A CASE STUDY OF A GIRLS' EXERGAMING PHYSICAL ACTIVITY PROGRAM

by

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For my parents, Jongsil Oh & Sunsook Jeon

ABSTRACT

Girls 6 to 19 years old have the highest rates of obesity with about thirty percent being obese in the US (Ogden et al., 2006). Researchers studying the prevention of childhood obesity are examining exergames because playing video games is popular among youth (Rideout, Foehr, & Roberts, 2010). Recent research has mainly focused on energy expenditures during exergame play (Lanningham-Foster et al., 2006; Unnithan et al., 2006; Graves et al., 2007; Maddison et al., 2007; Mellecker & McManus, 2008). Exergaming is playingvideo games that require players' physical exertion (Oh & Yang, 2010).

This dissertation explores how a walking support group centered around the video games Pokémon HeartGold and Soulsilver affected girls' daily physical activity levels and attitudes towards physical activity. Taking a qualitative case study (Stake, 1995) approach, this study uncovered the challenges girls at risk face in their lives and how these exergames are used in the real world by providing detailed descriptions. Consistent with previous literature (Taylor et al., 2000; Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003), social support was an important factor for building communities and promoting girl's physical activity.

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CHAPTER 1. Introduction

The Problem

Overweight and obese children and adolescents are big health concerns in the world (Deckelbaum & Williams, 2001). Thirty-four percent of adolescents in the U.S. are either overweight (i.e., BMI ≥ 85th percentile) or obese (i.e., BMI ≥ 95th percentile; Ogden, Carroll, & Flegal, 2008). Seventeen percent of adolescents are obese (Ogden et al., 2008), and this number has been increasing over recent years. Obesity increases the risk of chronic health problems, including type II diabetes and cardiovascular diseases. This is not only health problem as it also costs a significant amount of money to treat obesity-associated illnesses. According to Wang and Dietz (2002), obesity-associated annual hospital costs in youth from 6 to 17 years old increased more than threefold since 1979 to 1999 ($35 million dollars during 1979-1981 and $127 million dollars during 1997 to 1999).

When people are overweight as an adolescent, they are likely to be overweight as an adult (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Early prevention is key in averting this crisis. Overweight and obese status has resulted in an imbalance between food intake and energy expenditure. As for energy expenditure, doing physical activity is important and U.S. has been working on promoting physical activities. The CDC physical activity guidelines (U.S. Department of Health & Human Services, 2008) recommend a minimum duration of moderate to vigorous physical activities to have health benefits. For example, children who are between 6-17 years old should participate in moderate to vigorous physical activity at least one hour everyday.

We need to promote physical activity especially to female children and adolescents. Among young females aged 6 to 11 years old, 37.2 percent are at risk of being overweight or are overweight in 2003-2004 (Ogden et al., 2006); this is the greatest percentage among the demographics studied. Girls consistently show lower physical activity levels compared to boys

(Trost et al., 2002; Scruggs, Mungen, & Oh, 2010b; Scruggs, Mungen, & Oh, 2010a) and also decrease their physical activity level over time (Kimm et al., 2002; Trost et al., 2002).

There have been few physical activity interventions for only girls; those that exist focus on their physical activity levels via physical activity recall and other quantitative measures such as pedometers and accelerometers (Pate et al., 2005; Webber et al., 2008). However, their results are mixed, and they often don't provide the details of interventions and feedback from study participants. Since the research has analyzed changes with only quantitative data, it is hard to gain insight of what people think about interventions and what motivates or demotivates people to move.

What particular forms of interventions might be most effective for girls? Research on women may provide some insight on interventions for girls. Research has shown that one important factor for women to sustain a physically active lifestyle is social support from one's family and friends (Eyler et al., 1999). Previous programs that focused on increasing girls' physical activity, like the Lifestyle Education for Activity Program (Pate et al., 2005) and the Trial of Activity for Adolescent Girls (Webber et al., 2008) paid little attention to building a social community. As a form of communities of practice to become active, sociocultural theory (e.g., Vygotsky, 1978; Lave & Wenger, 1991) which focuses on learning via social interactions, may serve an important role in the intervention.

Video games appear particularly good at fostering communities in which members develop a strong social affinity by bonding with each other through "common endeavor[s]" (Gee, 2003, p. 192). Steinkuehler (2006) further explains that video game communities are "naturally occurring, self-sustaining" learning environments (p. 98). Such research suggested that video games that promote physical activity—exergaming— may be one productive model for physical activity interventions that target young women.

The most well known example is Dance, Dance, Revolution (DDR). When a young woman lost 95 pounds by only playing DDR, the possibility of using DDR as a weight loss program was highlighted in the media (Bogost, 2007). Research shows that the intensity of children playing DDR meets the minimum recommendation to improve or maintain cardiorespiratory fitness set by American College of Sports & Medicine (Tan, Aziz, Chua, & Teh, 2002; Unnithan, Houser, & Fernhall, 2006). This means that children can have health benefits by just playing DDR for about an hour everyday.

Other exergame research frequently focuses (e.g., Tan et al., 2002; Lanningham-Foster et al., 2006; Unnithan et al., 2006; Graves, Stratton, Ridgers, & Cable, 2007; Maddison et al., 2007; Mellecker & McManus, 2008) on physiological effects of exergames in short playing periods (15 minutes to an hour) in labs compared to playing other video games while sitting down.

Children showed a greater energy expenditure when they played exergames compared to sedentary video games (Tan et al., 2002; Lanningham-Foster et al., 2006; Unnithan et al., 2006; Graves, Stratton, Ridgers, & Cable, 2007; Maddison et al., 2007; Mellecker & McManus, 2008). Currently, there is no research on exergaming and its communities from a sociocultural perspective, and we don't know whether sedentary adolescents sustain exergaming for longer periods of time.

Purpose Statement and Research Questions

This dissertation explored how a walking support group centered around exergames affects teenage girls for improving their daily physical activity levels. To shed light on the problem, the following research questions are addressed:

1a. What knowledge do members gain about physical activity and pokémon through participation in the group?

1b. How do their BMI, physical activity levels and attitudes change as a result of participation in the group?

1c. Do these changes last after the program's end?

2a. What is the nature of the support group?

2b. Do participants' relationships endure?

Dissertation Overview

In Chapter 2, I review the definitions and effectiveness of exergames and exergaming. I discuss the inconsistent terms and definitions used for exergame by health-related and non health-related researchers. I then review physical activity intervention studies for girls and sociocultural learning in gaming communities.

Chapter 3 details the methodology including data collection and analysis for this qualitative case study. In chapters 4-6, I present the findings and analysis of the study. Chapter 4 provides detailed descriptions of the day-by-day meetings. I analyze the girls' stories in chapter 5 and their use of the pokéwalker in chapter 6. The final chapter synthesizes the findings of the study and discusses future directions.

CHAPTER 2. Literature Review

This section I review literatures on exergames and its definition. Next, I summarize exergames' effectiveness from the previous studies. I also look at research on physical activity interventions for girls only. As the theoretical frame, I review sociocultural perspectives on gaming communities.

Definitions of Exergames & Exergaming[1]

Researchers have recommended reducing sedentary activities, such as watching television and playing videogames, to prevent obesity (Epstein et al., 1995; Robinson, 1999; Rosenberg, Bull, Marshall, Sallis, & Bauman, 2008). For example, Robinson' (1999) physical activity intervention research showed that children who were asked to reduce sedentary behaviors lowered the percent of members overweight and their percent body fat more than another group with children who were asked to do more exercise and a final group who were asked to both reduce sedentary

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behaviors and increase exercise. Although the authors did not include behaviors like doing homework, reading for school or pleasure, and listening to music as target sedentary activities in their analysis, they considered playing video games as a sedentary activity. This ignores video games that allow players to be active, such as Nintendo Entertainment System's *World Class Track Meet (WCTM),* which was released in 1988 (Bogost, 2007). Playing *WCTM* requires players to move their feet similar to walking, running, or jumping on a power pad, a foot pad that has circles each with sensors that recognizes the player's movement, in order to play it. Even though *WCTM* was released in 1988 (Bogost, 2007) and dozens of other such games, consoles, and peripherals have been on the market (Yang, Smith, & Graham, 2008), many researchers still consider playing video games to be a sedentary behavior (e.g., Rosenberg et al., 2008).

The inconsistent use of terminology and definitions

There is a small but growing group of researchers who recognize that playing video games is not always sedentary. Because this area of study is still in "its infancy" (Yang et al., 2008), researchers have used numerous terms to describe these kinds of video game play (see Table 1) and as components of these descriptions (see Table 2). Out of 23 articles reviewed, 10 of the authors chose the term "exergame", which is the most frequent term in the literature (see Table 1). The other authors used terms such as exertainment, dance simulation video game, interactive video game, activity promoting video game, active video game, physical gaming, (kin)aesthetic

video game, and physical activity-change game. TA pattern is apparent after dividing the first authors by whether they are in health-related areas like kinesiology, nutrition science and medical science or not. I reviewed the articles based on where they were published and authors affiliation to decide whether authors are health-related researchers or not.

As you can see from Table 1, health-related researchers showed an inconsistent use in terminology compared to those who are not in health-related fields. Only two health-related researchers used the term exergame (Maddison et al., 2007; Yang et al., 2008). First-authors who are not in health-related areas all used the term exergame (Bogost, 2005; Behrenshausen, 2007; Bogost, 2007; Sall & Grinter, 2007; Sinclair, Hingston, & Masek, 2007; Suhonen, Väätäjä, Virtanen, & Raisamo, 2008; Wylie & Coulton, 2008; Adams et al., 2009; Klein & Simmers, 2009; Sinclair, Hingston, Masek, & Nosaka, 2009).

After I looked at the elements of these various terms used (see Table 2), eleven out of fifteen health-related researchers described the elements as combining videogames and physical activity (Maddison et al., 2007; Suhonen et al., 2008; Yang et al., 2008; Adams et al., 2009). Six out of eight non-health related researchers used Bogost's (2007) definition combining exercise and videogames (Sall & Grinter, 2007; Sinclair et al., 2007; Suhonen et al., 2008; Wylie & Coulton, 2008; Klein & Simmers, 2009).

This reflects a possible disagreement over the term among researchers. While the term

exergame is frequently used the most, why do health-related researchers disagree about using the term exergames? This inconsistency in terminology causes confusion and makes communication among researchers more difficult.

Terms used by health-related researchers

Researchers, especially those who study health-related areas, showed inconsistent term use to describe these video games, and many of them were reluctant to use the term "exergaming" (see Table 1). Although health-related researcher terms varied, their definitions shared a common purpose in increasing the level of physical activity (see Table 2). Researchers who used the term *activity promoting* and *active video game* defined them by using the same word. For example, *activity promoting video games* were defined as video games that "have the potential to promote physical activity during screen time" (Lanningham-Foster et al., 2006, p. e1832), and *active video games* "might provide a novel opportunity to turn a traditionally sedentary behavior into a physically active one" (Maddison, 2007, p. 335). The main idea of using these terms is to distinguish playing video games that promote active behavior from those that result in a sedentary one.

Four studies used the term *interactive video game* (DiRico et al., 2009; Epstein, Beecher, Graf, & Roemmich, 2007; Warburton et al., 2007; Schuler & Paradise., 2009). Epstein et al. (2007) is the only one who defined this term, saying that *interactive video games* "use physical

activity as the game playing controller, combining exercise and video game entertainment" (p. 124). However, video games are all interactive because one distinguishing element for video games is "immediate and interactive feedback" (Salen & Zimmerman, 2004, p. 87). Since this term potentially includes most of video games whether they are sedentary or not, the term "interactive video game" may fail to specify the physical nature of exergaming.

Tan et al. (2002) and Unnithan et al., (2006) used the term *dance simulation* for describing *Dance Dance Revolution* (*DDR*). Although Chin, Jacobs, Vaessen, Titze, & van Mechelen (2008) also used the same term, it is hard to guess what dance simulation meant for them since they did not state which video games they used in the study. Without knowing the definition for the term and inferring it from the one example of *DDR*, it is difficult to apply the term to other games. Dance simulation might include games like *Britney's Dance Beat*. *Britney's Dance Beat* is similar to *DDR* except it does not use a dance pad and instead only uses a hand-held game controller, which makes the game primarily a sedentary one. The term "dance simulation" may therefore not be able to distinguish between playing videogames that are sedentary from more active play.

Table 1

Various terms for exergames

		Exergame (10)	Exertainment (2)	Dance simulation video game (3)	Interactive video game (4)	Activity promoting video game (3)	Active video game (5)	Physical gaming (1)	(Kin)aesthetic of video gaming (1)	Physical activity-change games (1)
Health-related researchers	Tan et al. (2002)			√						
	Unnithan et al.(2006)			√						
	Chin A Paw et al.(2008)			√			√			
	DiRico et al. (2009)				√					
	Schuler et al. (2009)				√					
	Epstein et al. (2007)		√		√					
	Warburton et al. (2007)				√					
	Lannigham-Foster et al. (2006; 2009)					√				
	Graves et al. (2007)					√				
	de Vries et al. (2009)						√			
	Brown et al. (2009)						√			
	Mellecker et al. (2008)		√				√			
	Baranowski et al. (2008)					√				√
	Maddison et al. (2007)	√					√			
	Yang et al. (2008; 2009)	√								
Non-Health related researchers	Bogost (2005; 2007)	√								
	Sinclair et al. (2007; 2009)	√								
	Sall et al. (2007)	√						√		
	Behrenshausen (2007)	√							√	
	Klein at al. (2008)	√								
	Wylie (2008)	√								
	Suhonen (2008)	√								
	Adams (2009)	√								

Table 2

Elements of definitions of exergame

		Videogame(23)	Physical Activity(14)	Exercise (8)	Physical input device(2)	Exercise equipment(1)
Health-related researchers	Tan et al. (2002)	√				
	Unnithan et al. (2006)	√				
	Chin A Paw et al. (2008)	√	√			
	DiRico et al. (2009)	√	√			
	Schuler et al. (2009)	√				
	Epstein et al. (2007)	√	√	√		
	Warburton et al. (2007)	√		√		
	Lannigham-Foster et al. (2006; 2009)	√	√			
	Graves et al. (2007)	√	√			
	de Vries et al. (2009)	√	√			
	Brown et al. (2009)	√	√			
	Mellecker et al. (2008)	√	√			
	Baranowski et al. (2008)	√	√			
	Maddison et al. (2007)	√	√			
	Yang et al. (2008; 2009)	√	√			
Non-Health related researchers	Bogost (2005; 2007)	√		√	√	
	Sinclair et al. (2007; 2009)	√		√		√
	Sall et al. (2007)	√	√	√	√	
	Behrenshausen (2007)	√		√		
	Klein at al. (2008)	√		√		
	Wylie (2008)	√		√		
	Suhonen (2008)	√	√			
	Adams (2009)	√	√			

Exergame

Exergame was the most commonly used term primarily by researchers who do not have a heath-related background. Since the term "exergame" is the most frequently used in the literature and in the media and is a catchy word, I propose to continue using this term; however, I may need to take a deep look in its definition. Bogost (2007) stated that "exergaming is the combination of exercise and video games" (p. 294) and referenced a WebMD article by a medical journalist (see Lawrence, 2005). As such, it may help us to understand the term better after knowing what each of these words mean.

There are competing definitions of what video games are (see Salen & Zimmerman, 2004). For the purpose of defining exergames, a simpler definition will work. A video game is "any game played on a digital device and encompasses a wide range of games played at arcades, …on personal computers, or on dedicated game consoles (e.g., Nintendo GameCube, Sony PlayStation, or Microsoft Xbox) or handheld units (e.g., Nintendo Game Boy, Sony PSP)" (Baranowski, Buday, Thompson, & Baranowski, 2007, p. 74). For example, Go played on a physical Go board is not a videogame, but Go played on a digital device like a computer or any other gaming console is considered a videogame.

Lawrence's (2005) article title is "Exercise, lose weight with 'exergaming' – new 'active' video games combine body movement with gaming skill." She lists both exercise and body

movement which can interpreted as physical activity to describe exergaming. Since people often conflate the term exercise with physical activity (Caspersen, Powell, & Christenson, 1985), it is unclear whether she considered them different or not. In health studies, physical activity and exercise have different meanings. Physical activity is "any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen et al., 1985, p. 126). For example, physical activities include doing dishes, driving a car, sitting down and drawing pictures. Even sleeping is a physical activity, albeit one that is very sedentary. Because physical activity includes wide range of body movements, exergames should be combination of videogames and physical activity that is more than sedentary.

If we go back to Bogost's (2007) definition of exergames, a "combination of exercise and video games", exergaming may refer to playing a video game for exercise.

The problem of using the "exer-" part of "exergaming" from exercise is that researchers who have used it did not use "exercise" with a precise definition. Researchers instead used exercise in terms of being active.

Of 23 first-authors, 14 indicated that exergames are video games that can increase physical activity level. Only 8 out of 23 first authors indicated it is combination of video game and exercise; however, none of them stated what exercise meant or incorporated a definition of

exercise. They considered an exergame to be a video game that requires more than sedentary levels of physical activity.

Wylie & Coulton (2008) defined exergaming as "video games that also provide exercise" (p. 338) and this is similar to Bogost's (2007) perspective. Klein & Simmers, (2009, p. 35) defined exergaming as "the ability to tie video games and exercise into a single medium for the benefit of making exercise fun" by referencing Sall & Grinter's (2007) study, although Sall & Grinter (2007) defined exergaming more simply as "tying play to physical activity" (p. 200).

Problems for the definition of exergame

Using the term "exergame" to define video games that promote physical activity has some problems because of the "exercise" part. Exercise is a subset of physical activity, but specific conditions distinguish it. Exercise is doing physical activity "intentionally to improve or maintain physical fitness with a planned, repetitive, and structured format" (Caspersen et al., 1985, p. 126). In using exercise as a root word, it implies that all movements and physical motions were planned, structured and has a definite outcome.

In applying the current definition of exercise to exergames, there are some potential conflicts. To be an exercise, the activity needs an intention to maintain and improve physical

fitness and do the actions repetitively in a structured format. In this case, intention matters as when two people play *DDR* at a similar level. One wants to use this play to lose weight and the other one has no such similar intention. Although they are physically active and spending more energy than if they were sitting and talking, only the one who thought of the play in terms of fitness can call it *exergaming.*

From this viewpoint, using the definition of "exercise" for exergames may be problematic for promoting physical activity because it won't count some healthy behaviors without the intention to maintain or improve fitness. From a health benefit standpoint, some physical activity is better than nothing (U.S. Department of Health & Human Services, 2008). For an adult, participating in a minimum of 30 minutes of moderate physical activity (e.g., walking) is recommended to get the minimum health benefit.

Keeping in mind both the definitions of video game and exercise, exergaming may look as follows: Someone can call playing the video game *Wii Fit yoga* exergaming only if he/she plays it with the intention to maintain fitness (here, balance and flexibility) and does so regularly in a structured format with planning. This means that playing *Wii Fit yoga* without having any intention to improve or maintain physical fitness (e.g., because it's fun) may not be an instance of exergaming, even though the activity itself may look same. Because the definition of exercise

relies heavily on the player's intentions and behaviors, it is extremely difficult to call a video game an exergame.

Another problem of using this definition of "exercise" for exergames is that it may include sedentary activity as well. Physical fitness comprises two groups: One is health-related, and the other one is skill-related. The health-related physical fitness components are cardiorespiratory endurance, muscular endurance, strength, body composition, and flexibility (Caspersen et al., 1985). The skill-related physical fitness components are agility, balance, coordination, speed, power, and reaction time (Caspersen et al., 1985). Since physical fitness components also include flexibility, balance, coordination, and reaction time, physical activity working on these components may include playing video game that result in sedentary activity.

The coordination and reaction time components are prevalent in many video games but the activity may not contribute to one's health. If people continue to use the traditional definition of exercise in exergaming, someone can also claim playing a first person shooter game, such as *Team Fortress 2* (*TF2*), by sitting on a chair and using a mouse or traditional handheld controller is exergaming. He/she may want to improve hand-eye coordination and reaction time and does so repetitively in a planned and structured format. Although coordination and reaction time are included as components of physical fitness, playing *TF2* this way is a sedentary physical activity.

This definition may thus be unhelpful in distinguishing sedentary and non-sedentary video games.

This suggests that the media (e.g., Lawrence, 2005) may have started using exercise to create exergame without considering its traditional definition (Casperson et al., 1985), instead using it rather loosely to mean being physically active. Doing so implies some video games allow players to be active. Researchers from non-health backgrounds may have adopted this use since none appear to examine the definition of exercise critically when referring to exergaming. When we looked at the definition of exercise, it is problematic to call video games as exegames unless knowing players' intention and playing behaviors.

Other definitions of exergames

Some researchers added promoting "physical activity" or "exercise equipment" in addition to "exercise" in their definitions. Yang, Treece, Miklas, & Graham (2009) stated exergaming is "a new form of video game interaction that requires the game player to physically move in order to play." Similar to Yang et al. (2009) and Adams et al., (2009) defined it more specifically as "videogames that use exertion-based interfaces to promote physical activity, fitness, and gross motor skill development."

Some researchers mentioned exergaming but did not prefer to use that term. Maddison et al. (2007) referenced the term exergame in their study, but they used the term only once, instead preferring the term active video game. Similar to Maddison et al. (2007), Sall & Grinter (2007) used the term exergame, but used the term "physical gaming" more than exergaming, and defined it as "a genre of games that uses individual player's physical movement as input for gameplay" (p. 200). These researchers defined exergaming as video games that promote active physical activity.

Sinclair et al. (2007) defined exergaming as "the use of video games in exercise activity" (p. 289). This definition seems to be similar to Bogost's (2007) definition, but Sinclaire et al. (2007) also defined this by additionally defining exergaming as "the merger of video game and exercise equipment" (p. 289). The authors explained their examples of exergaming systems as an exercise bike connected to computer games, foot operated pads for the video games like *WCTM* and *DDR*, and motion sensors for the Sony *EyeToy* and Nintendo *Wii*.

For example, Warburton et al. (2007) used a racing video game that does not require players to be active, but by adding a stationary bike as the primary controller the game becomes more active rather than just sitting. If a player chooses to play the same racing video game without having a stationary bike, he/she will be participating in sedentary activity. It is also

difficult to call the racing video game that was not built for stationary biking as an exergame, but the activity itself can be exergaming when playing video games on an exercise machines.

Exergaming for healthy lifestyles

As mentioned earlier in this paper that I consider exergaming as providing more than sedentary physical activity during play. How do people know which video games provide moderate physical activity during play? There are two ways to assess aerobic intensity: absolute intensity and relative intensity. In absolute terms, moderate to vigorous intensity is at least 3.0 metabolic equivalents (MET), where "a MET is the ratio of the rate of energy expended during an activity to the rate of energy expended at rest." (U.S. Department of Health & Human Services, 2008, p.54). An example of an absolute moderate intensity activity is walking at 3.0 miles per hour, which is 3.3 METs (U.S. Department of Health & Human Services, 2008, p. 55).

Walking at 3.0 miles per hour may feel differently based on one's figure and fitness level. For example, an overweight person may feel tired and exhausted at this level while a fit person may not. Since everyone has a different figure and fitness level, relative intensity is also important to consider intensity. The 2008 physical activity guidelines used the simpler definition that a "relatively moderate-intensity activity is a level of effort of 5 or 6 on a scale of 0 to 10, where 0 is the level of sitting, and 10 is maximal effort. Relatively vigorous-intensity activity is a 7 or 8 on this scale" (U.S. Department of Health & Human Services, 2008, p. 55) Using this

recommendation of moderate to vigorous physical activity focused on cardiorespiratory endurance will provide health benefits.

If one tried to improve one's balance by playing *Wii Fit* balance games, the player will probably not expend enough energy to meet this recommendation. However, since people need to improve all around health-related fitness components, considering only energy expenditure is problematic.

Since exergaming researchers, especially those who have health-related backgrounds, wanted to see if exergaming has a potential to improve people's health, we would like to include some sedentary physical activities focused on the all health-related fitness components and one skill-related component. If we review them again, health-related fitness components are cardiorespiratory endurance, muscular endurance, strength, body composition, and flexibility. We would also like to include balance from the skill-related physical fitness components since it is critical in maintaining one's health, especially for older adults. The 2008 physical activity guidelines for Americans specified the importance of balance activities for older people who are at risk of falling (U.S. Department of Health & Human Services, 2008). By including this one skill-related component, we avoid having the majority of sedentary skill-based games, like *TF2*, considered exergames.

After reviewing the literature, many researchers used exergaming to indicate a healthy lifestyle activity. Given consideration of Casperson et al. (1985)'s exercise definition, I propose the new definition of exergames and exergaming: An exergame is a combinations of *exertion* and videogames, which means that these video games encourage or require players' exertion during play (see Figure 1). I note that exertion refers to physical activities that are more strenuous than sedentary-type movements and also includes movements that incorporate strength, balance, and flexibility. The term exertion has also been used by Mueller, Agamanolis, & Picard, (2003) as "intense physical effort" with his *Exertion Interfaces* projects which feature exergaming on numerous platforms and social interactions. By incorporating exertion into the definition of exergames, it more accurately describes the physical interaction that is taking place in the world of video games.

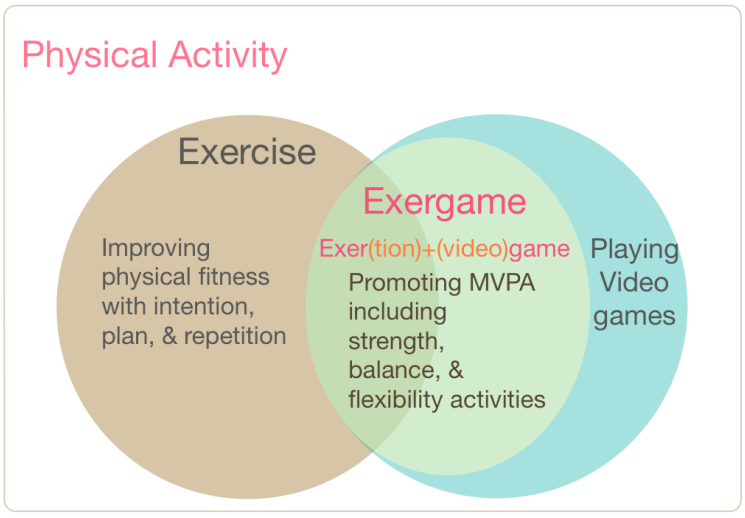


Figure 1. Relationship of physical activity, exercise, exergaming, and playing video games.

The term “exergaming” is playing these exergames or any videogames that promote physical activity (See figure 1). Figure 1 shows that exergaming is part of playing video games for healthy lifestyle. This new definition will allow the inclusion of playing any video game while using a stationary bike or similar equipment that is not necessarily contextually connected to the particular video games.

After exploration of the various terms used for exergames (e.g., active video game, interactive video game, activity promoting video games, etc) in current literature, the term exergames may have started without consideration of traditional definition of exercise. Health-related researchers may be aware of this exercise definition and try to avoid using it. After reviewing the elements of the exergame definition from the literature (Table 2), most of them indicated videogames and physical activity as exergame’s main element. I proposed to define exergames as combination of exertion (also including strength, balance, and flexibility activities) and video games. I also distinguished exergaming from exergame by focusing on more of activity itself. I hope this new definition of exergames will reduce the inconsistency of terms used, help to consolidate future research and researchers, and further promote the use of exergaming as a stimulus to lifelong physical activity and healthy lifestyles.

Effectiveness of exergaming

In this section, I review literature on the effectiveness of exergaming. It is not too surprising that much research focused on whether the video games require more physical work in terms of aerobic physical activity. They generally compared players' physiological responses by measuring energy expenditures while they played different video games.

Energy expenditure during exergaming compared to sedentary gaming

Researchers found that children's exergaming showed greater energy expenditures than playing sedentary video games (Tan et al., 2002; Lanningham-Foster et al., 2006; Unnithan et al., 2006; Graves et al., 2007; Maddison et al., 2007; Mellecker & McManus, 2008). Lanningham-Foster et al. (2006) found that children's energy expenditures significantly increased while they played *Nicktoons Movin's Jelly-fish Jam* and *DDR* compared to playing *Disney's Extreme Skate Adventure* games. This study showed that not all video game play is a sedentary physical activity. The authors argue that exergames are an alternative way to promote physical activity by converting sedentary screen time to active screen time (Lanningham-Foster et al., 2006). However, each play session was short—only 15 minutes—for each condition. Graves et al.'s (2007) study found a similar pattern as Lanningham-Foster et al.'s (2006) study. They found that children's energy expenditure significantly increased when they play *Wii Sports Bowling*, *Wii Sports Tennis*, and *Wii Sports Boxing* compared to playing the game *Project Gotham Racing 3*

while they sat.

