship holds true for any health interaction between family members, including physical activity and healthy nutrition. Because initial standards of how to communicate and behave socially stem from their mothers, adolescent girls learn quickly how they "should" perceive and view a woman's body.

Most parent/child negative self-talk research stems from self-report data from adolescents about their parents' behaviors rather than self-report data from the parents about their own behaviors (Rodgers & Chabrol, 2009). Very little research has examined parent reported behavior and its influence on adolescent health and those studies that have yielded mixed results (Baker, Whisman, & Brownell, 2000; Cooley et al., 2008; Keel, Heatherton, Harnden, & Hornig, 1997). Therefore, this study's inclusion of

mothers' and daughters' perceptions of body image and self-esteem is an important contribution to the literature. Moreover, a majority of the current research on mothers' and daughters' related health has used quantitative methods, which has limitations in depth of understanding (Ogle & Damhorst, 2000). Thus, the purpose of this study was to explore the relationship between adolescent girls' and mother's perceived physical and emotional health using qualitative methods. Because this is a qualitative exploratory study, no hypotheses were made. Rather, the researchers used a phenomenological approach to gain a broad knowledge of mothers' and daughters' lived experiences as they relate to their perceived physical and emotional health (Creswell, 2013). The guiding research question was as follows: what relationship exists between mothers' and daughters' perceived physical and emotional health?

Methods

Research Design

Data for this study were drawn from the post assessment (focus groups) of a larger study assessing the impact of Smart Fit Girls, an intervention designed to improve body image, self-esteem, and physical activity enjoyment in adolescent girls. During the ten week Smart Fit Girls program, girls meet twice a week for two hours. At each Smart Fit Girls meeting, the girls spend half of their time learning about anatomy, nutrition, and ways to improve body image and self-esteem and the other half being physical activity, with a particular focus on resistance training. Smart Fit Girls was administered at multiple sites over the course of two years. Further details about this intervention can be found in

Walters, Anderson, Jordan, and Chard (2017). are in process of publication in the journal of *Body Image*. After completing Smart Fit Girls, adolescent girls and their mothers (who received no intervention) participated in focus groups aimed at exploring the relationship between mothers' and daughters' perceived physical and emotional health. Over a two-year period, 44 girls and 19 mothers participated in seven and four focus groups, respectively.

Participants

Adolescent girls (SFG participants) and their mothers were recruited from three middle schools, two in Colorado and one in South Carolina. An average of 36% of students from the Colorado schools and 53% of students from the South Carolina schools were eligible for free or reduced school breakfast or lunch. Detailed participant demographic information and response rate per school can be seen in Table 1. An invitation for the mothers to participate in each focus group was sent home with Smart Fit Girls participants. Other than their daughters' participation in Smart Fit Girls, there was no additional benefit for the mothers to participate in the study. Prior to data collection, parent consent (for themselves and for their child's participation) and child assent were received. The school districts and the Institutional Review Board at Clemson University approved this study. Adolescent girls and their mothers were informed that participation in the study was voluntary and they could withdraw at any time.

Table 1: *Demographic Information*

Comparison of School Demographic Information

School	School A	School B	School C
Location	South Carolina	Colorado	Colorado
Eligible for Free or Reduced Lunch	53%	32%	39%
Student: Teacher Ratio	15:1	16:1	17:1

Public Schools. (2016, November 6). Retrieved from public-schools.startclass.com

Procedures

Focus groups were used in this study due to the nonthreatening environment and subsequent comfortable discussion they foster among participants (Rabiee, 2004). Focus groups allow researchers to observe group interactions and empower participants to drive the conversation, which has been shown to lead to new and unexpected results (Tiggemann, Gardiner, & Slater, 2000). Three members of the research team administered the focus groups, all of which had sufficient training and experience in conducting focus groups. In addition to the focus group administrator, a second research team member attended each focus group and took detailed notes. Pilot interviews were conducted with seven adolescent girls attending one of the school locations used in this study. These interviews were used to determine the appropriateness of questions, order of question administration, and approximate time needed to complete the focus group.

The focus groups were conducted in empty classrooms with the exception of one mother's focus group, which was administered in one of the mother's home. Each focus group lasted approximately 30-45 minutes and included an average of six girl participants or five mother participants. The focus group questions were written by the first author and approved by additional study investigators who have experience in qualitative

research. A total of 15 and 11 questions were developed for the daughters' (Appendix C) and mothers' (Appendix D) focus groups, respectively, with further discussion encouraged through supplementary probing or clarifying questions. Questions focused on the physical activity behaviors of the mothers and daughters (e.g., "Do you and your daughter do any physical activities together? If so, what kind?") and mothers and daughters body image and self-esteem (e.g., "Have you ever spoken to your daughter about her self-esteem or body image? If yes, what did that conversation look like?").

Data Analysis

The focus groups were analyzed using "Framework analysis", outlined in Rabiee (2004). To start, all researchers familiarized themselves with the data by listening to audio files and reading transcripts and observational notes multiple times (step 1). The researchers then identified a thematic framework by writing memos in the margin of the text containing ideas, codes, or short phrases (step 2). After indexing the data (i.e., sifting through the data, sorting and highlighting quotes and making comparisons between cases; step 3), researchers organized the data by re-arranging quotes under previously developed thematic content (step 4). Lastly, researchers interpreted the results by analyzing links among the data sets as a whole (step 5, Rabiee, 2004). After steps one and two were completed independently, the first three authors met to compare identified codes (30) which were collapsed into four primary themes and two subthemes per primary theme. Once the themes were agreed upon, the authors independently completed steps three and four and met again to discuss the validity of previously agreed upon themes (i.e., was

there enough evidence (quotes) to support such themes). Intercoder reliability was addressed through an iterative coding process (initial coding, code modification, recoding) whereby three of the authors developed and agreed upon the codes and subsequent collapsed themes. Using this repetitive process, researchers met several times to discuss themes that best represent the experience of the participants. To ensure trustworthiness, authors reviewed the personal notes they took throughout data analysis as well as the focus group notes taken during the actual focus groups (Creswell, 2009).

Results

The thematic analysis resulted in four major themes and four subthemes. Each theme, subtheme and sample supporting quotes are included in Table 2.

Table 2: *Summary of Themes*

Four Major Themes (gray) and Two Subthemes (white)

Complex Communication	Sample Quotes
Daughter's Frustrations	"She'll sit there and talk bad about herself, so one day I confronted her about it and she just blew up on me and started talking bad about herself again"
Mother's Confusion	"I have tried to give her advice that helped me...on eating better and gave her an app that somebody gave me to log your weight but I didn't want her to feel pressured because I remember what that was like being a kid and being overweight."
Societal Expectations of Women	
Social Networks	"There is that pressure and society just looking at you. I mean I freak out every time I think about having to go back and visit family because I was the 'skinny one'"
Women's Bodies	"What's funny is your body image probably started changing about the time you had children...because your body never goes back to how it was and there is nothing...you can do to put it back there...you become a mom and that changes everything."
Social Comparison	
Peer Comparison	"I went on vacations with like other women and if all the women looked good in their bathing suit I would just feel so inferior just because my body was different or I wasn't in a healthy state."
Mother/Daughter Comparison	"I look like you, does that mean I have to think that too?...that's why I have such a bad self-esteem."
Mother's Health Behaviors	
Weight Loss	"Most of the stuff that my mom has for her diets are just pills...which don't do anything."
Physical Activity	"Even though she is like a workout crazy person...she gets off working out on the machine thingy, she feels good for like the first ten minutes and then right before dinner it's always like, 'my legs are fat' and she doesn't like her butt."

Theme 1: Complex Communication

Both the adolescent girls and their mothers reported that they found health communication (e.g., pertaining to body image, self-esteem, and physical activity)

between one another challenging. Two subthemes emerged as 1) Daughters' frustration and 2) Mothers' confusion.

Daughters' frustration. The girls reported feeling discouraged when talking to their moms about health for multiple reasons, including 1) a general awkwardness surrounding mother/daughter communication about their bodies and 2) frustration with their moms' negative self-talk. Daughters perceived health related communications as challenging and mostly negative, particularly those surrounding physical activity and nutrition. One of the daughter participants said "I used to get like huge portions, because I love food, and she would have this tone and it was like, um you might want to go [eat] a little less...and I would get really mad". They also expressed not feeling comfortable talking to their mom about such topics and that previous experience doing so made them feel misunderstood. One girl said "it's kinda like you want to say something but you just don't know what to say". Another daughter said:

I talk to my friends about things like that all the time...I have this weird issue with my mother where I have the hardest time talking to her about things, I'm always afraid I am going to get the worst response.

Only a small number of participants reported feeling "open" with their moms, and even when they did, they still expressed being uncomfortable with such conversations. One girl said that "I feel kind of open with my mom but it's kind of awkward because we are

always told to like, at school and stuff, not to talk about that sort of stuff”, indicating that the girls are receiving messages from their social network about the appropriateness of health related conversations with their mothers. Mothers’ own negative self-talk was a source of frustration for many of the girls as well. The girls reported multiple examples of having to encourage their moms when their mothers spoke negatively about themselves (e.g., “when we go shopping together and she tries on stuff she’s, she always calls herself fat”), which resulted in the daughters feeling upset.

Every time I hear my mother say the words “I’m fat”, no matter where we are, no matter where I hear it, no matter how she says it, I run upstairs and I yell at her so loud like ‘you are not fat, call yourself fat one more time I’m going to smack you’. She did, I smacked her.

She kind of is a hypocrite because she would be like ‘you should feel good about yourself. You’re beautiful’ and then she’ll sit there and talk bad about herself. So one day I confronted her about it and she just blew up on me and started talking bad about herself again.

My mom used to always like talk bad about herself and I couldn’t like go to her and talk to her about the stuff I wanted to...I couldn’t tell my mom because she would always bring it in an opposite way and pull me down.

The daughters also described feeling poorly about their own bodies when their mothers used negative self-talk because they saw themselves in their mothers. When the daughters thought they looked like their moms, they questioned whether they should be worrying about their bodies the way their mom does.

Whenever I'm around my mom, she brings me down with my self-esteem because to tell you the truth, I look like her...most of your moms look like you, or you look like your mom and when they are saying something about themselves it means they are kind of saying it about you. So it's kind of bringing both of y'all down.

Me and my mom, we don't really look alike like in the face but we're built pretty much the same and so if she says something about her inner thighs, because I don't like my inner thighs very well, when she says something about hers, it makes me feel bad about it too...we're built the same so it makes me think sometimes, 'should I worry about this or do I look bad?'

When she says like she's fat or she's ugly or something like that, I get really um, I get furious and I get depressed because...we look so much like her that it's not funny and...so when she says things like 'oh I'm fat, I don't look good', I'm all, I look like you, does that mean I have to think that too?

Mother's Confusion. Results from the mothers' focus groups complement and confirm the themes found in the daughters' focus groups. The moms reported feeling confused in regards to how to adequately communicate with their daughters about body image, self-esteem, and healthy behaviors (e.g., physical activity and nutrition).

I would like to learn how...do I relate to her on a level that would be sensitive enough so that she doesn't think that I am blowing her off on certain types of things but at the same time how do I communicate to her in a better [way].

I don't want to say it's not even flattering because it's so tight because that's insulting her body image or making her feel 'fat' or 'heavy' so I'll just say 'I don't like that style...it's looks too tight...it doesn't look comfortable.

One mom stated that "it's really hard to watch what you say and how you say it." Some moms reported trying to find a balance between helping their daughters have a positive self-esteem while also staying modest. For instance, Teresa said "I don't want her to feel like I did but I don't want her to be too, like boastful about it either...I think it's a big deal and it's a hard balance to say one thing or another you know." Similarly, another mom said "there's that boundary that we've always talked about, like not being too prideful but you know, being confident in who you are." Conversations pertaining to physical activity and nutrition seemed to be the most challenging for moms.

She is a carb addict and we have had those conversations and they probably haven't gone the best but I feel like I don't know how to...respond to her because she's a petite thing. So I have had those conversations and I can say that they probably haven't gone the way they should but I don't know how to...

I have tried to give her advice that helped me when I did focus on eating better and gave her an app that somebody gave me to log your weight but I didn't want her to feel pressured because I remember what that was like being a kid and being overweight...

So I have that fine line of 'do I compliment her on how she looks'...I will say 'well I can tell you have been working out some...I can tell your arms feel a little, they look a little stronger here' but I don't use the word 'skinny'.

I try to relate to how I dealt with these things, so I will tell her 'well I did lose some weight as my body changed' or I did Weight Watchers a couple years ago so I told her 'well you know don't just talk about it you need to try to do something' and I offered 'well let's try to do this together' but like...sometimes [I] don't know how to like bridge the gap, you know how to make it happen.

Even when moms have good intentions, conversations surrounding their daughters' health remain challenging and often result in the daughters feeling poorly about themselves.

I've made comments to Julie about 'you can't eat junk food you will put on weight'...I know that it's coming from a place of protection because I don't want people to ridicule her and hurt her...my oldest daughter would get very angry at me for saying anything and she would be like 'you're always saying things, you're critical' and so she's a little sensitive.

They also acknowledged speaking negatively about themselves in front of their daughters and expressed concerns in doing so. One mom said "I realized I have to be careful of what I might say...she looks at me differently when I say I'm gonna gain weight or something." Similarly, three different moms said: 1) "I probably say that I'm fat out loud every single day. Every day", 2) "it dawns on me that I don't want them to hear me talking negatively about my body because I don't want them to do that", and 3) "I need to...model that behavior.

The moms frequently provided examples of times their daughters responded to their negative self-talk. While the daughters expressed frustration with their moms' negative self-talk, their responses remained mostly positive and encouraging. One mom reported her daughter saying "momma, you're being so hard on yourself." Another mom said "she has always been extremely supporting and she's always like 'you look great

mom’.” Similarly, other moms reported that their daughters have “told me to be nice to myself and that I’m beautiful and that I’m not fat and stop saying it...” as well as to “stop saying you’re fat, you’re not fat”.

I probably say that I’m fat out loud every single day and my kids hear that.

They’re always telling me ‘mom stop saying that about yourself, you’re not fat, stop saying that’ and they’re correcting me all the time...I used to tell them when we were exercising...’I’m only exercising so that I look better in my clothes’.

You know I say it jokingly but they are hearing me knock myself...I’m trying to be a little more conscious of saying ‘oh I’ve got bingo wings here instead of my arms’ because I don’t want them to be knocking themselves the way I sometimes do.

Theme 2: Societal Expectations

The second theme that emerged was the awareness of societal expectations of being a woman. Two subthemes emerged as 1) social networks influence self-perception and 2) a woman’s changing body (e.g., puberty, pregnancy, aging) influences self-perception.

Social Networks. The mothers reported feeling pressure to conform to a certain societal set standard of behavior and aesthetics. A clear distinction was made between the perception of expectations for men versus women in society. One mom stated “in society

women are picked on more than the men and you know my husbands gained just as much weight over the years as I have but because I've had three kids I feel...the pressure to get it off." Similarly, another mom stated "I think society is so tough on women and girls because, and especially mothers". The pressure to conform lead mothers to feel as though they could not express how they really felt about their bodies.

There's pressure to just feel good at wherever you're at and don't you dare say online one time, I said something about being fat online and so all these people came at me like 'you need to love where you're at.' So there's that pressure of being, really just acting, as if you're super comfortable with wherever you're at. And then, there's the pressure of the ideal, so I just feel like that's pressure.

I've worked out for years and I have had to come to realize that my body just isn't what it was when I first had Charlie and so there is that pressure and society just looking at you. I mean I freak out every time I think about having to go back and visit family because I was the "skinny one" and so I always have to kind of try to work out as much as possible to get as skinny as I can...so I would almost feel pressure and embarrassment sometimes.

The perceived difference in expectations between men and women was confirmed in the daughters focus group through the lens of their mothers ("my mom...feels like she has to

look a certain way”) and through their own experiences as a girl (“I hate it when boys say girls aren’t as strong as boys. It’s stupid because how do you know, you’re not a girl”).

Some sports like that, they don’t allow girls to play...then [there are] some sports that girls can’t play...or the girls just don’t think they’re like able to, like they’re too big or they’re too skinny, or whatever excuse they have.

Our moms workout together and they think they’re fat and I didn’t really talk to them, somebody else said ‘why do you really care’ and they said ‘because we were mistaken for being pregnant like three times’.

Mothers also expressed concern over how societal pressures of being a woman will impact their daughters. There was an overall agreement between the mothers that their daughters, by virtue of being a female, will experience societal pressures and expectations of being a woman, which will in turn impact how their daughters feel about themselves. Two moms stated, “obviously girls are just more, I think, insecure because of society” and “society is tough and especially in middle school, people are tough on kids.” Another mother said “guys can look however they want...they’ve got their beer bellies and no one comments but [people are]...making judgements about women so I don’t know how to make it with our girls to not get caught in that”.

I think society is hard on mommas because we're supposed to have it all together. We're supposed to be the calendars, we're supposed to be the organizers, we're supposed to be the housekeepers, we're supposed to be the cooks, we're supposed to have a job, we're supposed to be really sexy for our husbands and, and keep it all together...if our kids aren't smart we're doing something wrong...if they don't have their homework turned in, they don't think about the dad...if you come over to the house and it's messy, you don't think that the husband is a terrible housekeeper, you think that wife can't keep her crap together and so I think it's hard for women and girls and I think girls are seeing that and I think girls see their mothers handle a majority of things...so I think it's tough for girls to feel successful when...it's kinda hard to be successful in all those realms.

Women's bodies. The second subtheme that emerged was that a woman's changing body (e.g., puberty, pregnancy, aging) influences her self-perception. The mothers reported feeling frustrated with their bodies throughout their lifespan (e.g., "I was tough on myself at that age [and] I wish I wouldn't have because now I can be tough because I'm seeing changes"), many of them pointing out pregnancy as an event that shifted their body perception. One mother said that she realized "after three kids that [she] can't eat as much and that things change."

What's funny is your body image probably started changing about the time you had children...because your body never goes back to how it was and there is

nothing...you can do to put it back there...you become a mom and that changes everything.

I have worked out for years and I have had to come to realize that my body just isn't what it was when I first had July and after I had my second and third, and you know, I've gotten older and three kids and lifestyle and stress and moving and everything else that we've gone through throughout the years.

The idea that pregnancy is a catalyst for body dissatisfaction was identified by the daughters as well. One daughter said "she had three children so she has that extra skin I think that it's from having children, so she thinks she's overweight and she has to get back in shape". This same daughter reported feeling confused about how to talk to her mom about her pregnancy for fear of making her mom feel bad: "It's really hard for me to talk to her about that because I like don't want her to think she's too overweight." The mothers also reported feeling challenged by the clothing options available for young girls, noting that their daughters struggle trying to fit into a certain clothing styles and sizes. Mothers stated "it was always a big deal when they'd change sizes and they were worried about the sizes" and they would "get really frustrated about shopping, 'I can't wear these skinny jeans because they don't look right on me or I can't wear this because this doesn't look like it does on the model'".

My oldest one, she has a booty and so there have been times that she would be wearing something, I remember she would wear stretch pants as she was really, had just kind of made a big increase [in clothing size and]...I was so afraid for her to go to school wearing those stretch pants without like covering up or something...I wanted to protect her from anybody's saying something negative about her.

Being skinny and tall, she's having a hard time because she doesn't fit into little kids clothes anymore but she's not in the junior's section either so it is very hard to find things that fit appropriately and look nice and not too short...she struggles with that, you know?

The struggle of feeling pressured to fit into certain clothing styles and sizes was confirmed in the daughters' focus groups. One girl brought up a conversation she had with her grandmother (her female caretaker since her mother did not live with her) about clothing and body image.

I used to live with my grandma...and one day I couldn't fit [in] these jeans because the zipper was stuck but she thought it was just because I was so big and she was like...'Joy you are getting fat and you need to fix this now' and it kind hurted me very badly and I was like 'oh, OK then' and I went away and cried...I didn't' even want to be seen with her because like I wasn't even comfortable like I

was just now starting to accept myself and then she put me back down, like ‘thanks’.

The moms also reported feeling challenged with how to handle their daughters’ changing bodies. One mom stated “teaching your kids not to want to be an object...because that’s exactly what happens but they feel proud, they’re like ‘I’m known as like the booty girl’, you know, so it’s tough.”

The clothes for our kids has a lot to do with it too...[there’s] a fine line of being proud of who you are but not being too boastful of like, that you’re skinner or whatever, you know?...How you dress and stuff, it’s very hard to like to have that balance.

You need to not wear the little bitty shorts. You can wear them in the bed but you’re getting older now so when you are walking around the whole thing was like just being aware of that your body is changing and even though I know you’re not trying to get that kind of attention obviously from us...just have that mindset I am going to be proper and appropriate at all times.

Theme 3: Social Comparison

The daughters and mothers reported comparing themselves against other females frequently, which lead to negative perceptions of themselves. These negative perceptions

of themselves included how they viewed their own and others (e.g., daughters' or mothers') bodies and their personal life success (in work, school, and/or relationships). Two subthemes emerged: 1) Moms and daughters compare themselves to their female peers, and 2) Mom's comparison of themselves to their daughters influences their daughters' perception of self.

Peer Comparison. Social comparison between the moms and other moms was common. One mother stated "I went on vacations with like other women and if all the women looked good in their bathing suit I would just feel so inferior just because my body was different or I wasn't in a healthy state". Similarly, another mom said "if you're, you're not the prettiest one in the room, you're gonna cut down the woman that is prettier than you. You're gonna find something wrong with her." Daughters noticed their moms comparing themselves against other moms as well. When referring to her mother's weight loss attempts, one girl said "if they're doing it for healthy reasons, then it's good, but for bad it's like to look good in front of other people or for other people." The comparison between mothers extended beyond body image to perception of success.

You look at somebody else and think 'gosh they just have it all together', you know what I mean. And then you see someone that looks like they've got everything going on and then you think 'oh well they've got a house cleaner and they've got a personal chef'...that are helping them along the way you know? If

you're really trying to do all these things on your own, trying to balance them, it's hard.

The moms also reported that their daughters were high social comparers as well. In response to her daughter comparing herself to female peers, one mother said "I remember like a year ago Suzie was comparing herself to Amanda and we had to sit down and say 'you two are perfect the way you are but you're different'." Their daughters' social comparison episodes seemed to center around social media use ("girls get on their phones and 'oh my gosh, look at her' and just there's all this negative stuff going on with comparing people and who's pretty and who's not" or "she's sitting there on Instagram worrying about what people are wearing and how they look") and clothing ("I know a lot of girls are talking [about] what size jeans they wear").

Her thin, skinny, tiny friends would be like 'ugh I look so bad in this' and Eleanor would be like, 'what? You're wearing like that size and I'm like this and you're like that' and that has had the biggest impact on creating awareness [of body size/image], where before there just was not one of like what you are supposed to look like.

Mothers also reported that their daughter's experience with peer social comparison has resulted in their daughter trying to lose weight: "her friends that I have met are extremely

thin compared to her and they were telling her to do crazy stuff...like 'here's this diet' and I was like 'you are 10!' but [she] has asked to do that."

Mom/Daughter Comparison. The mothers frequently mentioned comparing their bodies to their daughters, articulating that they wish they would have had more appreciation for their bodies when they were young. One mother said, "when you get to be...this age...it's a difficult thing and then you have a young girl who, you used to look like that is, it's really hard to watch what you say and how you say it." Similarly, another mom reported that her daughter is "built like me and growing up I always felt so different because not many girls have body types, like very powerful legs, and so it was something that I had always struggled with." In addition to comparing themselves to their daughters, the mothers wished they would have been more accepting of their bodies when they were young.

If I would have known so many years later that I was going to be like this, I mean really wanting to hide when I thought about putting on a swim suit, like I wish I would have worn the nicer swim suit...but I wanted to hide then because I was embarrassed. I mean Jennifer's skinny, she's very tiny and I used to look like that...everyone picked on me for being skinny. Like there's not a happy medium...I look back and I'm like 'dang it! Why didn't I wear that bikini?' but it was because my hip bones stuck out and people made fun of it.

The daughters confirmed this finding with statements like “She says she’s jealous of me because she’s so skinny and I’m like ‘well I’m jealous of you because you’re so skinny’.” The daughters highlighted that when their mothers speak negatively about their bodies, they felt poorly about their own body image because “most of your moms look like you, or you look like your mom, and when they are saying something about themselves it means they are kind of saying it about you. So it’s bringing both of y’all down.” How the moms talked about themselves in front of their daughters also impacted their daughters’ self-esteem. One daughter said “she’s my role model so when she says things like... ‘Oh I’m fat, I don’t look good’ I’m all, ‘I look like you, does that mean I have to think that too?’...that’s why I have such a bad self-esteem.” As a result of what their mothers said about themselves, girls also reported feeling poorly about areas of their bodies that are typically not scrutinized by society (e.g., not liking her ears). When asked why the daughters felt frustrated about their mom’s poor body image, one girl responded with “because of genetics...when she’s saying that to herself, she’s saying that to me as well because I’m her daughter...we might have like funny ears too and so she is saying the same thing to us” while another said “because some bits of our bodies we take after hers.” The daughters reported feeling sad as a result of hearing their mothers speak negatively about their bodies because the daughters thought they looked like their mom. When their moms say something negative about their own body, the daughters question whether they should be worried about their own bodies since they look like their mothers.

Me and my mom, we don't really look alike like in the face but we're built pretty much the same and so if she says something about her inner thighs, because I don't like my inner thighs very well, when she says something about hers, it makes me feel bad about it too...it just makes me think about my image and well she is complaining about that, should I be complaining about that because I'm not worried about it but she is and we're built the same so it makes me think sometimes, should I worry about this or do I look bad?

My mom used to always like talk bad about herself and I couldn't like go to her and talk to her about the stuff I wanted to...I couldn't tell my mom because she would always bring it in an opposite way and pull me down.

We look so much like her that it's not funny and so when she says like 'oh my God I look really fat, she's kind of like my role model so when she says that I'm all 'Oh God, what if she is right, what if I look like that too.

The association the daughters drew between their feelings about their body and their mothers body dissatisfaction lead to feelings of depression and sadness. One daughter said "when she says like she's fat or she's ugly or something like that, I get really um, I get furious and I get depressed" while another said "it makes me feel upset, it makes me feel depressed...it makes me feel like it's my fault sometimes." Other girls expressed frustration and anger, saying things like "I hate when I hear her say that because it's like

‘dude, you’re skinnier than me and Zoey combined” and “It makes me feel...upset...that she doesn’t like her own body.” Similarly, another daughter said, “it upsets me because I feel like my mom is skinnier than me. When I hear her talking about how much she is fat...it upsets me because it makes me feel like I’m that way.”

Theme 4: Mothers’ Health Behaviors

The daughters focus groups revealed that the girls were very aware of their mothers’ health behaviors, including previous dieting experiences and physical activity participation. Two subthemes emerged: 1) Daughters reported that their mothers have tried multiple different methods of weight loss, and 2) Daughters noticed the level of physical activity participation their mothers engaged in.

Weight Loss. Many of the girls brought up examples of weight loss attempts their mothers had made, often mirroring the negative self-talk described previously. One daughter mentioned that her mom “goes through phases. Like a lot of the time she has like all these friends that go on diets and are always really active and healthy but that can be like a good thing or a bad thing.” Similarly, another daughter said, “most of the stuff that my mom has for her diets are just pills and all that, and she has like stuff that are smoothies which don’t do anything”. Many of the girls mentioned that their mothers participated in multiple weight loss attempts, often disapproving of them because they were perceived as unhealthy.

My mom, she's always talking about how her and my dad they're always complaining about how they're overweight...they say they, that they are going to go out there and do something about it, like they are going to start eating healthy and all that stuff, but that didn't really change my mom.

My mom like goes on diets, like she's done Weight Watchers twice, um she's done Slimgenics and she's done like one, like, I forgot the other one but she's done like three different ones because she thinks she is fat and then she makes us join in it just since their, their food is healthy, when really it's not...which isn't really helpful since it's not really doing anything except changing the way they think of themselves since all they're thinking is trying to get better, to get skinnier...it kind of makes me feel depressed just for their sake since they're not fat or anything. Yeah, they have curves but that's a good thing.

Physical Activity. The daughters were also very aware of their mothers' physical activity habits; some daughters reporting that their mothers were frequently physically active while others reporting their mothers were mostly sedentary. What was consistent across the group of daughters, however, was the awareness of their mothers' exercise behaviors.

Even though she is like a workout crazy person...she gets off working out on the machine thingy, she feels good for like the first ten minutes and then right before dinner it's always like, 'my legs are fat' and she doesn't like her butt.

My mom, you're supposed to look up to your mom, right, and have that one woman in your life you have to look up to? Sometimes I can't look up to her because she has low self-esteem...she's just not exercising anymore and we still talk about it.

When the daughters were asked if they were physically active with their moms, many of them responded by giving examples of times they were physically active with other family members (fathers, siblings, etc.) rather than examples of times they were physically active with their moms ("I do it with my brothers a lot and we'll just dance to songs", "me and my sister Emily...usually walk the dogs together", and "I either go on walks with my dad or I ...do the seven minute workout thing."). Being physically active as a family was a more common response than being physically active with their mom exclusively. Girls reported playing sports, going to the gym, and going on bike rides as a family.

Responses related to specifically being physically active with their moms ranged from simple "no, but I encourage her to [be physically active]" to "me and my mom used to go up to the Sandy Springs track and walk up there but now she don't walk up there as much because...she gets really sore...so she doesn't want to do anything anymore." The most common form of physical activity that the girls reported they did with their moms was walking and some girls expressed a sense of frustration with their experiences being physically active with their moms. One girl stated "She is like making excuses like 'I'm too old. I'm too fluffy'" and I tell her excuses don't get results, you actually have to take

the time to do something to get results.” Similarly, another daughter said “I used to work out with my mom a lot...but it aggravates me because I’m like a grumpy person so she’s always like ‘come run with me’ and I’m like ‘no, you get on my nerves’.

Discussion

Results from this study are similar to previous findings reporting that mothers communicate their weight concerns to their daughters and do so more commonly through indirect communication rather than direct communication (Arroyo & Andersen, 2016). Expanding on previous research, results from this study highlight the type of health communication that mothers and daughters perceive as most challenging; daughters and mothers found conversations surrounding health (e.g., body image and physical activity) complex and uncomfortable. The daughters disliked and struggled with indirect conversations with their moms about health (e.g., mom’s talking about their own health concerns around their daughters), whereas their mothers disliked and struggled with direct communication about health (e.g., speaking directly to their daughters about their daughters’ health). This demonstrates a disconnect between mothers and daughters pertaining to health communication. Conversations among women about their body image concerns are commonplace and negative self-talk is often rewarded with positive compliments about one’s appearance (Salk & Englen-Maddox, 2011). Many women participate in such conversations in an effort to make themselves and other women feel better about their own body image (Salk & Englen-Maddox, 2011). By watching their

mother's interactions with society, daughters learn that partaking in such conversations is socially "appropriate", accepted, and at times, encouraged.

Results from this study also demonstrate that daughters' and mothers' social networks (peers and family members) influence their perceptions of self and body image satisfaction. These results correspond with those of Clark and Tiggeman (2006) who found that peers have a significant impact on one's body dissatisfaction. McCabe and Ricciardelli (2001) reported that contrary to popular belief, girls' body dissatisfaction was influenced by mothers and female friends but not media. Results from this study demonstrate that mothers and daughters feel discouraged as a result of trying to live up to society's expectations for women and girls. Particular anguish was expressed when discussing times in their lives when their bodies were changing (e.g., puberty and post-partum). This corroborates previous literature demonstrating body image concerns of women during pregnancy. Evans, Walters, Leichty, and LeFevour (2016) demonstrated that during pregnancy, a woman's body image is affected by "pregnancy police" (members of a woman's social network that voluntarily tell a pregnant woman what behaviors are appropriate for her). Both the mothers and daughters in this study felt that regardless of one's age, there is a "right" way to look, demonstrating their perceived, often unrealistic, body image ideals.