Research has shown that the intensity of children playing *DDR* met the minimum recommendation to improve or maintain cardiorespiratory fitness set by American College of Sports & Medicine (Tan et al., 2002; Unnithan et al., 2006). Maddison et al. (2007) found that children's energy expenditures were significantly greater when they played *DDR* and *EyeToy* video games such as *Knockout*, *Homerun*, *Groove*, and *AntiGrav* compared to other video games. We don't know which games the researchers used for the other video games since it is not specified in the paper. The authors found that children's energy expenditures during exergaming is similar to moderate to vigorous physical activity such as walking, skipping, jogging, and stair climbing (Maddison et al., 2007).

Mellecker & McManus (2008) found that children's energy expenditures were significantly higher when they played exergames (*XaviX bowling* and *XaviX J-Mat Jackie's Action Run*) compared to when they played sedentary video game (a 10-pin bowling game where players use the mouse to bowl).

From this collection of research, exergaming requires children to spend more energy compared to other video games that have sedentary play. Research results indicate that the

intensity of playing *DDR* and *EyeToy* video games for children is moderate physical activity, so if children play them for an hour every day will meet the 2008 physical activity guidelines.

Energy expenditure comparison within exergaming

While the previously mentioned research focused on comparisons between exergaming and playing other video games that are sedentary, some researchers compared different kinds of exergaming. DiRico et al. (2009) found that playing *Wii Sports* boxing can provide moderate intensity aerobic physical activity by measuring 13 college students' VO_2 and heart rates while they played the video game. They also found that playing *Wii Sports Tennis* and *Wii Fit Basic Step Aerobics* could not provide moderate physical activity but can provide light intensity physical activity (DiRico et al., 2009).

de Vries, Simons, & Jongert (2009) found that four video games, *Xerbike*, *Lasersquash*, *ApartGame*, and *DDR* showed moderate intensity physical activity as recommended by ACSM for children, whereas *Wii Sports Tennis* and *EyeToy Beach Volleyball* did not. This result is not consistent with previous research result that recommended playing *EyeToy* games for children, and further research is needed to clarify the issue.

Schuler & Paradise. (2009) asked older adults aged from 60 to 80 years to play *Wii Sports Bowling* for 15 minutes once. They found that older adults' heart rates were raised after playing and that participants felt "more energized, refreshed, and revived" (Schuler & Paradise, 2009).

Preferences and Motivation

While some researchers were interested in measuring the energy expenditures of exergaming, others were interested in the players' preferences and motivations in exergaming. Epstein et al. (2008) measured what children liked from experiencing two different styles of video gaming: dancing and bicycling. The authors found that children significantly liked playing *DDR* without the dance mat and *DDR* with the dance mat compared to dancing along with instructional music or dancing along with instructional video. They did not find any significant differences in preferences among riding bicycles alone, while watching videos or while a riding a Cateye GameBike, which is a stationary bike that connects to game consoles and TVs. In order to play a videogame, players pedal the Gamebike to control their speeds by pedaling fast or slow and change directions by steering. In this study, children played each condition for only 2 minutes and decided how much they liked it on a scale from 1 (dislike) to 7 (like). Two minutes of experience may be too short a time to determine which activity is preferred among children.

Chin et al. (2008) compared two exergaming home-based interventions. In the first, one group exergamed at home alone, and the other group played exergames at home and participated in a weekly group gaming session. Sixty-four percent of children who played exergames only at home dropped out of the study, while only fifteen percent children in the other group dropped out. The authors assumed that a higher drop out rate meant to less motivation to play. They don't

appear to have measured motivation more directly to find the reason why so many of them dropped out. The authors did not specify which video games they used for this intervention.

Although Warburton et al. (2007) measured other physiological responses, they also mentioned players' motivations. Participants who were on the Cateye GameBike in order to play video games attended more sessions. They also improved their VO_2max and reduced resting systolic blood pressure compared to the stationary bike group that did not play video games (Warburton et al., 2007). This research data suggests that not only physiological benefit to playing video games but also a motivational aspect for participants to continue their workout during study session. Since the researcher did not measure motivation directly, investigating exergaming player's motivations with direct measurements will provide more insight into whether exergaming motivates people to be active.

This literature review suggests that children will have health benefits from exergaming, especially from using *DDR* or *EyeToy* video games (excluding *EyeToy Beach Volleyball*), as long as they play for about an hour every day. Although there are many physical fitness components, researchers have mainly focused on aerobic activities. Future work will need to investigate the other components. For example, the *Wii Fit* balance games and some of the *Wii Fit* yoga games require players to use balance skills in order to play them; however, there has not yet been research published on their effectiveness in improving players' balance. The

effectiveness of playing these games especially for older adults to improve their balance skills should be examined.

Since most of the research participants were children, investigating different ages is required to see if exergaming will be helpful for adolescents as well. Since previous research studied energy expenditure in lab settings, conducting research in more natural setting, like the home-based intervention study by Chin et al. (2008), may show more possibilities for exergaming for increasing daily physical activity for people to have a healthier life.

Physical Activity Interventions for Girls

Promoting physical activity is important especially for girls. Female children and adolescents aged 6 to 11 years showed the most prevalence (37.2 percent) of at risk of overweight and overweight among all ages (2-19 year) and sex (boys and girls) in 2003-2004 (Ogden et al., 2006).

The National Heart, Lung, and Blood Institute conducted a 10-year longitudinal Growth and Health study that showed adolescent girls' habitual physical activity significantly decreased from ages 9-10 to ages 18-19 by 100 percent for black girls and 64 percent for white girls (Kimm et al., 2002). Girls, in general, are also less active than boys (Trost et al., 2002). Encouraging sedentary children and adolescent girls (age 2-19) to learn about and sustain healthy lifestyles

that include physical activity throughout their lifetime could help prevent the obesity.

Despite this problem, there are few physical activity interventions just only for girls. In this part, I reviewed current literatures on these interventions only for girls. First, the Lifestyle Education for Activity Program (LEAP; Dishman et al., 2005; Pate et al., 2005) used both instructional and environmental interventions in school with middle and high school girls. Their curricular focused on girls' self efficacy and enjoyment. They included partial single-sex classroom setting that specifically targeted to female students interest-driven physical activities. It showed significant improvements in vigorous physical activity one year after the intervention compared with a control group as measured by three-day physical activity recall (Pate et al., 2005). Recall is problematic because it is not a stable measurement though such results are promising. They also found the increases in enjoyment of physical education among black and white adolescents (Dishman et al, 2005).

The Trial of Activity for Adolescent Girls (TAAG; Elder et al., 2007; Webber et al., 2008) linked school and community to support girls' physical activity levels via "cues, messages, and incentives" (Webber et al., 2008, p. 4). There were no significant differences in physical activity after two years between the control group and intervention group as measured seven-day accelerometry data (Webber et al., 2008). Both programs LEAP and TAAG are based on social cognitive theory "describes a relationships among self-regulatory behavior and supportive

functions of social environments for adopting and maintaining health-promoting behaviors" (Elder at al., 2007, p159). They also measured physical activity after a significant amount of time (one year and two years, respectively) after the interventions started and crucially fail to provide information about what happened between the start and end of the interventions. Since most of physical activity interventions mainly focused on quantitative measures like body mass index, physical activity level, and even enjoyments as in numbers, it ignores what adolescent girls think about the program and during the process of intervention participation. As such, we don't know what happened during and immediately after the programs' timespans to the participants in terms of health benefit.

In England, Fairclough & Stratton's (2005) intervention to increase girls' physical activity during gymnastic physical education class showed 11% more moderate to vigorous physical activity level than the control group. The teacher in the intervention group tried to enhance students' physical activity levels without changing the unit objectives. Since the paper does describe what the teacher did, it is difficult to determine what things were actually different from the control group's teacher. Researchers measured students' physical activity level only during class time by observing them individually and coding them following the SOFIT (McKenzie, 2002) Protocol. The study was not focused on girls' daily life physical activity.

After reviewing the literature, there are few interventions made only for girls, and also

research papers do not provide details of their interventions. These studies failed to discuss what work for female adolescents and what not in their viewpoints.

Sociocultural learning in gaming community

What motivates females to participate in physical activity? Social support from friends and family is a motivator for women and girls to be active. Research has shown that one important factor for women to sustain a physically active lifestyle is social support from one's family and friends (Eyler et al., 1999). African American and Latino middle school girls aged 11-15 from Taylor et al. (2000) also showed that many participants stated the importance of social support from friends. Since they spend most of their time with friends, their activity levels were influenced by their friends both to be more active or not. Neumark-Sztainer, Story, Hannan, Tharp, & Rex (2003) found that peers, parents, and teachers are the most consistent factors that change physical activity levels in inactive adolescents girls. They suggest including support from friends, family, and caring adults to increase physical activity level among adolescent girls.

Previous programs that focused on increasing girls' physical activity, like the Lifestyle Education for Activity Program (Pate et al., 2005) and the Trial of Activity for Adolescent Girls (Webber et al., 2008) paid little attention to building a social community. As a form of communities of practice to become active, sociocultural theory (e.g., Vigotsky, 1978, Lave &

Wenger, 1991), which focuses on learning via social interactions, may serve an important role in the intervention.

Vygotsky's (1978) cognitive process theory explains how people learn by stating that learning is when "an interpersonal process is transformed into an intrapersonal one" (p. 57). During an interaction, children learn from the responses of people to actions, receiving feedback on what is appropriate in that society. Children can then adjust their learning based on that feedback. The social values of a particular society thus influences a novice's learning, making apparent the influence of social environments.

Vygotsky also looked at individuals' levels of learning and development. He created the idea of the zone of proximal development, which he defines as "the distance between the [learner's] actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p.86). Under his model, individuals are at different developmental levels regardless of their physical ages. To maximize learning and development, a guide, teacher or peer who is more capable can identify learners' levels and help them reach their potential levels of development.

Lave and Wenger (1991) built on these ideas to describe apprenticeship as "legitimate peripheral participation". They explain that during legitimate peripheral participation “learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community” (Lave & Wenger, 1991, p. 29).

A social theory of learning focuses on “learning as social participation ” (Wenger, 1998, p.4). Wenger (1998) explained that participation means “a more encompassing process of being active participants in the *practices* of social communities and constructing *identities* in relation to these communities” (p.4). While Vygotsky (1978) focuses on internalization for learning, Lave and Wenger (1991) stress increasing one’s participation in a community and becoming more central to the community as learning. Although they have slightly different viewpoints of learning, they are both based on the idea that learning occurs with other people in social settings.

Video games appear particularly good at fostering communities in which members develop a strong social affinity by bonding with each other through “common endeavor [s]” (Gee, 2003, p. 192). Steinkuehler (2006) further explains that video game communities are “naturally occurring, self-sustaining” learning environments (p. 98). Steinkuehler & Squire (2009) describe a community as a group of people “which would entail honoring the attending values and norms of their own” (p. 8). Similar to this idea, Gee (2003) proposes the term affinity group, which is “a

group that is bonded primarily through shared endeavors, goals, and practices and not shared race, gender, nation, ethnicity, or culture" (p. 197). Although these are similar, Gee (2004) states that community is hard to define in terms of membership because people's level of participation within a community varies, and it is difficult to say what counts for being a member of community. Such research suggested that video games that promote physical activity—exergaming— may be one productive model for physical activity interventions that target young women.

CHAPTER 3. Methodology

This dissertation explored how walking support groups centered around the exergames Pokémon HearGold and SoulSilver affect girls' daily physical activity levels. I am interested in social interactions among girls, how they change their physical activity levels and their attitudes towards physical activity over time. I designed exergaming-based walking support group activities used in two cases.

I examined these research questions:

1a. What knowledge do members gain about physical activity and pokémon through participation in the group?

1b. How do their BMI, physical activity levels and attitudes change as a result of participation in the group?

1c. Do these changes last after the program's end?

2a. What is the nature of the support group?

2b. Do participants' relationships endure?

I used a qualitative case study methodology because it allows me to look at multiple sources such as (but not limited to) fieldnotes, observations of and interviews with the participants. It helps researchers understand the complexity of cases. In this case study, the units of analysis are the walking support groups and individual girls embedded in the groups.

Case Study

According to Stake (1995), "case study is the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances" (p. xi). It is not used for generalization because the characteristic of a case study is on its "singularity—of the phenomenon" (Simons, 2009). The case is a bounded system in time and space (Creswell, 2007). The qualitative case study methodology will provide an in-depth understanding of the case through a "thick description" (Geertz, 1973, p.39; p42).

Previously published physical activity intervention studies (Dishman et al., 2005; Pate et al., 2005; Elder et al., 2007; Webber et al., 2008) for girls provided only quantitative results before and at the end of the program. As these programs lasted one (Dishman et al., 2005; Pate et al., 2005) or two (Elder et al., 2007; Webber et al., 2008) years, drawing a causal conclusion is difficult without understanding what happened to the participants before, during and after the interventions. A case study's in-depth descriptions of the program and participants can complement this kind of quantitative results.

Taking a qualitative approach focuses on the understanding of girls' experiences. The complexity of the cases as individual girls and the groups can be explained by the qualitative case study. It can also capture social support for girls' physical activity as suggested by Taylor et

al. (2000) and Neumark-Sztainer et al. (2003). The in-depth descriptions allow to examine learning as doing (Wenger, 1998) and not just the results.

Pokémon and Pokéwalker as tools promoting physical activity

Pokémon has been popular among youth since the 1990s (Tobin, 2004). Pokémon was the most successful video game from 1996 to 2001 (Tobin, 2004). When the game was released in the United States in 1999, the Pokémon franchise produced $5 billion (Buckingham and Sefton-Green, 2004). As of July 3rd, 2011, the Pokémon video game series has sold more than 200 million copies worldwide since the first Pokémon video game was release in 1996 in Japan (Parker, 2011). Although Tobin (2004) mentioned that Pokémon's popularity has declined since 2002, new pokémon videogames are still released, and pokémon game events such as tournaments still exist.

Buckingham and Sefton-Green (2004) called this the "pokémon phenomenon" and describe it as a "cultural practice" because "pokémon is something you do, not just something you read or watch or 'consume'" (p. 12). The main Pokémon cultural practices include collecting pokémon, trading them, and competing to become the very best pokémon trainer. Players play as pokémon trainers who catch mysterious creatures called pokémon, a combination of the words pocket and monster. Once pokémon are caught, players train them by battling them against other

pokémon. The pokémon games have appeared across various game systems including the Game Boy, Nintendo DS, and Wii and in a trading card game.

The Pokémon game series have attempted to integrate pedometers into the series. The Pokémon Pikachu was released in 1998 and Pokémon Pikachu 2 was released in 2000 (see figure 2). These are a combination of a pedometer and virtual pet. In both, every 20 steps taken were converted into a watt to be used in the game. Ten years later in 2010, the pokéwalker was released with the Pokémon HeartGold and SoulSilver games in the United States. It looks like a pokéball with a small monochrome LCD screen (see figure 3).

The pokéwalker makes Heartgold and SoulSilver unique exergames. A recent study (Lanningham-Foster, Foster, Barnes, Kracke, Kling, and Vik, 2011) showed that pokéwalkers measure steps well for children and adults, even better than the standard (Barfield et al., 2004; Nevill et al., 2005) Digiwalker (Yamax, USA) pedometers.

Figure 2. Pokémon Pikachu (on the left) and Pokémon Pikachu 2 (on the right).

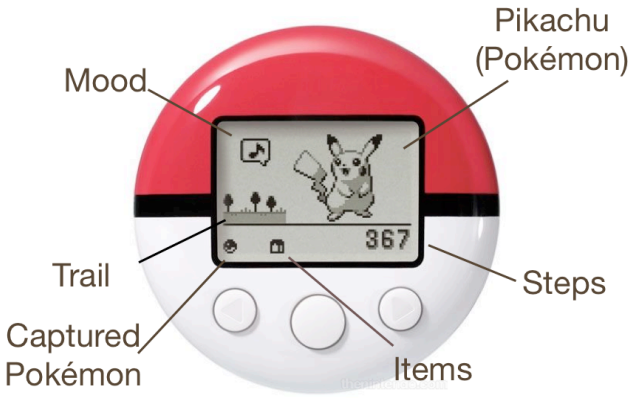


Figure 3. A pokéwalker.

To start using a pokéwalker, players need to transfer a captured pokémon to the pokéwalker. Whereas the previous versions of the pokéwalker only used Pikachu (a pokémon), players can transfer any pokémon they have in game into the pokéwalker. When a player takes a pokémon for a walk on in a pokéwalker, their friendship goes up. Each time a player brings a pokémon back from a walk intto the DS game, the pokémon levels up or becomes more powerful. If a player does not complete this cycle, the pokémon does not level up inside of the pokéwalker.

Every 20 player steps measured converts into one watt, which is used for finding, fighting, and capturing pokémon and items. Watts are also used to play mini games and unlock new virtual trails for the pokéwalker. Players encounter different pokémon and gifts based on the virtual trails they select to walk on. The pokéwaker allows players unlimited access to items and

pokéballs as long as they have taken steps, while players have limited access to items on the ground and must buy pokéballs in the DS games. Players can visit other's pokémon with their pokéwalkers and receive items.

Pokémon HeartGold and SoulSilver introduces players to walking as a part of the games. When the player starts the game, pokémon professor Oak introduces the player to the Pokémon world where humans get along with Pokémon as friends and also use them for battle. Another pokémon professor, professor Elm, asks the player to help his research by walking with pokémon and to determine whether pokémon and people develop special feelings and bonds. The player becomes a pokémon trainer who goes on an adventure with pokémon to find, fight, capture, and train other pokémon. Players receive their role as a pokémon trainer in the pokémon world from the professors in game.

Players undergo apprenticeship (Lave & Wenger, 1991; Steinkuehler, 2004) as a pokémon trainer from professors and other non-player characters who are masters and more experienced pokémon trainers in game. In this game, the player's character literally walks around with a pokémon until attaining more items and abilities (e.g., finding, chasing, and talking with a person who give running shoes that enable the player to move quickly). The main mode of transportation in the game, at least in earlier stages, is walking and running. Through the practice

of using a pokéwalker, players perform a pokémon trainer's role in the real world by actually walking, battling and capturing pokémon. Both the DS and pokéwalker develop a player's identity as a pokémon trainer who walks with pokémon. The pokéwalker is a pedometer well situated as a pokemon trainer's tool for the game narrative. The pokéwalker enables players to share their experiences as a pokémon trainer outside of the DS game.

The game itself invites players to use a pokéwalker by including one in the DS game package. However, within the game, the players are not asked to set up the pokéwalker. In this sense, the pokéwalker isn't necessary for game play. This allow us to see players's interest-driven game play. For those that use it, the pokéwalker allows players to take on the role of a pokémon trainer in the real world by walking.

Pokémon Heartgold and Soulsilver exergaming program for girls.

I hosted two pokémon exergaming programs (see table 3) for girls who are 5-8th grade students. First, I piloted the program with girls who are 6-8th grade and attending the Girls Incorporated (Girls Inc.) program at the local community center. The program lasted a total of eight weeks (from March 13th to May 6th in 2011). We had seven face-to-face meetings due to students' spring break, and each session lasted about 60 minutes. They met each Friday from 3:30 to 4:30 pm at the Girls Inc room at the local community center. The eight weeks of durations is modeled after Baranowski et al.'s (2007) reviews for exergame intervention studies and other game-based

afterschool programs (e.g., Squire & Barab, 2004). To see the intervention's sustainability, I contacted girls through facebook and the Girls Inc coordinator for an interview two months after the end of the program.

Table 3
Overview of study contexts

Case	Pilot Study	Summer Program
Settings	Girls Inc. after school program at the local community center	Local community center's summer program
Ages	12-14	10
Participants	6 (3 dropped out)	6
Time	8 hours (2 hours x 1 week + 1 hour x 6 weeks)	30 hours (2 hours x 1 week + two 2-hours x 7 weeks)
Duration	March 13 - May 6th, 2011	June 23 - August 11, 2011
Researcher	Myself	Myself
Staff	Girls Inc. coordinator, Amy, and Girls Inc. staff, Mary	Girls Inc. coordinator, Amy, and Girls Inc. staff, Mary, on Thursdays only
Data collection tools	Video camera, audio recorder, pokéwalker,	Video camera, audio recorder, pokéwalker,

I hosted the summer pokémon exergaming program with girls who are 5-6th grade and attending the local community center's summer camp at the local community center joined. The program ran a total of eight weeks (from June 23rd to August 11th in 2011). Girls met on Tuesdays from 1 to 3 pm and on Thursdays from 10am to 12pm at the local community center. We had fifteen face-to-face meetings and each session lasted about 120 minutes. Since the girls

at the summer camp spent for a longer period of time at the center (from 8am to 4 or 5pm), the Girls Inc program coordinator set up a longer meeting time. To see the intervention's sustainability, I contacted girls through phone and Skype calls for an interview two months after the program's end. I then hosted a reunion party at a local university's campus and measured participants's heights and weights.

At each meeting, participants reviewed their physical activity levels and attitudes and their pokémon playing experience since the prior meeting. They then played the pokémon game and walked as a group, discussing their game play along with healthy habits including physical activity throughout. In the pilot program, the girls walked on a bike path and to a local park. In the summer program, the girls additionally walked on the University campus and local botanical gardens.

Research Sample

A purposeful sampling procedure was used to select the sample. Creswell (2007) describes purposeful sampling when "the inquirer selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon in the study" (p. 125). The research sought to locate samples at sites where the population served may need the intervention the most (see Chapter 1). The criteria for selecting participants were:

- Females,

- In 5th-8th grade, and
- Interested in playing Pokémon HeartGold and SoulSilver

The study used a convenience sampling strategy with snowball or chain sampling (Creswell, 2007) to reach additional members of the population.

I attempted to recruit samples from a midwest school district initially, but no girls signed up for the study, though a few boys showed interest. Due to a lack of interest from girls in the school district, I recruited samples for the pilot through the Girls Inc. after school program. The Girls Inc. after school program serves local middle and high school low socioeconomic status (SES) girls. The program is free to attend. Girls come to Girls Inc. once a week.

Most after school programs for low-income children face challenges like staffing, facilities, and financing (Halpern, 1999). This also seems to be the case at the Girls Inc. site. They have only two main staff members, the program coordinator Amy and Mary from AmeriCorps; a few volunteers provide additional support. Their facility is one room in the local community center. The room has about eleven individual seats and a big couch.

The van they use for giving girls rides from school and to their facility sits up to 13 girls. However, some of the van's safety belts were missing and the others were stuck underneath the seats. Transportation thus limits how many girls they can accept for each day of the program.

Mary told me that about thirty girls come to their program on a regular basis. The program runs from Monday through Thursday. On Monday, high school students come to the program and from Tuesday to Thursday, middle school students come to the program. Each day is assigned to one grade level in middle school. About seven to eight students come to their program daily. In addition, Girls Inc. girls receive free snacks and dinner at the community center.

The summer program was at the same community center except the samples were not from the Girls Inc. program. The samples came from the community center summer camp program. This program is for children who are 5 to 12 years old, and they meet from Monday through Friday. It functioned as daycare with children staying from 8am to either 4 or 5pm. Attending each week cost students' families $175, with a $25 activity fee. They also offered a sliding fee scale for people from low SES. From the summer camp program, six girls met my criteria.

The majority of attendees are also from low SES families. This program also did not seem to be well-funded. When I volunteered outside of my program time, I noticed the children eating donated apple chips for their snack. All of the chips had expired. The sample size was six girls in both the pilot and summer studies. In the pilot study, three girls dropped out of the program, leaving three participants. Even though the sites did not serve a large population of children, girls

who go to the sites are the population who need the intervention most. Data from "Welfare, Children, and Families: A Three-City Study" showed that 62% of adolescents aged 10 to 14 from low income and urban families were at home for their out-of-school care with only 9% in a structured program (Coley, Morris, & Hernandez, 2004). Even though a small percentage of children from low income families attend these after school programs, the program site provides the most access to at-risk youth populations outside of school.

The majority of the girls in the Girls Inc. and local community center summer camp programs are African American from low socioeconomic status families. African American girls had the highest overweight rates in the U.S. (Ogden et al., 2006). Furthermore, low SES is linked to the childhood obesity (Goodman, 1999; Winkelby, Robinson, Sundquist, & Kraemer, 1999). Although the specific race and obesity status of participants were not included in the criteria for selection, this population is more at-risk of obesity than adolescent girls generally. This site may not the best place to reach out the most girls, but the sites helped reach girls who may need this intervention the most.

There were a total of six participants in the pilot study and they were all African American from low SES family. Four of the six girls were overweight and obese with high BMI percentiles for their age. Three girls dropped out of this exergaming program. All of them were overweight

and obese. The summer study also had a total of six participants. There were three obese African American girls from low SES family. Everyone in the summer program stayed in the program.

Data Collection

In order to answer my research questions using a case study methodology, I collected multiple forms of data. Multiple data sources provide more trustworthy and credible data. Drawing from Creswell's (2007) and Stake's (1995) forms of qualitative data, I collected four basic types of data: observations, interviews, documents, and audiovisual materials.

Table 4
Data Collection

Research Questions	Data Collection
1a. What knowledge do participants gain about physical activity and Pokémon through participation in the group?	Fieldnotes: knowledge gain on physical activity Video & audio recordings: game play, their knowledge Physical activity journal Audio recordings: Entry, exit, & follow-up interviews on physical activity & Pokémon knowledge
1b. How do participant BMI, physical activity levels and attitudes change as a result of participation the group?	Weight & height measurements: Pre, post Fieldnotes: Physical activity levels, attitudes towards physical activity, their attendance on the program reasons why attending or not attending Video recordings: Game play where participants show physical activity levels and dispositions

	Physical activity journal on pokéwalker steps and attitudes Audio recordings: Entry & exit: on why they joined the program, physical activity level, attitude
1c. Do these changes last after the program's end?	Weight & height measurements: Follow-up Fieldnotes: Participant answers and notes Audio recording: Follow-up interview on physical activity level, attitude towards physical activity, whether they still play pokémon game with pokéwalker
2a. What's the nature of the support group?	Fieldnotes: Observation Video recordings: Game play where participants express friendship, support group, and membership Audio recording: Entry & exit interviews with questions about social network, who they walk with, & who they play pokémon with
2b.Do their relationships endure?	Fieldnotes: Participant answers and notes Audio recording and follow-up interviews: questions about social network, who they walk with, & who they play pokémon with

Observations

My role was both running the exergaming program and conducting the research in this study. I kept a small notepad on hand to take observations and fieldnotes. Due to few researchers participating, I ran this study with a potential risk of missing important data. To minimize the risk, I used a video camera and an audio recorder (see audiovisual data). During the program, I used informal interviews to clarify my observations and learn participants‘ thoughts, attitudes and opinions.

Interviews

There were three formal interviews for girls (see table 5): a pre-interview before starting the program, a post interview at the end of the eight-weeks program, and a follow up interview eight weeks from the program's end (sixteen weeks after the program started). In the interviews, I tried to create an "atmosphere of face-safety" (McCracken, 1988, p. 38) for participants. I used the technique of "playing dumb" (Becker, 1954) as McCracken (1988) suggested to assure and clarify what each responder meant. Pre- and post-interviews were conducted in-person, while the follow-up interview was conducted either in-person or at a distance using a phone, Skype, or facebook depending on each participant's preference.

Table 5

Schedule for individual data collection

	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk 16
Entry Interview (Physical Activity Attitude)	√								
Pokémon play Log (including steps per day from pokéwalker)	√	√	√	√	√	√	√	√	
Weight & Height (Pre & post intervention)	√							√	√
Exit interview (Physical Activity Attitude)								√	
Follow-up Interview (Physical Activity Attitude)									√

Only one girl in the pilot completed all three formal interviews; all six girls in the summer program completed them (see table 6). I also did informal interviews with participants throughout the study to clarify their statements and to probe for additional information.

Table 6

Collected formal interview data

Pilot study	Names	Julia	Emma	Olivia	Ashley	Daisy	Lily
	Pre	√	√	√	√	√	√
	Post	√	√	√			
	Follow Up	√					
	Names	Emily	Molly	Lanie	Marta	Kirsten	Nora
Summer study	Pre	√	√	√	√	√	√
	Post	√	√	√	√	√	√
	Follow Up	√	√	√	√	√	√

Documents

Each student was encouraged to record their daily pokéwalker step number and their feelings and attitudes in a provided journal throughout the program and for an additional eight weeks after the program ended. Julia was the only participant who recorded her step journal regularly in the pilot study (see table 7). Three girls turned in their journal for eight weeks during the summer program, and Emily was the only girl who continued to record her step number after the program (see table 7). I kept students' daily pokéwalker step-number records in a distinct document from students' journals. I collected all the written documents they created during the program.