While people may not perceive themselves as social comparers (Hemphill, 1991), evidence suggests that virtually everyone compares him or herself to others (Gibbon & Buunk, 1999). Research indicates that adult women compare themselves to their peers significantly more than adult men (Gibbons & Gerrard, 1995). Adolescence represents a

time period when individuals are particularly preoccupied with their social images (Gerrard et al., 2002; Oyserman & Markus, 1990) and are therefore more likely to be high “social comparers”. Similar to Jones (2001) and Jones and Crawford (2006), the daughters and mothers in this study reported using information gathered from their peers’ behaviors and values to judge their own behaviors and values. The current study’s results support previous findings, demonstrating that mothers and daughters compare themselves frequently to girls/women their age.

Daughters in this study reported that their mothers frequently compared themselves to their daughters. This corroborates previous research demonstrating a high level of disagreement (30%) between a child’s and parent’s report of the parent’s use of negative self-talk (Haines, Neumark-Sztainer, Hannan, & Robinson-O’Brien, 2008). It is likely that mothers are not aware of the frequency of their negative self-talk and/or are unaware of the damage such indirect health communication has on their daughters. Our study expands upon previous research that demonstrates a strong relationship between mothers’ and daughters’ body image concerns (Arroyo & Anderson, 2016; Abraczinskas et al., 2012; Hill, Weaver, & Blundell, 1990) by demonstrating *how* adolescent girls are negatively impacted by their mothers. When the mothers say negative things about their own bodies, the daughters wonder if they should feel negatively about that same body concern because they feel like they look like their mothers. Daughters reported feeling sad, depressed, and angry as a result of their mothers’ negative self-talk. It is likely that in addition to negatively impacting a daughter’s body image, indirect negative health communication likely influences other components of her health, including her self-

esteem and anxiety levels. This supports the family systems theory, whereby a family member's individual behavior (e.g., mothers' negative self-talk) influences the behaviors of other family members (e.g., daughters' negative self-talk).

Lastly, results from this study demonstrated that daughters were very aware of their mothers' health behaviors, often expressing frustration in regards to their mothers' dieting and physical activity history. The level of awareness and subsequent frustration daughters had of their mothers' behaviors is consistent with previous research (Haines et al., 2008; Keery, Eisenberg, Boutelle, Neumark-Sztainer, & Story, 2006) and the mostly negative impressions from their mothers likely explains the high prevalence of dieting and weight concerns of adolescent girls (Hill et al., 1990). This finding expands on previous research, demonstrating that adolescent girls are not only aware of their mothers' nutritional choices but are also very cognizant of their mothers' physical activity habits. Parental support (e.g., driving a daughter to practice), rather than parental modeling (e.g., the mother being physically active herself), is a greater predictor of physical activity levels of adolescents (Yao & Rhodes, 2015). Based on these results, the daughters' awareness of physical activity habits of their mothers seems mute. However, conflicting research demonstrates that adolescents with mothers who are highly physically active are less likely to decrease their physical activity levels from childhood into adolescence (Anderssen, Wold, & Torsheim, 2006). The level of frustration daughters expressed when describing their mothers' relationship with physical activity suggests that their perception of physical activity is impacted by their mothers' personal experiences. To the authors best knowledge, this is the first qualitative study to

demonstrate that the modeling of physical activity behavior by mothers is a salient source of their daughters' physical activity perception.

Implications

This study expands upon the current literature by providing a more in depth perspective of mother/daughter dyad health. Research indicates that health care professionals are unaware of how to best advise parents on how to discuss healthy behaviors (eating, physical activity, and weight) with their children (Foster et al., 2003). Additionally, conversations between parents and adolescents regarding healthy behaviors (healthy eating and weight talk) have been associated with both negative (e.g., more screen time) and positive (e.g., greater intake of vegetables and fruit) adolescent behaviors (Berge et al., 2015). This demonstrates the complexity of health conversations between parents and their children. Since a majority of these conversations are between mothers and daughters, a particular focus should be placed on how to best facilitate health communication between both groups. Results from this study also demonstrate the influence of mothers' weight related talk (indirect and direct) on adolescent girls' self-perception. Therefore, a possible implication of this study includes support for targeting mothers, in addition to adolescent girls, in interventions aimed at improving adolescent girls' health. Other possible implications include targeting psychosocial health (e.g., body image) and including a mothers' educational component for programs aimed at improving adolescent girls' health.

Limitations and Future Directions

There were multiple limitations to this study. First, the number of focus groups for each cohort (mothers and daughters) was uneven. However, the researchers all agreed that data saturation was reached and therefore no further mother focus groups were needed. In an effort to increase validity, future research should aim to include the same number of focus groups per cohort. Second, the use of focus groups has limitations as well (Bryman, 2012). Some participants may dominate the discussion while others may feel uncomfortable discussing sensitive issues in front of others (Barbour, 2007). Trained focus group facilitators were used to avoid and/or navigate such situations. To ensure trustworthiness of the data, each focus group transcription was coded by three individuals separately and trained qualitative researchers facilitated the focus groups. Third, the generalizability of the findings is somewhat constrained given the use of the relatively small convenience sample. Future research should expand upon these findings using mother/daughter dyads from diverse cultural and racial backgrounds. It is also possible that maturation (various stages of pubertal development) influenced research findings. Usmiani and Daniluk (1997) found that the association between mothers' and daughters' body image existed when their daughters reached menstruation, however this relationship did not exist premenstruation. In the future, researchers should expand the age range of girls and collect longitudinal data to explore whether maturation influenced such findings. Lastly, since data used in this study came from a larger study where half the participants (daughters) were participating in a health intervention, it is possible that the intervention had an effect on the mother/daughter relationship. However, when the

mothers were asked “has the way you looked or thought about yourself changed while your daughter was participating in SFG”, the overwhelming response was no. A few mothers responded by saying they realized they needed to be more cognizant of what they said in front of their daughters but this is most likely a result of the conversation previously had in the focus group (i.e., discussing fat talk and the implications on their daughters) rather than a result of their daughters’ experiences with SFG influencing their own behaviors.

Due to the high prevalence of body dissatisfaction in adolescent girls (Abbott, Barber, & Dziurawiec, 2012) and associated health consequences (e.g., depression, obesity, increased likelihood of eating disorders) (Byely, Archibald, Graber, & Brooks-Gunn, 2000; Johnson & Wardle, 2005; McCabe & Ricciardelli, 2001), it seems necessary that more research is conducted to better understand girls’ body image. Even more pressing is the need to educate mothers on how to best communicate (both verbally and non-verbally) with their daughter(s) about their own and their daughters’ body image. It is the authors’ hope that results from this study will advance the literature on the relationship between mothers’ and daughters’ body image as well as positively influence communities through the application of this study’s findings (e.g., creation of mother/daughter programs aimed at decreasing body dissatisfaction through improved communication).

CHAPTER THREE
NOVEL AFTER-SCHOOL PROGRAM, SMART FIT GIRLS,
IMPROVES ADOLESCENT GIRLS' BODY IMAGE

Introduction

Obesity is a health pandemic due to its high number of associated comorbidities. In 2010, 3.4 million people died from obesity related diseases, including heart disease, certain cancers (e.g. breast and colon), and diabetes (Malnick & Knobler, 2006; Ng et al., 2014; Powell, Teichtahl, Wluka, & Cicuttini, 2005). As a result, children born today will be part of the first generation likely to die at a younger age than their parents (Lee et al., 2010). In a recent review on childhood obesity, prospective evidence indicates two factors that lead to the development of obesity in children and adolescents: genetic predispositions and low levels of physical activity (PA) (Pate et al., 2013). Adolescent girls have a higher prevalence of obesity (Ogden et al., 2014), are more sedentary (Tudor-Locke et al., 2006), and suffer from psychosocial distress more commonly than their male counterparts. Therefore, creating and studying the impact of programs tailored towards adolescent girls physical and emotional health is imperative in addressing this health disparity. This study does this by studying the efficacy of Smart Fit Girls (SFG), a non-profit organization that aims to improve the physical and emotional health of adolescent girls.

Literature Review

Body Image

Body image is defined as the “subjective sense of satisfaction or dissatisfaction with one’s body or physical appearance” (Meland, Haugland, & Breidablik, 2007, p. 343). In adolescent girls, poor body image is associated with many mental and physical health problems including depression, low self-esteem, obesity, increased likelihood of eating disorders, and low physical activity (Byely et al., 2000; Johnson & Wardle, 2005; McCabe & Ricciardelli, 2001). Women and adolescent girls are more likely to experience body image concerns compared to men and boys, most likely due to an increased cultural emphasis on appearance for women (McKinley, 1999). Body dissatisfaction increases throughout adolescent years, particularly for young girls (Abbott et al., 2012). It is thought that weight gain attributed to puberty may cause adolescent girls to become more dissatisfied with their bodies (Byely et al., 2000). Additional contributing factors to one’s body image include socio-cultural factors such as the mass media, one’s peers, and the family unit (McCabe & Ricciardelli, 2001; Rodriguez & Moreno, 2010). Same sex support systems, such as mother/daughter relationships, seem to be more influential to body image compared to opposite sex support systems, such as father/daughter relationships (Clarke & Griffin, 2007; McCabe & Ricciardelli, 2001; McKinley, 1999). Adolescent girls often define health in relation to their size and/or body shape and these culturally determined expectations of a woman’s body often constrain them from participating in health behaviors, including physical activity (Witmer, Bocarro, &

Henderson, 2011). This is particularly problematic due to the strong correlation between physical activity and body image (Campbell & Husenblas, 2009).

Physical Activity

The health benefits of being physically active throughout the lifespan are widely known (Haskell, Blair, & Hill, 2009). Physical activity has been shown to decrease the risk of many chronic diseases, including obesity, Type II diabetes, and cardiovascular disease (Warburton, Nicol, & Bredin, 2006). In addition to physical benefits, physical activity has also been shown to improve social, emotional, and mental health. For instance, individuals who are highly physically active are more likely to have greater self-esteem, better body image, and increased physical activity self-efficacy (Campbell & Hausenblas, 2009; McAuley et al., 1999; Robbins et al., 2004; Schmalz et al., 2007). Despite numerous efforts to increase national physical activity levels, less than 10% of U.S. (United States) adolescents meet the recommended levels of physical activity (Troiano et al., 2008). A contributing factor to sedentary behavior in adolescence is the limited amount of physical activity that students engage in during school; the average PE program provides less than 12% of the recommended daily amount of physical activity to adolescent students with young girls being the least active (Tudor-Locke et al., 2006). Adolescent girls are estimated to cross below the recommended physical activity threshold (60 minutes per day) approximately 1.5 years earlier than their male counterparts (13.1 years old and 14.7 years old, respectively) (Nader, Bradley, Houts, McRitchie, & O'Brien, 2008). This health phenomenon has led many researchers to

explore constraints to physical activity participation for adolescent girls, including intrapersonal barriers. Perceived physical activity barriers include energy and time (due to competing leisure activities) as well as perceived confidence (Eime et al., 2014), not wanting to be physically active in front of boys (Casey, Eime, Payne, & Harvey, 2009) and concern with appearances (Davison, Schmalz, & Downs, 2010; Witmer, 2011). As a result, same sex programs such as SFG have been developed to help overcome such barriers.

Self-Determination Theory

Self-determination theory (SDT) was used to guide the Smart Fit Girls' program and lesson plan development. SDT is a theory of motivation that emphasizes the extent to which humans behave autonomously (Ryan & Deci, 2000). Behaviors move along a motivational continuum; the more autonomous the behavior, the more internalized and sustainable that behavior becomes. The most influential factors that determine internalization include autonomy (desire for control), competence (desire to be effective/skilled), and relatedness (desire for relationships with others) (Deci, Eghrari, Patrick, & Leone, 1994), all of which are addressed during Smart Fit Girls.

Smart Fit Girls Program

SFG is a 10-week program aimed at improving the physical and mental health of middle school girls. During the program, girls participated in activities specifically designed to improve body image, self-esteem, and physical activity enjoyment. Participants also

learned about anatomy and nutrition and were taught how to lift weights (aka weight training or resistance training). Each activity was led by a volunteer SFG coach, who had participated in the SFG training and passed the coaches certification test. During the course of SFG, coaches completed daily process evaluations to ensure the program was being implemented as intended.

The SFG lesson plan, outlined in Figure 1, was influenced by previous research and intentionally designed. Face validity was addressed by using activities that research suggests would work with adolescent girls. For example, research from Deci and colleagues demonstrates that including activities that foster autonomous behaviors is likely to lead to lasting behavior change in youth (Deci et al., 1994). Extensive research into programs designed for adolescent girls, most notably Girls on The Run (GOTR), was conducted prior to creating Smart Fit Girl's lesson plan. Knowledge gained from this research informed the co-founders of SFG on what they did and did not want to include in the design of SFG. For instance, literature on GOTR suggests that the model of meeting with girls twice a week (what SFG adopted) to discuss body image and self-esteem can improve their psychosocial health (DeBate & Thompson, 2005). However, women often associate cardiovascular exercise (e.g., running) with weight loss, which conflicts with the message SFG wants to relay to their participants. Additionally, fewer girls participate in weight training activities compared to running (0.2% vs. 25.3%), which is likely a result of not being exposed to that form of physical activity (Tammelin, 2003). Therefore, weight training, a form of physical activity that focuses on what the body can do when it is strong, was chosen as the mode of physical activity for SFG.

Figure 1.

Inputs	Activities	Outputs	Outcomes	Impacts
<ol style="list-style-type: none"> 1. Volunteer coaches 2. Weight lifting equipment 3. Food for nutrition 101 4. Plates, napkins, cups, & cutlery 5. Awards 6. Computer 7. Music 8. Internet for videos 9. Art supplies (markers, glue, pens, scissors, tape, paper, etc.) 10. Old magazines 11. Journals 12. Lesson plan 13. Program binder 14. Registration forms, pre and post questionnaires 15. T-shirts 	<ol style="list-style-type: none"> 1. Teach basic anatomy & nutrition 2. Watch videos about media manipulation, body image, & anti-bullying 3. Guest instructors teach yoga and dance 4. Teach different weight lifting exercises 5. Teachers/staff workout night 6. Family workout graduation 	<ol style="list-style-type: none"> 1. 18 workouts 2. 18 self-esteem, body image, and physical activity motivating discussions 3. 15 journals 	<ol style="list-style-type: none"> 1. 75% of the girls will have significantly improved body image, self-esteem, and physical activity enjoyment markers by the end of the program 2. 50% of the girls will have met and maintained their SMART goal(s) by the end of the program 3. 30% of the girls will decrease their levels of social comparison by the end of the program 	<ol style="list-style-type: none"> 1. Girls will experience improved psychosocial and physical health 2. Girls will feel more comfortable using positive self-talk and lifting weights 3. The girls will feel more comfortable talking with their parents about physical activity, nutrition, body image, and self-esteem 4. The girls will grow up to be strong, empowered women

Weight training is a form of physical activity that focuses on the body working against a range of resistive loads (i.e., body weight or external force such as dumbbells).

According to the World Health Organization (WHO), the fourth leading risk factor for global mortality is sedentary behavior (lack of physical activity) (Goldfield et al., 2017;

Kohl et al., 2012). As a way to combat this health pandemic, many health organizations, including the WHO, now include weight training as part of their physical activity guidelines for adolescents (Lloyd et al., 2014). Previously held fears of adolescents participating in resistance training (e.g., resistance training will stunt growth) have been replaced by reports demonstrating how adolescence may be the most opportune time to build bone (Hind & Burrows, 2007) and develop the foundation for an active lifestyle (Lloyd et al., 2014). With the guidance of a trained professional, resistance training can have many positive health impacts on adolescents. For example, resistance training has been shown to improve body composition (Schwingshandl, Sudi, Eibl, Wallner, & Borkenstein, 1999), decrease the risk of developing type II diabetes through improvements in insulin sensitivity (Shaibi et al., 2006), and enhance cardiovascular function in overweight or obese adolescents (Dias et al., 2015; Naylor et al., 2008). In addition to the physical benefits resistance training has on adolescent development, this form of physical activity has been demonstrated to improve psychosocial health as well.