I collected pre- and post-intervention observations of participants' height, weight, and BMI. Each participant's stature was measured in centimeters (using a Seca 214 Road Rod portable stadiometer; Seca, Hamburg, Germany) and body mass in kilograms (with a Seca 882 body mass scale) to the nearest 0.5 cm and 0.1 kg, respectively.

Table 7

Collected completed student journals including daily pokéwalker step numbers

	Names	Julia	Emma	Olivia	Ashley	Daisy	Lily
Pilot study	Program	√					
	After Program						
	Names	Emily	Molly	Lanie	Marta	Kirsten	Nora
Summer study	Program	√	√	√			
	After Program	√					

Audiovisual Data

I video recorded the meetings that happened indoor to capture the social interaction between girls including their conversations, gesture-, and facial expressions. I used an audio recorder as a backup device for the video data in case the audio in the video recording was not loud and clear enough to listen to. I also used an audio recorder to capture conversations while playing and walking outside. I also gathered text messages participants sent me.

I set up a video camera on a tripod to record all the participants during each meeting. The camera was positioned to frame where the participants sat together initially in each meeting. I

also used an audio recorder on the table to record participants voices to limit missing audio data from the video-recorded data. I also used the audio recorder instead of a video camera when the group went outside to play and walk.

Data Analysis

I followed Creswell's (2007) and Stake's (1995) case study analysis in my study. I used Microsoft Word, Pages and Numbers as the main tools to store and organize my data. Stake (1995) suggested using two strategies to draw new meanings; as such, I used both direct interpretation and aggregation of instances (see table 8). To manage the data, I coded them into themes using the research questions as a guide and looked for patterns. I also looked for similarities and differences between cases.

Table 8

Case study data analysis and representation as presented in Creswell (p. 156, 157; 2007)

Data Analysis and Representation	Case study
Data managing	Create organize files for data
Reading, memoing	Read through text, make margin notes, form initial codes
Describing	Describe the case and its context
Classifying	Use categorical aggregation to establish themes or patterns
Interpreting	Use direct interpretation Develop naturalistic generalizations
Presenting, Visualizing	Present in-depth picture of the case (or cases) using narrative, table, and figures

I used Lave and Wenger (1994)'s communities of practice to analyze this study. Communities of practice are everywhere. They can be health-games researchers, walkers, or pokémon trainers. In

Pokémon trainers' community of practice, there are all sorts of members. Some participate in the trading card game, play the video games, and others watch the animated shows. People have different participation levels within each community. Newcomers start at the edge of a community. They might have just picked up the video game without prior experience. People gain knowledge and skills by learning through interaction with other members.

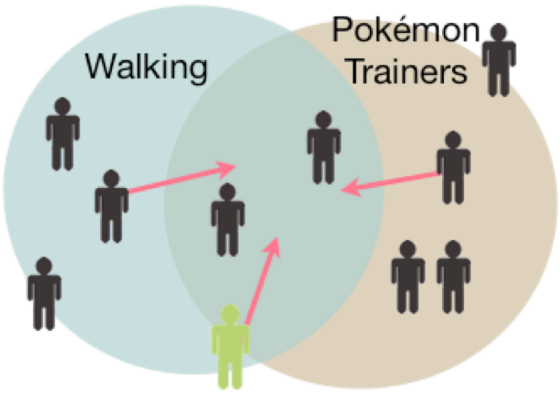


Figure 4. Communities of practices in walking and pokémon trainers.

Based on the Lave & Wenger (1994)'s communities of practice, Pokémon HeartGold and SoulSilver has the potential to encourage players to become more central in both the walking and pokémon communities since the games incorporate both (see figure 4).

In table 9, I listed the data collection and data analysis methods for answering each research question. I reported my case in narrative form with vignettes (Stake, 1995) to present each case's story.

Table 9

Data collection & data analysis method

Research Questions	Data Collection	Data Analysis
1a. What knowledge do participants gain about physical activity and Pokémon through participation in the group?	Fieldnotes: knowledge gain on physical activity Video & audio recordings: game play, their knowledge Physical activity journal Audio recordings: Entry, exit, & follow-up interviews on physical activity & Pokémon knowledge	Read documents and write margin notes in fieldnotes Describe the case and its context Seek patterns Direct interpretation Present in-depth picture of the case using narrative
1b. How do participant BMI, physical activity levels and attitudes change as a result of participation the group?	Weight & height measurements: Pre, post Fieldnotes: Physical activity levels, attitudes towards physical activity, their attendance on the program reasons why attending or not attending Video recordings: Game play where participants show physical activity levels and dispositions Physical activity journal on pokéwalker steps and attitudes Audio recordings: Entry & exit: on why they joined the program, physical activity level, attitude	Calculation into BMI Read documents and write margin notes in fieldnotes Describe the case and its context Seek patterns (make a graph of participants' steps changes each day – individual and group) Direct interpretation Present in-depth picture of the case using narrative, tables, and figures

1c. Do these changes last after the programs end? (sustainability)	Weight & height measurements: Follow-up Fieldnotes: Participant answers and notes Audio recording: Follow-up interview on physical activity level, attitude towards physical activity, whether they still play pokémon game with pokéwalker	Calculation into BMI Comparison to previous data Read documents and write margin notes in fieldnotes Describe the case and its context Seek patterns Direct interpretation Present in-depth picture of the case using narrative and figures
2a. What's the nature of the support group?	Fieldnotes: Observation Video recordings: Game play where participants express friendship, support group, and membership Audio recording: Entry & exit interviews with questions about social network, who they walk with, & who they play pokémon with	Read documents and write margin notes in fieldnotes Describe the case and its context Seek patterns Draw relationships among participants Direct interpretation Present in-depth picture of the case using narrative.
2b.Do their relationships endure?	Fieldnotes: Participant answers and notes Audio recording and follow-up interviews: questions about social network, who they walk with, & who they play pokémon with	Read documents and write margin notes in fieldnotes Describe the case and its context Seek patterns Direct interpretation Present in-depth picture of the case using narrative

I used Stake's (1995) suggestion to incorporate triangulation (Denzin, 1989) to make a more credible and trustworthy study. To minimize misrepresentation and misunderstanding of this

case, I sought multiple sources and asked back to the participants for confirmation. As Stake (1995) recommended for investigator triangulation, I had another researcher read my fieldnotes and transcriptions to triangulate the interpretation.

CHAPTER 4. Case Study Program Findings

The pilot study

Initially, I intended to pilot the exergaming program at a middle school in a midwest school district for eight weeks, but only a few boys showed interest in the program, and no girls signed up. The last minute notice from the school district about the lack of interest from female students did not allow the scheduled data collection. I contacted a 4-H Youth Development Specialist at the local University-Extension program, and she introduced me to another specialist who showed interest in health-related after school programs. The interested specialist introduced me to Amy, a Girls Inc. program coordinator at a local community center. I explained to Amy about my plan for the pokémon exergaming after school program as walking support group. Amy helped me to recruit 6th to 8th grade girls who were interested in playing pokémon and joining the study as part of their Girls Inc. program. Since Girls Inc. runs from Monday through Thursday, Amy suggested holding the exergaming program on Friday afternoons.

The Girls Incorporated group

Girls Inc. is a nonprofit organization that advocates for girls' potentials, values, and rights. The space offers a judgement-free safe zone for middle school and high school girls. The Girls Inc. program I worked with is located at a local community center in a midwest city. Girls Inc. at this location serves mostly African American students. They have about 30 girls coming in once

a week on different days throughout the week. Since the program is offered at no cost, regular attendance is not required. Six participants from 6th through 8th grade joined the pokémon exergaming program on Fridays from 3:30 to 4:30 for eight weeks during the spring semester in 2011.

Week 1

On the first day, I hoped to introduce the research project, explain the plan for the program, and have students play a pokémon game until they transfer a pokémon into a pokéwalker by the end of the session. As mentioned earlier in the methods section, players need to catch at least two pokémons and deposit one into a computer in the pokémon center in the game. Doing so takes at least an hour and half if you proceed as fast as possible. I asked Amy to set our first meeting to last two hours instead one hour to enable the students to use their pokéwalker for the following week.

When I arrived at Girls Inc., Amy was out to pick up girls from their school. While I was waiting for Amy and the new students, I was nervous and excited to meet them. Two girls entered the room, giggling, and found seats around the table while I was setting up for the meeting. They were both 6th graders from the same middle school.

The room is located on the first floor and has tables and chairs in the middle that could fit about 8 people. A blackboard was hung about three feet from the tables, and people entering the room could see it on the left wall. The windows faced onto outdoor basketball courts, and the one-way blinds only allowed people inside to view outside.

The two girls went out to grab some snacks, fruit juice and celery with peanut butter, and came back to the room. The local community center offers free snacks and meals to students, and the snack time was apparently scheduled from 3:30 to 4:00, the same time as my program. I was not informed that our meeting was scheduled during their snack time. I realized the snacks were a possible distraction for girls since they seemed to chat and hang out during their snack time.

After the two girls returned, we sat around the table as they were eating snacks, and I suggested that we introduce ourselves. As I started introducing myself, the students did not pay attention. As a new person working with Girls Inc., I felt rather intrusive as opposed to being included in their group. After their brief introduction, I asked the students if they had heard of exergaming, and none of them had. I explained exergaming to them, but the girls did not appear interested in listening to me. Ashley was eating snacks. Olivia was looking at some other print materials and not paying attention to my words.

After six minutes, Daisy showed up. Amy introduced me to her and told me that Daisy is a 7th grader and Ashley's sister. They had both just moved from another midwestern state. Daisy found a seat next to Ashley. I introduced my research and the students' role in the program. I gave the students empty journals, and I explained about the daily physical activity journal writing process. Olivia was stretching, which seemed to indicate her boredom.

I next placed some Nintendo DS game systems and pokémon games on the table. Ashley leaned in close to the table to look what they were and smiled. Each student received a DS with pokémon game ready to play, a DS charger, and a pokéwalker in a small zippered pouch. All the students seem to be excited to have a new toy. Olivia received one and held it tight to her chest. She started examining the DS to find a way to turn it on. Daisy asked how to turn the DS on, so I showed her. Ashley had already pulled out the stylus pen from DS without asking any questions. I asked how many of them have played any pokémon games previously, and Daisy and Ashley raised their hands. However, both of them couldn't recall the name of the pokémon games that they had played.

Once they started playing the game, all of them became quiet. The room was filled with the pokémon game background music. I challenged the students to catch a minimum of two

pokémon. All girls were playing the game without any distractions even when they were all facing towards the windows with boys playing basketball outside.

Fifty minutes after we started the program, Emma came into Girls Inc. to participate in the program. She sat next to Daisy. Daisy and Emma are both 7th graders and going to same school. I heard later that Emma was the one who had brought Daisy to Girls Inc.; she later brought her sister Ashley to the program. Olivia asked Amy to borrow her cellphone to call her mom. Olivia was on the phone and said "You want me to come home? Okay." She left soon after a short interview with me. Amy left with Olivia to give her a ride. Students seemed to join and leave the program freely since Emma and Daisy had joined the program late and Olivia had left early from the program. I realized that such freedom could hinder commitment to this program.

After a brief introduction about the program to Emma, she mentioned that she has a DS at home and that she would like to use her DS in the future. I asked if anyone had reached Cherry Grove City, which is the closest city from the game's beginning. Players can go to the first pokémon center in that city and deposit a pokémon; doing so allows them to transfer pokémon to their pokéwalker.

Daisy said, "I can't find it!". She soon stopped playing the game and began chatting with her sister Ashley. Emma continued playing the game on the DS. I noticed that Amy had come

back, and everyone was soon quiet again and playing the game. Daisy and Ashley may behave differently when Amy is around, I thought. I needed to give myself some more time to become more familiar with the space, students, and their culture.

On the first day of the meeting, none of the participants reached the pokémon center with two pokémon. This resulted in no one being able to set up their pokéwalker on the first day. We discussed continuing to work on it next week, and I encouraged the students to have two or more pokémon in their DS game by the next meeting.

Week 2

Students were sitting around the table and eating their snacks. Two new students, Julia and Lily, had joined the group. My plan for this meeting was to have students wear their pokéwalkers and to take a walk outside as a group. Since the orientation for the game would take a little longer than our allotted meeting time, I encouraged the new students to participate in group walking without their pokéwalkers.

All four students who had received a Pokémon game, Ashley, Emma, Daisy, and Olivia, had collected more than two pokémon. When I asked if they had a pokémon into their pokéwalker, they all responded that they had one on their waist. Olivia looked at her pokéwalker and said out loud her pokéwalker step number: “five thousand, two hundred forty eight!” She

seemed to be proud of having those numbers. Ashley clicked through her pokéwalker buttons and said "Today I walked…" and she keep clicking though the buttons. She raised her hand and said, "I walked five thousand, four hundred and seven." Both Olivia and Ashley had set up the pokéwalker on their own and walked with it.

Some of students had received questions about the pokéwalker from their teachers, and they all seemed to have had positive responses. Olivia told us that her gym teacher thought it was a toy at first, but Olivia explained it to her that it was not a toy. The teacher was excited for her and told her to "keep doing it." Emma also shared her story as well: "Oh yeah, uh, Mr. Peterson asked me what this was, and he liked it. He said that 'It looks like a watch or something,' and I explained to him, and he said it's great."

To follow up on their physical activity, specifically their steps on the pokéwalker, I gave them a daily step log (see appendix 4). I explained how to get the step information from the pokéwalker. After walking around to write down each student's pokéwalker steps, I mentioned the plan to walk outside:

> Researcher: What we are going to do today is going out and walk.
> Ashley: [thumb up and points her thumb towards the door] Out! We are gonna go out!
> Researcher: Let's pick up your jackets and place your pokéwalker on.
> [Students are still sitting in their chairs, playing on the DS.
> Ashley opens up her applesnack packet and chats with Olivia.
> Emma eats her chips.]

Researcher: [Clapping] Alright, everyone.
Olivia: It's cold.
Researcher: Are you ready?
Ashley: [Eating her apple and looking at the researcher] I am eating.

It was late March in the midwestern city. The weather was windy, but it was still a walkable day with a jacket on. The students did not show interest in walking outside. The students kept playing the game and chatting with each other. I felt that the students' resistance to my instructions. With the help of another Girls Inc. staff member, Mary, the students started to walk outside.

As we walked down the hall to exit the building, Olivia sat down on one of the couches in the hallway and expressed that she does not want to go outside. The other girls in the group dragged her off of the couch, and she joined the group for walking. We followed a bike path for our walk. Once students walked outside of the building, the girls paired with one another and started chatting while walking. Olivia and Ashley paired up and ran the entire time chasing after each other. I observed that Ashley and Olivia were in front of the group entire time. It was interesting to observe Olivia running especially since she did not want to go outside before. After about 11 minutes of walking, Lily said, "I don't wanna walk no more." Ashley repeated the sentence in a funny sound. "I don't wanna walk no more. No more," she said, laughing, before running away.

After 15 minutes, we turned around and headed back toward the building. As noted in the first week, Emma and Daisy were friends and in the same class. They were walking next to each other. I walked by and see how they were doing.

Emma: Pretty good. I gotta walk. Walk.
Daisy: [pulling out her pokéwalker and reading her steps] Seven thousand, seven hundred and seven.
Emma: Good for you.
Daisy: Alright. I am going to put back and start walking. I don't want my steps to be wasted.
Emma: [running with small steps] This is a drill we do in basketball. We do it like this.
Daisy: Cheater. You can't get more steps. Cheater.
Emma: Yeah, I guess so.

Daisy had started to pay attention to her steps and value her walking counted by the pokéwalker. This encouraged Emma to try and get more steps by taking more frequent smaller steps while running. As we walked into the building, I asked Lily how walking was, and she told me that it was fun. However, as she sat down in the chair, she said, "My back hurts," and stretched out. Students started playing the game on their DS and checking each other's pokéwalker:

Emma: I got nine... What' yours? [to Daisy]
Daisy: I took. Wait. [looking at her pokéwalker]
Ashley: Mine is eight thousand, two hundred fifty four
Researcher: How many steps did you get? [to Ashley]
Ashley: Eight thousand, two hundred fifty four. I wanna walk again! [She puts her pokéwalker back onto her waist].
Emma: I did way more steps than you do. Nine thousand, two hundred twenty eight.
Researcher: What was yours? [to Olivia]
Olivia: Seven thousand, seven hundred thirty one.

I remember Ashley did not want to go outside for walk actively earlier, and she had just said that she wanted to walk again. Sharing their step numbers seemed to create a competition on who took the most steps.

The students had a hard time focusing on filling out their meeting reflection journals. I asked them to write down at least one sentence about what they had felt about today's walking. Daisy wrote, "I walked around and visited some people in pokémon world… yes it gave me a gift and I found a pokémon… I took a walk and I got 8790 it was very collldddd…" Oliva took 7,731 steps that day, and she wrote, "good and fun". Ashley had 8,260 steps and wrote, "it felt great". Emma had 9,228 steps and wrote, "I took a walk for 25 min today. It was nice to get outside and walk."Emma wrote, "I look a walk for 25min today. It was nice to get outside and walk."

Students had initially resisted the idea of going outside and walking, but during and after the walk, most of them seemed to enjoy the experience and reflected positively on the walking.

Week 3

Lily did not come to the program. She had a physical fight with another student at her school, and police came to handcuff her. She was suspended from school and was grounded at home.

Julia was in the Girls Inc. room when I arrived. I helped her connect her pokéwalker to the DS. Daisy came into the room and said, “I forgot my pokéwalker.” Emma came in later and said, “I don’t have my pokéwalker. I left it at home by accident.”

Ashley knocked on the door. The Girls Inc. door is always locked, so people inside need to open the door. I opened the door for Ashley, and she came in with her snack. She said, “I lost it [the pokémon game]. I lost pokémon.” I asked her, “Where?” She explained, ”When I went to bathroom and came back, but uh. It’s gone.” She said that her game and pokéwalker disappeared while she went to bathroom. Ashley was living at the Salvation Army Shelter with her family, and she lost it in its cafeteria.

Olivia was the only student who had a pokéwalker in working condition with her. After the second week of group walking, the students seemed to expect group walking again:

Daisy: Can we still go walking?
Researcher: Yeah. We can still go to walk.
Ashley: I am gonna do jogging.

While students were still eating their snacks, Olivia started a pokémon conversation:

Olivia: I love my pokémon. pokémon game.
Researcher: How’s the pokémon game?
Olivia: But I didn’t get to play it this whole week because um. I had. I have to do this homework. It’s like research project.

Students also started sharing their catching pokémon experiences:

Ashley: I tried to catch this one thing. It looks like a dog but it kept running.
Emma: Oh, are you talking about... wait, which one?
Ashley: I tried to catch it. It came back thing and ran.
Emma: I've got so many pokémon. I've go so many in the storage. I've got so many that I had to put some in the storage and take out from the storage.
Olivia: I've got three pokémon.
Emma: That sucks. Let's see. Look at all the pokémon. I've got four with me right now. These are powerfulest one. This one is Minie and then I got Wiggles, and then I got Lele, and then I got Willy.

After the students finished their snacks at around 4pm, I asked if they wanted to go outside and walk. Emma asked me about the time and then told me that she and Daisy had to leave to go somewhere else. Emma's mom came to pick them up, and Emma and Daisy left. Like last week, the students seemed to join and leave the program freely.

Researcher: Well, Ashley, Olivia, and Julia, What do you think? do you want to go outside and walk for thirty minutes?
Olivia: But they ain't got their pokéwalker.
Researcher: They don't have their pokéwalker, but we can still walk.
Ashley: You can go jog. It will be good for Olivia.
Olivia: Hmm!
Researcher: We can walk and jog.
Ashley: Let's jog. We could jog. You gotta jog if you are going.
Researcher: Are we ready?
[Olivia and Julia were still playing the game on the DS and Ashley were eating her yogurt]
Researcher: Are we going?
Olivia: [look at the researcher] Oh, yeah.
Researcher: Let's walk.

Julia was quiet entire time. She is a new student and didn't look comfortable in the new group.

When we walked outside, it was raining and cold. The students and I decided to stay inside and

play the Pokémon games. Back in the Girls Inc. room, Julia played the pokémon DS game quietly. Olivia laid down on the couch and played the pokémon game, also quiet. Ashley lost her pokémon game and pokéwalker, but still had the DS game system. I told her that I would bring her a new pokémon game the following week.

I think students were excited about the group walk outside, but the weather did not help us to go outside and there was not enough room for us to walk inside. The students had also started to forget and lose their pokéwalker.

Week 4

Lily got grounded again at home, so she couldn't join the program. I was not sure if Lily was still grounded because of the prior week or for something else. Julia, Ashley, and Daisy did not show up. Girls Inc. coordinator, Amy called Ashley and Daisy's mom, and their mother didn't know where they were. Amy told me that their mom is a single mother and that they lived with six other siblings. Amy left to look for Ashley and Daisy.

She came back later without them, mentioning that she had been driving down the streets that they might be walking. Amy and the other students didn't know where Julia might be, either. When Amy went to pick up the students from their school, she did not see Julia. Although four students did not show up to the program, Olivia and Emma came. Olivia and Emma did not wear their pokéwalker for the whole week. Emma had lost hers.

Researcher: Olivia, do you have your pokéwalker with you?
Olivia: [Shakes her head.]
Researcher: No?
Emma: I am looking for mine.

Olivia did not bring her pokéwalker or the DS game system. Emma misplaced her pokéwalker in her room. They explained:

Researcher: Olivia, do you have your log?
Olivia: No. I know it's zero. I didn't wear the whole week cause I had homework.
Researcher: You didn't wear the whole week?
Olivia: Cause I had a homework, and I just had hard time focusing in the morning. In the morning, I will wake up and I have little bit more each day, so I just keep forgetting, and I didn't want to forget my strings instrument. Cause if I forget it, then I have to the room 117 and that's like all the bad people will go.
Emma: It's called detentional room.
Olivia: Because I forgot my instrument then I have to call my mom. They have us to sign this roll of paper. So if you forget your instrument, then you have to call your parents and bring this paper says "I am not allowed to participate in this class because I forgot my instrument at home whatever whatever." I had to tell my mom.
Researcher: Emma, have you been wearing pokéwalker and just today you lost it?
Emma: Well, it's been lost all week. I've been trying to look for it. But I've been kind of busy because we're just getting back to the basketball practice.

I had a spare pokéwalker with me, so I gave it toEmma:

Researcher: Would you like to take a new pokéwalker and start using it now? If you find the other one, you can bring it back.
Emma: Yeah, that will work. Thank you. It's kind of weird because I had it like one day and the next day, I was like where did it go? My cousins probably was messing with it and misplaced it, because they always go to my room while I am gone.

She then started talking about her living situation is getting better.

Olivia: I am so happy. I don't know how happy I am. I got a good news.
Researcher & Emma: What good news?

Olivia: Okay, so my sister and her two kids, they've lived with us like a year and some moths now. Now my sister just found a place that she can finally leave and never come back ever again with her two kids. And this is why I haven't gotten homework done. This is why I can't like focus on pokémon thing cause they are always in my room. And if I lock my door, I won't be able to hear my mom like call my name, you know? They are gonna leave and my sister's gonna get out the room. I will have my own room and she can have her own room and we are all gonna be happy.

After 30 minutes of Emma's playing the game inside, I suggested that we start walking outside:

Researcher: Girls, should we start walking?

Olivia was washing her t-shirt in the sink in the Girls Inc. room. She had a stain on her shirt, so she wanted to get it cleaned:

Olivia: I can't get my shirt.

She seemed to be annoyed by the stain on her shirt. When I asked again about walking, they said:

Emma: We can walk to a little park.
Mary [Girls Inc. Staff]: Then we can walk around the park?
Researcher: Sure.
Olivia: No.
Mary: Olivia.
Olivia: What.
Mary: Alright. Olivia. You are left.
Emma: We are leaving you.
Researcher: Olivia, let's go.

Olivia showed a resistance to walking outside again. We eventually left the Girls Inc. room.

There was a small park close to the local community center. As we walk on the bike path, Olivia mentioned a problem:

Olivia: Can't walk.
Researcher: What?
Olivia: Can't walk.

Olivia expressed her resistance by slowing down her walk. She fell behind the group:

Researcher: Olivia!
Emma: Come on, Olivia.
Researcher: Olivia!
Emma: She's coming.
Mary: She's gotta run to catch up.

Olivia took big steps that looked like a lunge to catch up the group. Since she did not come right towards to group, but began walking in circle, the others ran back to Olivia and linked arms with her:

Mary: We had to come back for you.
Emma: You are going circles.

Once we arrived to the park, Emma and Olivia played on the playground swings:

Emma: I lost my pokéwalker! It's so silky smooth [indicating pokéwalker].

Emma found it on the ground and put it in her hoodie's front pocket. She didn't put her pokéwalker back on her waist as I showed her on the first day. It seemed that it would come out easily if she's putting it in her hoodie's pocket.

Olivia resisted the idea of going outside and walking at first, but once she was outside with the group she seemed to have fun. She wrote in her reflection paper, "I had fun at the park today." The girls enjoyed walking to the park for 30 minutes. They played on the swings and

climbed the monkey bars. Providing the opportunity to go outside might be a small step to increase their physical activity levels. Although Olivia still showed the reluctance, she became more active after the group members ran back to her and showed social support.

Week 5

When I went to Girls. Inc at 3:30 in the afternoon, it was raining and dark outside. While I set up for the program, Olivia mentioned that she didn't walk with her pokéwalker:

> Olivia: I found it when got home, and then I couldn't and then the whole week I was looking for it. Yesterday, I found it yesterday.

I asked Julia if she had walked with her pokéwalker in the last week. She answered, "I couldn't. Because I had work to do. I was too busy." I asked to her, "Do you think you will be able to?" She said "I, I will try." When I asked them, "Are you comfortable with pokéwalker and pokémon game?", Emma answered , "Pokéwalker is kind of small and hard to keep track of." And Olivia said, "It's hard for you to remember to wear it." The girls, Olivia, Julia, and Emma, did not seemed to like wearing pokéwalker in regular basis.

Emma and Olivia were the most regular attendee of this program, and they had problems wearing their pokéwalkers regularly. Since the students hadn't been wearing the pokéwalkers regularly and bringing them in to the group, I failed to record their daily walking steps counts.

I had wanted to encourage them to wear the pokéwalkers for at least the remaining four weeks. Before the meeting, I had drafted a one page paper (see appendix 5) to introduce them to a four-week pokémon trainer challenge. Each student received the challenge paper to record their steps each day. I challenged everyone to wear their pokéwalker and record their daily steps. I also mentioned that each student who completed each week's record will get recognized.

Ashley came in to receive a new game and pokéwalker as a replacement after losing her game and pokéwalker two weeks ago. Ashley left after 15 minutes later to go to the local teen center because she wasn't interested in playing the same game from the beginning again. I realized that games with a strong story line may not motivate replaying the game.

Since it was not a good weather for walking outside, the group played pokémon games inside the Girls Inc. room. Emma and Julia sat down quietly and played the game individually. Olivia came in and out of the Girls Inc. room to play with another friend outside of exergaming program.

Week 6: Spring break

The sixth week was their spring break. The students did not have any classes, and the Girls. Inc exergaming program did not meet.

Week 7

The weather was sunny with some wind. Olivia mentioned that she walked with her pokéwalker only one day in the preceding week, the prior Thursday. Olivia told me why she doesn't wear the pokéwalker:

I took it off during the gym class. I don't like this stuff fall off and somebody else step on it or like lose it. I didn't want that to happen. That's why. I have to put it back on and then...

She mentioned that she walked 1,905 steps on that day during her gym class. She also said that she misplaced her pokéwalker last week. This week, Olivia, Julia, and Lily came to the meeting but nobody brought their pokéwalker.

Although she did not wear her pokéwalker regularly, Olivia wanted to go outside this time before I asked about it:

Olivia: Can we go play at the park?
Researcher: Do you want to go outside?
Olivia: [nodding]
Olivia: Are we going to the playground?
Researcher: Yes.
Olivia: Yay! I wanna swing on some swings and monkey on those monkey bars.

During previous meetings, Olivia has consistently shown resistance to going outside. This was the first time she wanted to go outside voluntarily. Olivia, Julia, and Lily walked out to the park.

As we were walking towards the playground, Lily told me that she had injured her foot. A nurse told her that she should not be walking.

Lily: My foot, uh... I think it might be sprained. It's really hard to walk on.

Lily walked with us to the playground. When we arrived at the playground, I told the students, "We have three minutes here and then we will walk for 20 minutes." I soon realized that this was not a good idea for the girls because they liked playing at the playground. Especially Lily, she showed a strong resistance to walking because of her injury.