While research examining the psychological benefits of weight training during adolescence is limited, existing literature suggests a positive relationship between resistance training participation and psychosocial health. A recent randomized control study in overweight and obese adolescents demonstrated an increase in health-related quality of life (HRQoL) in those adolescents who participated in resistance training and aerobic training versus those adolescents who participated in the aerobic training only, thereby demonstrating the value of resistance training participation (Goldfield et al., 2017). Similarly, Lubans, Aguiar and Callister (2010) reported improvements in physical

self-perception in adolescent girls who participated in an 8-week resistance training program.

In addition to establishing health behaviors such as physical activity participation and healthy eating, adolescence is a critical time period during which one's body image develops. Given the high prevalence and detrimental effects of poor body image in adolescent girls (Abbott et al., 2012), the implementation and study of programs geared towards improving their body image is a public health concern. To the authors knowledge, this is the first study examining the impact of a combined physical and psychosocial intervention on adolescent girls that focuses on resistance, rather than aerobic, training. The purpose of this study was to explore the impact of Smart Fit Girls on participants' body image. The authors hypothesized that participation in Smart Fit Girls would result in improved body image as compared to girls who did not participate in Smart Fit Girls.

Methods

Research Design

Data from this study were part of a larger exploratory study assessing the impact of Smart Fit Girls and were collected at multiple time points (i.e., the beginning and end of each Smart Fit Girls session) over the course of two years (2015-2016). A quasi-experimental, embedded mixed methods design was used. The authors felt a single data set (quantitative or qualitative) was not sufficient in measuring the effect of Smart Fit Girls on

participants' body image and therefore, focus groups were conducted to further exam the efficacy of Smart Fit Girls (Creswell & Clark, 2011).

Participants

Quantitative data were collected at the beginning and end of each SFG program from two different cohorts: 1) intervention (those who completed 75% or more of the Smart Fit Girls program) and 2) comparison (girls who did not participate in Smart Fit Girls).

Intervention: The intervention cohort (N = 57) consisted of sixth-eighth grade middle school girls from multiple Smart Fit Girls locations (mean age = 12.3 years; SD = .86).

Participants also completed an electronic 19 item survey during the first and last weeks of Smart Fit Girls and participated in a focus group during the last week of, or one week post, Smart Fit Girls. A total of 46 girls participated in six focus groups over the course of two years, averaging eight girls per focus group. *Comparison:* Comparison data were collected from non-Smart Fit Girls participants in the spring of 2015 (mean age = 12.6; SD = .74) from Middle School A. To have equal distribution between comparison and intervention cohorts, comparison participants were randomly chosen from the larger comparison data set (N = 142) to match the number of intervention participants (N = 57). Comparison participants completed the survey at the beginning and end of their physical education class (8-10 weeks apart). An average of 53% and 36% of students from the South Carolina and Colorado schools, respectively, were eligible for free or reduced school breakfast or lunch. Participant demographic information for both cohorts can be seen in Table 3. Child assent and parent consent were received prior to collecting data

and all methods were approved by Clemson University’s Institutional Review Board and associated school districts.

Table 3: *Demographic Information*

Comparison of Site Demographic Information

School	School A	School B	School C
Location	South Carolina	Colorado	Colorado
Eligible for Free or Reduced Lunch	53%	32%	39%
Student: Teacher Ratio	15:1	16:1	17:1

Public Schools. (2016, November 6). Retrieved from public-schools.startclass.com

Procedures

Quantitative: A modified version of the Body-Esteem Scale for Adolescents and Adults (BESAA) was used to assess participants’ body image (Mendelson, Mendelson, & White, 2001). The original BESAA consists of three body esteem (BE) subscales: 1) BE-Appearance, 2) BE-Weight, and 3) BE-Attribution. The BE-Appearance section includes 10 questions about the participants’ general feelings about their appearance (e.g., “I like what I look like in pictures”), the BE-Weight section includes eight questions about the individual’s satisfaction with her weight (e.g., “I’m proud of my body”), and the BE-Attribution section includes five questions about perceived evaluations from others about one’s body appearance (e.g., “I’m as nice looking as most people). As described in Cragun, DeBate, Ata, and Thompson (2013), two items in the BE-Attribution subscale are not appropriate for pre-adolescents (“my looks will help me get a job” and “my looks will help me get dates”) and another BE-Attribution item fits more clearly with the BE-Appearance subscale (“I’m as nice looking as most people”) and as such, a modified

BESAA scale was used (Cragun, DeBate, Ata, & Thompson, 2013). This modified BESAA scale includes all BE-Appearance questions plus one question from BE-Attribution (“I’m as nice looking as most people”) and all BE-Weight questions. Using the modified BESSA, Cragun and colleagues reported good internal consistency reliability (BI-Appearance $\alpha = .90$ and BI-Weight $\alpha = .93$). Because the population in this study is similar to Cragun et al., the modified BESAA scale was used in this study. Participants answered each question using a 5-point Likert scale ranging from never (1) to always (5). Items that were negatively worded were reverse coded to reflect a positive body assessment.

Qualitative: Focus groups were administered by three experienced qualitative researchers. Audio was recorded and detailed notes were taken during each focus group. The focus groups were conducted in empty classrooms and each focus group lasted approximately 30-45 minutes. Questions were written by the first author and approved by authors two and three, both of which have extensive experience in focus group administration. Similar to the quantitative data, the focus groups were part of a larger exploratory study, totaling 14 questions. Two of the questions were specifically included to address the current research questions: 1) has the way you looked or thought about yourself changed during Smart Fit Girls and 2) how do you think Smart Fit Girls impacted you as a person? In addition to those set questions, further discussion was encouraged through supplementary probing or clarifying questions. Pilot interviews were conducted with seven adolescent girls attending the comparison school and were used to

determine the appropriateness of questions, order of question administration, and approximate time needed to complete the focus group.

Data Analysis

Quantitative: Data were analyzed using SPSS version 22. Prior to comparing changes in body image between cohorts, descriptive information was analyzed to characterize participant demographics. Reliability (Cronbach's alpha) was calculated for BI-Appearance ($\alpha = .92$ and $\alpha = .94$) and BI-Weight ($\alpha = .90$ and $\alpha = .93$) for pre and post data, respectively. A repeated measures MANOVA was used to assess cohort differences in body image (BE-Appearance and BE-Weight) between pre and post measurements.

Qualitative: The Framework analysis, a five-step process outlined in Rabiee (2004), was used to analyze the focus groups: 1) familiarization of data, 2) thematic framework identification, 3) indexing data, 4) data organization and 5) data interpretation. Steps one and two were completed independently by the first three authors who subsequently met to compare identified themes. A similar, iterative process was used for steps three and four, resulting in a set of agreed upon themes. Trustworthiness was addressed by reviewing focus group notes alongside any notes taken by the researchers during the focus group process (Creswell, 2009).

Results

Quantitative

A repeated measures MANOVA was conducted to test the intervention effect on body image. There was no significant difference between groups in the dependent variables in the pre and post results, however the change in dependent variables was significantly different between groups. While both groups saw improvements in BE-Appearance and BE-Weight (Table 4), results (Table 5) demonstrated a statistically significant difference between intervention and comparison groups on BE-Appearance and BI-weight over time, $F(2,84) = 4.3, p = .02, \text{partial } n^2 = .09$. Univariate tests (Table 6) also demonstrated a statistically significant intervention effect on both body image subscales, $F(1, 85), = 6.8, p = 0.1, \text{partial } n^2 = .07$ for BE-Appearance and $F(1,85) = 8.2, p = .01, \text{partial } n^2 = .09$. Therefore, the authors hypothesis was confirmed (Figure 2).

Table 4: *Descriptive Information*

	<i>Mean</i>	<i>St. Dev</i>	Pre/Post % Change
Intervention			
Mean BE-Appearance Pre	28.72	9.96	
Mean BE-Appearance Post	33.44	10.87	16.44%
Mean BE-Weight Pre	20.82	7.90	
Mean BE-Weight Post	25.69	8.78	23.40%
Comparison			
Mean BE-Appearance Pre	31.17	8.17	
Mean BE-Appearance Post	31.92	8.86	2.41%
Mean BE-Weight Pre	22.85	7.07	
Mean BE-Weight Post	24.19	7.98	5.86%

Table 5: Overall main effect $N=87$

	F	ρ	η^2
Cohort * Time	4.342	.016*	.094

* $\rho < .05$

Table 6: Effects of intervention over time $N = 87$

	F	ρ	η^2
BE-Appearance	6.828	.011*	.074
BE-Weight	8.193	.005**	.088

* $\rho < .05$. ** $\rho < .01$.

For both BE-Appearance and BE-Weight, higher numbers indicate higher levels of domain specific body image. In the intervention cohort, the minimum and maximum scores for BE-Appearance Pre and Post ranged from 11 to 50 and 11 to 55, respectively. In the comparison cohort, the minimum and maximum scores for BE-Appearance Pre and Post ranged from 15 to 48 and 11 to 52, respectively. In the intervention cohort, the minimum and maximum scores for BE-Weight Pre and Post ranged from 9 to 38 and 8 to 40, respectively. In the comparison cohort, the minimum and maximum scores for BE-Weight Pre and Post ranged from 8 to 36 and 8 to 37, respectively.

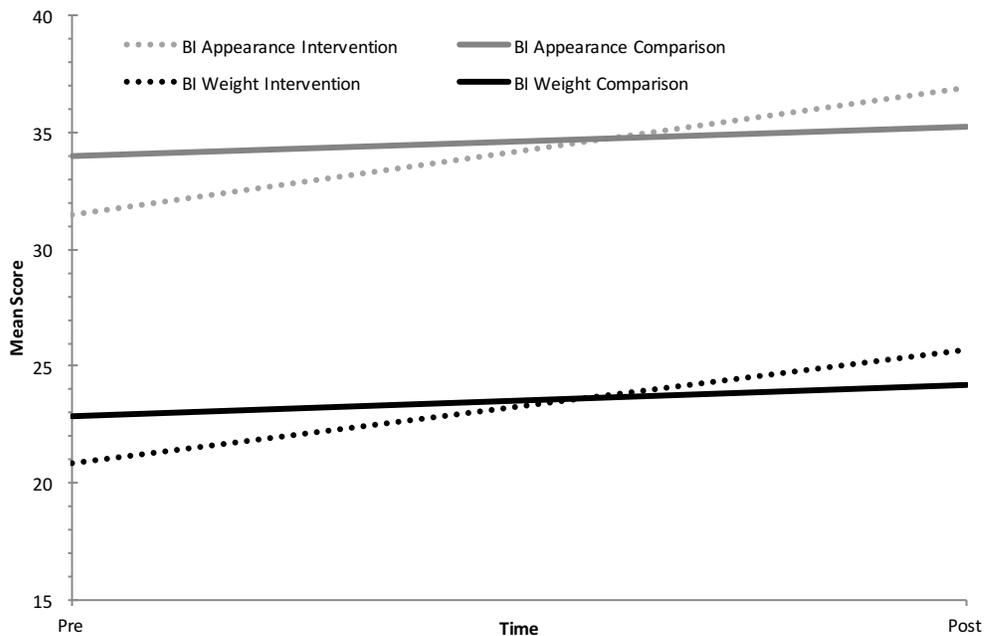


Figure 2. Change in BE-Appearance and BE-Weight

Qualitative

Data from the focus groups confirmed the quantitative finding that Smart Fit Girls participation results in improved body image. When asked about the impact of Smart Fit Girls, participants said “Smart Fit Girls helped me change what I thought in my head about my appearance”, “I didn’t think good of myself but now I think...I’m pretty and I think I’m strong”, and “Over the summer I would look at myself in the mirror and think...why did I look like this...but after coming to Smart Fit Girls, I can look in the mirror now and just be like ‘I am beautiful’”. The girls acknowledged that learning about body image helped them view their own body image differently. One participant said, “It sorta changes girls’ appearance of themselves because it shows you that not everything

is...based on how you look and how people think of you.” Data suggest that participating in Smart Fit Girls taught the girls that body image is a perception of oneself, which can be altered with positive thinking.

Before Smart Fit Girls I used to think that I was fat and that I was ugly and that I wasn't worth anything but now after what...we've learned about body image...it's just like based on our opinions and it's not like what we actually are

The qualitative data expanded upon the quantitative findings by providing insight into why body image increased during Smart Fit Girls. The qualitative results suggest that improvements in body image were likely a result of increased self-acceptance and a shift in expectations for what a woman's body “should” look like. Participants said “I liked...learning the different parts [of my body] and not to be ashamed of it”, “It made me confident and it made me want to like, be healthy and to love me the way I am and don't change for other people”, and “I've kinda started recognizing how you know I look at all the negative about me and I look at everything bad but there is a lot of good stuff about me...I'm able to walk, I'm able to do sports...”. The girls also reported changing how they viewed a woman's body, saying things such as “I thought before [there was such a thing as a] perfect girl...now I realize that the perfect girl is like inner-beauty.” Similar comments were made, indicating acknowledgement of beauty and health beyond aesthetics.

I thought that like having big thighs was a bad thing and like having curves and all and having big arms I thought that was a bad thing and that I should be ashamed of it and then at Smart Fit Girls...I was taught 'oh you are pretty inside and out and you don't have to worry about what people think about you'

Both of my parents are overweight and I read somewhere online that like their children sort of grow up like how they look now...I'm more confident about my body [now] so I don't really care how I grow up as long as I'm healthy

Multiple girls brought up examples of activities they participated in during the program that helped improve their body image. For example, one participant said

towards the beginning we drew in our notebooks like a picture of ourselves and then we said like these five things I like about myself...I couldn't think of a lot of things I liked about myself...now I can think of like 18 things I like about myself.

Another Smart Fit Girls activity helped the girls realize that they were not alone in feeling insecure about their body image. During the "take what you need" activity, participants created sticky notes with positive affirmations for other girls in the school to take and one participant said "a few days later it was like almost like gone...once you see like how many people took stuff, it gives you a different perspective on all of them".

Focus group data also confirmed that all three SDT constructs (autonomy, competence, and relatedness) were achieved during the Smart Fit Girls program. Autonomous behaviors are behaviors that originate from the self, as compared to behaviors that are more extrinsically driven (Deci et al., 1994). Participants reported enjoying activities where they made decisions and were in comparison of what they were doing rather than being told what to do. One girl mentioned that during PE “they’ll like set a goal for us and we have to reach that goal but I like how in here we can set our own goal.” Similarly, another girl said, “I think one of my favorite parts [of Smart Fit Girls] was when we...made up..the game, workout games”. The girls particularly enjoyed when coaches encouraged, rather than mandated them to do a certain activity. One girl said, “it was fun how like the leaders weren’t pushing me to do stuff that I didn’t want to do and they were, they were being nice about it...and like encourage you”. The coaches also provided a sense of relatedness to the participants. Relatedness is the sense of being valued by others and having a sense of belonging (Deci et al., 1994). One girl said she “liked being able to grow relationships with the coaches” while another said she liked “how the coaches...[were] not trying to like parent”. Some girls even compared their relationship to the coaches to relationships with their close family members saying “they really connect with us and they really try to see how our feelings are and they really listen when we like wanna talk to them or when you need to talk to them they listen.”

The participants also really enjoyed meeting new girls and making friends with other participants: “I like making new friends, like my 8th grade friends”, “I like having people to workout with, like kinda, you just like encourage each other to do better”, and

“in here no one teases you, they see you different because you are different from them but they like don’t judge you on how you look or what you do”. Other girls mentioned enjoying “deep conversations because we all got to share our feelings and share how we felt about like those times” and that Smart Fit Girls “made me feel like I fit in more because like everybody knew me and I knew everybody.”