Lily: What? I can't do that. I can't do that with my foot. I wasn't supposed to be walking on it. And every time I walk on it, it's like...
Researcher: Hurt?
Lily: I can feel something moving inside of there. I don't know what it is, so I have to go to the doctor.

The other girls also preferred playing on the playground, so we did. When we arrived at the playground, all of them went to the swings. Afterwards, the students played tag on the playground. They played for 30 minutes.

Week 8

Olivia came by, but told us that she would like to stay and do her homework. She didn't join Girls Inc. today and instead went to the teen center. Emma, Julia, Mary, and I started walking on the bike path. We planned to walk for 30 minutes. As we came to forks in the path, Emma asked

me where we were heading. I told her we should continue straight on the path to prevent us from staying in the park like last time.

Emma: Cause Olivia is going everywhere [referring to the 5th week where Olivia walked around in a circle in the park].
Julia: Oh that Olivia.
Emma: I know. Wait, we left Olivia.
Researcher: Olivia said that she needs to do her homework.
Emma: Oh yeah, and plus her ankle. Supposedly hurt her ankle.

Olivia did not tell me about her ankle, but Emma told me about her injury.

When we had walked about 15 minutes, I had planned to turn around and walk back. Emma said, "We are so close to the Badger [a pseudonym for a local middle school]. It's ridiculous." Mary and Julia responded with, "It's real close," and, "We are close to Badger," respectively.

Researcher: Do you want to go there and come back?
Emma: Sure. Then we walked the mile. Exactly a mile from here to Badger. Badger is right down here.

Emma took the lead to Badger middle school until Julia saw a park and playground.

Julia: Hey look. There is a little park. I want to go on to swing. Can we? Let's take a little break.
Mary: We can walk back [to Girls Inc.] on the street [pointing towards the park].
Julia: Yes. Shall we take a little bit of break?
Mary: Yes.
Julia: Yay! [run towards to the park]

Students consistently showed their excitement over the playground at the park. The girls had been playing at the park for around 30 minutes since we began walking. I asked them "It's been thirty minutes. Do you want to get going?" Both girls shook their heads and started playing again. This was a different response than when I had asked them to go outside from Girls Inc. I felt that I needed to have them stop playing due to the program time limit.

> Researcher: Let's get going. Let's go.
> Emma: Are we taking a long way back? I don't care.
> Mary: It's a little bit longer, but not that much longer. We can walk pass the lake now.
> Emma: Oh sure. That was fun.

Emma showed the positive attitude towards walking. After about 50 minutes of walking together, Julia had accumulated 9257 steps on her pokéwalker for the day:

> Julia: This [walking] just feels so amazing.
> Researcher: Do you know how long we've been walking today?
> Julia: No.
> Researcher: Fifty-five minutes.
> Julia: Wow. Almost an hour.

Although we did not go to Badger middle school, Julia and Emma enjoyed playing at the park and showed positive attitude towards walking.

Community Center's elementary summer camp

Mary and I planned to continue the exergaming program with Girls Inc. students. However, the Girls Inc. program schedule was changed a week before the summer program from meeting once a week to a one-week-long meeting. Since the schedule didn't support meeting with students

weekly, I had to change research plans. Mary helped me connect with the local community center's summer camp program where I would be able to recruit 5th and 6th grade female students who were interested in playing pokémon in a group.

This summer camp program is for children between 5 and 12 years old, and they meet from Monday through Friday. The each week costs $175 with $25 activity fee per student, and they offer a sliding fee scale as well. With help from Mary, I was able to set up an exergaming program for 5th and 6th grade girls in the summer camp, meeting twice per week for two hours each session. There seemed to be a few differences with the pilot Girls Inc. program. The ages of the girls in the summer program were younger than the girls in the pilot, and their ages were closer together. In addition, each session was two hours instead of one, and we met twice per week.

Week 1

Since the recruitment and changes happened near the start of the summer camp, I only had two students sign up the first week. Molly and Lanie were both 5th grade students. We started with introductions to each other, and I used this time to have them get used to playing the pokémon game. At first, I asked them about their previous experience with pedometers. Molly had experience of using a pedometer, but Lanie had never used one before. I showed them the pokéwalker , and Molly nodded, smiling.. I told them, "You can have a little pokémon," and

Molly said, “Oh, that’s cute.” I showed them how to wear the pokéwalker on their waist. Both of them were watching and paying attention.

When I gave each of them a DS, Molly opened her DS and said, “Oh, it’s cool.” Both Molly and Lanie smiled when they first held onto the DS systems. Neither of them knew how to turn on their DS and where their stylus was at first. As Molly started the pokémon game, the game sound track started playing; Molly said, “Oh, that’s cool.” Molly consistently showed a positive attitude towards the game and pokéwalker.

They started playing the pokémon game and exploring the world:

Lanie: Yay!
Researcher: What happened?
Lanie: I went to the pokémon world now.
Molly: [Smiling] They made me a tiny person.

Lanie leaned over to Molly to see what happened on her screen and smiled:

Lanie: Wow.
Researcher: What’s happening?
[Researcher goes over to see Lanie’s screen.]
Researcher: Talking with your mom?
Lanie: Oh, that’s your mom?
Researcher: Yes.
Lanie: Oh yeah, she said she was. Yay. I got a bag.Yay. Dang.
Molly: These are fun looking
Researcher: Yeah. Isn’t it cute?
Molly: Yeah.
Lanie: Yay. I saved the game. So, should I sign my trainer card?

Researcher: Of course.
[Lanie signs on her trainer's card]
Lanie: Yay. Oh that's cute.
Researcher: What's that?
Lanie: I just found a door. I couldn't find a door.

It is interesting how both girls shared what was going on on their screens with one another. They seemed to be comfortable to each other. I also felt that they followed the instructions from the game given that they both have not used a Nintendo DS. I commented:

Researcher: You both are catching up so fast.
Molly: Because I have played this one before.
Researcher: You played the same one?
Molly: Well, not exactly the HeartGold and SoulSilver one, but my cousin downloaded on to my computer, so...

Molly hadn't played this version of pokémon, but she had played previous pokémon games on the computer with her cousin before. It also explains why she did not know how to start the DS at first.

Lanie: I name it [her pokémon] Chichi.

The game allows players to name their pokémon when they catch them.

Lanie: I can make a phone call, too. I don't remember how. Okay. Okay. I know. I know. Okay. I know now. Are you going to Mr. professor's house now? Oh, right there. Guess what he did? He came out the door. I was going the other way. He just slammed the door out. [smiles] He gave me his phone number. Yeah. [chuckles] He just came out and door slammed. I was laughing. That's at Route twenty nine. I can't go pass now. [battle music in the background; Lanie's eyes get bigger] Oh! [smile] Something just happened. Pokémon! A pokémon just... Chichi! Chichi! Rawr! Fight! [Touches her touchpad with a stylus] Chichi! Oh, Bye bye [Smile]. Run! Oh I got away safely. [smiles] Move! Girl! [to her character] I am going to

> Ethan's house. Where is professor's house? I am calling a professor [smile]. I am calling my mom. [smile] I am calling everybody. [She gets in another fight.] Go Chichi! That's funny name. Go chichi. Beat him up! Beat him up! Oh you lost. That's sad. Chichi lost.

Lanie was very expressive while playing. Not too long ago, she had named her first pokémon, and now she's calling out her pokémon's name a number of times during battles. She even said that she's sad because her pokémon, Chichi, lost a battle. Lanie seemed to have developed a connection between her and her pokémon.

Researcher: How are you doing, Lanie?
Lanie: Good. It's so fun [smiles].

At the end of the session, I showed them how to get to the pokémon center and transfer a pokémon into their pokéwalker (see appendix 6). I encouraged them to start using the pokéwalker on their own until next meeting.

Two days after the first meeting on Saturday, Lanie called me at 8:24am. She wanted me to help her set up her pokéwalker. We talked on the phone about how to do so. Lanie readied her pokéwalker and was very excited.

Week 2 (Tuesday)

Molly and Lanie came to the meeting, and Emily joined the group. Molly figured out how to battle other players on her own over the weekend, and she showed Lanie how to battle together. They then did so:

Molly: Come on. Just kill him. That's right. Yeah!
Lanie: Yes! You [Molly's pokémon] missed. Oh, I died.
Molly: I just always have to confuse it [the other pokémon]. What?

Molly started talking to Lanie about battling against the gym leaders in the game:

> Molly: Gym leader always goes first. I always go down on the first hit. And if you die, you have to play again. I saved it right before, too. Lanie, you know what I do. You should save right before you battle with gym leader. And then when you die, just turn it off and it will reset all your potions. [smiles.] That's what my cousin taught me.

Molly had shared how to be economical in the game with Lanie. Molly had just started playing the game five days ago, but she already knew a way to save her resources such as potions when losing against a gym leader. I did not see this in my pilot data throughout the eight-week long period. This is a way to break the game system. I observed them connecting their pokéwalkers for the first time:

Molly: Go to the pokémon center.
Lanie: Wait. Wait. Where is your pokéwalker?
Molly: Right here. [She pulls her pokéwalker off of her waist.]

Lanie and Molly then connected their pokéwalkers. After they connected, they both returned the pokéwalkers to their waist and continued their battling. I was surprised that they figured out how to battle on the DS in their second week. It happened without prompting, and I did not see this happen during my pilot study. I was spoke with Molly about the pokéwalker:

Researcher: If you walk more, you can get pokémon really easy.
Molly: Yeah. It's really easy to get pokémon.
Researcher: On pokéwalker.

Molly: Yeah. That's how I got most of mine.

Molly showed her comfort level with the game and pokéwalker. She set up the pokéwalker on her own without receiving help from me. She also learned how to battle other players on the DS. She experimented with her pokéwalker and recognized how easy catching pokémon after walking was with it. While players need to buy pokéballs to catch pokémon in game, a pokéwalker supplies unlimited pokéballs for free to catch pokémon.

Lanie turned off her DS after an hour of playing. She grabbed her pokéwalker and took a look at it. She said "I am going to walk." She put her pokéwalker back on her waist. She joined the other kids from the summer camp on the playground. On Tuesdays, the summer camp students who were not in the exergaming program were playing on the playground in front of the building. After about 30 minutes of playing, she came back.

Researcher: Can we see how many steps you have right now?
Lanie: Five thousand five hundred eighty six (5586).

After that, Lanie left again to the playground.

Molly: My steps right now is eight hundred twenty one. It refreshes at one [in the afternoon].
Researcher: What? Why does it do that?
Molly: I don't know.
Researcher: [Pulls out Molly's DS] I think it's actually hooked up with this. I know why. Your DS's time is 2 am now. That's why. Let's change time on the DS. That's the reason why.

Since the pokéwalker uses the time from the Nintendo DS, it is important to set the current time on the DS to the correct time. I reset the time on Molly's DS and connected her pokéwalker again. Molly left to get more steps on her pokéwalker. After a while, Lanie came back from playground.

Lanie: Okay. I have six thousand right now. Six thousand two hundred and something.

Lanie left again. Lanie wanted to get steps on her pokéwalker and then initiated doing so. Molly also wanted to do the same, and both of them played on the playground together.

After the individual interview with Emily, she started playing her pokémon DS game. She smiled and showed her excitement.

Emily: How do you start to play?

She was at her house in the game.

Researcher: You already started playing.
Emily: I can only stay in my house though?
Researcher: Did you walk out the door?
Emily: There is a door? Oh!

She started shaking her torso and smiling at Lanie.

Emily: I started to play the pokémon.

Emily did not reach at the point where she could transfer her pokémon into her pokéwalker by the end of the session. Since she couldn't, I showed her the manual on how to transfer pokémon to pokéwalker and encouraged her to start using the pokéwalker on her own time. A day later,

Emily called me on the phone at around 8:40 pm for help connecting with her pokéwalker. It took us about forty minutes.

When she finally got her pokéwalker working, she screamed "Yay!" on the phone. She was so excited that she said that "I am going to walk around to see how many I can get." That was at 9:20 pm, around her bed time. After the phone calls from Lanie and Emily and hearing their excitement over the phone, I felt that this group had a more positive attitude towards the pokéwalker.

Week 2 (Thursday)

Emily and Molly came to the meeting. Lanie did not come to the summer camp. Molly wore her pokéwalker, but she forgot to bring her DS. Emily has three younger brothers, and Molly has one younger brother. They talked about the difficulties of playing pokémon at home with their brothers around:

> Emily: My brother's bothering me. "Can I play? Can I play?"
> Molly: Exactly.
> Researcher: How old is he?
> Emily: Four. Well I have three (brothers).
> Molly: Um. Emily, what I do is that I remember where I played, but then he just turns it off. He doesn't save. so then you are back at where you were at. He doesn't change anything. He doesn't save anything.

This happened often. During the pilot, Ashley's brother took her game and played on her DS. Ashley's brother did not turn off the game without saving his play, so it was difficult to know how much Ashley had played. Molly seems to use the DS game system well to deal with her brother.

At the last meeting, Lanie had initiated going outside and walking. This time, Emily was curious about walking.

Emily: [whispering] Are we taking a walk today?
Researcher: Yeah. We can go outside.
Emily: Isn't it too hot to walk?

The average temperature of the day was 76°F (ranging from 63°F to 89°F).

Researcher: We can just play around.
Molly: Hey. Do you have a soccer ball anywhere?
Researcher: [to Amy] Do we have a soccer ball?
Amy: Yes. We can find one.
Molly: [Raising both of her arms] Yes!
Researcher: Do you want to play soccer?
Molly: Yeah.
Researcher: Okay. [To Emily] Do you want to play soccer?
Emily: I will.

Molly suggested playing soccer instead of walking. This summer group seems to initiate physical activities.

Researcher: If you guys are ready, we can go outside.
Emily: Not quiet yet.
Researcher: Not quiet yet?

Emily is playing her DS.

Researcher: Why don't we go outside and have fun.
Emily: Okay. I am waiting for the pokémon...
Researcher: I will give you one minute to finish up.
Emily: [Laughing out loud] Yes! That's what I am talking about. Ohhh that's a hideous one.
Researcher: Are you done?
Emily: I can ask for a battle. [Raises one arm up) Oh ho ho! What's wrong with him? Hehehe. [Stands up.] I beat him! [Loudly] I beat him! [Dances]

I couldn't tell if Emily wanted to go outside that day. She initiated the talk about walking but was also concerned about the hot weather. When Molly grabbed her water bottle and left, Emily followed Molly and me outside. Although she showed some resistance to stepping outside, leaving the room was not too difficult compared to the pilot study group. Emily, Molly, and I went outside of the building to play soccer on the grass field. We played horse on the basketball court. After that, we walked back into the building because of the heat and continued to play a simon says walking game where the leader finds a path to walk.

When we finished our walking, Molly and Emily wrote a short reflection paper. Emily took my audio recorder and began talking about the game:

Emily: Hey, San Diego, this is Emily. And Emily just wants to tell you guys that I just beat this Youngster [a character in the game]. He thinks he can beat me. Ha ha ha. He don't know the great Emily. Cause I am the... My name is Emily. So he thinks he can beat me. So that's what I've got. I won sixty four thousand [money in game]. And his name was Joey Youngster. Ha ha ha. Sure. Bye, San Diego.

It had been only three days since Emily began playing the game, but she seems to have taken on the role of a pokémon trainer quickly.

I asked Molly about pokémon:

Researcher: Molly, what do you think about pokémon?
Molly: Um... I think pokémon is fun. It's been very old, so I still can't believe the creators still like to create stuff.
Emily: Read your thing. Read your thing [points at her reflection journal].
Molly: What thing? Oh and I have the script apparently. I feel very happy, hot, and a little bit sweaty. I took four thousand and seven hundred forty steps. And my name is Molly.
Emily: I am Emily. I feel good right now. We just got down playing soccer, kickball, basketball. I did four thousand two hundred forty seven steps. This morning I started off with zero. OMG. I can't believe. I got 4247 steps. And I am hot and sweaty from those physical activities. I feel great. Pokémon to me, pokémon is something that I really enjoy. I never thought I will be. I never thought I would enjoy it. But now that Yoonsin got me stuck on it. Gosh, I want all the pokémon in the world. I want to be the best pokémon trainer.

Week 3 (Tuesday)

Today, Emily and Molly came to the meeting. Lanie did not come to the summer camp because she went to Indiana for Independence Day. Emily didn't bring her DS because she didn't know we had a meeting. Emily had her pokéwalker, but she didn't wear it when I saw her.

Emily: I don't wear it [the pokéwalker] now. I don't know why. I just didn't.
Researcher: You didn't wear it yesterday?
Emily: Oh yeah, I couldn't find it yesterday.
Researcher: You couldn't find it?
Emily: Nope. And I found it. The day before, I lost it, too.
Researcher: Where did you find it?

Emily: It was my brother. My brother, uh, my brother found it in between our couch. Because sometimes pokéwalker falls off.
Researcher: Yeah?
Emily: Is this what this clips for something?
Researcher: Uh huh.
Emily: Oh.

I showed Emily how to use the clip to prevent losing the pokéwalker.

Molly brought her DS, but she didn't bring her pokéwalker because she had forgotten it. Since the meeting often included both playing the game and doing physical activities with a pokéwalker, not having one or the other made it difficult to keep track of their physical activity and perform the same activity together. It was problematic today since Molly had only brought only the game, and Emily had only brought the pokéwalker.

As a review of last week's physical activity, I asked to the girls about their physical activity last week.

Molly: Last week, I like played a lot. I went swimming. Well. When I have my pokéwalker on, I sometimes forget that is on. I just move around regularly, exercise regularly. Cause it's not in my waist. I put it in my pocket hole.
Researcher: How was your physical activity, Emily?
Emily: Fun.
Researcher: Did you walk more last week?
Emily: In the pool, yeah.
Researcher: In the pool?
Emily: I can't take the pokéwalker in the pool, can I?
Molly: Exactly. We spent like a long time in the pool.
Emily: Yeah. that probably wasted 700 steps in the pool. We can't take it.

Molly said that once she has the pokéwalker on her waist, she forgets that she has one. If this is true, then wearing the pokéwalker may not change her physical activity behavior. At the same time, Molly had seemed excited about using the pokéwalker earlier. Tracking girls' physical activity with pokéwalkers when they go swimming is problematic. The summer camp students go swimming every week, and since the pokéwalker is not waterproof, it can't measure physical activity in water.

I shared the Center for Disease Control's physical activity guidelines for children, especially for girls.

> Researcher: Do you know how much you need to be active to be healthy?
> Molly: An hour a day?
> Emily: At least like an hour a day you should.
> Molly: Because it's always just like you should do an hour a day and you don't have to do an hour a day. You can do like ten minutes to walk, five minutes in the pool.

Both Molly and Emily knew about being physical active for an hour a day as children. Molly was more specific that those physical activities can be broken down into shorter time periods. Emily seemed to be bored of the conversation and showed interest in going outside to play. Although she expressed that she wanted to go outside, the conversation continued with the recommendation for the girls' daily steps number:

> Emily: Can we go outside and play?
> Researcher: How many steps do you think you need to have to be active as a girl?
> Emily: As a girl?

Researcher: Yes. Per day. How many steps have you been taking?

Molly: It's usually 9000 to 10000. Sometimes 6000 or 5000 steps. Sometimes I will be feeling sick and no, I don't wanna move.

Researcher: What about Emily?

Emily: [Looking at her steps.] Hey, The highest I've gone so far is 9361. And the lowest I got is zero cause I was being lazy on the July second and July third.

Researcher: Were you being lazy?

Emily: Yes, I was lazy. I had to put it on. That's too much work. [giggles]

Molly: Wow, Emily.

Emily: So what I've think for girl, you should get steps in as like say like ten or eleven thousand?

Researcher: Eleven thousand steps per day is the recommendation for girls.

Emily: I got two of them right. Can we go outside like ten more minutes?

Emily and Molly used their previous step numbers to guess the recommendation. They had a large range of daily step numbers, but Emily answered eleven thousand steps per day, which is the recommendation. Molly mentioned that she doesn't want to move when she's feeling sick. On the other hand, Emily talked about being lazy as a reason why she did not wear her pokéwalker. Then she expressed again that she wanted to go outside and play:

Research: So can you meet the 11000 steps goal?

Emily: No.

Molly: If I find my thing [her pokéwalker], yes I will.

Emily: I guess I can do the eleven thousand steps, but that will be a lot of work.

Emily looked at Molly's step count:

Emily: Wo-ah. [Her eyes opened wide, looking at Molly.] She had. You [Molly] had ten thousand two hundred and twenty two. Oh, girl. You are so active. That's pretty cool.

Emily answered no to meeting 11000 steps per day at first. After Molly's positive attitude about reaching the target steps, Emily changed her response from "No" to "I guess I can do..." Emily checked Molly's previous daily step numbers and she showed the positive attitude toward the fact that Molly had reached 10,000 steps one day.

Researcher: Do you want to go outside?
Molly: Sure.
Emily: Yeah, me and Molly, we can go and play, gal.

Molly, Emily, and I jumped rope together for 30 minutes on the playground. They wanted to compete with one another to break their records.

Week 3 (Thursday)

Today, Molly and Emily came to the meeting. I checked if they brought their pokéwalker to meeting.

Researcher: Do you guys have pokéwalker?
Molly: We connected [our pokéwalkers] this morning.
Emily: We connected. Ha ha ha ha. Oh, I got up to eight thousand yesterday, so it's kind of close to the... [eleven thousand steps].

I was glad that both of them hadbrought their pokéwalkers since we had a plan to walk together today. It's interesting how they answered my question by stating that they had already connected their pokéwalkers. Emily mentioned her step number from the previous day on her pokéwalker before I had asked her about it.

Researcher: Oh, You got up to eight…Can I see?

Emily: I don't have much steps [today]. Hold on. I will show you. I will read it to you. Today. Woo. Didn't get that much steps at all!
Researcher: Today is July seventh.
Emily: Oh! I got two thousand two hundred ninety four.
Researcher: Yesterday one [step count]) was 7,515.
Emily: Seven five one five.
Researcher: Look at that. 6,092 [for the day before yesterday].
Emily: That's not a lot at all.

After talking about the recommended step number last Tuesday, Emily had started to talk about her step numbers compared to eleven thousand steps per day.

Emily looked through my pokémon collection on my DS, and she asked me to trade her one. I used her interest to increase her step numbers:

Emily: Can I steal a pokémon from you [Yoonsin]? Take one like trade?
Researcher: Can we set up a goal to reach for two hours. If you reach that goal, I will trade you with my pokémon.
Emily: How many? How many? My goal will try to be, um, I am at 2,294, but I am gonna try to be at least 5,360. Is that a good one?
Researcher: Yeah.

Emily knew about the daily recommendation of 11,000 steps. I did not want to set up the goal for them during the two-hour program time.

Emily: No. 6,000. 6,000 or more.
Researcher: Okay.
Emily: Researcher, if I reach that goal, you have to trade with me.
Researcher: So 6,000 steps?
Emily: Or more. Molly is going for that goal, too.

Emily started by setting her own goal as 6,000 steps. She then forced her goal upon Molly as well. At 10am, Emily had 2,294 steps, and Molly had 2,083. They had both set their two-hour goal to reach 6,000 steps by noon. We went to the University campus. After a short visit at Molly's mom's smoothie cart on campus, we walked by the lake and university buildings. Emily checked on Molly's step number in the middle of the walk.

Emily: How much steps do you have, Molly?
Molly: 4,229
Emily: 4,250
Researcher: Can you guys walk faster? You might be able to get 6000. Let's go.

We all walked a little bit faster speed.

Molly: At least I am not shaking it.

Molly's comment showed concern about cheating on a device like a pedometer or pokéwalker. Molly was careful not to shake her pokéwalker. She didn't seem to value reaching a certain number of steps without walking.

At 11:30am, Emily had 4,684 steps.

Molly: So, what was our goal again? Six thousand?
Researcher: Yeah
Molly: Okay. We've got like about two thousand to go. That was not too hard [to Emily] Hey, do you wanna race? Emily, do you wanna race?
Emily: Where to where? To the flag?
Molly: Okay.

I walked to the pole and gave them signal to start running. They both ran and high fived me, laughing.

Researcher: Do you guys wanna do it one more time?
Molly and Emily: Sure

They ran again.

Molly: That was too short.

They tried again.

Emily: Let's see how much steps I got. 4,968.
Molly: I am 5,155.

Molly had a positive attitude about walking, and collecting steps on her pokéwalker wasn't too hard. She, then, asked Emily to race to get more steps. They both seemed to enjoy racing each other.

Molly: Yoonsin, You owe me a pokémon. I have 6,280 [steps].
Researcher: I will trade you a pokémon.
Emily: I don't have that much.
Researcher: How many steps do you have?
Emily: I am looking. Oh, Yoonsin, you owe me a pokémon. I have six thousand, hold on.
Researcher: Are you sure?
Emily: Six thousand...
Molly: Yoonsin just like "I don't want to give up all these pokémon."
Hey [Emily], do you want to battle again?

At the end of the session, Emily and Molly finished with 6,174 steps and 6,557 steps respectively on their pokéwalkers. They had met their own goal of 6,000 steps. Although both of

them spent at least an hour walking, they took about 4000 steps in that time. They did not reach the 11,000 step goal for girls based on the Presidential Active Lifestyle Award.

As wrapping the session up, I wanted to hear how they had been during the session:

Researcher: How was today?
Molly: Fun.
Emily: Good.
Researcher: What about your steps?
Molly: I did reach my goal.
Emily: 6,081.
Molly: 6,287.
Researcher: I will trade you pokémon before I leave.
Molly: Yay.

The students ended up setting their day goal for the rest of the day.

Researcher: Are you going to set another goal for today?
Emily: 7,000.
Molly: Today I am going trying go for that 11,000.
Researcher: 11,000?
Emily: I will go for 10,000 I think.

I saw a pattern in Molly setting her goal to reach the recommended step number and Emily then changing hers after listening to Molly. From Emily's physical activity log and pokéwalker, Emily had a total of 14,149 steps on that day. This was the first time she took more than 11,000 steps.

Week 4 (Tuesday)

Nora joined the group after last week's group meeting. I gave her a DS and pokéwalker so she could start on her own. Lanie came back from her trip. Molly did not come to the summer camp because she went to a water park. Emily came to the summer camp, but she did not want to join the exergaming program for the day.

Lanie told me about her physical activity during her trip last week. She seemed to be very excited about her adventure:

> Lanie: We walk down the canal in Indianapolis.
> Researcher: You walked with your dad and friends?
> Lanie: Yes.
> Researcher: For an hour?
> Lanie: Yeah. We walked for an hour. It was really dark. It was like 12 o'clock.
> Researcher: 12 am?
> Lanie: Yeah. [laughing]

I was checking their pokéwalkers when Lanie told me, "Two days ago, I have zero [steps] because I forgot to take the pokéwalker." Nora did not bring her pokéwalker to the meeting. But she had brought her DS.

Since today was the first day for Nora, Lanie wanted to help Nora since she had been playing the game for three weeks. Lanie seemed confident about her game play; however, she seemed frustrated with how Nora was playing. Lanie and Nora were sitting next to each other.

Lanie: Uhhhh. You [Nora] are so slow [in the game]. This guy will give you fast shoes. Don't worry. He will give you fast shoes. This guy will give you fast shoes. You don't got no acorns. He needs acorns.

Nora: Why do you need acorns?

Lanie: Oh, you can't put the acorn in yet. Oh. Man! Okay. He's going to give you fast shoes. Nora.

Nora: Who?

Lanie: He's going to give you fast shoes. The guy is going to pop up. He's going to give you fast shoes.

Nora: I know that. I know that.

Lanie: [Showing her game] See? I am fast [in game]!

Nora: Can I see? Why you got the fast shoes?

Lanie: Because he gave me.

Nora: Who gave you?

Lanie: See? He gave me the shoes.

[Lanie plays Nora's game with Nora watching]

Lanie: See? Now you can run finally fast. I was too tired!

Lanie was demonstrating how running works in her game to Nora. Later, Lanie showing running by playing on Nora's game for her. With help of Lanie, Nora collected more than two pokémon in the first meeting. She was ready to connect her pokéwalker to the game. Since she had not bring her pokéwaker, I gave her an extra one. I wanted her to start using a pokéwalker as soon as possible. Lanie wanted to help her with the pokéwalker, too:

Lanie: So can I help it with her [Nora]?

Researcher: Yeah. Do you want to help her with it [connecting pokéwalker]?

Lanie: Yeah. Yeah. Okay. So, you can only go on one [virtual trail]. Which one? Noisy Forrest or Refreshing Valley?

Nora: Noisy.

Lanie: Oh good. So this is what you gotta do. It took me a while, but it's actually easy. Now you have to do this. It has to be on the good surface. So, like that. Okay. It does that. Hold on. I am not doing it right. That's all.