Lastly, many of the girls reported feeling competent in the knowledge and skills they learned during Smart Fit Girls. Competence can be explained as one’s perceived ability to achieve a task and demonstrate that task in front of their peers (Deci et al., 1994). One participant said Smart Fit Girls “made me stronger on both [the] inside and outside and now I know like how to use the weights and different spots.” Similarly, others said “my brother he does...karate and stuff so I work out with him and Smart Fit Girls [taught] me to do more things with him” and “I didn’t really want to like try to do a sport...now like I feel like I can do a lot more...like you learn how to do something but like you feel like you can do something.” This newly found competence extended past their physical abilities into other areas of their lives as well.

I started sticking up for more people. Like I often see a lot of people making fun of other people and I kind of just stayed quiet because I didn’t want to get involved but then I started...sticking up for them.

In the real world, like outside of Smart Fit Girls, [people]...judge you more and like here you’re always getting like respect and motivation...and so we like start

applying what we have [learned] in here to like everything else and to like the real world.

Discussion

The current study was designed to explore the impact of Smart Fit Girls on middle school girls' body image. This is the first study investigating the efficacy of Smart Fit Girls. The comparison and intervention group had similar pre scores on body image (appearance and weight) indicating that changes in body image seen in the intervention group were likely a result of participating in Smart Fit Girls. While both cohorts saw improvements in BE-Appearance and BE-Weight, only those girls in the intervention group experienced statistically significant increases in both body image subscales. This demonstrates that as a result of Smart Fit Girls, participants' perception of their looks (BE-Appearance) and weight (BE-weight) are improved, thus confirming previous findings that intentionally designed programs can improve adolescent girls' health (Casey et al., 2013; Gabriel, DeBate, High, & Racine, 2011). The most well-known and studied health program for adolescent girls is Girls on the Run (GOTR), a 12-week program for girls in 3rd through 5th or 6th through 8th grades aimed at improving participants' emotional, social, mental, and physical wellbeing. DeBate and Thompson (2005) found that after participating in GOTR, girls had greater self-esteem and body size satisfaction, and better eating attitudes/behaviors. Similarly, Martin, Waldron, McCabe, and Choi (2009) found that girls who participated in GOTR reported meaningful increases in running and physical self-concept and reduced fear of becoming fat . While these studies provide further

insight into improving adolescent girls' health, their results lacked the depth that qualitative data provides. This study contributes to the current body of literature by providing a mixed methods analysis of a program geared towards improving adolescent girls' health.

Not only do results from this study reveal improvements in body image through program participation, but add clarifying information as to why and how those improvements were made. The focus group data suggest that body image improved because of a shift in how the girls viewed themselves and other women. Without often knowing, mothers communicate body image ideals to their daughters, who then internalize such ideas as their own (Abraczinskas et al., 2012; Wertheim et al., 1999). Results from this study demonstrate that Smart Fit Girls was successful in providing another source of body image development through the deconstruction of previously developed body image ideals, thereby breaking the cycle of body dissatisfaction behavior modeling.

Results from this study also support previous research demonstrating that adolescent girls thrive in scenarios where they have autonomy (Iachini, Bell, Lohman, Beets, & Reynolds, 2017), feel connected to others (relatedness), and feel competent in a given activity. Focus group data showed that Smart Fit Girls participants enjoyed the activities more when they felt they had some choice and/or control. Similarly, Standage, Gillison, Ntoumanis, and Treasure (2012) demonstrated that by providing students with a sense of autonomy during physical education (PE), students reported higher satisfaction during PE and were more likely to be physically active outside of PE. The focus group

data also established that girls in Smart Fit Girls valued making friends and connecting with the coaches. This finding is particularly important since adolescent girls highly value social support, particularly in physical activity settings (Sallis, Prochaska, & Taylor, 2000). Lastly, many of the program participants described experiences where they demonstrated the knowledge they gained or skills they learned during Smart Fit Girls outside of the program. Among adolescent girls, a commonly reported barrier to physical activity is a lack of perceived confidence (F. Gillison, Sebire, & Standage, 2012; Rees et al., 2006). Participation in Smart Fit Girls resulted in improved perceived confidence through increased health knowledge and skills, thereby further supporting the use of intentional programming (e.g., the use of SDT) in design of adolescent health programs.

Limitations and Future Directions

Several study limitations should be addressed. First, data were collected from three different schools (one in South Carolina and two in Colorado) with slightly different demographic profiles so generalizability is limited. A study by Craike and colleagues (2016) suggests that region (metropolitan versus non-metropolitan areas) may impact adolescent girls' body image, however, the difference between a metropolitan versus non-metropolitan area was not revealed in their study thus making comparison to this study difficult. Additionally, no significant differences in pre data existed between each Smart Fit Girls' location suggesting no regional effect. A second limitation is that three of the focus groups were administered by coaches and all data were collected via self-

report, which may have increased social desirability bias. However, the coaches were trained qualitative researchers and the data collection scripts (e.g., focus group directions) included reminders to the girls that their responses were confidential and that questions should be answered honestly. Future research should take effort to avoid using coaches as focus group administrators. Another limitation is the small sample size. The small sample was a result of collecting data from a new, growing program and therefore was limited to the number of girls who participated in the program since inception. Due to the small data set, inconsistencies within the data collection procedures were accommodated for by condensing one group's body image scale from a 1-7 likert scale to a 1-5 likert scale to match the remaining data set. The use of focus groups has inherent limitations as well, including the possibility that some participants dominated the conversation. Trained qualitative researchers facilitated the focus group to limit this from happening. Future research should corroborate findings from this study, using a larger sample size, a more homogenous group, and a longitudinal design. Lastly, while not significant, the intervention group had lower pre mean scores compared to the comparison group. This indicates that the intervention group had poorer body image to start, which may be why those participants experienced a larger increase in body image over the ten-week period. However, from a public health perspective this is a positive finding because not only did the intervention group see a significant increase in body image between pre and post data collection, but the amount they improved brought them from below to above the comparison groups' mean scores, further demonstrating the effectiveness of Smart Fit Girls.

Adolescence is a transitional period where lots of growth and development occurs. During this time, adolescents establish health behaviors including physical activity participation and healthy eating. The high prevalence of body dissatisfaction (Abbott et al., 2012), low levels of physical activity (Tudor-Locke et al., 2006), and associated physical and mental health consequences in adolescent girls (e.g., depression, obesity, increased likelihood of eating disorders) (Byely et al., 2000; Johnson & Wardle, 2005; McCabe & Ricciardelli, 2001), provides justification for the implementation and study of programs geared towards improving adolescent girls' health. Given the fact that adolescent girls (and women) represent nearly 50% of the population ("Population Distribution by Gender," 2016) and will most likely grow up to be the primary decision maker of the household ("Women Call the Shots at Home; Public Mixed on Gender Roles in Jobs," 2008), the disparity and influence of their health is a large public health concern. Results from this study support community adoption of Smart Fit Girls, a novel after school program aimed at improving adolescent girls' body image, for communities interested in improving adolescent girls' body image.

CHAPTER FOUR

A STRUCTURAL MODEL EXPLORING THE PROTOTYPE WILLINGNESS MODEL WITH ADOLESCENT GIRLS

Introduction

There are many health benefits to being physically active (Haskell et al., 2009) including reduced risk of obesity and associated comorbidities (Warburton et al., 2006). Despite this fact, a majority of Americans do not meet the recommended levels of physical activity (Troiano et al., 2008). Today's youth are the most sedentary generation to date, with less than 5% meeting the recommended 60 minutes of moderate physical activity per day (Troiano et al., 2008). Adolescent girls are the least active and drop below the recommended physical activity threshold 1.5 years earlier than adolescent boys (Nader et al., 2008; Tudor-Locke et al., 2006). This health disparity has led many researchers to explore physical activity behaviors of adolescent girls. While many health theories have been used to better understand the determinants of physical activity participation in adolescent girls, very little research has been conducted using the prototype willingness model (PWM; Appendix E). To date, the authors are aware of only five articles published that use PWM to predict physical activity behaviors (Lazuras, Ourda, Barkoukis & Tsorbatzoudis, 2011; Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005; Rivas, Sheeran, & Armitage, 2006; van Lettow, de Vries, Burdorf, & van Empelen, 2014), none of which examined the possible moderating effects of social comparison nor were conducted using middle school aged girls as participants. Therefore, this research expands upon the literature and advances the PWM.

Literature Review

Prototype Willingness Model

Developed by Gibbons and colleagues (Gibbons, Gerrard, Blanton, & Russell, 1998; Gibbons, Gerrard, & McCoy, 1995), the PWM is a social reaction model that aims to improve the predictive power of previous health expectancy-value models such as the theory of planned behavior (TPB) (Ajzen, 1991) and its precursor the theory of reasoned action (TRA) (Ajzen & Fishbein, 1980). Much like the TPB and TRA, the intentional pathway in the PWM holds that subjective norms and attitudes predict one's intention to engage in a certain behavior. Previous behavior is an antecedent to positive attitudes towards a behavior, thereby strengthening the impact of attitudes on behavior (Bentler & Speckart, 1981). However, adolescents often react to social stimuli unconsciously and therefore frequently engage in behaviors opposite of their intentions. The PWM was developed to explain elements of risky, often unplanned, health behavior (e.g., smoking and drinking).

In addition to the planned/intentional pathway commonly used in expectancy-value models of health behavior, the PWM includes a social reactive pathway that is unplanned and image based. The social reactive pathway includes two sub categories: prototypes and willingness. Prototypes include images of individuals who engage in a certain behavior and are influenced by perceptions of similarity and favorability. Most people have a clear image of the type of person who participates in a given behavior, even if they do not have experience with the behavior themselves (Gibbons & Gerrard, 1995). For instance, Andrews and Peterson (2006) found that children as young as seven had already

developed distinct prototypes for cigarette, alcohol, and marijuana users. Despite health-promoting prototypes being historically under investigated, research supports physical activity as an identifiable prototype (Keresztes, Piko, Gibbons, & Spielberger, 2009). While the impact of favorable images (e.g., someone who is physically active) versus unfavorable images (e.g., someone who is sedentary) on behavior is unclear, there is evidence to suggest that healthy prototypes may be as influential on behavior as unhealthy prototypes (Gerrard et al. 2002), including the prototype of a typical exerciser (Ouellette et al., 2005).

According to the PWM, prototypes impact behavior through one's willingness to engage in a given behavior if that opportunity arose. Unlike intentions, willingness captures one's acknowledgement that engaging in a risk behavior is a possibility, not a planned behavior. Therefore, behavioral willingness is described as how open or willing an individual is to engage in a behavior. Although one may not plan on behaving in a risky manner (intention) they may be open to doing so in the future (willingness). The more positive the image, the more willing and likely that person is to engage in the associated behavior (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). By adding a social reactive pathway to traditional expectancy-value models, the PWM has the potential to increase predictability of behavior. A recent meta-analysis of the PWM reported that on average, willingness explains an additional 5% of variance in behavior, and willingness and intentions combined explain ~21% of variance in behavior (Todd, Kothe, Mullan, & Monds, 2016).

Due to the interpersonal nature of prototypes, prototypical images likely influence willingness and subsequent behavior through social comparison (Gibbons & Gerrard, 1997; Gibbons & Gerrard, 1995). Adolescents are highly preoccupied with their social images (Gerrard et al., 2002; Oyserman & Markus, 1990) and as such, are more likely to be high social comparers. Additionally, compared to adult men, adult women have been shown to engage in social comparison significantly more (Gibbons & Gerrard, 1995), further justifying the exploration of social comparison in adolescent girls.

The degree of social comparison has been shown to moderate the impact of prototypes on risk behavior. For example, prototypes predicted health risk behaviors including reckless driving, smoking (Gibbons & Gerrard, 1995), and drug use (Gerrard, Gibbons, Stock, Lune, & Cleveland, 2005) more commonly for those adolescents who were higher social comparers. Exercise prototypes have also been shown to influence behavior (i.e., increase physical activity) with high social comparers being more likely to be physically active compared to their lower social comparer counterparts (Ouellette et al., 2005). In fact, Ouellette and colleagues (2005) were the first to demonstrate that a one-time lab manipulation of prototypes (showing participants positive pictures of people being physically active and negative pictures of people being sedentary) positively influenced behavior (i.e., increased physical activity levels) a month later.

Since most research using the PWM has focused on health-risk behaviors, little is known about the relationship among the physical activity prototype (PAP), social comparison, and health behavior change (i.e., physical activity). A recent meta-analysis by Todd et al., (2016) and subsequent commentary by Gibbons and Gerrard (2016)

conclude that further research on the application of PWM on health protective behaviors rather than health risk behaviors is needed. Thus, the primary purpose of this study was to explore the impact of physical activity prototypes of adolescent girls on their willingness to engage in physical activity. A secondary purpose was to explore the possible moderating effects of adolescent girls' social comparison likelihood on physical activity behavior as predicted by willingness. This study has three hypotheses: 1) social comparison likelihood has mediating effects on physical activity willingness (PAW), 2) social comparison has moderating effects on the strength of the relationship between physical activity prototype and willingness, and 3) physical activity prototype has a meaningful effect on physical activity willingness.

Method

Participants

Smart Fit Girls (SFG) is a non-profit organization aimed at improving adolescent girls' physical and emotional health. The sample used in this study was part of an ongoing larger research project, which examines the impact of the SFG intervention on adolescent girls. The current study focused on applying the heuristic path of the PWM to physical activity in adolescent girls. A total of 334 adolescent girls in grade six ($n = 65$), seven ($n = 167$), and eight ($n = 102$) were invited to participate in this study ($M = 12.82$, $SD = 0.89$). Due to missing data and outliers, 321 were included in the final sample (CFA, Mediation, and Moderation). Participants were recruited from two middle schools with similar demographic characteristics (see Table 7) in the southeast United States. A post-

data-collection power analysis indicated that given the number of potential independent variables and desired effects (e.g., 30% of variance explained; $\alpha = .01$) a suitable minimum sample size of 255 respondents was used (Cohen, Cohen, West, & Aiken, 2003), indicating that we have exceeded the sample size necessary to conduct the analyses of interest for this study.

Table 7: *Demographic Information*

Comparison of School Demographic Information

School	School A	School B	South Carolina State Average
Eligible for Free or Reduced Lunch	52%	33%	57%
Student: Teacher Ratio	15:1	17:1	16:1
Minority Enrollment (black, Hispanic, and more than one race)	23%	21%	48%

Note. Data received from publicschooreview.com on 6.1.16

Procedures

Participants completed a 91-item electronic Qualtrics questionnaire as part of the larger SFG research project; 28 of which were specifically included for this study. The 20-minute questionnaire was administered during school hours at the beginning of the girls' health/physical education class. Every girl who attended class volunteered to take the survey, which lead to 334 completed questionnaires. Prior to taking the questionnaire, a trained research assistant read the institutional review board approved script, emphasizing how responses would be kept confidential. The research assistant was also available to answer any questions the students might have had while completing the questionnaire. Participation in the study was voluntary, however, every girl who was asked to

participate in the study chose to complete the survey. Prior to collecting any data, parental consent and child assent were received. The Clemson University Human Research Institutional Review Board approved this study.

Measures

Physical Activity Behavioral Willingness. Behavioral willingness represents the extent to which an individual is open or willing to engage in a certain behavior when presented with the opportunity (Gibbons et al., 1998). Using methods outlined by Gibbons and Gerrard (1995), physical activity behavioral willingness was measured by asking participants to respond to a series of questions pertaining to the following scenario: “Physical activity is defined as any active games, active play, sports, or exercise that gets you moving, breathing faster, and your heart beating faster. Please mark your willingness to participate in the physical activities below. In general, how WILLING are you to...” After participants read this scenario, they were asked to answer the following questions using a 5-point scale (1 = Never to 5 = Always): 1) “How willing are you to be physically active alone?”, 2) “How willing are you to be physically active with friends?”, 3) “How willing are you to be physically active with family”, 4) “How willing are you to be physically active for 60 minutes a day?”, and 5) “How willing are you to be physically active for 30 minutes a day?” All five items were used as indicators of the latent willingness factor.

Physical Activity Prototype. In this study, physical activity prototypes (PAP) were defined as similar age peers who are physically active. Questions were phrased to reflect

an assessment of their ideal peer. For example, “I think my physically active peers are motivated” and “I think my physically active peers are outgoing/popular.” Respondents then rated questions on a 5-point Likert Scale (e.g., 1 = strongly disagree to 5 = strongly agree). This scale was developed in part by Rivas and Sheeran (2003) in a study of undergraduate university students where they solicited study participants to write down three characteristics that described a person who exercises three or more days per week. Those characteristics with the highest percent endorsements (i.e., frequency of reporting a given characteristic to someone who is physically active) were then used to create the scale measuring physical activity prototypes described below (Rivas & Sheeran, 2003). Keresztes et al. (2009) were the first to report using this scale (reduced to 11 from 12 questions) in secondary school students ($M = 16.5$ years) living in Szeged, Hungary. Results from their study suggested three distinct constructs embedded within the PAP scale. The first construct was titled “positive personality-related prototype” and included characteristics such as “intelligent” and “outgoing/popular”. The second construct was titled “positive fitness and health-related prototype” and included characteristics such as “healthy” and “athletic”. Finally, the third construct was titled “negative prototype” and included characteristics such as “bore” and “carefree.” Results of their study were limited to internal reliability analysis that suggested only two of the three constructs possessed moderate internal reliability: positive personality related prototype ($\alpha = 0.78$) and positive fitness and health related prototype ($\alpha = 0.76$), with negative prototype possessing a relatively low reliability ($\alpha = 0.14$). However, since the physical activity

prototype scale has only been studied once, the full scale, including factor three reported in Keresztes et al. (2009), was used in this study.

Social Comparison Likelihood. The Iowa-Netherlands Comparison Orientation Measure (INCOM) was used to assess social comparison likelihood (Gibbon & Buunk, 1999). The questionnaire consists of 11, 5-point scale Likert questions which range from 1 = strongly disagree to 5 = strongly agree. Prior to answering each question, the following prompt was given,

Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly ‘good’ or ‘bad’ about this type of comparison and some do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like to ask you to indicate how much you agree with EACH statement below, by using the following scale.

After reading this prompt respondents were presented with questions including “I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing” and “If I want to learn more about something, I try to find out what others think about it.” The INCOM scale has been shown to be a valid two-factor structure $\chi^2(43) = 170.933, p \leq .001, RMSEA = .053$ (90%, CI .), SRMR, .066, CFI =

.933) (Schneider & Schupp, 2011) and reliable one-factor measure with Cronbach's alpha ranging from .78-.85 in American and .78-.84 Dutch samples, respectively (Gibbon & Buunk, 1999).

Analysis

Congruent with recommendations provided by Byrne (2006) and Kline (2011) the structural analysis of relationships consisted of two phases, the first exploring the measurement properties of the questionnaire utilizing confirmatory factor analysis (CFA) and the second exploring the proposed relationships in the structural equation model (SEM), described later in this manuscript. The data were first imputed into SPSS 23 software for basic descriptive analyses and then transferred to EQS 6.3 software for the CFA and corresponding SEM, to determine the measurement properties of the Willingness, Prototype, and Social Comparison measures as a total scale and then to explore potential direct, moderational and mediational relationships among the constructs of interest. Prior to investigating the measurement model, the data were examined for multivariate kurtosis using both Mardia's coefficients and normalized estimation techniques (see Byrne, 2006). This examination resulted in 14 cases being removed from the sample. A multi-stage CFA of the total scale was then conducted with all items orientated towards the three theorized factors and examined for statistics such as model fit and factor loadings. Then, through multiple stages, the model was re-specified for issues such error, items with poor unidimensionality and items with unusually high or low covariances (Brown, 2015).

Measurement Model Testing Results

Based on both prior evidence and theory the final model consisted of three factors and a total of 19 items. The sample variance-covariance matrix¹ was analyzed with EQS 6.3 software and the maximum likelihood minimization function. Goodness of fit was estimated by using the Chi-Square, CFI, RMSEA, its 90% confidence interval, and SRMR. Together these indices provide a conservative and reliable evaluation of the seven-factor solution. Each of the overall goodness-of-fit indices suggested that the three-factor model fit the data well: $\chi^2(147) = 319.172, p \leq .001$, RMSEA = .060 (90%, CI .058-.075), SRMR, .071, CFI = .948.

After good model fit was determined, the convergent and discriminant validity of the 19-item scale were examined. Convergent validity is the degree of agreement between two or more measures of the same latent variable. This is typically examined by looking at statistics such as factor loadings and reliability estimates (Byrne, 2006). As evidenced in Table 8, the three factors reported good convergent validity as demonstrated by factor loadings, Average Variance Extracted (AVE) scores, and reliability as supported by Joreskog's Rho (ρ) and Cronbach's Alphas (α). After the measurement model testing indicated good convergent validity, between-factor correlations were examined to determine the levels of discriminant validity (Kline, 2011). All correlations were below 0.6, (see Table 9) indicating discriminant validity among factors (Brown, 2011). Finally, the comparison of shared variance (squared correlations) between each factor to the averaged AVE for each pair of factors indicated that in the three possible pairs of factors

¹ Each factor was independently examined with CFA. Individual psychometric properties and the covariance matrix are available upon request.

the shared level of observed variance was lower than the corresponding averaged AVE (see Fornell & Larker, 1981). The confluence of these statistics indicated strong convergent and discriminant validity among the three factors tested. Moreover, the high reliability estimates and factor loadings suggested that the scales utilized for this study were both valid and reliable measures of the constructs of interest; therefore, it was appropriate to proceed with relationship testing between factors through the use of SEM (Fornell & Larker, 1981; Marsh, Hau, & Wen, 2004).

Table 8: CFA

CFA of the Physical Activity Prototype Willingness Model (PAPWM) Scale. ($N = 321$).

Factor/Question	M (SD)	β	ρ	α	AVE
Factor One: Social Comparison Likelihood			.828	.827	.417
I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing.	3.23 (1.091)	.599			
I always pay a lot of attention to how I do things compared with how others do things.	3.43 (1.115)	.780			
If I want to find out how well I have done something, I compare what I have done with how others have done.	3.44 (1.107)	.812			
I often compare how I am doing socially (E.g., social skills, popularity) with other people.	3.23 (1.215)	.711			
I often compare myself with others with respect to what I have accomplished in life.	3.39 (1.101)	.581			
I always like to know what others in a similar situation would do	3.84 (.965)	.498			
If I want to learn more about something, I try to find out what others think about it.	3.74 (.940)	.451			
Factor Two: Physical Activity Prototype			.914	.907	.604
<i>Prompted with: I think my physically active peers...</i>					
Are physically fit	3.99 (.885)	.844			
Are motivated	4.01 (.854)	.817			
Are healthy	4.03 (.839)	.804			
Are sporty	3.83 (1.035)	.830			
Are athletic	3.90 (.991)	.828			
Are outgoing/popular	3.69 (1.041)	.560			
Have desirable physical attributes	3.75 (.998)	.717			
Factor Three: Physical Activity Willingness			.841	.842	.523
<i>Prompted with Please mark your willingness to participate in the physical activities below.</i>					
Be physically active alone	3.66 (1.108)	.555			
	4.15 (1.017)	.699			
Be physically active with friends					
Be physically active with family	3.87 (1.174)	.561			
Be physically active for 60 minutes a day	3.67 (1.208)	.862			
Be physically active for 30 minutes a day	4.07 (1.105)	.871			

β : standardized coefficient (factor loading); ρ : Joreskog's Rho; α : Cronbach's Alpha; AVE: Average Variance Extracted.

Table 9: *Between Factor Correlations*

Between Factor Correlations ($N = 321$).

	F1	F2	F3
F1: Social Comparison Likelihood	1		
F2: Physical Activity Prototype	.056*	1	
F3: Physical Activity Willingness	.095*	.409*	1

Note: * indicates $p \leq .001$

Results

As suggested by the CFA results, the Physical Activity Prototype Willingness Model Scale (PAPWM) is a reliable and valid measure as verified by the quality of model fit and the evidence of both convergent and discriminant validity. As such, two separate structural equation models (SEM) were developed to examine the potential mediational (see Figure 3) and moderational (Figure 4) relationships. As with the CFA, EQS 6.3 was utilized for this analysis. The results of the SEMs for both models indicated good model fit (see Table 10).

Table 10: *Fit Indices*

Summary of Fit Indices for Measurement and Structural Models ($N = 321$)

Model	χ^2	df	RMSEA	SRMR	CFI
Measurement Model	319.172	147*	.060 (.058, .075)	.071	.948
Mediational Model	295.671	147*	.056 (.047, .065)	.065	.952
Moderational Model	381.086	87*	.065 (.056, .073)	.051	.928

* indicates $p \leq .001$.

Hypotheses Testing

Hypothesis one posited that social comparison likelihood would have a mediating effect on physical activity willingness (Figure 3). However, this hypothesis was not supported as the paths from physical activity prototype to social comparison likelihood ($\beta = .094, p = .232, SE = .078$) and from social comparison likelihood to physical activity willingness ($\beta = .116, p = .066, SE = .063$) were both non-significant, thus indicating no further mediational testing was warranted. Hypothesis two posited that physical activity prototype would have a meaningful effect on physical activity willingness and we did find support for this hypothesis at both a statistically and practically meaningful level ($\beta = .439, p \leq .0001, SE = .078$). Finally, hypothesis three posited that social comparison likelihood would have a moderational effect on the strength of the relationship between physical activity prototype and physical activity willingness. Our moderational analysis (see Figure 4) did not indicate the presence of any statistically meaningful moderational effect ($\beta = .007, p = .939, SE = .092$).

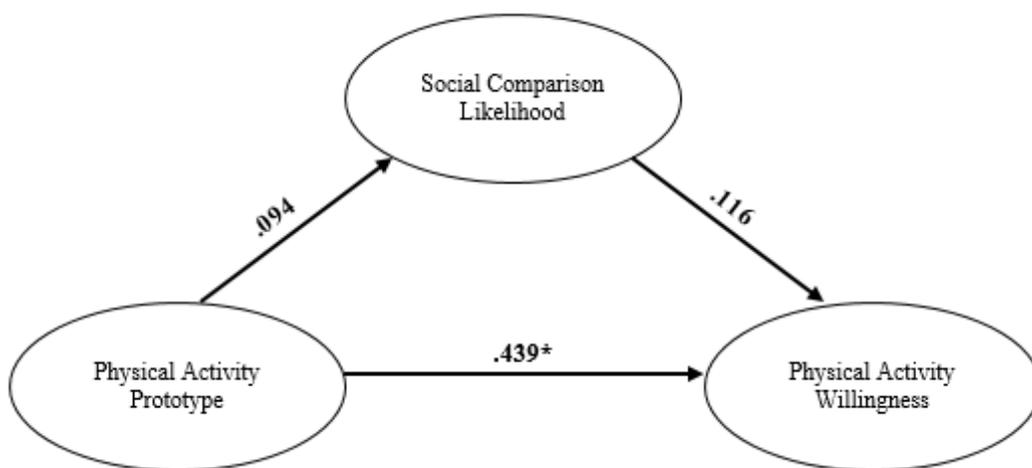


Figure 3. Mediational model of effects on Physical Activity Willingness * indicates $p \leq .001$. All covariances and individual items excluded for parsimony of presentation.

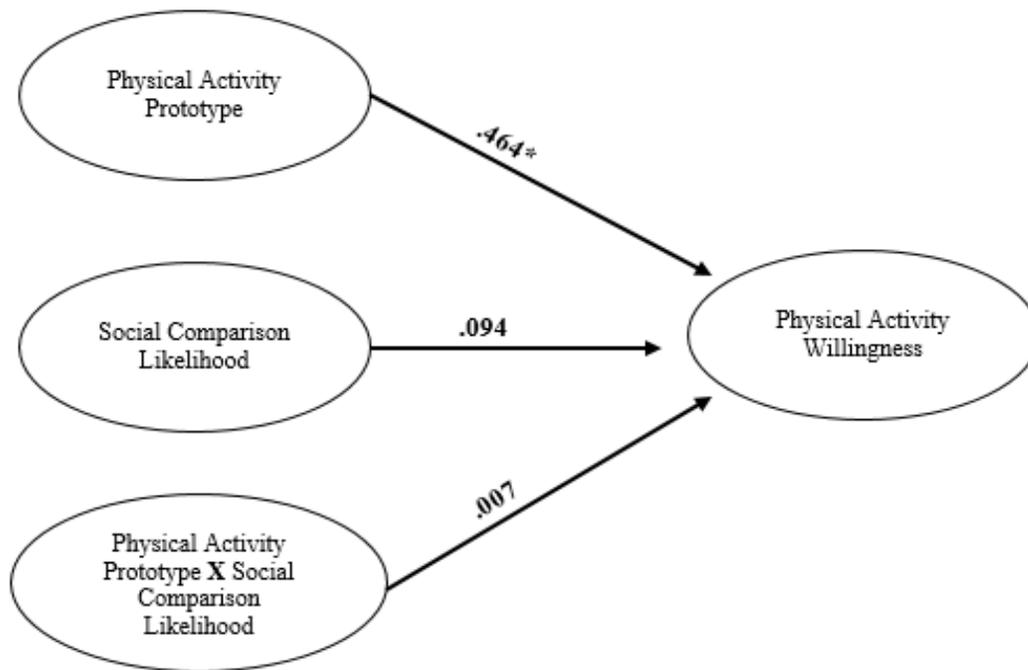


Figure 4. Moderational model exploring moderational influence of social comparison likelihood on relationship between physical activity prototype and physical activity willingness. * indicates $p \leq .001$. All covariances and individual items excluded for parsimony of presentation.

Discussion

The current study set out to examine the applicability of the PWM on physical activity in adolescent girls and to explore the possible mediating and moderating effects of social comparison. The PWM was developed as an augmentation to the TRA and TPB. These types of models have been shown to be less effective in explaining risk behavior compared to health-protective behavior (Cho, Keller, & Cooper, 1999), particularly in young people (Webb & Sheeran, 2006). Consequently, the PWM was specifically designed to include a heuristic path that increases the predictability of behavior by including unintended behavior (which most risk behaviors are), as well as intended

behavior, in the model. Understandably then, the majority of the PWM literature is comprised of studies using health risk behaviors (e.g., smoking) (Todd et al., 2016) as opposed to health-protective behaviors. Evidence suggests that health-protective behaviors are more strongly predicted by intention whereas health-risk behaviors are more strongly predicted by willingness (Rivis et al., 2006). Founders of the PWM confirm these findings by stating, “In general, there is no reason why positive behaviors could not come within the purview of the model. However, if there is not some level of risk involved, then willingness is likely to be less appropriate than intention” (Gibbon and Gerrard, 2016, p. 45). However, the current study provides evidence supporting a significant relationship between physical activity prototype and physical activity willingness, suggesting that health-protective behaviors may be influenced by behavioral willingness as much as behavioral intentions. Although intention was not measured in this study, results suggest that the route by which prototypes influence health-protective behaviors may be more heuristic than previously theorized.

Despite only a few studies exploring the use of the PWM with physical activity, evidence demonstrates that the PWM increases the predictability of physical activity behaviors. Rivas, Sheeran, and Armitage (2006) reported a strong relationship between exercise prototypes (both actor and abstainer) and reported exercise behavior. Similarly, Ouellette et al., (2005) found that prototype images of people who are physically active were related to behavioral willingness and exercise behavior. Results from this study are congruent with Rivas, Sheeran, and Armitage (2006) and Ouelette et al., (2005) as they indicate that physical activity prototypes have a meaningful effect on physical activity

willingness. The clinical significance of this finding is that programs aimed at increasing physical activity levels in adolescents should include developing positive physical activity prototypes in adolescents (e.g., girls who workout are “cool”) so that they are more willing to be physically active in the future. Moreover, a theoretical contribution of this study includes expanding our understanding on the implementation of the PWM in predicting health-protective behaviors (e.g., physical activity), as only five studies to date have examined the application of PWM on physical activity.