Researcher: Oh, you need to just go more longer.
Lanie: Okay.
Researcher: And then you can do it.
Lanie: You have to have a good point at it. Takes a while.
Nora: Okay. This is what? Continue?
Researcher: Connection was disrupted. Let's do it again.
Lanie: Can somebody hold it for me? And then I can like. It's better on the carpet.
Researcher: We can do it now. Connecting to pokéwalker now. And yours got shrunk so small and then went up to the pokéwalker. Take a look. There is your pokémon.

Lanie introduced Nora to pokémon trainer practices by connecting their pokéwalkers:

Lanie: And then now we can connect and you can defeat people.
Researcher: Oh yeah. Connect. Let's connect.
Lanie: Can we all connect now?
Researcher: Yes. let's connect.
Lanie: Went for a run. What did you get? I got stardust.
Nora: You just keep it like this?
Lanie: See when you get watts, like um, you can discover stuff like that.
[Lanie shows Nora the dowsing mini game on the pokéwalker.]
Lanie: I wanna play again. I love this.
Nora: How do you play games? How do you play the games?
Researcher: You don't have any watts right now.
Lanie: You have to walk to get the watts.

Nora's lack of watts led both Lanie and Nora to play outside on the playground.

Researcher: Lanie, how many steps do you have now?
Lanie: I have 6,888.
Researcher: Nora, can I see your steps?
Lanie: She got 10 [steps].
Researcher: Are you interested in jump roping?
Lanie: Oh! Yeah. I wanna do jump rope.
Nora: I wanna do jump rope.

There was no resistance to go outside and do physical activity. After 30 minutes of playing on the playground including jump roping, Lanie had taken 7,923 steps and Nora had taken 792 steps.

To wrap the program up for the day, I asked Lanie about the day and her opinion on the pokéwalker.

Lanie: Pretty good. Fun.
Researcher: How's using pokéwalker?
Lanie: It's pretty fun. I like it.
Researcher: Tell me more?
Lanie: Pokéwalker is fun because it makes you active, because um, when you walk you have to get watts to play games. You have to get certain watts to play games and um, that's pretty good because it's giving you to do, uh, active activities to do what you wanna do. So it's pretty cool.
Researcher: So what do you do with it?
Lanie: Um, you walk with it. And it's your animal, your animal is in your screen.And it gets smaller when you walk tons a lot. And you can earn stuff by doing this game.

Week 4 (Thursday)

Emily, Molly, and Lanie came to the summer camp. Nora couldn't join the morning meetings on Thursdays because she had summer school in the mornings. I announced that we would go to the botanic garden near the community center. Emily said, "Well, I don't feel like walking that long. My feet hurt." Emily told me that she had hurt her left ankle the previous week, and she didn't think she could walk for a long time. Although the garden is about a fifteen minute walk from the center, she wanted to ride a car to the garden.

Emily: I don't think... I want to come,
Researcher: Uh huh.
Emily: But I don't wanna walk that far. My leg hurt.
Researcher: I don't know if we can get the Van.
Emily: Can't we just go talk to teacher here?
Researcher: We can ask Amy for the van.
Emily: For a van. If we don't have [the van], I am not going to be able to come.
Researcher: When we see Amy, we will ask her. If she doesn't have, we can walk. It's super fast. It's super close.
Emily: I want to go, but I can't walk that much. See I want to come, but
Researcher: Then come.
Emily: I don't wanna walk.

With Emily's strong resistance to walking to the garden, we waited until Amy came back to give us ride there. Lanie didn't bring either her DS or pokéwalker. She said, "I totally forgot. I was thinking about other stuff." Emily also didn't bring her pokéwalker. Molly was the only one who had brought her pokéwalker, but she mentioned, "Yesterday, I forgot my walky thing for a while."

Researcher: How many steps do you have?
Emily: I have 2,500 [Didn't bring pokéwalker]
Molly: I have 4,099.
Emily: I have been counting my steps. Like one, two, three, four.
Molly: Hey do you want to connect [to Yoonsin]?

Although Emily did not bring her pokéwalker, she had made up a number to answer my question. Once I had checked in with Molly on her pokéwalker, she wanted to connect her pokéwalker with me. Molly seemed to assume the role of a pokémon trainer.

Amy showed up 30 minutes later because of her other meeting. She took us to the garden. Emily was concerned about walking again:

Emily: Are we really walking? Cause my ankle sore.

Once we arrived at the garden, we walked around it. We went to its Thai pavilion and talked with volunteers there. Molly and Emily sang pop songs. Lanie danced in front of the Pavilion. As we were exiting the garden, I checked Molly's pokéwalker, and she shared her experience of playing against the gym leaders in game.

Researcher: How many steps do you have? [Reading Molly's pokéwalker] 6,386. How was playing with pokémon last week, Molly?
Molly: Last week, I think it was actually pretty easy. I went through whole bunch of gyms, and I didn't play for an hour.
Researcher: You didn't play for an hour but you went through a lot of gyms?
Molly: Yeah. Like everyday, I didn't play for one hour. And then I would have like one gym done. It was actually pretty easy.

To end the today's activity, I asked about their walk in the garden:

Researcher: How was walk here?
Emily: Good.
Molly: Good.
Researcher: Really?
Emily, Molly, Lanie: Yeah.
Emily: [Whispering] say are you sure.
Researcher: Are you sure?
Emily: Lady, I am sure. Don't make me change my mind.

Earlier, Emily had said that she couldn't walk much, but she had been walking well at the garden. She had even said that she was sure that walking was good.

Week 5 (Tuesday)

Marta and Kirsten joined the group. They are in 6th grade and knew each other before joining the group. Molly, Lanie, Marta, Kirsten, and Nora came to the meeting. Emily didn't come to the summer camp because she wasn't feeling well.

As a review of the prior week, Molly and I talked about her physical activity:

Molly: Yeah. I walked with my mom and stuff.
Researcher: How long did you walk with mom on the day you took 15,000 steps.
Molly: Well. I walked with my mom for thirty minutes. And after thirty minutes, I ran a lot.
Researcher: So you are walking with your mom a lot.
Molly: Yeah, I like to walk with my mom a lot.

Molly talked about walking with mom in her pre-interview. She was still walking with her mom, and one day in the previous week, she had taken 15,121 steps.

I checked the students' pokéwalker steps:

Molly: 2,423
Kirsten: I don't know mine started over. Before I had 1,500. We ran around the gym the whole time after. I had 1,500 and now I have 150, so.
Marta: I have 1,507.

To Kirsten, her number was reseted to zero in the middle of day. This happened to Molly during the second week. The problem was the same: we needed to ensure her DS time was correct.

Marta and Kirsten started playing the game today in the morning. Marta and Kirsten already had their own Nintendo DS devices. Marta told me that she had played another version

of pokémon before. However, Molly had played for a month recently, and Marta and Kirsten looked to her for help:

Marta: To capture a pokémon, do you have to defeat it a little?
Molly: It's easier.
Kirsten: Yeah.
Marta: To capture a pokémon, do you have to kill a little?
Molly: A little bit.
Marta: A little.
Kirsten: Where do you get balls?
Molly: You have to buy one.
Kirsten: How much are they?
Molly: 200.
Marta: That's expensive.
Molly: Everything is expensive in this game.
Kirsten: Gosh, not even Club Penguin is that expensive.

Marta, Kirsten and Molly continued to talk about naming pokémon:

Marta: I don't want to fight Weedle.
Kirsten: I want a Weedle. I am fighting Weedle. Yes! I got a Weedle.
Marta: You can get the Weedle?
Kirsten: Yeah. See? This is my Weedle. I don't know what to name that.Woo, it's a girl Weedle.
Marta: How do you know?
Kirsten: Cause it says female. I don't know what I should name it. What is yours name, Molly?
Molly: I just usually left the same name that had.
Marta: What about Jigglypuff?
Molly: Yeah, Jigglypuff still has the same name. the only one I gave the nickname to is Oddish thing. I call it Oddie.
Kirsten: I don't know what to name mine. What should I name mine, Marta?
Marta: I am gonna name mine Weedly.
Kirsten: Weedly? I am gonna name mine Weedles.

It took a while for Kirsten to name her pokémon.

Researcher: So, Kirsten, your favorite pokémon is Weedle now? Are you going to move it over to pokéwalker?
Kirsten: Yeah. I am trying to get two. so I can have one on hand, and one on my thing [pokéwalker].

I helped her with transferring her pokémon into her pokéwalker. When she saw Weedles on her pokéwalker, she we very excited:

Kirsten: Weedles, So cute!

Kirsten showed Molly Weedles:

Kirsten: See it?
Molly: Yeah. That's a Weedle.
Kirsten: Isn't it cute?

Marta and Kirsten explored the pokéwalker.

Marta: Oh connect. How many times can you connect to a trainer?
Researcher: Once per day.
Marta: Would you like to connect?
Kirsten: I didn't do it with Lanie.

Lanie had not brought her pokéwalker, so Kirsten couldn't connect with her. Lanie and Nora did not bring their DS or Pokéwalker. It was difficult to keep them interested while other students played the games. Lanie and Nora eventually left the meeting early.

Week 5 (Thursday)

Molly, Emily, Lanie, Kirsten, and Marta came to the meeting. Lanie didn't bring her pokéwalker. While reviewing pokéwalker step numbers, Molly mentioned that she forgot to wear her pokéwalker:

Molly: I forgot my pokéwalker. I only have 6 steps. I forgot my pokéwalker yesterday.
Emily: I didn't wear and got zero this time because my ankle was hurt at the worst. But now it's better. I did an x-ray on thursday, but I can walk now.

Emily had been sick on Tuesday. Her voice sounded as if she were sick still.

Molly, Marta, and Kirsten seemed to become better friends after playing together at the previous meeting. They connected the pokéwalker together before our meeting.

Marta: Can you battle against people on the pokéwalker?
Researcher: Yeah, well. You can meet with other trainers. Did you all connect with other?
Molly: Yeah.
Kirsten: I did trade with you. Molly? Did I do you, today?
Molly: Yeah.
Kirsten: Molly, Marta, and I did with Lanie.

Emily was confused about collecting watts on her pokéwalker and getting gym badges. Molly answered her questions with short and simple replies.

Emily: Molly, how do you get watts?
Researcher: Watts?
Molly: Walk.
Emily: Okay. I need more badges. How do you get badges?
Molly: You battle gyms.
Emily: I don' know where the gym at.
Molly: Use your map.

We stayed inside of Girls Inc. room because it was hot outside. The average temperature of the day was 81°F (ranging from 74 °F to 88 °F). Molly had been dehydrated when she was younger, and she had been taken to an emergency room. Since then, she has been extra careful when it is hot outside. With Molly's history of dehydration during hot weather, we decided to stay inside and walk around the table in the small room to get some steps for thirty minutes.

Researcher: Are you guys ready?
[Kirsten begins running in place and playing DS.]
Emily: Let's go walk! Walk! (loud)

Lanie and Molly, Marta were still sitting.

Kirsten: Will hopping count?
Emily: Walk. Walk. Walk. I am it!
Researcher: You are it?

Walking around the table turned into a game of tag because after Emily called herself "it". The children chased each other while running around the table to play tag. There was a lot of laughter from the students. During the game, Emily said, "Oh, my ankle again," and she sat down in a chair. The other students continued to play tag while listening to music on a radio in the room. At the end of the session, Molly had 1,459 steps, and Marta had 1,508 steps. Kirsten took 3,451 steps. Staying inside and playing tag did not help them take many steps.

Week 6 (Tuesday)

Molly, Emily, Lanie, Nora, and Marta came to the meeting. Kirsten did not come because she was on summer vacation for the week. Nora and Marta did not bring their pokéwalkers. The students told me that they went to watch a baseball game in the morning. The weather was too hot for Lanie, and so she said that she didn't feel well.

When I checked Emily's daily step numbers from last seven days on her pokéwalker, I saw that she had a day with 10,000 steps.

Researcher: Look at that. You got 10000 steps?
Emily: Who?
Researcher: You.
Emily: Yes, I did. Thank you.
Researcher: Molly, can I see your pokéwalker?
Molly: Oh Yeah, for few days, I forgot to wear it. So...

Today, students received an activity sheet that asked them to find out each other's pokémon names on their pokéwalker (see appendix 6). After each battle on the DS, they finished by taking 200 steps together. For Nora and Marta, these activities were hard to complete since they didn't bring their pokéwalkers.

To learn about each other's pokémon, the students connected their pokéwalkers.

Lanie: Emily, can I do it with you? Can I do yours?
Emily:Yeah, sure.
Lanie: Ready, Set. go.
[Pokéwalker music starts playing]

Students who had brought their pokéwalkers connected with one another. Even the students who had not brought their pokéwalker shared their pokémon names with the other girls to complete the sheet.

There is a small hallway where students have small storage boxes and hang their bags in the summer camp. The hallway connects from a hallway in the community building to two rooms for the summer camp students. After battling, Marta wanted to go out into the hallway to get her step numbers up.

> Marta: Can we go outside [pointing to the hallway]?
> Researcher: Hallway? Right here?
> [Marta gets Lanie's and Molly's attention by tapping them]
> Marta: Do you guys want to go to the hallway?
> Molly: Sure.

At that time, the hallway was quiet, and the teachers from summer camp allowed us to use it for walking. Although Marta asked us about going into the hallway first, Nora, Emily, and Lanie also went into the hallway to gain some steps. In the meantime, Marta and Molly battled on their DSs. When I checked in on the hallway, Lanie was checking her pokéwalker and putting it back on her waist. She told me, “I am almost there.”

Emily and Nora were skipping back and forth down the hallway. Lanie and I joined them in skipping. Soon after, Marta and Molly came out into the hallway and started walking together.

Emily started dancing by herself and Lanie did some jumping jacks. Nora was dancing by stepping and stretching arms forward and back. Lanie and Emily followed her dance moves while Marta and Molly were walking. After Nora and Emily went back to play some more on their DSs, Lanie, Marta, and Molly ran a relay in the hallway. At the end of the session at around 2:30pm, Emily had 5,687 steps. Molly had 8,548, and Lanie had 9,449 steps.

Week 6 (Thursday)

Molly, Lanie, Marta came to the meeting. Kirsten was on her vacation, and Emily didn't come to the summer camp. Nora couldn't join the meeting on Thursdays because she was at summer school in the morning. Marta did not bring her pokéwalker or DS. She had left her pokéwalker at Kirsten's home, and Kirsten was on vacation, so Marta couldn't pick it up. She also said that her DS was out of power, and it was recharging at her place. The weather was hot and humid, an average of 76°F. As usual, I began by checking students' pokéwalkers. Molly had 1,070 steps, and Lanie had 1,502 steps.

Researcher: Can I see your pokéwalker, Molly?
Molly: Uh huh. I forgot it for few days.
Researcher: [Looking through her week-long pokéwalker step count] You didn't wear it yesterday. Why?
Molly: Because, I forgot.

She had 15,000 steps.

Researcher: Look you had 15,000 steps?
Molly: It's okay.

Molly sounded a bit indifferent about her steps. I wondered if Molly didn't care about how many steps she was taking each day. She had forgotten to wear her pokéwalker more recently. When she wears it, she says that she forgets that she is wearing one.

Researcher: Do you want to go to the botanic garden today?
Marta: Yeah. I think we should go. Do you want to go to the garden?
Molly: Yes.
Lanie: I wanna go!

All the girls were excited to go to the botanical garden. I didn't see any resistance to going outside and walking today. We walked on the bike path to the botanical garden.

While we were walking, the girls talked t about their trip the prior day. They said that they had went to a local lake for a hike with the summer camp.

Marta: We went with [the summer camp].
Molly: It was like torture.
Researcher: Torture?
Molly: No, she was tortured.
Marta: I was freaking out. It’s not like I don’t like hikes. I love hikes except that falling off.

While we were walking in the outdoor garden, Molly checked her steps:

Molly: I am closed to my goal.
Researcher: what’s your steps number?
Molly: 3,698.

The students made a goal to reach 5,000 steps by the end of the session. Although Molly had mentioned that she forgets that she is wearing a pokéwalker, she seems to check her step numbers when there is a goal. She did this during week 3 as well.

We walked to the Herb garden. We all smelled chocolate beige herb. It smelled like chocolate.

Lanie: It makes me hungry for chocolate. I am hungry for chocolate. I am more hungry for chocolate. Can we have chocolate?
Researcher: We don't have chocolate.

During the walk in the garden, I checked with Lanie on her walking.

Researcher: So, how's walking?
Lanie: Pretty good.
Researcher: Pretty good?
Lanie: Yeah
Researcher: Do you like walking?
Lanie: Yeah. I wanna see how many steps I have.
[Lanie showed her pokéwalker to me.]
Researcher: Let's see. 3,800. How many steps did we talk about?
Lanie: 5,000.

We took a break to have some peaches at the garden. On the way back, I checked with Lanie on her walking again.

Researcher: How many steps do you have, Lanie?
[Llooking at the pokéwalker.] 6,784?
Lanie: Yup!
Researcher: How does it feel?
Lanie: Good. Sweating in my pants though.

At the end of the session at around 11:50pm, Molly had 7,873 steps, and Lanie had 7,798 steps.

Week 7 (Tuesday)

Lanie, Molly, Marta, Kirsten, and Emily came to the meeting. Nora did not come to the summer camp. Emily had forgotten to bring her pokéwalker.

Molly: Emily, do you wanna connect?
Emily: Who?
Molly: You wanna connect, Emily?
Emily: No, I forgot [to bring it].

When I checked the girls' pokéwalkers, I found that Lanie's pokéwalker's back cover had become loose, preventing her from wearing it:

Researcher: What's your steps now, Lanie?
Lanie: 259
Researcher: Okay. [Writing down in the fieldnote]
Lanie: See, I told you, Yoonsin.
Researcher: Oh, what happened? Can I see?
Lanie: It keeps on falling off. It won't put stay one.

Lanie did not want to wear her pokéwalker because it was loose. It was the first time I had seen the cover come off, and I did not have the right screwdriver to tighten it. I used masking tape for the temporary fix and promised Lanie to fix it during our next meeting.

To review their physical activity levels during the previous week, I asked for their logs. Molly had difficulty remembering to wear her pokéwalker and record her steps in her log. She told me, "It's hard to remember to put it on. At least for me."

Molly: Oh, I forgot to record my log.
Lanie: I forgot to do my log.
Molly: Yeah.
Lanie: It's hard to remember.
Lanie: I forgot to bring it. I forgot cause it was in my bag. Cause I slept over at my friend's house. But I did reach [the goal].
Researcher: You had 15,000 steps.
Lanie: Yes.
Researcher: You had 10,000 steps on this day. What did you do?
Lanie: We skateboarded a lot. We went outside a lot and skateboarded.
Researcher: You skateboard?
Lanie: Yeah. Well that day, we did a lot of walking and stuff.
Emily: That's good.
Lanie: And I just walked.

Lanie did not skateboard before she joined the program. Lanie sounded very excited when she talked about her skateboarding. She seems to have found a new physical activity.

The weather outside was hot with an average temperature of 85°F (ranging from 77°F to 92°F). The summer camp did not allow students to go outside and play because of the heat. Instead, the students stayed inside and played their games. Molly was helping out by answering questions from the other girls on the game. Lanie was working on a puzzle in the ice patch, a level in the DS game. Molly had already finished the ice patch area, so she gave Lanie advice to solve her problems:

Lanie: Oh my gosh, where can you get to this stupid thingy?
Molly: Okay. Oh my god. I am gonna just give away escape rope [an item that allows her to leave the place]. I am tired of going through this.
Lanie: It's hard. Oh my gosh. How can you get through this?

Molly: Get a person who has a strength. Try move the rocks around.
Lanie: What?
Molly: Try move the rocks around.
Lanie: What do you mean try move the rocks around?
Molly: You know how those rocks are?
Lanie: You mean the blouders or whatever?
Molly: Yeah yeah boulders. Try move them around.
Lanie: I did do that. And guess what? Nothing.
Molly: Oh, I caught a dido! Didos are awesome.
Lanie: I love didos. Didos are awesome [singing]. So try move the boulders around?
Molly: There might be different holes there.

Marta was working on her fight against the first gym leader, Bugsy, who uses bug type pokémon.

Marta: How do you defeat that one dude? How do you defeat Bugsy? What's the best pokémon to use?
Molly: Fire Pokémon [chuckles.

The reason why Molly chuckled is that she had been working on the same gym leader during second and third week of the program. Pokémon attacks and characters have different elements, and each element has strengths and weaknesses. For example, bug-type pokémon are weak against fire-type pokémon attacks. Since there are 17 elements, it is more complicated than rock, scissors, and paper.

When Molly was facing Bugsy in the second week, she was looking for a fire-type pokémon to help win. She asked:

Molly: Hey, do you have any fire pokémon you wanna trade with me?
Researcher: I have some.

Molly: Can I have some?

Molly knew exactly what kind of pokémon she needed against Bugsy. She seemed confident in her knowledge about pokémon and shared it with the other girls in the group.

When I asked the girls' step numbers at the end of the session at 3pm, they reported:

Molly: 3,337.
Kirsten: 3,061.
Marta: 2,252.

Since the girls did not walk or play, their step numbers were around two to three thousand. This confirms that not giving opportunities for being physically active does not help them reach their daily step recommendation. After our meeting, only Lanie and Kirsten stayed to play the game more together.

Week 7 (Thursday)

Marta, Molly, Nora, Lanie and Emily came. Kirsten had gone camping with her family. I told students that we would go see the "Blooming Butterflies" exhibit at the botanical garden.

Researcher: Today, we are going to go to [the garden] to see butterflies.
Emily: Woo! Can I get ice cream?
Researcher: No.
Emily: Can I pay for it?
Researcher: No.
Emily: I can pay for everyone.
Researcher: No. I brought cherries. It will be healthier and yummy.
Emily: No, I can't have cherries.
Researcher: Why not?

Emily: Seriously, I can't. Because my mom doesn't like the seeds and it's just... and I don't like them much. I tasted one and I don't like it. And I can't have it.

She showed her excitement at first, but Emily was angry after this conversation.

Researcher: Let's go.
Emily: I am not going. I am not walking. Give me my clip.
Researcher: You don't wanna go?
Emily: No.
Researcher: We are going to butterfly blooming.
Emily: I don't care. I don't wanna go.
Researcher: Emily.
Emily: [Yelling] I don't wanna walk. I am not going! I would rather stay here.

The summer camp teachers and I were trying to have her to come with the group, but Emily insisted. We left Emily at the summer camp. As we were leaving the community center, I asked for each girl's step numbers.

Molly: 1,345
Marta: 66
Lanie: 2,073
Nora: 109

The weather was hot outside with the average temperature 75°F (with a minimum of 63°F and maximum of 86°F). It was better than our last meeting. As we were walking to the garden, I checked if the students had connected their pokéwalkers.

Researcher: Did you guys exchange your pokéwalker [gifts]?
Molly and Marta: Yeah.
Marta: Oh, I didn't do it with you [to Yoonsin].
Researcher: No, I didn't. Hold on, Ready? Connect?
Marta: Kind of hard.
Marta: Maybe we have to take it off.

Since the pokéwalkers use infrared connections, they needed to face to each other in a stable manner. While walking, connecting the pokéwalkers was difficult. We ended up stopping to connect.

Researcher: 33 watts.
Molly: You got watts?
Researcher: Um hm.
Marta: I keep getting super repel.
Molly: I keep getting berries and shards.
Marta: You get a lot of leppa berries.
Molly: Yeah.
Researcher: Do you wanna exchange with me, Molly?
Molly: Okay.
Molly: Diveball.
Researcher: 50 watts. Let's keep going.

Molly and Marta connected theirs.

Marta: Super repel received. Great. I will never gonna have another wild thing in my life.
Researcher: Another wild thing?
Marta: Yeah, you know wild pokémon? Cause I have so many super repels?

Marta and Molly seemed to know the items and their uses in the game. This also shows that receiving items from the pokéwalker by connecting with other trainer helps players in their game play.

In the greenhouse at the botanical garden, the students paired up naturally to walk. I saw Marta and Molly walking together, and Nora and Lanie were walking together the entire time. At the end of the two-hour walking session, the girls increased their step numbers.

Molly: 7,215
Marta: 5,552
Nora: 6,331
Lanie: 7,859

Week 8 (Tuesday)

Molly did not come to the summer camp because of a doctor's visit. She had broken her arm last semester and was following up with her doctor today. Emily, Lanie, Kirsten, Marta, and Nora came to the meeting. Lanie forgot to bring her DS and pokéwalker. When I saw them at 1pm, Nora had the least steps with 806 steps in her pokéwalker. Kirsten had 2,187 steps, and Marta had 2,254 steps. Emily had the most steps with 2,520 steps.

Emily: Can we walk to the [the garden] again?

Emily suggested it with excited tone. I was a bit surprised to hear it since she had not wanted to go to the garden last week. Lanie told me that she had already gone to the garden that morning with her summer camp group before our meeting. However, she was fine going to it again, and all the other girls agreed to go to the garden. We walked to the botanical garden again. I did not see any resistance to walking to the garden. It was good to see since this was the last week. The weather was also good for walking as it was warm with an average temperature of 71°F (with a minimum of 63°F and maximum of 79°F).

On the way to the garden, Emily took out her DS and played while we walked.

Emily: Oh my god. What's the egg doing? I don't know what this is. It's an egg.

[She screams loud] Sorry. What's this name?
Researcher: It's a Togepi.
Emily: Should I give it a nickname?
Researcher: If you want, it's your baby.
[Emily screams again.]
Emily: I just feel like I won a fifty million dollars. Oh my god. Oh my god. Oh my god.

Emily seemed to be in a good mood and to be excited about her new pokémon in the game. I observed Marta and Kirsten walking together and Nora and Lanie walking together. Emily was walking next to me.

During the walk in the garden, I checked each girl's step numbers. Kirsten and Marta checked Emily and Lanie's step numbers as well.

Marta: We did earned the steps.
Researcher: How many steps did you get?
Marta: A lot.
Kirsten: We ran all the way to here.
Marta: I got well I said 2,000 and now I got 6,000 almost 7[000].
Kirsten: Same here.
Marta: So we did.
Kirsten: 6,257.
Marta: 6,000.
Researcher: How many steps did you get, Nora?
[Looking at Nora's pokéwalker] 4,245.
Kirsten: How many steps do you have, Emily?
Marta: And Lanie?
Emily: 5,823. I started off with two thousand and something.

Unfortunately, Lanie did not bring her pokéwalker. She couldn't answer the question.

Emily saw a playground across from the garden and asked me:

Emily: Yoonsin! Can we play on the um, play structure for ten minutes? Can we play at the playground, please?

All the girls wanted to play at the playground. In the middle of her play, Emily said out loud, "6,344".

On the way to the community center, I checked in with Nora.

Researcher: [To Nora] Did you have a good day?
Nora: I got 4,388.

Nora's answer is interesting. I did not ask her for the step numbers, but she answered with them. I don't know if this happened because I frequently asked students' step numbers. Or if she wanted to say that she had taken a good number of steps for her.

I then checked in with Marta and Kirsten as they were walking together.

Researcher: How was it?
Marta: Interesting. [Laughs.]
Kirsten: No. No. I mean like us running.
Researcher: How was running and walking?
Marta: It was incredibly fun. [Exaggerated voice]
Kirsten: Yeah.
Researcher: Oh, you are lying.
Marta: No, it was actually fun.
Kirsten: It was a big rush. It was a big rush.
Marta: It was pretty exciting.

At the end of the session, Nora had 4,965 steps. Kirsten had taken the most steps with 7,288 steps. Marta had 7,138 steps, and Emily finished with 6,461 steps.

Week 8 (Thursday)

All girls in the program (Molly, Emily, Lanie, Kirsten, Marta, and Nora) joined the last day of the meeting. Unfortunately, Lanie didn't bring her DS or Pokéwalker. Molly, Kirsten, and Marta didn't bring their pokéwalkers. Nora and Emily had pokéwalkers on their waists.

To celebrate the last day, we had planned to go to the university campus. As I walked in to meet the girls, Emily was very excited and asked me, "Hi girl. Can we go early?" Lanie asked "Can we go?" Lanie told me that it was her first time visiting the university campus. The girls seemed to be excited about the campus visit.

While waiting for the Girls Inc. coordinator to come, Emily looked at the group's pedometer step number chart.

Emily: All those zeros. Uh uh. I aint not get all those zeros [steps].
Lanie: That's me. That's not you.
Emily: Oh, cause I didn't get all those zeros.
Lanie: I didn't wear my pokéwalker.
Emily: All those zeros you got. Hee [Laughs.]
Lanie: Cause I didn't bring my pokéwalker. That's why.
Emily: Okay.
Lanie: I didn't wanted to put on a pokéwalker.
Researcher: You didn't want to put on... Why?
Lanie: Because I didn't wanna put my DS on, no my pokéwalker on.