Due to their positive and desirable nature, health-promoting prototypes may act as motivational goals for individuals. As such, there has been a push to use prototypes, particularly health-promoting prototypes, in health interventions (Gibbons & Gerrard, 2016). An initial step in doing so is confirming the applicability of the PWM to physical activity and verifying that physical activity/exercise prototypes are recognized similarly by different people. Rivas and Sheeran (2003) were the first to explore exercise prototypes by asking college students to describe three characteristics of the “type of person who exercises at least 3 times a week” (p. 572). Results indicate that exercise prototypes are mostly positive in nature, and the three most commonly reported exercise prototypes were: “physically fit”, “motivated”, and “healthy”. Using the prototypes reported by Rivas and Sheeran (2003), Keresztes and colleagues (2009) confirmed that older adolescents ($M = 16.5$) have clear images (i.e., prototypes) of individuals who engage in physical activity. Unlike Rivas and Sheeran (2003), however, Keresztes et al. (2009) reported exercise prototypes as two versus one factor: “positive personality related image” and “positive fitness and health-related image.” Of both types of exercise

prototypes, those participants who were less physically active scored significantly lower on the positive-personality related prototype scale, indicating that exercise prototypes were influenced by physical activity status. Additionally, those who were higher social comparers were more likely to support positive personality-related prototypes. Similar findings were reported by Hampson, Andrews, Peterson, and Duncan (2007) , confirming that adolescents have a clear understanding of physical activity prototypes and that these prototypes are influenced by physical activity levels. The difference between levels of social comparison (e.g., high versus low social comparers) was not investigated in this study as the categorization of groups is often arbitrary (e.g., high, medium, low) and does not reflect the continuous and latent nature of the factor. Additionally, the lack of clear differentiation between groups is likely due to the population studied (adolescent girls), who have been previously reported as being frequent social comparers (Jones, 2001).

Previous research (Gibbons & Gerrard, 1995) has shown that in college freshman, social comparison moderates the impact of prototypes on anticipated risk behaviors (e.g., reckless driving, smoking, and drinking). A similar relationship was found by Ouellette et al. (2005), who reported the impact of social comparison on exercise prototypes and physical activity levels. After being asked to think about exercise prototypes (typical exercisers and non-exercisers), college students who were high social comparers were more likely to increase their exercise behavior in the future and vice versa (Ouellette et al., 2005). The current study expands on these findings by testing whether the moderational effect of social comparison occurs earlier in the behavior process outlined in the PWM. Traditionally, social comparison is analyzed as a possible moderator

between prototypes and behavior. However, one of the unique components of the PWM compared to other expectancy-value models is the heuristic path, including behavioral willingness. Behavioral willingness has been shown to strengthen the relationship between prototypes and behavior (Todd et al., 2016) because unlike intentions that are planned behavior, willingness captures reactive determinants of behavior. Due to the impact willingness has on predicting behavior, it is reasonable to question whether the moderational effects of social comparison on prototypes impacts behavior through behavioral willingness, rather than through predicted or reported behavior.

Results from this study indicate no significant moderational or mediating effect of social comparison on the relationship between physical activity prototypes and physical activity willingness. It is important not to rule out this relationship as a possibility in the model as there are multiple confounding variables that could have led to this result. Most notably, the sample in this study was homogeneous by nature (e.g., mostly white adolescent girls) and as such may have unique characteristics leading to such results. It is important to corroborate these finding in more heterogeneous populations and behaviors. Doing so would improve the overall understanding of the PWM, thereby contributing to advancement of the model.

Limitations and Future Directions

Limitations of this study should be acknowledged. In an effort to keep the questionnaire short enough to keep the adolescents' attention, only two components of the PWM (prototypes and willingness) were measured and reported. However, those constructs that

were not measured have been investigated extensively within the TRA/TPB literature and it is common practice to not report those constructs. Following methodology developed by Rivas and Sheeran (2003) and implemented by Keresztes, Piko, Gibbons, and Spielberger (2009), prototype similarity (the extent to which someone sees themselves as similar or dissimilar to the prototype) was not measured. Rather, prototype favorability (a general assessment of whether a person views the prototype as favorable) was measured. While prototype similarity and favorability are thought to be related, emerging evidence suggests that their effects differ with the former having slightly greater effect sizes (Rivas et al., 2006; van Lettow et al., 2014) and therefore, future studies should consider measuring both prototype similarity and favorability. Additionally, recent findings indicate that behavioral intentions and willingness are equally predicted by actor and abstainer prototypes (Rivis et al., 2006). Only actor prototypes were used in this study and therefore, future research should measure the relationship among behavioral willingness, behavioral intention, and physical active prototypes (actor prototype) versus sedentary prototypes (abstainer prototype). A second limitation is that actual physical activity levels and the intent to be physically active were not measured. This was a result of this study being part of a larger, different research design. While most research uses self-report data for behavior, future studies should aim to objectively measure behavior (e.g., accelerometer data for physical activity). Third, the study population was limited to adolescent girls living in South Carolina. Although research indicates there is no impact of gender on PWM application (Todd et al., 2016), replicating this study with adolescent boys is another future research direction. To better understand the predictability of the

PWM in various cultures, repeating this research with adolescents living in various, ethnically diverse areas of the U.S., is also recommended. Despite these limitations, the results from this study are novel and translational by nature. To continue the advancement of literature supporting the use of the PWM in predicting health positive behaviors, corroboration of this study is recommended.

The interaction among psychosocial, biological, and behavioral factors in health is of great interest to health practitioners and health researchers. This study is significant due to the translational nature, and novelty, of the findings. Health inequalities experienced by adolescent girls have led to a growing number of programs focused on improving adolescent girls' wellbeing. The results of this study can be implemented in many health related settings for adolescent girls, including but not limited to, physical education, health interventions, and after school programming. Finally, this research is novel in two primary ways: 1) only five studies have used the PWM to predict physical activity behavior and 2) of those studies, the population studied was late adolescents (high school or college). Thus, the current study is the first to use the PWM to better understand physical activity behaviors of early adolescent girls.

CHAPTER FIVE RESEARCH CONCLUSIONS

Conclusions

The primary purpose of this dissertation was to study the efficacy of Smart Fit Girls and to better understand the relationship between mothers' and daughters' body image and physical activity behaviors. A secondary purpose was to explore how physical activity enjoyment was impacted by social comparison likelihood in adolescent girls. Three research questions were asked: 1) What relationship exists between mothers and daughters regarding their perceived physical and emotional health? 2) Did Smart Fit Girls have any impact on participants' body image? and 3) How do physical activity prototypes impact willingness to engage in physical activity in adolescent girls? A summary of findings is listed below.

1. What relationship exists between mothers and daughters regarding their perceived physical and emotional health?

Results from chapter two indicate that there is a close relationship between a mothers' and daughters' body image and relationship with physical activity. Often, mothers do not recognize the influence they have over their daughters' health, including their daughters' relationship with food, self-perception, and physical activity behaviors. Mothers acknowledge societal pressures of being a woman and wish to communicate to their daughters how to live a healthy lifestyle within the constraints of such expectations, yet they admit to not knowing how to best communicate such concepts. Daughters are very aware of their mothers' health behaviors and perceptions of self and question if they, too,

should have such concerns. Mothers have a much greater impact on their daughters' perceived physical and emotional health than they reportedly understand. As such, interventions and community programs aimed at improving adolescent girls' health should consider including their mothers in such programming as well.

2. Did Smart Fit Girls have any impact on participants' body image?

To test the impact of Smart Fit Girls on body image, both quantitative (i.e., survey) and qualitative (i.e., focus groups) data collection procedures were used. Results suggest that Smart Fit Girls participants experience greater improvements in body image compared to girls who do not participate in Smart Fit Girls due to increased self-acceptance and changes in their expectations of what a woman's body should look like. This is the first study to analyze the impact of Smart Fit Girls on one of its program outcomes (i.e., body image). Results suggest that Smart Fit Girls is successful in accomplishing its vision of creating "a world where all adolescent girls believe in themselves and feel empowered to lead healthy, active lifestyles." The primary implication of this study is the support it provides Smart Fit Girls as an intentionally designed program as it expands across the U.S.

3. How do physical activity prototypes impact willingness to engage in physical activity in adolescent girls?

Results from chapter four demonstrate a significant relationship between physical activity prototypes and physical activity willingness in adolescent girls; the more positive the

prototype, the more likely they were willing to be physical active. This is the first study to demonstrate such relationship in adolescent girls. Given the prevalence of sedentary behavior and associated comorbidities in adolescent girls, finding ways to increase physical activity levels in this population is critical to the health of this nation. One way to go about doing so is through intentional programming for girls. Programs aimed at increasing physical activity levels in adolescents should include developing positive physical activity prototypes in adolescents so that they are more willing to be physically active in the future.

Implications for Practitioners

As a result of the applied nature of this dissertation, there are multiple implications that can be of use for practitioners in health-related fields (e.g., Parks and Recreation, Public Health Sciences, Exercise Science, etc.). These implications range from specific recommendations for organizations working with adolescent girls to more broad suggestions regarding program implementation, development, and evaluation. Four primary implications are outlined below:

1. Offer single sex programming

Smart Fit Girls was developed as a single sex program due to the data demonstrating the success of single sex programs (Sherwin, 2005). Evidence from this dissertation support previous research, suggesting that programs aimed at improving adolescent girls' health (e.g., physical activity levels, body image, self-esteem) may be more effective when done

so in single sex environments. Additionally, since adolescent girls are more likely to be overweight and/or obese (Ogden et al., 2014), sedentary (Tudor-Locke et al., 2006), and suffer from anxiety and/or depression (Ivarsson et al., 2006), it is important that evidence based programs are developed to diminish this health disparity. As previously discussed, programs tailored towards improving girls' health are becoming more prevalent (e.g., Girls on the Run and Girls Get Going) and as such, practitioners should aim to include such programs in their communities.

2. *Add psychosocial components (body image, self-esteem, etc.) to programs aimed at improving adolescent girls' health*

Evidence demonstrates a strong relationship between psychosocial health and physical health (Rosenkranz, Welk, Hastmann, & Dzewaltowski, 2011; Warburton et al., 2006). Adolescent girls are at particular risk of developing low self-esteem, poor body image (McKinley, 1999), anxiety, and depression (Ivarsson et al., 2006). Recognizing these health concerns, Healthy People 2020 added an additional topic area, adolescent health, that focuses on the goal of improving the healthy development and well-being (including mental health) of adolescents (Koh, 2010). While there are plenty of programs that focus on the physical health of adolescent girls, very few programs include a psychosocial component as well. Smart Fit Girls was intentionally designed to improve the physical and emotional health of adolescent girls, as exemplified in improvements in participants' body image. If organizations want to improve the health of adolescent girls' in their

communities, they should consider including activities geared towards improving their psychosocial health as well.

3. Include mothers as part of programming for adolescent girls

Results from this dissertation (chapter two) demonstrate a clear need for mothers to be involved, on some level, with programs aimed at improving adolescent girls' health. Programmers should consider developing education based programs aimed at teaching mothers about different forms of communication (e.g., direct vs. indirect) and the impact their communication has on their daughters' perceived physical and emotional health. Results from this study also confirmed previous findings indicating a strong positive relationship between prototypes and willingness to engage in a behavior. Efforts should be placed on improving adolescent girls' prototypes of people who are physically active so that their willingness to be physically active increases as well. This can be done on a small (e.g., more female athletic coaches in schools) or large (e.g., positive media coverage on women who are physically active) level. Additionally, including mothers in programming for adolescent girls' will likely improve their perception of physically active prototypes since mothers are a salient source of prototype development in adolescent girls.

4. Use theory in program development

In order to avoid the "black box" of programming, it is important for practitioners to include logic models (Appendix B) and theory in program development. Not only does a

logic model guide program development, implementation, and evaluation, but it demonstrates to others (e.g., public officials and funders) the program's underlying theory of action and program goals. By determining program's outcomes prior to administering programs, practitioners are better able to intentionally design a program and make appropriate adjustments when outcomes are not met. Programmers should also seriously consider using theories, such as the SDT or PWM, in the development of their program. This is typically easier said than done due to time constraints faced by most programmers. However, the powerful evidence supporting the use of theory in program development should be enough to persuade any programmer to use theory in their program development (Chen & Rossi, 1983). This dissertation confirms previous evidence demonstrating the successful application of SDT in adolescent programming (Gillison, Standage, & Skevington, 2006; Ntoumanis, 2005). The use of SDT in the development of Smart Fit Girls is outlined in Chapter Three.

5. Collaborate with local universities

This dissertation would not have been possible without collaboration between Clemson University and middle schools within the community. Where feasible, programmers should consider reaching out to local universities' and/or recreation and health related departments to assist in various steps within the programming and evaluation process. University researchers (e.g., professors and graduate students) can help with *program design* by introducing multiple theory(ies) to programmers and helping them decide which are best to guide the proposed program, assist in logic model development, and

provide an unbiased, theory driven evaluation lens on program development. University researchers can also help with *program implementation* by using undergraduate students as program organizers (e.g., coaches) and by taking advantage of the universities' space and/or equipment. Additionally, university scholars can help with *program evaluation* by advising programmers on data collection procedures including which methods to use based on program goals and outcomes and working with the university's ethics board to get approval to study and publish results from the program. Lastly, researchers can help with *human resources* by organizing field experience opportunities for undergraduate and graduate students. Doing so provides programmers with free or reduced human resources (via practicums, internships, and/or externships) to help with the following: 1) data collection and analysis, 2) marketing the program, and 3) running the daily operations of the program.

Future Research

My future research endeavors will expand upon my current research while continuing to focus on adolescent girls' and adult women's health. Areas of research focused on adolescent girls' health include: 1) objectively measuring physical activity levels of SFG participants, 2) studying the application of SFG during school time (i.e., physical education), 3) examining the impact of SFG on economically and racially disparate cohorts, 4) exploring implicit versus explicit measures of self-esteem and body image and implement in intervention evaluation when appropriate, and 5) further examining the

application of the prototype willingness model positive health behaviors (e.g., physical activity and healthy eating).

Areas of research focused on mother/daughter dyad health include: 1) creating, implementing, and evaluating Smart Fit Moms, a program aimed at improving the health of mothers as well as educating them on how to appropriately communicate with their daughters about health behaviors and 2) further examining the relationship between mothers and daughter's health, with a focus on anxiety and depression as mediating factors.

Interdisciplinary Approach

In order to best understand the interdisciplinary approach I took when theorizing, proposing, and writing my dissertation, it is important to recognize the framework from which I draw. With a Bachelor's degree in Kinesiology and a Master of Science in Exercise Science, most of my academic and research experience has been in the "hard sciences". I have worked with a variety of cohorts (obese, athletes, young, and the elderly) and in many different settings (physical activity interventions, research labs, and the community). Prior to starting my PhD, I viewed science as something that was observable, measureable, and true. For instance, I was told many times that the obesity pandemic was a simple matter of energy imbalance; obesity is measureable through ones' nutrition and physical activity. However, after working closely with overweight and obese adults, I realized that this health crisis was as much a social disease as it was a physical one. Having the ability to measure one's

joint loads and metabolic outputs while walking is helpful; however, that knowledge means nothing if we (health professionals) cannot figure out how to motivate them to walk in the first place. The behavioral component of health is precisely why I pursued a degree in a social science; to better understand why people behave in certain ways and how that behavior can be altered.

One of the most valuable lessons I have learned from the social sciences and the leisure field is the use of using different methods, specifically qualitative and mixed-method designs. Although some areas of health sciences (health promotion, public health, epidemiology) use variations of qualitative data collection and analysis, the occurrence is less frequent and the depth of using these methods is typically limited to interviews or focus groups. My experiences in the leisure field have taught me how beneficial qualitative data can be in understanding human behavior as it sheds insight into *why*, rather than just *what*, is occurring.