Amy arrived and drove us to the university campus from the community center. On the way to the campus in the van, Emily sat next to me and showed me her game:

Emily: I have a slowpoke [a pokémon].
Researcher: Slowpokes are cute.
Emily: Yeah, I went to this building. And they said that slowpokes are um that slowpoke people are taking their tails off.

Earlier, Marta had also told me about the slowpoke's tail.

Marta: People eating slowpoke tails.
Researcher: Why?
Marta: Because in Azalea town, it's specialty. It's sad. Cause it's like slowpoke's walking around without tail. Sad.

I realized that Emily and Marta were at similar points of the game.

Researcher: Marta was just talking about it today.
Marta: Yeah.
Emily: (Turn herself towards to Marta) Um, you know, I went to a building today and they were taking off slowpoke's tails.
Marta: Yeah.

We first stopped by Molly's mom's smoothie cart, said hi to her and got fruit smoothies. The group then walked around the lake. Because we did not have enough time to get back to the center, we had to come back right away.

Emily and Nora were the only girls with pokéwalker. At 10am, Emily had 5,387 steps and Nora had 0 steps. After our session at 11:48am, Emily finished it with 7,559 steps and Nora took 5,050 steps.

When we arrived at the community center, all the students received a certificate of completion for the program to end the session. We all hugged each other and said goodbye. After

dropping the girls off at their summer camp, Nora told me that she had left her pokéwalker in the van. We contacted Amy to get her pokéwalker back from van. Misplacing pokéwalkers seemed to be a common issue for the girls in our program. I am glad that Nora found hers.

CHAPTER 5. Case Study Participants Findings

Lily was looking at the scale while I was weighing her before conducting the pre-program interview. Lily and I were inside the Girls Inc. teacher's room with the doors closed. When she read her own weight out loud, she said "Ah! I need to lose weight!" I met Lily during the pilot study. Lily is a 12 year old African American obese girl from a low socioeconomic status (SES) family. Her BMI percentile was at 99th percentile for her age.

Childhood obesity is associated with various factors such as race, gender (Ogden et al., 2006), socioeconomic status (Goodman, 1999; Winkelby, Robinson, Sundquist, & Kraemer, 1999), and body dissatisfaction (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozyliski, 2003). Lily was not the only girl in the study with these factors. In the first part of this chapter, I discuss issues my samples faced related to their obesity and factors associated with the obesity.

The prevalence of childhood obesity differs by race and gender. Non-hispanic African American female children and adolescents had the highest rates of being overweight according to the National Health and Nutrition Examination Survey (NHANES) (Ogden et al., 2006). They were significantly more likely to become overweight than non-Hispanic white females and Mexican American female children (Ogden et al., 2006). African American female children and adolescents are the population who may need physical activity interventions the most.

In this study, there were total of nine African American girls out of twelve girls in both the pilot and summer programs combined. In the pilot program, there were six African American girls aged from 12 to 14. Four out of six girls, Ashley, Daisy, Lily, and Olivia, were overweight or obese based on their BMIs for their age percentiles (see table 10). Specific ethnicities and BMI percentiles were not inclusion criterion for this study. All six girls in the pilot program happened to be African American female students, and four of them were overweight or obese.

Table 10

Participants in the pilot program

Name (Pseudonym)	Age	Ethnicity	Pre			Post (at 8 week)		
			BMI	BMI for age percentiles	Status	BMI	BMI for age percentiles	Status
Julia	13	African American	16.9	18th	Healthy	17.1	20th	Healthy
Emma	13	African American	17.9	37th	Healthy	18.8	54th	Healthy
Olivia	12	African American	42.5	99th	Obese	44.1	99th	Obese
Ashley	12	African American	31.4	98th	Obese	-	-	-
Daisy	14	African American	25.6	93rd	Overweight	-	-	-
Lily	12	African American	35.5	99th	Obese	-	-	-

In the summer program, I also had six female students. Three African American students, Emily, Lanie, and Nora, were obese (see table 11). I had two African American girls who had healthy BMI percentiles in the pilot program. Not all African American girls in my program were overweight or obese, but seven girls out of nine African American girls were at risk.

While about a third of children are overweight and obese in the US (Ogden et al., 2006), more than half of these small sample groups were overweight and obese. Some of them also had high BMI percentiles for their ages in the 98th or 99th percentiles.

Table 11

Participants from the summer program

Name (pseudonym)	Age	Ethnicity	Pre			Post (at 8 week)			Follow up (at 16 week)		
			BMI	BMI for age percentiles	BMI Status	BMI	BMI for age percentiles	BMI Status	BMI	BMI for age percentiles	BMI Status
Molly	10	Asian American	15.9	27th	Healthy	14.9	10th	Healthy	16.2	29th	Healthy
Emily	10	African American	28.1	98th	Obese	27.5	98th	Obese	28	98th	Obese
Lanie	10	African American	27.4	98th	Obese	27.1	98th	Obese	-	-	-
Nora	10	African American	25.8	97th	Obese	25.9	97th	Obese	25.9	97th	Obese
Kirsten	10	Caucasian	17.5	51st	Healthy	17.6	51st	Healthy	17.9	55th	Healthy
Marta	11	Asian American	16.4	27th	Healthy	16.5	27th	Healthy	16.4	25th	Healthy

Low socioeconomic status is a fundamental causes of health inequalities because it limits access to the resources including knowledge, money, power, prestige, and social connection with others (Link and Phelan, 1995). Low SES is related to higher BMI (Goodman, 1999; Winkelby, Robinson, Sundquist, & Kraemer, 1999). Goodman (1999) found that obesity in adolescents is associated with low socioeconomic status using the National Longitudinal Study of Adolescent health data. Winkelby et al. (1999) analyzed the data from the NHANES, and they found that socioeconomic status was a significant predictor of body mass index among girls but not boys. Their data showed that girls' BMI has a negative correlation with SES.

Most of participants from this study were from low SES families. Olivia from the pilot study was a 12 year-old African American female student from a low SES family. Her living situation was not comfortable for her to focus on her school work and other activities. In week four of the program, she told me that she had good news to share. She said in an excited tone:

> "Okay, so my sister and her two kids, they've lived with us like a year and some months now. Now my sister just found a place that she can finally leave and never come back ever again with her two kids. And this is why I haven't gotten homework done. This is why I can't like focus on pokémon thing [referring to the exergaming afterschool program] cause they are always in my room. And if I lock my door, I won't be able to hear my mom like call my name, you know? They are gonna leave and my sister's gonna get out the room. I will have my own room and she can have her own room and we are all gonna be happy."

She sounded as if she had been stressed because of her sister and her sister's two children at her home. Olivia explained that her living situation made it difficult for her to focus on homework and the pokémon program. Although she attended the program, she often forgot to bring her pokéwalker (see chapter 6). I had never seen Olivia so excited and happy to share a story. Her sister's moving out seemed to be a stress reliever for her.

Ashley and Daisy from the pilot study were sisters. They are both African American female with low SES. Ashley was 12 years old, and Daisy was 14 years old. They moved from another states about a month before the program started. Daisy, a new girl at the school, met Emma in her class, and Emma introduced Daisy to the Girls Inc. program. Daisy also brought her sister, Ashley, to Girls Inc.

They were living in a local Salvation Army shelter with six siblings and their mom. Their mom was a single parent without a job, and she was figuring out what she would like to do. This was likely a stressful environment for Ashley and Daisy to adjust to.

These three girls were not in a healthy BMI percentile range. Olivia's pre-program BMI was at the 99th percentile, which is high for her age. Ashley was obese in the 98th percentile BMI for her age. Her BMI percentile is also high. Daisy was overweight in the 93rd percentile BMI for her age. These three girls have obesity problems in poverty.

What does obesity and poverty mean to these girls lives? Ashley had been excelling at her pokémon game play in the first two weeks of this program. She had some previous experience playing the pokémon games. When I saw her gameplay record on her DS, I was surprised to see that she had played a total of 40 hours and 56 minutes and collected 9 badges in her game during the first five days of her playing. I asked how she had done so so fast, and she told me that her brother's had also been playing. I didn't expect that another sibling would play for her. I can't tell how much playing was from her or from her brother, but playing about 41 hours in five days is a full-time job of sedentary activity.

Ashley came in to the Girls Inc. room in the third week and told me, "I lost it [the pokémon game]. I lost pokémon." I asked her where, and then she replied, "When I went to bathroom and came back, but uh. It's gone." Her game and pokéwalker had disappeared at the Salvation Army Shelter cafeteria while she had been in the bathroom. Based on her story, the game and pokéwalker disappeared at her place which she happened to share with many other people. She did not say that she misplaced it or that it was stolen. Living in a community space for Ashley might have meant that there is no security for her own goods. Having no sense of security would contribute to a stressful environment.

Living as a single mom with six children in a shelter without a job is likewise stressful. It could limit the parental support available for her kids. In the pre-interview with Ashley, she had

thought that her parents would describe her as “stupid bad”. Daisy answered the same question by saying that they will think of her as being “grumpy”. Both of them thought of themselves negatively from their parents’ perspectives.

Ashley and Daisy did not show up to Girls Inc. in week four and hadn't notified either their mom or the Girls Inc. coordinator. The Girls Inc. coordinator, Amy, called their mom, but she did not know where they were. Ashley and Daisy may not have a strong relationship with their mom. Their mom had not been planning to go outside and try to find them after the phone call with Amy. Instead, Amy drove the roads where they might be walking to find them, but she was unable to.

When Ashley came to the exergaming program the fifth week, she left the meeting soon after it had started. I had given her a replacement game and pokéwalker, but she was no longer interested in playing the game. She told me that she didn't want to start playing the game all over again and soon left. Due to the game’s set storyline and tutorial at the beginning, the game does not seem to encourage replaying (see chapter 6). After that short visit to the program, she did not come back to the program and Girls Inc. again. For Ashley, losing the game and pokéwalker seemed like another contribution to her loss of interest in the program. She lost the opportunity that the other girls had to walk and play outside in this group.

Reilly et al. (2003) found that “obese children are more likely to experience psychological

or psychiatric problems than non-obese children" (p. 748-749). During my pre-interview with Lily, she told me that she has some mental health problems. When I asked her, "What would you like to get out of this program?" she answered, "I am hoping I don't get out of this program." I quickly said, "I didn't mean that you [should] leave the program." She replied by telling me about her mental health issue:

> "See? Like my brain doesn't process right. I don't really understand correctly as usual people do. I have a disability. It's called mental health issues. Do you know what that is? It's... I would not say it's necessarily crazy. But it's kind of like crazy people. But it's like... Do you know what mental means? I am kind of like that. My brain is different than other people. It process different. Like I don't understand things like other people do. I don't learn as fast as other people, sometimes I can learn as fast as other people, but it's hard for me. I have really low self esteem. I have bipolar. So, I attached to people quickly. It's kind of different for me. I have mind of eight year old, so it's kind of hard for me to tell other people what I need."

She listed psychological issues that she had including low self esteem, being bipolar, and having the mind of eight-year-old. I am not sure how many of these had been diagnosed by clinical professionals, but she self-identified with these issues.

Although Lily mentioned above that she was hoping that she didn't leave the program, she missed five of seven possible meetings for the program after she joined on second week. She could not come to one meeting because she had been suspended from her school. In week three, she had a physical fight with another student at her middle school. Amy told me that police had gone to the school and handcuffed Lily. I did not hear the details of her story why she was in a

fight, but Amy told me that Lily had an anger problems. She had been in a similar situation before. This time, she was suspended from school and grounded at home for two weeks. This issue prevented her from attending the exergaming program and other activities.

In the summer program, I had a girl named Emily who was experiencing similar emotions as Lily. Emily is an African American girl who was 10 years old in the 98th BMI percentile for her age. Her BMI status is also obese. She is talkative and friendly when she is in the good mood. However, Emily also became angry easily. When she did so, she quickly entered a bad mood. She mentioned in the pre-interview that

> "Sometimes I get a bad attitudes. Sometimes. I don't know. I just get mad really easy sometimes. But sometimes, I can control it. A lot of times, I can control it. I just say Woo-sa in my head or something. My teacher just told me like to calm all of us down. She's like 'everybody say Woo-sa in your head'. We just like 'Woo-sa, Woo-sa.' five times."

She did not know what "Woo-sa" meant, but I was surprised to hear that she had been learning how to control her anger.

There were a few times that I saw Emily become angry during the program. In week 6, the students were going to play tag in the Girls Inc. room. Emily said loudly to other girls, "Let's go walk! Walk!" and the other girls remained sitting. She then said loudly, "Walk. Walk. Walk. I am It!" All kids giggled and ran around the table, chasing each other. In the middle of playing, Emily said "Oh, my ankle again," and sat down in a chair. The other children continued playing

without noticing her.

Emily continued sitting down, and her face became red. She looked like she was angry and did not talk to anyone. When Amy and I tried to talk with her, she put an opened book in front of her face to ignore us. She looked angry, but she wouldn't share what would make her feel better. It could have been her hurt ankle or because the other kids kept playing even though she felt hurt. Her ankle had been a problem since the second week of the program; she had written, "ran and hurt my ankle" in her journal on July 10th. Her bad mood made everyone uncomfortable, and the other kids became quiet soon after.

At week 7, Emily showed excitement when she had heard that the group would go to the botanical garden. She wanted an ice cream there, but soon after she realized that we would have cherries instead, she was angry. She quickly changed her attitude and told me "I am not going. I am not walking," and "I don't wanna walk. I am not going! I would rather stay here." Even though the summer camp teacher and I tried to convince Emily to come with the group, Emily resisted. Because of our limited time, the group had to leave her behind at her summer camp. Her quick change in mood made an uncomfortable atmosphere in the group. Emily missed an opportunity to play tag and walk with the other kids.

Lily and Emily's anger issues contributed to them to staying inside and being sedentary. This vicious cycle does not help them become more physically active and healthy, which should

eventually contribute to helping them feel better. Both Lily and Emily had high BMI percentiles for their age. Understanding their difficulties is important to reach out to these girls and promote a physically active lifestyle.

Being overweight is associated with body size dissatisfaction in African American girls (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozyliski, 2003). As Lily said, "Ah! I need to lose weight!" in the pre-interview, three of the obese girls including Lily in the program showed dissatisfaction with their body sizes. Lily spoke about her dissatisfaction during the pre interview, saying, "I am fat." When I asked her what she didn't like about herself, she replied, "Um, I am kind of fat. I am fat. I have acne. I am not the prettiest, well I am pretty, but not the prettiest girl as other girls." This might be related to the psychosocial impact of obesity as stigmatization (Myers & Rosen, 1999; Schwartz & Puhl, 2003) and low self esteem (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozyliski, 2003).

Similar to Lily, Olivia from the pilot study and Emily from the summer program also expressed similar reactions about their weights during interviews with me. Olivia told me that she did not like her weight, but she did not feel comfortable talking more about it. Emily in the summer program did not show a negative attitude toward her weight, but she showed concern about other people knowing about her. When I first met Emily, she worried about her weight being said out loud.

Emily: [Whispering to Researcher] There is a question. I was kind of freaked out about that. I wanted to say no. But then I am like oh I guess. It was the one of how much I weigh.
Researcher: Did I say "how much do you weigh"?
Emily: Height and Weight. (Points at the Youth IRB document for the agreement of measuring her height and weight) It's right there. The first page.
Researcher: You wanted to say no?
Emily: No. I will tell you.
Researcher: I am going to measure you today after this meeting. Is that okay?
Emily: Yeah.
Researcher: And I will not say out loud. Nobody will know.
Emily: That's the only thing I was like "is she [researcher] going to tell anybody?"
Researcher: No. I will not tell anybody.
Emily: Okay. Thank you.

Emily showed relief and appreciation when she was ensured confidentiality. She was aware of her weight and not comfortable talking about the issue. After her first measurement, she was in the obese group in the 98th BMI percentile for her age. For Emily, measuring it confidentially was okay, but talking about it seemed to make her nervous.

Lily, Olivia, and Emily were all at or above the 98th BMI percentile for their age group. Lily and Olivia spoke negatively about their weights, and Emily was nervous about her weight measurement in the pre-interview. All of them were uncomfortable to talk more about the issue even though they all introduced this issue during their first meeting with me. Their body size dissatisfaction and insecurity are additional psychological impacts of obesity.

Olivia and Emily are African American girls with obesity problems from low SES families. Both girls shared similar problems related to obesity like poverty and psychological problems with Ashley, Daisy, and Lily. While the latter three girls dropped out of the program, Olivia and Emily stayed until the end. Not only did they stay in the program, but they also showed changes in their attitudes, physical activity levels, or both. In the next part of this chapter, I follow the trajectories of these two obese girls with more detailed stories and analysis.

Both Olivia and Emily did not show positive attitudes towards physical activity and walking at the beginning of the program. In Olivia's case, when she reviewed her physical activity in the pre interview, she told me that she's physically active "sometimes". Olivia told me that "There is no reason. I just don't wanna do it sometimes." Olivia also mentioned that her opinion on her physical education class: "I think it's good, but I just don't like it." Her feelings, mood, and attitude towards physical activity seems to be a barrier.

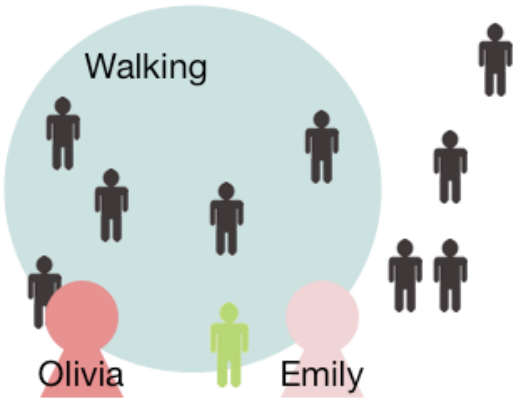


Figure 5. Olivia and Emily outside of walking community of practice.

In Emily's case, she showed a negative attitude when she was angry (see above). Emily wrote in her pre-program survey that "Walking is something I don't really care for but I will do it anytime I have to." Then she told me, "If you tell me get up and walk around the whole building like twelve times, I will do it." Her statement says that Emily would not choose to walk voluntarily. Olivia and Emily shared negative attitudes towards physical activity and walking. Olivia and Emily might not be in a physical activity community of practice (see figure 5; Lave & Wenger, 1994).

In both the pilot and summer studies, there were also girls in healthy BMI percentiles for their ages, such as Emma and Molly. Are there any differences between overweight & obese girls and healthy girls in terms of their attitudes towards physical activities and physical activity levels?

Emma from the pilot program was in a healthy BMI percentile. She was a 13-year old African American girl who liked playing video games and sports. She was on two basketball teams, one at her school and another one outside of school. She described herself as being "energetic, confident and old souled girl". When I asked her "Do you walk in general?" her response was "Oh, yeah. A lot." She described people she likes as

> "people that are pretty open to doing something new or like to do things, you know that are fun and not like mope around all day. I really don't like people who are lazy and like don't do much and because I feel that you are missing out on a lot of things."

She does not value laziness. She told me that she is physically active by playing sports and trying to get outside whenever she can. Emma seemed to like being active in her daily life.

Molly from the summer program was a 10 year-old Asian American girl. Her BMI was in the 27th percentile for age was which is healthy BMI status. She is an active girl who likes singing, acting, playing the violin, swimming, biking, and sledding. She also enjoys playing keep away with a soccer ball. She thinks physical education as being like recess and fun.

In the pre-interview, Molly told me, "My mom, uh, she likes walking a lot. And I usually go on walks with her." When I asked her how often, she told me that "Sometimes she's really busy since she has the cart. Usually we go two or three times a week. If we are lucky, we go everyday." She likes walking with her mom. She has positive attitude towards walking, using the word "lucky" to describe going on a walk everyday. Her mother owns a fruit smoothie cart on the university campus area. Molly went on a walk with her mom the prior day around her house.

Molly told me that the benefit of being physically active is that it "prevents you from being fat." She laughed and continued,

> "My mom says that if you don't exercise, then you can't burn off the fat. But you don't necessarily become fat. You just become lazy. When you become lazy, that's a bad thing because... Let's say you [referring to the researcher] started to become lazy. You won't

> get as much studying done because you are lazy. And you are the Ph.D...[student] It seems like a further goal, so."

In Molly's case, her mom seemed to be influencing her physical activities and attitude. Similar to Emma, she has negative attitudes towards being lazy. Emma and Molly both engaged in regular physical activities such as basketball and walking. They both had positive attitudes towards being physically active as well.

From the conversation with girls in the program on their attitudes towards being physically active and being inactive, I also saw their general physical activity habits. Of the healthy girls, Emma was in two basketball teams to play sports with other girls. Molly liked walking with her mom, and her mom also likes walking. Emma and Molly are already practitioners of their physical activity communities, engaging in activities such as basketball and walking (see figure 6). Peers, parents, and teachers are the most consistent factors that change physical activity levels (Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003). Both Emma and Molly engaged in a physical activities with someone like their friends or family on a regular basis. Emma and Molly already had social support for physical activity before joining this program.

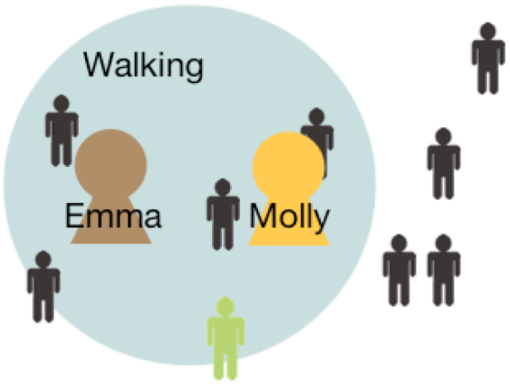


Figure 6. Emma and Molly in the walking community of practice.

Social support is important for girls' physical activity levels (Taylor et al., 2000). Social support was mixed in both the pilot and summer programs. Initially six girls joined the exergaming afterschool program in the pilot study. Half of them, Ashley, Daisy, and Lily, dropped out of the program during the eight-week period. Another six girls joined the summer exergaming program. All of them stayed in the program for eight weeks.

I introduced the sisters Daisy and Ashley earlier in this chapter. Daisy never returned to the Girls Inc. program or the exergaming program after the fourth week. The last I heard from Amy was that Daisy had found new friends, and that she had been skipping classes at her school. New friends who were not part of Girls Inc. did not encourage her to return to the Girls Inc. program. Although she only came to three meetings, the exergaming program failed to build a strong community that supported Daisy making good friends in the group.

In Ashley's case, her loss of her game and pokéwalker discouraged her from continuing in the program. Although she received a new game, she was not interested in playing the same story for another 41 hours. I also heard from Amy that Ashley had dropped out of the Girls Inc. program because she also wanted to hang out with her other friends who were not in the Girls Inc. program. While I did not see Daisy at the local community center after the fourth week, I saw Ashley with some boys and girls regularly at the teen center. As I explained in Chapter 4, the teen center includes both boys and girls, and it is located next to the Girls Inc. room.

Amy tried hard to bring Daisy and Ashley back to the Girls Inc. program. She did not see Daisy from her school when she picked up the other girls, and Ashley insisted on not coming back. Just like Ashley and Daisy, did Lily drop out of the program due to finding new friends who were not in the after school program?

During the pre-interview with Lily, she mentioned ,

> "I don't really get out of the house a lot cause I don't really have many friends, but like I am practicing on that by going to Girls Inc. I am like wanting to have friends and wanting to have lose weights and how to have fun instead of being stuck in the house all the time.".

Lily explained her life as being stuck at her house. Although she wanted to make new friends and leave her house, her situation also encouraged her to stay home. Staying inside the house probably did not help her to get the physical activity she needs.

Lily was going to two different schools. She was in a special program for 6th graders at a local charter high school. She was also attending a middle school. She told me, "They are trying to get me back into [middle] school." Since her schedule was different from other students, it was harder for her to make friends.

When she first joined the exergaming program during its second week, we walked outside as a group. She walked next to me most of the time since she did not know many of the other girls. After eleven minutes of walking, she told me, "I don't wanna walk no more." Ashley was walking by her and heard it. She repeated the sentence in a funny voice, "I don't wanna walk no more. No more." laughed, and ran away. Lily might have felt not welcomed to the group.

Since Lily came back to the program only one more time, in week seven, she did not have a chance to become friends with other girls in the program. I did not hear from Amy or Lily that Lily did not want to come to the program, but she was not able to come to the program due to problems at school.

Daisy, Ashley, and Lily did not participate in the program because they struggled with other bigger issues in their lives. It also important to point out that the exergaming pilot program failed to create a strong community that supported them in developing friendships within the group. Especially in Daisy and Ashley's cases, they met other friends who they wanted to spend

more time with, and unfortunately their friends were not in this program. Lily was struggling with her weight and anger problems. She also did not make friends with other girls in the program.

Olivia and Emily stayed in the program. During the eight weeks of the program, both Olivia and Emily showed some changes in their attitudes and physical activity. Olivia resisted going outside at first, but she enjoyed walking and running once she was outside. Emily did not like walking when she was hurt physically or when she was angry. Emily also received social support from Molly in the summer program.

Olivia resisted going outside and walking with the group during the group's second meeting. She showed her resistance by dragging her feet in the room and hallway. When pulled by the other girls in the group, she finally got off of the couch and joined the group for walking. Grabbing her off of the couch might be a small act, but it showed social support for Olivia and that helped her to enjoy the rest of the time. Her initial response for going outside and walking was negative, but once she was outside, she started to race with Ashley and ran almost entire time. I was surprised to see her running in front of everyone while the other girls were walking.

Olivia showed the same pattern of not wanting to go outside and walk during the fourth week meeting. Mary from the Girls Inc. staff, Emma, and I persuaded her to walk together.

Olivia told everyone, “(I) Can’t walk,” and she slowed down until she was far behind the group. Emma and I ran back to her and linked our arms with her's to walk together. We sped up little by little, and we all started laughing. Later, Olivia and Emma wanted to stop at the playground in the park to play on the swings and slides.

When she started walking, she did not like going outside, but once she got in the better mood, she laughed more and played with Emma at the playground. Emma and my social support of running back and helping her move forward together made her laugh and enjoy the rest of play time. It seemed to me that Olivia may not like the idea of going outside and walking in her head when she hears the idea, but once she is out with social support, she seemed to feel better and enjoy her walking.

For the first eight weeks, Emily’s physical activity, especially walking, was affected by Molly during the summer program. On the first day of physical activity together as a group, Emily and Molly showed up. Emily asked me, “Isn’t it too hot to walk?” Molly ignored her question and asked me “Hey. Do you have a soccer ball anywhere?” Molly wanted to play soccer, and she suggested it for the day’s activity. At first, Emily tried to show that she did not want to go outside because it was too hot, but Emily agreed to play soccer with Molly and me. We played by keeping the ball away from each other.

After our first physical activities together as a group on June 30th, Molly described her feelings as "I feel very happy, hot and a little bit sweaty." Emily described her feelings as,

> "I feel good right now. We just got done playing soccer, kickball, basketball. I did 4297 steps today this morning. I started off with 0. OMG I can't believe I got 4247 and I am hot and sweaty from those physical activities."

She later grabbed my audio recorder and pretended to do a radio show. She sounded satisfied with her physical activity for the day.

On Tuesday of week three, the group talked about the physical activity recommendations for walking. Molly and Emily knew that the recommendation was being physical active for an hour a day as children. Molly and Emily did not know the exact daily step numbers for girls, but after the third week's discussion, they both learned.

When I asked Emily if she could meet the recommended 11,000 steps per day, she didn't hesitate in saying, "No." However, right after Molly said, "Yes, I will," with confidence, Emily also said, "I guess I can do the eleven thousand steps, but that will be a lot of work." I don't think Emily and Molly were competing against each other; Emily's response changed quickly right after Molly's positive answer. She might have felt peer pressure from Molly. After the discussion, Emily initiated going outside by asking me, "Can we go outside and play?"

On Thursday of week three, Emily and Molly went to the university campus (see chapter 4). Emily had set a goal to reach 6,000 steps within 2 hours. Molly verified that their goal was

6,000 steps. She then said to Emily, “Okay. We’ve got like about two thousand to go. That was not too hard. Hey, do you wanna race? Emily, do you wanna race?” I walked to a pole and gave them a signal to start running. They both came to high five me and laughed. After that initial race, they wanted to try two more times.

Molly has positive attitude towards her walking. Her initiation of racing naturally helped Emily participate in running while enjoying their time. Emily told me that the day was “good” after reaching her goal of 6,000 steps. Molly had been a positive influence in helping Emily to get motivated and have positive attitude towards physical activity. On that day, Emily had a total of 14,149 steps, and it was the first time she had taken more than 11,000 steps. Emily and Molly’s interaction shows the importance of the social support from peers.

Both Emily and Molly are from the summer program. While the pilot program failed to build a community early, the summer program seemed to do better. There were significant differences in how much contact each group had with its members. Girls in the pilot program only met once a week for one hour (see chapter 3). This only allowed them to play the game together for thirty minutes and walk for another thirty minutes. Girls in the summer program met twice a week for two hours. They had four times more potential contact compared to the pilot girls. In addition to the longer hours and more frequent meetings, students in the summer program saw each other every weekday from about eight in the morning to four in the afternoon.

Although the girls were split into two different groups in the community center summer camp, they have more chances to meet and talk with each other. With more time, the girls were able to share more experiences like playing pokémon and walking outside.

Both Olivia and Emily stayed in the program. They also had a social support from the group. For Olivia, she had Emma and me to support her walking. For Emily, she had Molly in the group who influenced her attitude and physical activity level throughout the program.

In week seven of the spring program, I was very surprised by Olivia. When I entered the Girls Inc. room, it was filled with girls who were not in the exergaming program. Amy told me that the Girls Inc. program had other plan that day and that and some of the girls showed up to attend the event. Seeing other girls during the exergaming program was unexpected. Olivia saw me walking into the room, and she told me how she had been the prior week and asked, “Can we go play at the park?”

I confirmed what she had said because I couldn’t believe what I heard: “Do you want to go outside?” She nodded. She didn’t say that she would like to walk, but it was a surprising change for me to hear from her that she wanting to go outside. It might be that she did not like being in the Girls Inc. room with the girls who were not in exergaming program, but it was her first time initiating to go outside. Once we were out to the building, she was walking so fast alone that I had to ask her to wait for me and other girls. She has shown consistently that she is physically

active once she is outside of the building. In Olivia's case, helping her to go outside might be first step to increasing her physical activity.

At the exit interview, Olivia told me her favorite part of the program was "going to the park and walking thingy and pokéwalker. Because pokéwalker lets you see how much steps you take and going outside was really fun to play and hang out when it's nice outside." Her attitude towards going outside and playing or walking changed during this eight week period. Although Olivia did not wear the pokéwalker regularly to show her physical activity changes (see chapter 6), her attitude changed. She may not be an active practitioner in a walking community yet (figure 7), but her attitude might be the first step towards to become more physically active.

While Olivia changed her attitude over eight weeks, Emily changed both her attitude and physical activity levels over eight weeks. When she was in the summer program, she was influenced by Molly from the same program. In Emily's case, she continued walking with the pokéwalker even after the program ended for another eight weeks. Her physical activity level continuously increased over the total of sixteen weeks.

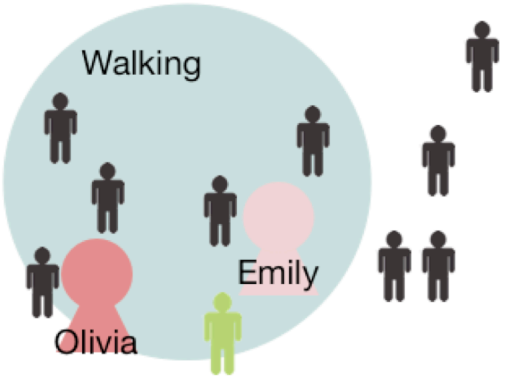


Figure 7. Olivia and Emily's changes.

Emily asked me with as excited tone “Can we walk to the [botanical] garden again?” the last week of the program as soon as she saw me walking into the meeting room. I did not see any resistance to walking from Emily that week. After walking from the garden, Emily saw a playground across from the street and asked, “Yoonsin! Can we play on the um, play structure for ten minutes? Can we play at the playground, please?” She seemed to be in a better mood and excited about walking and playing outside.

Emily showed some changes in the eight weeks, and she was generally excited about walking except when she was hurt physically or emotionally. It was good to see her excitement again at the last week of the program.

Emily changed her attitude to be more positive and increased her walking level. At the end of the program, Emily's BMI lowered from 28.1 (pre program) to 27.5 (post program after 8 weeks). Her BMI percentile was still in the 98th percentile, but her BMI slightly decreased.

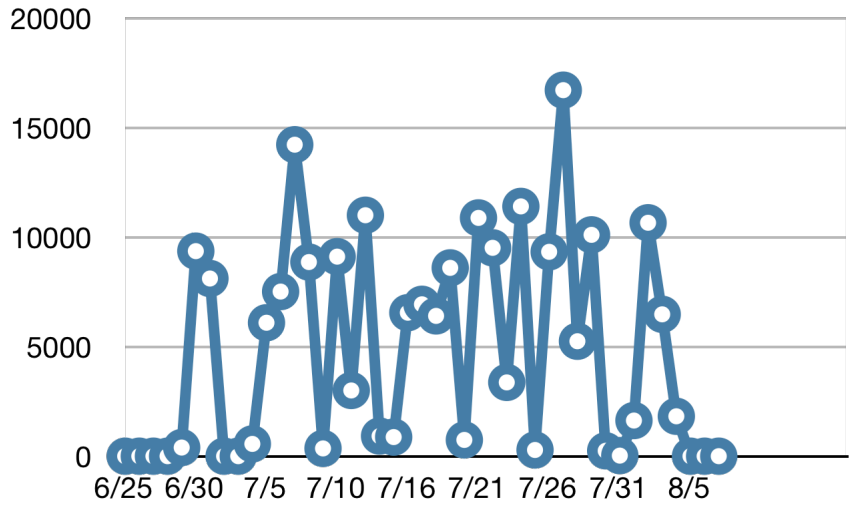


Figure 8. Emily's pokéwalker step numbers during the program based on her log and the researcher's.

Emily diligently recorded her daily pokéwalker step numbers (see figure 8). As I mentioned in previously, she a total of 14,149 steps on July 7th. Two days before then, she was not confident that she would be able to reach 11,000 steps per day. On July 7th, Emily walked around the university campus, and she accumulated 6,081 steps by noon. She had all afternoon and evening hours to take the additional 8,068 steps. Throughout the eight weeks, she reached

the 11,000 steps recommendation four times. Providing Emily opportunities to walk was helpful especially early in the day.

Emily reviewed her physical activity during the eight weeks of the program by saying, "I am more active. Going outside and bike ride." When I asked how she changed the walking over the eight weeks, she told me, "I walked a little bit more at home. I used to never walk at home." Although it is based on self report, she described some changes in her walking habit. She had started to become a more central part of the walking community (see figure 7).

I followed up with both Olivia and Emily eight weeks after each program had ended. In Olivia's case, she had dropped out of the Girls Inc. program during those eight weeks and had become part of the teen center at the local community center like Ashley. I tried to interview her, but she told me that she did not want to participate in anything related to Girls Inc. anymore. I don't know what happened to her during the eight weeks, but I failed to follow up with her.

I was able to do a follow-up phone interview with Emily eight weeks after the summer program had ended. She described her physical activity changes since the program had finished by saying, "Running a little bit." When I asked if she had been running before, she said "No. We play tag a lot more, so running a lot more."

Since Emily and Molly do not go to the same school, and Emily stopped going to the after school program for financial reasons, they have not seen each other since the program ended. However, Emily increased her physical activity level after the program had ended (see figure 9).

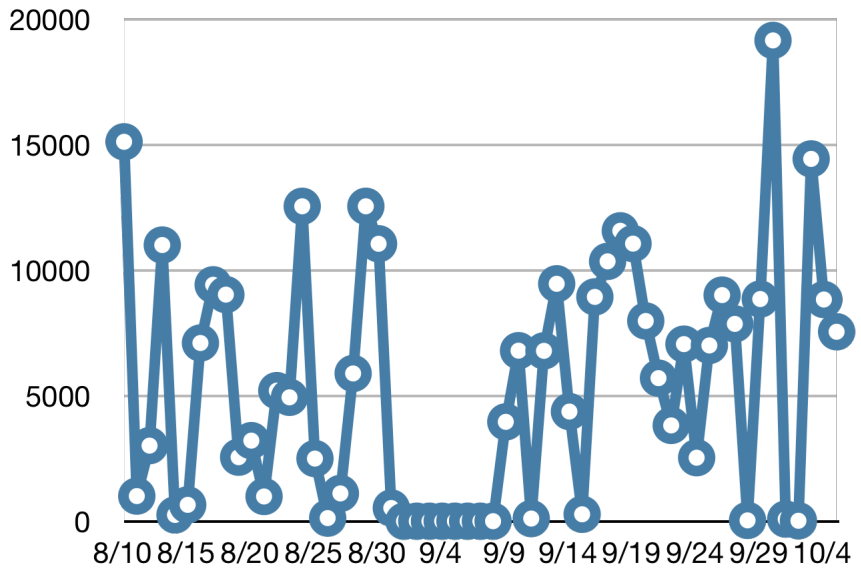


Figure 9. Emily's pokéwalker step numbers after the program.

She asked me "Do you wanna know how many steps I got?" Emily started telling me the numbers. "8,233." That was her steps for the day of interview (October 6th).

> "And then yesterday, I got 7,545 [10/5]. The day before yesterday, I got 8,830 [10/4]. And then the day before, yeah you know, um I got 14,431 [10/3]. And I didn't wear my pokéwalker, so I got only 17 (10/2) and then I got 85 (10/1). And then I got 19,151 (9/30)."

I was surprised to hear 19,151 steps. I asked what she had done that day. She told me, “I walked to home. And then I got 8,849 (9/29).”

She missed wearing the pokéwalker for two days, but she had met the girls’ daily step guideline of 11,000 steps twice in the prior seven days. Comparing it to the summer program, she had been actively wearing the pokéwalker. When she wore it, she accumulated her daily steps by walking home. While my response to hearing 19,151 steps was very surprised, her voice was calm, and she continued to read her other daily steps.

Emily was the only girl in my program both pilot and summer who continued her daily step logs after the program. The log was voluntary, and most other girls told me that they forgot to wear their pokéwalkers or write in their logs. Emily, though, wore the pokéwalker consistently for another 8 weeks, excluding one week when she was sick (9/1-9/8). She met the 11,000 steps per day guideline 8 times. She doubled the number of days meeting the guideline. She told me that she liked knowing her steps on the pokéwalker, and she is going to continue to use the pokéwalker.

Emily’s case shows benefits from social support, playing the pokémon game and wearing a pokéwalker in increasing her walking level and sustainability.

In this chapter, the girls' stories were introduced. The overweight and obese girls in this study had difficulties in their lives. They were all African American youth who were living in a low SES family. Living in low SES is stressful for young girls due to lack of personal space, secure space, and parental support. Childhood obesity is further linked to psychological problems such as anger and low self esteem. While Olivia and Emily initially showed negative attitudes towards physical activity, the girls with healthy BMIs, Emma and Molly, showed positive attitudes. Emma and Molly were already walking and being physically active before joining the program.

Social support seems to be important to build communities and promote physical activities for girls. Three girls in the pilot study dropped out of the program due to difficulties in their lives and a lack of social support or friendship in the program. Two other African American obese girls with low SES, Olivia and Emily, stayed in the programs for eight weeks. Both Olivia and Emily experienced some level of social support and a sense of being in a community during the program from their peers. In Emily’s case, Molly directly and indirectly influenced Emily’s attitudes and actual walking behavior. To reach this vulnerable population, the obesity intervention may consider social support in their interventions in terms of communities of practices.

CHAPTER 6. Pokémon, Pokéwalker and girls

Video game players bond with other players because they share common interest and goals (Gee, 2003; Gee, 2008). As Buckingham and Sefton-Green (2004) described the pokémon "phenomenon" in the 1990s as a "cultural practice", the pokémon game players' affinity (Gee, 2003; Gee, 2008) could create provide social support for each other. Did pokémon game players in the pilot and summer group practice this pokémon culture? What were the social aspects of the game?

Since Tobin (2004) claimed that Pokémon's popularity has declined since 2002, I wondered if pokémon would still attract girls to my study. Girls in both the pilot and summer programs ranged from 10 to 14 years old in 2011. In the pilot, four girls, Emma, Ashley, Daisy, and Lily, reported that they had played a pokémon video game previously. Emma was a 13 year old African Amercan girl who likes both playing video games and sports. She had a healthy BMI for her age. Emma was the most experienced pokémon player among the pilot group, and she told me that she wanted to get back into pokémon.

In the pilot program, Emma and Julia collected eight pokémon gym badges in the game by the end of eight weeks. Although Emma and Julia collected pokémon, I did not see them battling against each other in game or trading their pokémon. I will address battling and trading in the

Pokémon game later in this chapter. When girls in the pilot study played the pokémon DS game, they only focused on their own screen to work on their own problems. Julia and Emma did not share their problems or solutions in the games with each other. The girls in the pilot program participated in pokémon cultural practices only at the individual level by playing the game by themselves and collecting pokémon.

In the summer program, Molly had played the pokémon game series previously. Molly had an interesting story about pokémon when she was younger. She played the Pokémon Emerald version when she was six. She told me that

> "Mythical animals [pokémon] do not exist. So, when I got my Game Boy, I was turning six. And so, I thought that If I went outside with a pokéball, that I will catch a pokémon. And so, I go outside with a ball that painted like pokéball and I was like "Come on pokémon, come on!"

She told me that her cousin didn't want her to be disappointed on her birthday, so he told her, "Oh, I think they ran away." When I explained to her that the pokéwalker will realize her idea of catching pokémon outside in the real world, she was very excited.

Molly's cousin was in high school, and he is an expert pokémon game player. She learned about pokémon's gameplay from him, and she shared the knowledge she received in our group. Because of her knowledge, she became a resource for the other girls in the group (see figure 10).

She was an experienced Pokémon player who shared her passion and knowledge with other girls in the group.

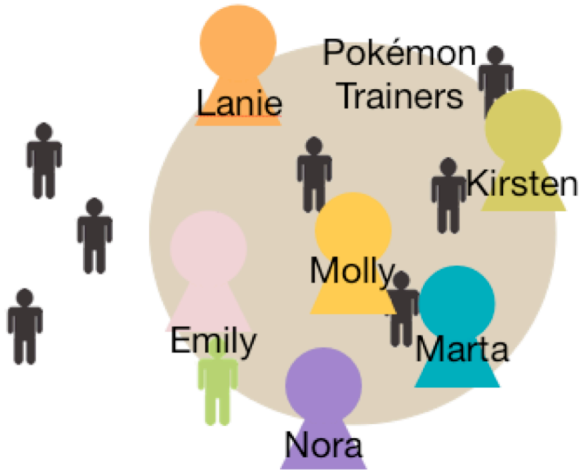


Figure 10. Summer program girls in the Pokémon trainers community.

Molly shared her knowledge on gym leader battle to Lanie:

> "Gym leader always goes first. I always go down on the first hit. And if you die, you have to play again. I saved it right before, too. Lanie, you know what I do. You should save right before you battle with gym leader. And then when you die, just turn it off and it will reset all your potions. [Smiles] That's what my cousin taught me."

During week five, Emily was asking questions to the group. Molly answered:

> Emily: Molly, how do you get watts [in the pokéwalker]?
> Researcher: Watts?
> Molly: Walk.
> Emily: Okay. I need more badges. How do you get badges?
> Molly: You battle gyms.
> Emily: I don' know where the gym at.
> Molly: Use your map.

Molly's answers were short and simple because she was playing her game at the time.

Kirsten, a 10 year old non-Hispanic white girl, and Marta, an 11 year old Asian American girl, joined the group during week 5. Since Molly was the girl with the most pokémon knowledge in the group, they specifically looked for help from Molly:

Marta: To capture a pokémon, do you have to defeat it a little?
Molly: It's easier.
Kirsten: Yeah.
Marta: To capture a pokémon, do you have to kill a little?
Molly: A little bit.
Marta: A little.
Kirsten: Where do you get balls?
Molly: You have to buy one.
Kirsten: How much are they?
Molly: 200.
Marta: That's expensive.
Molly: Everything is expensive in this game.

Molly answered in the same short and simple manner that she did to Emily. All three girls were playing the game while sharing information about the game. As I mentioned earlier, I did not see these conversations shared during the pilot program.

Molly figured out how to battle other players on her own over the first weekend. During the second week of the program, she showed Lanie how to battle by connecting their DS games, and they battled each other. Since I did not show them how to connect to each other's DSs for battles and trading, I was surprised by how fast she had explored the functionality in the game and started using it.

Battling against and trading pokémon with other players are essential social aspects in the Pokémon HeartGold and SoulSilver video games. These pokémon games are single player role playing games except when players connect to each other by visiting a pokémon center in game. When players meet each other through the pokémon center, they can see the other player in their DS. This allows players to battle each other with their pokémon. Players practice battling in the single player mode with non-player characters (NPCs).

Just like the pokémon animation theme song begins ("I wanna be the very best / like no one ever was"), the main goal of a pokémon player is to become the best pokémon trainer. To become one, pokémon trainers practice through collecting pokémon, training them, and battling against other pokémon trainers. Julia and Emma in the pilot study collected pokémon and trained them in the single player game mode. I did not observe them battling and trading with each other during the program. I also did not hear them talking about either activity. On the other hand, Molly introduced this practice to other girls in the group, and the girls regularly battled each other in our meetings.

Another pokémon trainer practice is trading pokémon. The game company makes two different games for each series to encourage player trading. Both Pokémon HeartGold and SoulSilver are the same game except for the pokémon that players can capture in game. Trading

is the only way to gain the other pokémon. Players can also trade pokémon from previous of pokémon games. When players catch pokémon, the pokémon is labeled with the player's name. This information remains even after the pokémon is traded. Traded pokémon, level up faster than other pokémon. There are a few pokémon that only evolve when traded, such as Haunter evolving into Gengar. The game company uses these mechanic to encourage social interaction among players.

Molly's curiosity found the trading option by trying different things in the game. Molly and Emily traded pokémon during the third week:

Molly: Let me try doing something now. Let's trade.
Emily: Trade? You can not have Snub. I want that (pokémon).
Molly: Yeah. I am gonna give you a good one.
Emily: I will give you... You can pick except for that one.
Molly: Okay. How about? I will take a geodude, the rock person? Bye bye, Dodou. This is so cool.
Researcher: What's so cool?
Molly: like how you trade pokémon.
Emily: It just goes up in the air.
Molly: This is so cool. I haven't seen it before.
Emily: Oh, hey Dodou.
Molly: Hi, Geodude.

This was Molly and Emily's first time experiencing trading in Pokémon HeartGold and SoulSilver. Emily explained what she was seeing on the screen while trading. When pokémon are traded, the pokémon shrinks to fit into a pokéball that is tossed up into the air. New pokémon

arrive in a pokéball in the reverse manner. Molly had said, “This is so cool. I haven’t seen it before.” Although it sounded as if she knew what she was doing by leading Emily through trading, it was her first experience.

The game mechanic allowed players to connect to other DS systems when both are physically close to each other. They also provide connection via wifi, but the girls in the summer program connected without wifi. The girls in the summer program seemed to enjoy connecting to each other to battle and trade pokémon.

Similar to connecting DSs between players, pokéwalkers allowed players to connect to each other. When players connect their pokéwalker, each screen shows the other player’s pokémon visiting your pokémon to do some activity together. At the end, players receive a gift.

In the pilot program, girls forgot to bring their pokéwalkers to the meetings. Connecting pokéwalkers was impossible without a pokéwalker. But in the summer program, girls connected pokéwalkers more frequently. They connected their pokéwalker and received a gift from each person once day. The gifts were mainly game items, but sometimes they included watts for the pokéwalker. Connecting their pokéwalkers became a part of their playing, but they usually did not talk about the connection afterwards. They connected and that was it.

Lanie and Molly first connected their pokéwalker at the beginning of the second week meeting. After the connection, they both put their pokéwalkers back on their waists and continued their game play on their DSs. During the third week, I asked Molly and Emily if they had their pokéwalkers to check if they had brought them to the meeting:

Molly: We connected [our pokéwalkers] this morning.
Emily: We connected. Ha ha ha ha [laughs].

The girls in the group had started to connect their pokéwalkers on their own. I also connected my pokéwalker with the girls' in the summer program. On Tuesday of week four of summer program, Lanie, Nora, and I connected our pokéwalkers:

Researcher: Oh yeah. Connect. Let's connect.
Lanie: Can we all connect now?
Researcher: Yes. let's connect.
Lanie: Went for a run. What did you get? I got stardust.
Nora: You just keep it like this?
Lanie: See when you get watts, like um, you can discover stuff like that.

In week four, Emily and Molly came to the meeting. Emily forgot to bring her pokéwalker. Molly asked to me, "Hey do you want to connect?" The following Thursday, Molly and I also connected our pokéwalker. Emily could not participate in either connection.

In week five, Molly, Marta, Kirsten, and Lanie connected their pokéwalkers together before our meeting:

Marta: Can you battle against people on the pokéwalker?

Researcher: Yeah, well. You can meet with other trainers. Did you all connect with other?
Molly: Yeah.
Kirsten: I did trade with you. Molly? Did I do you, today?
Molly: Yeah.
Kirsten: Molly, Marta, and I did with Lanie.

Although most of pokéwalker connections were done quietly, the connection mechanic allowed players to create at least one shared community activity to do on a daily basis. It also helped me to connect with the girls because it gave me a chance to start talking with them by connecting pokéwalkers.

Connecting pokéwalkers helps create social support, but connecting does not require players' physical exertion to connect with others. Research (Taylor et al.,2000; Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003) showed that social support is important for girls to become more physically active. Adding a small requirement like walking a few steps with other players to receive a gift might have encouraged players to take a few more steps.

In the main game, conversations with NPCs also created social support for players. Players interact with pokémon professors, their virtual mother, a rival, and other NPCs during the game. Through interaction with NPCs, players learn how to play and are challenged to battle.

Julia as a 13-year old African American girl in 8th grade. She was from a low SES family. She was in the healthy BMI percentile zone for her age. She was very quiet when I first saw her. She moved from an eastern state the prior year. She still missed her friends back in the other

states. When I did the pre-interview, her voice was so quiet that I had to put my ear close to her to hear her.

After eight weeks of playing, Julia said her favorite part of the program was, "When I was playing the game. Because I had to beat the gym leaders and that was my goal." Before joining the program, she had never played a pokémon video game before. At the end of the program, Julia had collected all eight gym badges in the game. She said,

> "I feel I got out of accomplishment from beating a lot of the gym leaders all of them. And I am proud of myself for actually putting on the pokéwalker and using it."

Her voice had full of confidence. It was loud enough for me not to lean on her to listen. There was definitely a change since pre interview. She continued to share what she thought of herself as a pokémon trainer.

Researcher: What have you learned about pokémon and pokémon trainer?
Julia: I learned that if each pokémon is different and if you take care of it and be nice to it, then they will grow up to be stronger and healthy.
Researcher: What do you think of yourself as pokémon trainer?
Julia: I think I am pretty good because in the game, everyone think that I am pretty good trainer.
Researcher: What is that?
Julia: Because I tried the hardest to succeed. When they say, I think Yay! I am very proud of myself and I feel great.
Researcher: How do you think you've changed as a pokémon trainer over the eight weeks?
Julia: In the beginning, I didn't really get the game that much and I was like "Aww, how do you do this and how do you do that?" Then I change from bad to good one because I've gotten into be you know very good at challenging and battling and beating people.

She was the only girl in the pilot program who wore the pokéwalker regularly and recorded her step numbers.

As a game mechanic, the NPCs respond differently based on the player's levels and their achievements. The "everyone" in Julia's response of "everyone think that I am pretty good trainer" meant the NPCs. As I discussed in the above, girls in the pilot study did not share their game progress and problems; this also meant that they did not support Julia as becoming a good trainer. The NPCs in the game, though, "knew" how she was doing in the game.

From Julia's last excerpt, we can guess that she did not do well at the beginning because she did not have previous pokémon gameplay experiences. However, she beat all eight of the gym leaders, major obstacles and goals in the game. After a player defeats a gym leader, the leader says something like, "I am sorry about my attitude. I admit defeat... You are too strong." (see figure 11) or "Whoa, amazing! You are an expert on Pokémon!". By interacting with NPCs in the game, she became more confident. The NPC conversations acted as social support for Julia to keep on trying and feel better about her self as she gets better in the game. This was not something I expected to find out from the study.

Figure 11. Screenshot after defeating the gym leader Maylene.

In the post interview, Julia also told me, "I think I am more social now." She told me, "I have more friends than I did when I started a year." She continued by saying

> "Sometimes I felt really shy around people and I wouldn't speak or anything. And then I got more used to it and loosened up and now I speak to people. A lot of people I didn't talk to or anything. Now I talk to them a lot more. This group helped me because it's telling me to go out there and be yourself and express yourself and that's what I did. And now I have more friends than I did."

She previously had four or five friends that she would talked with, but later she gained more friends and spoke more loudly in classes. She thought that change happened during our program. She recalled that, "You can barely hear me even if you sat or next to me. And now I speak up louder. Everyone can hear me." In Julia's case, she had social support from the game.

Similar to Julia, Lanie from summer program also received support from playing pokémon. Lanie is a 10 year-old African American girl from a low SES family. She was obese in the 98th

BMI percentile for her age. After the eight-week program, Lanie felt that pokémon taught some values about life:

> “I liked the game because it teach me a lot of stuff like "don’t give up" and "be who you wanna be" or "don’t be like somebody else and be yourself". And "be nice to people." Well, I already knew that. That’s good, I know that stuff but it can teach people. Sometimes people think that pokémon is actually boring, but it actually teaches you some stuff that people might not know.”

It is interesting to hear Lanie discuss this, because Julia from the pilot study received a similar lesson from the game that helped her become more social and confident. Julia told me that the group helped her gain confidence because she thought, “This group helped me because it’s telling me to go out there and be yourself and express yourself and that’s what I did. And now I have more friends than I did.” The pokémon game seemed to encourage players with phrases like "don’t give up" and "be yourself". I did not expect that this aspect of the game would help the girls, but it seemed that some girls learned from it.

After sixteen weeks, I did a followed up phone interview with Lanie. She was proud of herself as a pokémon trainer. She felt that she became a stronger trainer by beating the eighth gym leader. She learned that “sometimes you don’t give up. well, I knew, but I learned more about it cause sometimes you will lose but you just have to keep on trying.” Her response is consistent with what she told me in the post interview. Similar to Julia, she was proud of herself. It shows that some players can possibly gain confidence through playing.

So far, I discussed social support in the pokémon games. Molly in the summer program took on an advocate role and spread her knowledge and passion to other girls in the summer program. That seemed to help foster the pokémon culture early on in the program. Students in the summer program used the social game mechanic such as battling and trading with each other. Connecting their pokéwalkers in the summer program also became a social norm in the group. Unexpected social support in the game came from conversations with NPCs. Some girls gained confidence and learned life lessons that positively impacted their lives.

While the summer girls, centered around Molly, explored these social aspects fully, the pilot study group failed to explore the social aspects of the game to build their own social support group. There were some difficulties in and barriers to playing the pokémon games and using pokéwalkers. Most of these were caused by the pokémon game design and the pokéwalker's mechanics and mechanical problems.

First, the pokémon game's linear storyline design prevented some girls from continuing to play the game. Ashley from the pilot study lost her game in the third week (see chapter 5). When she received a new game two weeks later, she was no longer interested in playing the game. Before she lost her game, she had spent about 41 hours playing the game and had beat all eight gym leaders. The linear storyline could capture players' attention if they enjoy the story, but it

also made it harder for players to start from the beginning after reaching later parts of the game. Ashley did not come back to the program, and her loss of interest in playing the game from the start may have contributed to her dropping out.

Olivia in the pilot study stayed for the entire eight-week program, but she did not enjoy playing the game. During her exit interview, she said that her least favorite part of the program was playing the game. She told me,

> “Trying to play the game because it was so confusing to me sometimes. You had to figure out what they are trying to say. I really didn’t get what they are trying to say. I tried to walk around and tried to ask some more people but they kept saying the same thing. They didn’t say anywhere to go. "hey you need to go to the Mr. whatever hi's name was, professor." you know. I went to the down and they say "Oh, good luck" Okay I am like, you know, it’s really confusing.”

Since pokémon is a role playing game with adventure elements and has a linear storyline, it requires players' full attention by giving them clues to continue their journey. I recall Olivia having trouble reading early in the game. She confirmed that her least favorite part of the game was “reading everything they tell you. It takes a long time to do it. You don’t really wanna miss anything.” Since the game did not direct her actions clearly, it might have been a difficult game for her to play.

Since the game is driven by its story, and the story is told via text, reading skills are important for players. Nora in the summer study had difficulties reading and writing. She was a

10-year old African American girl in the 97th BMI percentile for her age. One of the reasons why the summer group met on Tuesdays in the afternoon was because she attended a summer school program. Nora came to the local community center after her morning summer school.