Challenges Faced When Synthesizing Fields

When I first started my PhD, I struggled with my own research identity. As a trained hard scientist, the subjective nature of social sciences made me uneasy. To me, data collection consisted of putting a mask on someone's face, reading the results, and comparing average pre and post markers. Admittedly, there was a stigma I associated with social sciences. I previously viewed the leisure field as an easier one and worried that I would not be challenged by my experience. Shortly after starting my PhD, however, I realized how wrong those assumptions were.

In addition to adjusting my perspective on research methods, another challenge I experienced when starting my PhD was switching my train of thought from “there is only one answer” to “maybe there are multiple answers”. I have transitioned from viewing science in black and white to appreciating the multiple shades of gray. I no longer feel ashamed of being part of a social science. Rather, I am proud of my diverse educational background and subsequently, can speak to the value of interdisciplinary approaches to research.

Impact on Education, Research, and Practice

My experience in the exercise science and parks and recreation fields has provided me with a unique perspective of research, education, and practice. The parks and recreation field has exposed me to new forms of data collection and analysis, with a focus on qualitative methods (e.g., phenomenology). The exercise science field, however, has taught me the importance of scientific rigor, specifically the value of an experimental design. As a result of these experiences, I chose to use multiple methods for my dissertation, including mixed methods. Although ideal, using an experimental or quasi-experimental design is rarely seen in the social sciences. However, my education and research past has instilled in me the importance of such a design and therefore, I used quasi-experimental design for the program evaluation section of my dissertation. Originally, I planned on using a full experimental design for Smart Fit Girls (including randomization); however, my PRTM mentors politely reminded me of the ethical issue related to limited program access based on

randomization. In other words, randomly choosing which girls would be able to participate in SFG out of all the girls who expressed interest in participating can be unethical. My experience in social science has taught me that social research commonly impacts participants' lives to a greater extent than in the hard sciences, and as a result, participants should be thought of as more than just research subjects.

The diversity in my research and education has also made me realize the importance of a multidisciplinary approach to research and practice. Prior to starting my PhD, a multidisciplinary approach to health consisted of a collaboration among nutrition, exercise science, and the public health departments. However, I now realize the value of collaborating with many health researchers and professionals, including but not limited to: parks and recreation, sociology, and health psychology. For example, during a Research Forum at Clemson University I met Dr. Erin Ash, an Assistant Professor in the Communication Studies Department at Clemson University. Dr. Ash's research involves media based stereotyping in various social groups and during the research forum, we discussed collaborating to make a media education lesson plan for Smart Fit Girls. Had I never worked in the social sciences, I believe my perspective of health research would have been limited and subsequently, I may not have been open to the idea of working with professionals in non-traditional health fields.

My experience as a PhD student at Clemson University has left me with more questions than answers; however, I would argue this is the point of higher

education. Questioning one's own opinions and thoughts is a difficult and uncomfortable task. Yet, without this process one is likely to be limited in their research and practice. I am grateful for the experiences Clemson has afforded me, particularly the opportunity to approach my dissertation using an interdisciplinary lens.

Summary

Adolescence is acknowledged as a difficult period of life, during which physical activity participation is influenced by biological, environmental, and psychological factors (Garcia et al., 1998). Compared to adolescent boys, girls are less likely to meet the physical activity guidelines for youth (Tudor-Locke et al., 2006) and more likely to be overweight or obese (Ogden et al., 2014). An additional health disparity adolescent girls experience is that of their psychosocial health. Adolescent girls are more likely to suffer anxiety and depression (Ivarsson et al., 2006) compared to boys. The primary purpose of this study was to explore the effectiveness of Smart Fit Girls and to better understand how physical activity and mother/daughter relationships affect adolescent girls' perceived physical and emotional health. A secondary purpose was to explore how comparing oneself to individuals who are physically active impacts physical activity enjoyment.

This study demonstrated that Smart Fit Girls is an effective intervention for improving adolescent girls' body image. Both quantitative and qualitative data suggest that adolescent girls who participate in Smart Fit Girls experience an increase in body image as a result of the program. Not only do results reveal improvements in body image

through program participation, but add clarifying information as to why and how those improvements were made; body image improved because of a shift in how the girls viewed themselves and other women. Smart Fit Girls was successful in providing another source of body image development through the deconstruction of previously developed body image ideals, thereby breaking the cycle of body dissatisfaction behavior modeling.

This study also demonstrated that communication between mothers and daughters pertaining to health and body image are perceived by mothers and daughters as challenging, complex, and uncomfortable. Mothers may not be aware of the frequency of their negative self-talk and/or may be unaware of the damage such indirect health communication has on their daughters. Daughters are also very aware of their mothers' health concerns and express frustration with their mothers' dieting and physical activity behaviors. The level of frustration daughters expressed when describing their mothers' relationship with physical activity suggests that their perception of physical activity is impacted by their mothers' personal experiences. Therefore, not only do *actual* health behaviors get “passed down” from mothers to daughters, but mothers' *perceptions* of their health (body image, opinion of physical activity, etc.) get “passed down” as well.

Lastly, this study demonstrates that a significant positive relationship exists between physical activity prototypes (how we view people who are physically active) and physical activity willingness in adolescent girls. This suggests that health-protective behaviors may be influenced by behavioral willingness as much as behavioral intentions. The clinical significance of this finding is that programs aimed at increasing physical activity levels in adolescents should aim to include developing positive physical activity

prototypes in adolescents (e.g., girls who are physically active are “cool”) so that they are more willing to be physically active in the future. A theoretical contribution of this study includes expanding the application of the PWM to health-protective behaviors (rather than just health-risk behaviors), thereby contributing to the advancement of the model.

In sum, this dissertation sought to explore how to improve the health of adolescent girls and their mothers. This was done through the investigation of Smart Fit Girls, an analysis of mother/daughter relationships, and the application of the PWM on physical activity in adolescent girls. Information gathered from each manuscript will be used to pursue future research interests and scholarly activities. Moreover, the lessons learned through the process of writing this dissertation will remain with me as I continue my career in academia.

APPENDICES

Appendix A Smart Fit Girls Curriculum

Week 1	
Day 1	<ol style="list-style-type: none"> 1) Ice breaker (Circle of Truths) 2) What it means to be a Smart Fit Girl 3) Draw yourself activity
Day 2	<ol style="list-style-type: none"> 1) Ice breaker (Animal Noises) 2) Pre questionnaire & fitness assessment & SMART goals
Week 2	
Day 1	<ol style="list-style-type: none"> 1) Upper body anatomy 2) Coach led upper body group workout
Day 2	<ol style="list-style-type: none"> 1) Lower Body Anatomy 2) Coach led lower body group workout
Week 3	
Day 1	<ol style="list-style-type: none"> 1) Core anatomy + coach led core group workout 2) DOVE: Tummy Twists
Day 2	<ol style="list-style-type: none"> 1) At home workout discussion and workout 2) Nutrition 101
Week 4	
Day 1	<ol style="list-style-type: none"> 1) Self-Esteem, Body Image, and Self-Efficacy Discussion 2) Whiteboard activity & SMART goal check In
Day 2	<ol style="list-style-type: none"> 1) Sticky note activity 2) Coach led workout
Week 5	
Day 1	<ol style="list-style-type: none"> 1) Introduction to media manipulation and prep 2) Lifting game: Lift to music
Day 2	<ol style="list-style-type: none"> 1) DOVE: Media manipulation 2) Lifting game: Circuit
Week 6	
Day 1	<ol style="list-style-type: none"> 1) The art of positive thoughts 2) Lifting game: Team upper and team lower
Day 2	<ol style="list-style-type: none"> 1) Guest instructor 2) Anti-bullying activity
Week 7	
Day 1	<ol style="list-style-type: none"> 1) DOVE: Express yourself
Day 2	<ol style="list-style-type: none"> 1) Vision board 2) Lifting game: Girls' choice
Week 8	
Day 1	<ol style="list-style-type: none"> 1) Extra Day: Make up missed lesson(s) or participate in girls' choice of activity
Day 2	<ol style="list-style-type: none"> 3) Coaches Choice: Create original activity or use one of the suggested activities
Week 9	
Day 1	<ol style="list-style-type: none"> 1) Family workout creation and practice: Warm up 2) Lifting game: Girls' choice
Day 2	<ol style="list-style-type: none"> 1) Finish vision board 2) Family workout creation and practice: Workout
Week 10	
Day 1	<ol style="list-style-type: none"> 1) Post questionnaire & fitness assessment 2) Practice family workout: warm up, workout, & cool down
Day 2	<ol style="list-style-type: none"> 1) SFG recap & SMART goal check in 2) Family workout set up and practice 3:30-5:30 <p>***Family Workout 5:30-7pm</p>

**Appendix B
Logic Model**

Inputs	Activities	Outputs	Outcomes	Impacts
<ol style="list-style-type: none"> 1. Volunteer coaches 2. Weight lifting equipment 3. Food for nutrition 101 4. Plates, napkins, cups, & cutlery 5. Awards 6. Computer 7. Music 8. Internet for videos 9. Art supplies (markers, glue, pens, scissors, tape, paper, etc.) 10. Old Magazines 11. Journals 12. Lesson plan 13. Program binder 14. Registration forms, pre and post questionnaires 15. T-shirts 	<ol style="list-style-type: none"> 1. Teach basic anatomy & nutrition 2. Watch videos about media manipulation, body image, & anti-bullying 3. Guest instructors teach yoga and dance 4. Teach different weight lifting exercises 5. Teachers/staff workout night 6. Family workout graduation 	<ol style="list-style-type: none"> 1. 18 workouts 2. 18 self-esteem, body image, and physical activity motivating discussions 3. 15 journals 	<ol style="list-style-type: none"> 1. 75% of the girls will have significantly improved body image, self-esteem, and physical activity enjoyment markers by the end of the program. 2. 50% of the girls will have met and maintained their SMART goal(s) by the end of the program. 3. 30% of the girls will decrease their level of social comparison by the end of the program. 	<ol style="list-style-type: none"> 1. Girls will experience improved psychosocial and physical health 2. Girls will feel more comfortable using positive self-talk and lifting weights 3. The girls will feel more comfortable talking with their parents about physical activity, nutrition, body image, and self-esteem 4. The girls will grow up to be strong, empowered women

Appendix C Daughters' Focus Group Questions

*Crossed out questions indicate questions that were deleted from the focus group questions fall of 2015. Italicized questions indicate questions that were asked as part of the larger Smart Fit Girls study.

Fall 2014-fall 2016

1. *What were some of your favorite moments at Smart Fit Girls and what made them your favorite?*
2. *How do you think Smart Fit Girls has impacted you as a person?*
3. *Have you spoken to your friends or family about Smart Fit Girls? If so, what have you told them?*
4. ~~How do you think we can improve the program? What other activities or discussion topics would you like us to include? What other activities or discussion topics would you like us to include?~~
5. *Has the way you looked/ thought about yourself changed during SFG? Why or why not?*
6. ~~What is the first thing you think of when you think about the term physical activity or exercise?~~
7. ~~What does the terms body image mean to you?~~
8. ~~What does the term self-esteem mean to you?~~
9. Do you and your mother do any physical activities together? If so, what kind?
10. Have you always done these activities with each other?
11. *Has the amount or type of physical activity you participate in with your mom changed since joining Smart Fit Girls?*
12. Do you remember your mom talking to you about your image or self-esteem? If yes, can you tell us the story of how that went?
13. Have you ever spoken to your mom about her self-esteem or body image? If yes, what did that conversation look like?
14. Finally, is there anything else you'd like to share with us today?

Added to previous questions listed above fall 2016:

15. *Our research indicates that girls who participate in Smart Fit Girls experience increases in self-esteem, body image, and physical activity self-efficacy. Why do you think that's the case?*
16. *Has SFG sparked your interest in participating in any other leisure activities (e.g., trying out for a school sport)? Why or why not?*
17. *During Smart Fit Girls did you ever feel a sense of connection with the coaches or the other girls? If so, please describe.*
18. Do you think the amount that girls compare themselves to other girls impacts whether or not she participates in physical activity? Why or why not?
19. Which do you think is more impactful to your health behaviors (e.g., getting physical activity and eating healthy): your mother's own health or the amount of

support (e.g., driving you to practice, attending her events, etc.) your mom gives you for YOUR health behaviors? Why?

Appendix D Mothers' Focus Group Questions

*Crossed out questions indicate questions that were deleted from the focus group questions fall of 2015. Italicized questions indicate questions that were asked as part of the larger Smart Fit Girls study.

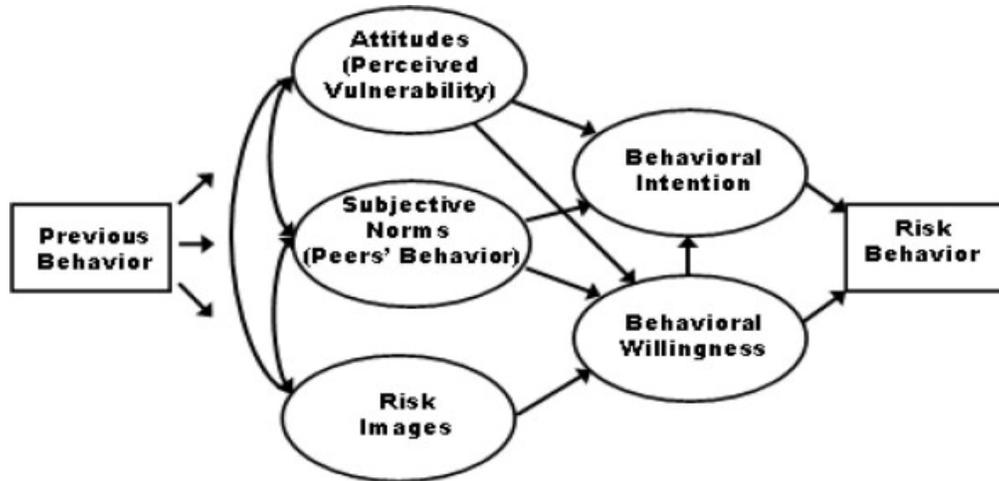
Fall 2014-fall 2016

1. *Has your daughter ever spoken to your or other family members about Smart Fit Girls?*
 - a. *If so, when what did they tell you?*
2. *Do you think Smart Fit Girls had any impact on your daughter? If so, how?*
3. *Has the way you looked or thought about yourself changed while your daughter was participating in SFG? If yes, how?*
4. ~~Based on what your knowledge and experience with Smart Fit Girls, is there anything you would like to see added or changed to the program?~~
5. ~~What is the first thing you think of when you think about the term physical activity or exercise?~~
6. Do you and your daughter do any physical activities together? If so, what kind?
 - a. Have you always done these activities with each other?
7. ~~What does the terms body image mean to you?~~
8. ~~What does the term self-esteem mean to you?~~
9. ~~How do these terms relate to being a woman?~~
10. Have you ever spoken to your daughter about her self-esteem or body image? If yes, what did that conversation look like?
11. Do you remember your daughter talking to you about your body image or self-esteem? If yes, please describe your experiences.
12. Finally, is there anything else you'd like to share with us today?

Added to previous questions listed above fall 2016:

13. *Do you think Smart Fit Girls has impacted your daughter's self-efficacy or confidence? Why or why not?*
14. *Has your daughter showed interest in or started participating in other leisure activities (e.g., trying out for school sports) as a result of participating in SFG? If so, please explain.*
15. Do you think the amount that girls compare themselves to other girls impacts whether or not she participates in physical activity? Why or why not?
16. Which do you think is more impactful to your daughters' health behaviors (e.g., getting physical activity and eating healthy): your own health behaviors or the amount of support (e.g., encouraging her to be physically active, providing transportation to her physically active events, etc.) you give your daughter for her health behaviors? Why?

Appendix E
Prototype Willingness Model



Gerrard, M., Gibbons, F. X., Houlihan, A. E., Stock, M. L., & Pomery, E. A. (2008). A dual-process approach to health risk decision making: The prototype willingness model. *Developmental Review, 28*(1), 29-61.
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