I recognized that she might be having some difficulties reading and writing. During week four, the girls filled out their weekly survey. One of the question in the survey was “Who did you play pokémon with last week?” Nora read it out loud slowly, holding her pencil for a while without writing anything. I suggested that she write 'nobody' if she did not play it with anyone:

Nora: How do you spell body? B-O-D-E-Y?
Researcher: Yeah? Nobody. B-O-D-Y
Nora:B-E-O-D-Y?
Researcher: B-O-D-Y
Nora: BOBY?
Researcher:DY
Nora:This supposed to be D?
Researcher:Yeah.

Nora had difficulties spelling the word and also had difficulty understanding me. She asked Lanie the same question again the following week:

Nora: How do you spell body?
Lanie: B-O-D-Y.

Playing the game with poor reading abilities can be difficult especially for people who don’t have experience and prior knowledge of pokémon.

Also during week four, Nora read sentences early in the game out loud. The game had two lines of text on the bottom of screen (see figure 12).

She said, “Mr. Pokémon is always freak what?” I looked over her screen and read it for her, “fascinated by eggs.”

Figure 12. Conversation with professor Elm about the Egg.

Second, there were some barriers to using pokéwalkers as an exergaming tool. The main problem is that the pokéwalker functions as an extra accessary to the main game play. The pokéwalker is not required to play the game, and players can proceed in the game without wearing a pokéwalker. In the main game, NPCs also do not mention using the pokéwalker to the player.

The linear story also made difficult to start using pokéwalkers. To start using a pokéwalker, players needed at least two pokémon with them. Players choose one pokémon soon after they

start the game. To get a second pokémon, players need to learn how to catch wild pokémon with pokéball. To do this, players need to spend about two hours to finish a tutorial integrated into the story line. It seemed oxymoronic to have students play a sedentary game for at least two hours to use a pokéwalker in an exergaming program. In both the pilot and summer programs, I was not able to have girls start using pokéwalkers on the first day we met.

Having more than one pokémon is a start. The players also need to find a pokémon center to access a computer in the game and deposit one pokémon they have. In the game, players are not asked to use a pokéwalker, and the tutorial does not introduce how to start using a pokéwalker, either. If players are not interested in using it, they can still play the game without it.

When players deposit a pokémon at the pokémon computer, they need to save the game and turn off their DS. When they turn it back on, players must choose the "connect to pokéwalker" option to use the pokéwalker. The girls in the pilot program had difficulty understanding how to start using the pokéwalker. I helped each student set up their pokéwalker. To prevent time consuming confusion, I added a homework assignment (see appendix 4) for the summer program students.

For some girls, the assignment was still confusing. Lanie and Emily from the summer program called me on the phone for help transferring their pokémon into their pokéwalkers

outside of the group meeting days. On the first week of Saturday, two days after Lanie had started playing the game, Lanie called me on the phone at 8:24 am. She wanted me to help her set up her pokéwalker. We talked on the phone about how to do so. We had some trouble having her pokéwalker communicate with the game cartridge. She finally got her pokéwalker working and was very excited.

Emily joined the group on the second week. A day after Emily had started playing the game, she called me on the phone at around 8:40 pm for help connecting to the pokéwalker. When I hung up on the phone with her, it was 9:20 pm. It took us forty minutes. Similar to Lanie, Emily was having difficulties facing her pokéwalker correctly towards the game cartridge. When she finally got her pokéwalker working, she screamed “Yay!” on the phone. She was so excited that she said, “I am going to walk around to see how many I can get.” That was 9:20 pm, so it was about her bed time, but she wanted to walk to see how it worked.

A pokéwalker communicates with game cartridges and other pokéwalkers via infrared signals. This connection was not always stable. As discussed above, Lanie and Emily had difficulty making a stable connection between their pokéwalker and game cartridge. During the fourth week, Lanie helped Nora connect to Nora's pokéwalker.

Lanie: So can I help it [connecting a pokéwalker] with her [Nora]?
Researcher: Yeah. Do you want to help her with it?

Lanie: Yeah. Yeah. Okay. So, you can only go on one [trail]. Which one? Noisy Forrest or refreshing valley?

Nora: Noisy.

Lanie: Oh good. So this is what you gotta do. It took me a while, but it's actually easy. Now you have to do this. It has to be on the good surface. So, like that. Okay. It does that. Hold on. I am not doing it right. That's all.

Researcher: Oh, you need to just go more longer.

Lanie: Okay.

Researcher: And then you can do it.

Lanie: You have to have a good point at it. Takes a while.

Nora: Okay. This is what? Continue?

Researcher: Connection was disrupted. Let's do it again.

Lanie: Can somebody hold it for me? And then I can like. It's better on the carpet.

Researcher: We can do it now. Connecting to pokéwalker now. And yours got shrunk so small and then went up to the pokéwalker. Take a look. There is your pokémon.

Although Lanie was successful at her own connection on the phone with me, I still saw some struggles. After few attempts, she was able to help Nora connect to her pokéwalker.

Similar to connecting pokéwalkers and game cartridges, connections between pokéwalkers weren't always stable. During the eighth week of the pilot study, I wanted to connect my pokéwalker with Julia's, but we couldn't connect:

Researcher: Do you want a gift?

Julia: Sure. I like gift.

Julia and I stopped walking and tried to connect our pokéwalkers:

Researcher: Cannot connect?

Julia: cannot connect.

Researcher: What's wrong? I don't know what's making us not to.

Julia: Connect?

Researcher: Uh huh.

We saw “cannot connect” written on our pokéwalkers. We thought that connecting while walking was not stable, so we stopped walking. We touched our pokéwalker’s infrared areas, but but for some reason, we couldn’t connect to each other’s pokéwalker. As described in the excerpt above, Julia and I tried again, but failed. We had to give up connecting. Due to this happening during our last meeting, I was not able to try again with Julia afterwards. This unstable connection prevented players from receiving the full benefits of using the pokéwalkers.

Pokéwalkers were not always reliable during the program. First, pokéwalkers did not always record steps for some girls. During the post-program interview with Emma from the pilot study, she told me that her pokéwalker had not recorded her steps.

> “I had it on my hip and I was walking. When I walking, I was like walking a long distance, and then I checked it and it had the same number of steps that before I even started. It was weird.”

She did not tell me about this during the program. She mentioned that this happened before she had lost her pokéwalker, which was about the middle of the program. Emma seemed to lose interest in using the pokéwalker after this happened to her.

When using pokéwalkers, it is important to check if the DS time is set to local time. The DS game system allows players to change the local time in the settings. It doesn’t automatically change the local time for the player. Pokéwalkers sync their time with the DS and reset the step

number to zero every midnight. During the second week of the summer program, Molly experienced her pokéwalker steps resetting to zero in the middle of our program:

> Molly: My steps right now is eight hundred twenty one. It refreshes at one [in the afternoon].
> Researcher: What? Why does it do that?
> Molly: I don't know.
> Researcher: [pulling out her DS] I think it's actually hooked up with this. I know why. Your DS is 2 am now. That's why. Let's change time on the DS. That's the reason why.

During week 5, this happened again with Kirsten. Since she uses her own DS, I forgot to check her DS local time. During the program, Kirsten said "I don't know. Mine started over. Before I had 1500. We ran around the gym the whole time after. I had 1500 and now I have 150, so." We found it on her first day of using the pokéwalker. After the experience with Molly, I checked the local time on Kirsten's DS, and it was set incorrectly. Checking the local time on the DS is important to prevent these incidents.

Girls in the programs experienced some barriers and problems of playing the pokémon DS game and the pokéwalker. I learned that game's linear story prevented some players from continuing to play the game, especially when starting from the beginning. Appropriate reading skills are required to play the game when the game primarily uses text. Once a player becomes lost, it is difficult to return to the story line.

The Pokémon HeartGold and SoulSilver series does not advocate using pokéwalkers. It is difficult to start using the pokéwalker because the games requires some initial play time, and the steps to transfer pokémon into a pokéwalker are complicated. Connecting the pokéwalker to the game cartridge or another pokéwalker was not always stable. It is also important to check local time in DS before connecting pokéwalker because it uses the time in DS.

I have discussed some weaknesses and drawbacks of the pokéwalker in the previous section. Did girls in the program care about the pokéwalker? To answer this question, I analyzed whether the girls' wore the pokéwalker or not during and after the program. I checked whether girls brought DSs and pokéwalkers to meetings regularly. Table 12 shows the number and names of students who did not bring their pokéwalker during the pilot or summer study.

In the pilot program, Olivia, Emma and Julia were the three girls who completed the program. From the Table 12, we see some girls did not bring their pokéwalker to our meetings. This also meant that they did not wear the pokéwalker on that day.

In both the pilot and summer programs, students brought the pokéwalkers until the second week; afterwards, I started seeing one or two students in each group lose or forget to bring their pokéwalker to our meetings.

Table 12

Numbers of girls who did not bring pokéwalker and misplaced/lost pokewalker

Program	Dates	Did not bring pokéwalker	Misplaced or lost pokéwalker
Pilot	3/18	0	0
Afterschool	3/25	0	0
program	4/1	2 (Jessica & Emma)	1 (Ashley)
	4/8	1 (Olivia)	1 (Emma)
	4/15	2 (Emma, Julia)	1 (Olivia)
	4/29	3 (Olivia, Julia, & Lily)	0
	5/6	1 (Emma)	0
Summer	6/23	0	0
program	6/28	0	0
	6/30	0	0
	7/5	1 (Molly)	0
	7/7	0	0
	7/12	1 (Nora)	0
	7/14	2 (Lanie, Emily)	0
	7/19	1 (Lanie)	0
	7/21	1 (Lanie)	0
	7/26	2 (Nora & Marta)	0
	7/28	1 (Marta)	0
	8/2	1 (Emily)	0
	8/4	0	0
	8/9	1 (Lanie)	0
	8/11	4 (Lanie, Molly, Kirsten, & Marta)	1 (Nora)

There were a few responses to why they did not wear their pokéwalkers. The most frequent reason I heard was that they forgot to wear it. I also heard that they had misplaced or lost the pokéwalker.

During the fourth week meeting in the pilot program, Olivia wrote, “The reason I haven’t been wearing my pokéwalker is because I have a lot of homework and I had fun at the park today.” She did not bring her pokéwalker because she had left it at her place. Wearing her pokéwalker did not become a habit.

Emma from the pilot study forgot to bring her pokéwalker in week three. She told me, “I left it at home by accident” In fact, she had misplaced her pokéwalker at home, and she couldn’t find it for another week. She was guessing that her cousin might have placed somewhere she didn't know. In week four, Emma wrote

> “I lost my pokéwalker. I think the reason why I lost it was because it is too small, it falls off easy and it’s hard to keep track of. I just got back from walking and it was fun we walked through the park.”

Before we went to the park, I gave Emma a new pokéwalker. I even asked her to put it on her waist, but she left it in the front pocket of her hoodie. When she was on the swing in the park, her new pokéwalker fell out from her pocket. She said, “I lost my pokéwalker! It’s so silky smooth.” She found it on the ground and just put it back into her front pocket again.

Though not listed in this table, Julia lost her pokéwalker a week after the program finished. Thus all three girls who remained in the program lost their pokéwalker at least once during the program.

To help prevent pokéwalkers from being lost, I added a clip to each of them in the summer program. In contrast to the pilot program, girls from summer program did not lose their pokéwalker as much, but they often forgot to wear them. Girls from the summer program have misplaced the pokéwalker for few times, but they eventually found them back.

In the summer program, Emily came to the meeting in the third week without wearing her pokéwalker.

Emily: I don't wear it [pokéwalker] now. I don't know why. I just didn't.
Researcher: You didn't wear it yesterday?
Emily: Oh yeah, I couldn't find it yesterday.
Researcher: You couldn't find it?
Emily: Nope. And I found it. The day before, I lost it, too.
Researcher: Where did you find it?
Emily: It was my brother. My brother, uh, my brother found it in between our couch. Because sometimes pokéwalker falls off.
Researcher: Yeah?
Emily: Is this what this clips for something?
Researcher: Uh huh.
Emily: Oh.

When I looked through her last seven days of pokéwalker steps numbers, I found that she had not worn it for many days the previous week. She had lost it in her couch, and her brother had found it for her. Emily did not know how to use the extra clip to prevent the pokéwalker from being lost. I showed her how to use the clip. The next day, I stopped by their summer camp and saw Emily. She told me about the clip pinching her skin:

Emily: The pokéwalker on the waist hurts a little bit.

Researcher: Oh the clip [the one to prevent the pokéwalker from being lost]. Why don't you put clip on somewhere else? [Placing the clip on the bottom of her shirt] Is it going to hurt you?

Emily: No.

The metal clip had hurt Emily's skin. Clipping the pokéwalker to her pocket or a t-shirt seam (see figure 13).

Figure 13. A pokéwalker with lanyard clip.

Since pokéwalkers are similar to pedometers, they share similar weaknesses. First, pokéwalkers require clothing that support clips, such as pants or skirts. Physical Educators who use pedometers in class often have extra belts for students who wear dresses that lack a place to clip pedometers. During the second week of the summer program, I was checking in with Molly about the pokéwalker:

Researcher: How do you like your pokéwalker, Molly?

Molly: Umm. I like it except sometime I don't like. Sometime I am wearing a dress and I can't put it on. So I am like Oh, I really wanna...
Researcher: So do you have a belt like this?

That day, I had worn a belt on top of my dress. I pointed at myself to show how she could wear a dress and a pokéwalker using an extra belt.

Molly: Oh, Yeah.
Researcher: You can wear a belt on top of dress.
Molly: Oh, Yeah. Or I can put shorts under my dress and put that on.

Molly told me that she wore shorts under her dress and put the pokéwalker on them.

Second, pokéwalkers cannot measure physical activity in water. They can't measure physical activities like swimming because they are not waterproof. Girls from the summer program went swimming at least once a week for few hours. They sprayed water at each other in the playground in their swimming suits when the weather was hot. When they were doing these activities, they did not wear their pokéwalkers. In the third week of the summer program, we reviewed the girls' physical activity in the prior week. I asked the girls, "So how was last week's physical activity?"

Molly: Last week, I like played a lot. I went swimming. Well. When I have my pokéwalker on, I sometimes forget that is on. I just move around regularly, exercise regularly. Cause it's not in my waist. I put it in my pocket hole.
Researcher: How was your physical activity, Emily?
Emily: Fun.
Researcher: Did you walk more last week?
Emily: In the pool, yeah.
Researcher: In the pool?

Emily: I can't take the pokéwalker in the pool, can I?
Molly: Exactly. We spent like a long time in the pool.
Emily: Yeah. that probably wasted 700 steps in the pool. We can't take it.

This conversation reflects how Molly and Emily thought about the pokéwalker and swimming. Emily is used the word "wasted" when her steps were not counted by her pokéwalker. Emily seemed to care about getting steps in her pokéwalker. I continued talking with Molly on how she felt about her daily step numbers:

Researcher: You've been wearing pokéwalker last four days. What do you think of your step numbers [June 30-July 3]?
Molly: Well, ah, I was just normally walking actually cause I don't pay attention to my pokéwalker cause it's like every two hours I check on it and "Oh, look! I have this many watts already." and so.
Researcher: Do you pay more attention to watts?
Molly: I just like uh, like I exercise normally,and so I've been swimming lately, and so that's why I don't get so much steps sometimes, but...

It seems that swimming makes these two girls think that they don't get as many steps as they would like.

In Molly's post interview that she also reflected:

> "When you have to remember to put it on everyday, it's sort of well.. I always forget to put on my pokéwalker. Cause I wake up, brushed my teeth, eat breakfast. Oh no, I forgot my pokéwalker. It's hard to remember to put it on."

Molly also forgot to wear her pokéwalker. It might be natural behavior for young girls to forget their pokéwalkers during a busy morning. However, when the girls did not bring their pokéwalkers to the meetings, it was a challenge for me to collect data.

In Emma's case, her experience with the pokéwalker was negative. Emma said that her least favorite part of the program was the pokéwalker during the post-interview. She told me, "Because it was so small and kind of hard to keep track of and it doesn't really trip on." When I asked what she meant by hard to keep track of, she replied:

> "It's hard to keep track of cause sometimes you just forget that it's like with you, but if there is a way that it could work with the game that track your step because I always keep my DS with me. So that way when I am walking with it in my pocket or with it in my backpack, I will be able to track and I think another reason why I didn't really like it was because not only it was hard to keep track of and small, it was because it didn't always count everyone that your steps. Like sometime when you are walking and it wouldn't count it. It' done that couple times."

In her response, she felt that her pokéwalker was not measuring her steps correctly. It might have been a manufacturing defect in this case. It might also have reflected a gap between "real life" data and laboratory experiments since a study showed that pokéwalkers measured steps for children and adults more accurately than the standard Digiwalker (Yamax, USA) pedometers (Lanningham-Foster, Foster, Barnes, Kracke, Kling, and Vik, 2011).

Emma did not value the pokéwalker for leveling her pokémon. She told me during the post interview, "Well, the pokéwalker, it takes a longer to level up your pokémon like I've noticed. But the pokémon I have the highest one right now, I used leveling up by playing the game." Whenever players bring their pokémon back from a stroll in the pokéwalker to the DS game cartridge, it gains a level. If Emma had not been taking her pokémon back to the game often, she

could have thought that they didn't level. It is unfortunate that Emma did not find a benefit to using her pokéwalker.

Girls in my program did not wear their pokéwalkers because they forgot to wear them in the morning, misplaced them, or lost them. In Emma's case, she did not trust the pokéwalker's step measurements and saw little benefit in using it.

The girls recognized a few benefits in using pokéwalkers. First, girls liked the pokéwalkers because they saw how many steps they had taken. In the exit interview with Olivia from the pilot study, she told her favorite part of the program was "going to the park and walking thingy and pokéwalker because pokéwalker lets you see how much steps you take and going outside was really fun to play and hang out when it's nice outside." Like Olivia, Molly wrote that walking with the pokéwalker is "fun. I got to know how much I walked" during the week four meeting. However, a pedometer would serve a similar purpose for this reason.

Second, pokéwalkers rewarded players' walking with items and pokémon. To collect watts in their pokéwalker, the girls needed to walk with it. In the pilot, Julia was the only student who wore the pokéwalker regularly until she lost her pokéwalker a week after the last meeting. During the post-program interview, I asked about her experience with the pokéwalker:

> Researcher: How was your experience with using pokéwalker?
> Julia: I say it was good. And I haven't stopped using it.
> Researcher: Tell me more.

Julia: Because it's fun to use it. And you just wanna carry around everywhere so you can get more points for walking. If you just carry around and just walk.

Julia is talking about the watts. She liked getting more points from the pokéwalker. That seemed to be her motivation to wear and walk with it.

During the fourth week's meeting, Lanie also told me

> "It [the pokéwalker]'s pretty fun. I like it. Pokéwalker is fun because it makes you active, because um, when you walk you have to get watts to play games. You have to get certain watts to play games and um, that's pretty good because it's giving you to do, uh, active activities to do what you wanna do. So it's pretty cool."

Players can use their collected watts to win pokémon or items. The pokémon and items found in the pokéwalker then helps players in their DS game play. Capturing pokémon on the pokéwalker is easy and economical. In the DS game, players need to buy pokéballs to catch wild pokémon, and each pokéball costs money. I previously showed a conversation among Kirsten, Marta, and Molly on pokéballs and expense. Molly explained to them that a pokéball costs 200 pokémon money, saying, "Everything is expensive in this game."

In the pokéwalker, players do not need to buy pokéballs. If they collect 10 watts, which meant they had walked 200 steps, pokéballs are free to use on the pokéwalker. During the second week meeting, Molly shared how she collected most of her pokémon through her pokéwalker:

Molly: It's really easy to get pokémon.
Researcher: On pokéwalker?
Molly: Yeah. That's how I got most of mine.

Molly recognized how easy it was to collect most of her pokémon on her pokéwalker. I was surprised that she knew about the benefits of using a pokéwalker and practiced them within a week since she had started playing the game and wearing a pokéwalker.

The items from pokéwalkers help players make money in the DS games. During the third week of the summer program, I spoke with Molly about pokéwalker items.

Researcher: Somebody is playing the pokéwalker. What do you think about the item thing?

Molly: It's cool.
Researcher: It's cool. Do you get to use it a lot in the game?
Molly: With the items, I find very useful. I plan to sell some pearls sometime.
Researcher: Pearls?
Molly: Yeah, I have two of them.
Researcher: What's pearls?
Molly: If you sell them, they have really like price. It's like high price.

Pokéwalker items mattered to Molly because they helped her to obtain money in the DS game. Molly seemed to care about using the pokéwalker for her game play.

Although connecting pokéwalkers between players does not require watts or physical activity, the gifts players receive also benefit in their game play. Towards the end of the summer program in week seven, I saw Molly and Marta had connected their pokéwalkers on the way to the botanical garden. This was the first time I had heard a girl in the program discuss the benefit of connecting and receiving the gift by doing that.

Marta: Super repel received. Great. I will never gonna have another wild thing in my life.

Researcher: Another wild thing?

Marta: Yeah, you know wild pokémon? Cause I have so many super repels?

After connecting, Marta received the item super repel. When players use a super repel in the DS game, they can avoid the random fights with wild pokémon. Super repel lets the players to focus on the story and achieving their goals because it allows them to move faster and not spend time battling.

Girls who wore the pokéwalker recognized benefits of using it for their game play. Pokéballs are unlimited in pokéwalkers if players have enough watts to play. The items players receive through mini games or from connecting their pokéwalker also help their game play.

In this chapter, I discussed the social aspects found in the pokémon games. Girls from the summer group who played the game incorporated the social elements like battling and trading. The social activity created a social norm in the group for exchanging gifts in the pokéwalker which also encouraged girls in the summer to wear their pokéwalkers more often compared to the girls in the pilot study.

There were some barriers and drawbacks for playing the pokémon DS game and for using the pokéwalker. The linear story discouraged a player who had lost the game from playing the game again. Reading skills and catching clues in the game story is important for this type of

adventure game. When a player is not paying attention to them, it is easier for them to lose interest in the game. The initial pokéwalker connection requires a few hours of playing, and the steps were complicated for the young girls in the program. The game did not fully integrate the pokéwalker into the main game play. The pokéwalker is an additional accessory that is not required to play the DS game. There were also a few mechanical difficulties girls faced such as syncing problems.

In the last section, I looked at the reasons why the girls wore their pokéwalkers and why they didn't wear them. The girls who wore their pokéwalkers saw a benefit in the rewards that they received from walking. The main reason they did not wear their pokéwalkers was that they forgot to wear them along or misplaced or lost their pokéwalker.

In the next chapter, I conclude the findings from chapters 4 to chapter 6. It discusses the caveats and implications of the study. From the conclusions, I suggest future research.

CHAPTER 7. Conclusion & Discussion

This dissertation takes a qualitative approach to a physical activity intervention using video games. It details what the girls did in the program meeting by meeting. This study also provides opportunities to learn about the sample from their stories. Physical activity intervention studies for girls (Dishman et al., 2005; Pate et al., 2005; Elder et al., 2007; Webber et al., 2008) and exergaming physical activity intervention studies (Chin et al, 2008; Baranowski, 2012) generally use quantitative research methods to report changes in participants' BMIs to argue for intervention effectiveness. These studies miss explaining about their program, learning about their participants and reporting how participants changed over the time.

Based on the Stake's (1995) case study methodology, my study findings and results do not argue for broad generalizations and instead aim for "petite generalizations". Stake (1995) explained petite generalizations are "generalizations about a case or a few cases in a particular situation" (p. 7). In this study, I tried to understand the girls in the study and the group, focusing on how the exergaming-based support group worked. However, this study may not represent the larger population. I do not argue for generalizing my results.

I examined the following research questions for the study:

1a. What knowledge do members gain about physical activity and pokémon through participation in the group?

1b. How do their BMI, physical activity levels and attitudes change as a result of participation in the group?

1c. Do these changes last after the program's end?

2a. What is the nature of the support group?

2b. Do participants' relationships endure?

In terms of gaining knowledge about physical activity, regular participants learned the physical activity guidelines for the girls, in particular that their step numbers be 11,000 or more daily. The summer program discussed the physical activity guidelines during the week 3 meeting. Participants did not know the guideline before joining the group, but they started to use it for their daily pokéwalker step goal.

Participants shared their knowledge of pokémon when they played the game together. Participants gained knowledge through exploring the games by themselves and by learning from other players. Molly had prior knowledge of pokémon game on the Game Boy, but she had not played pokémon on a Nintendo DS before. She started playing Pokémon HeartGold and SoulSilver through the summer program. Molly figured out how to battle and trade pokémon with other players of the game by herself and shared that knowledge with the other girls in group

to play with them. Molly became the person with the most pokémon knowledge in the group, and other girls asked Molly for help and learned from her. Lanie and Emily learned from Molly how to battle and trade on the DS, for example, and Kirsten and Marta asked Molly for help on catching pokémon in the game with pokéballs.

Participants also learned pokémon names, and they started to have their favorites. Kirsten wanted a Weedle pokémon and caught one during the week 5 meeting. She said "This is my Weedle. I don't know what to name that. Woo, it's a girl Weedle." She asked Molly and Marta for their opinions on naming the Weedle. She wanted to catch two Weedles one in for her pokéwalker and the other for her DS game.

After the eight weeks of participation in the group, the girls' BMI status based on their BMI for age percentiles did not change. All the girls with healthy BMI statuses stayed healthy. All the girls with obese BMI statuses stayed at the same obese status. Although I did not see changes in all girls in their BMI status, two obese girls in the summer program, Emily and Lanie, lowered their BMI slightly after the eight week program. Emily lowered her BMI from 28.1 (pre program) to 27.5 (post program), and Lanie's lowered from 27.4 (pre program) to 27.1 (post program).

The overall participants' daily physical activity level changes are difficult to assess. One of the challenges in the study was following participants' daily physical activity levels based on their pokéwalker step numbers. Participations in the study misplaced, lost, or forgot to wear their pokéwalkers during and after the program. Attaching an additional leash with a clip helped prevent lost pokéwalkers in the summer study.

Emily was the only girl who completed her eight week pokéwalker step log during the summer and the additional eight weeks after the program ended. Although she finished her log, she also misplaced and forgot to wear her pokéwalker occasionally. In Emily's case, she increased her physical activity level after the program finished. In terms meeting the 11,000 steps daily guideline for girls, Emily met the goal for four days during the eight-week program. After the program finished, she met the guideline for eight days for the following eight week period. From the study, it is hard to say that the girls in the pokémon exergaming-based program changed their physical activity levels.

In the previous literature on the effectiveness of exergaming, researchers (Tan et al., 2002; Unnithan et al., 2006; Maddison et al., 2007) found that children's energy expenditures during exergaming is similar to moderate to vigorous physical activities such as walking and jogging.

These research assumed that exergaming that offers moderate to vigorous physical activities may improve children's overall fitness and health.

However, there are few things that research like this ignores. The relative intensity of physical activity for children who are fit or not can vary. Especially for overweight or obese children, their perceived exertion might be different than other children. In the pilot study, Lily, an obese child, expressed that her back and foot hurt during and after walking. Emily in the summer study often mentioned that her ankle hurt and prevented her from walking.

Even if an exergame offers moderate to vigorous physical activity, if players do not play it regularly and continuously, it does not provide many health benefits. Walking with a pokéwalker offers participants moderate intensity for physical activity. Girls like Emily who showed interest throughout the program and even after the program continued walking with her pokéwalker. However, some girls slowly lost interest in walking with their pokéwalkers. Since this case study did not show that children's BMI and physical activity level improved over the eight-week long period, the assumption that children will continue to play exergames and receive health benefits were not supported.

The lack of regular attendance and the high drop out rates in the pilot study showed that some girls did not continue to play this exergame due to their life situations. This also made it

difficult to observe participants. Three girls, Lily, Ashley, and Daisy, dropped out of the study and the Girls Inc. program. Lily had problems at her school that took priority over this program. The other two girls, Ashley and Daisy, are sisters who were living in a local shelter. Both of them left the program due in part to lack of social support.

Research on health-related behavior change games (which may or may not include exertion) suggests that game stories may help hold players' attention and result in positive behavior changes (Baranowski et al., 2008). In this study, the linear storyline of Pokémon HeartGold and SoulSilver required players to spend at least two hours completing the initial tutorials. Gameplay after the initial tutorials support more exploration and choice but remain linear. Ashley's example suggests some drawbacks of this linearity in the games.

Ashley lost her game and pokéwalker after spending about 40 hours playing the game. She was reluctant to play a replacement copy from the start. Children might lose their saved games, including losing physical games and digital save files, which may result in disinterest like Ashley. Further, if the narrative is linear and set, there is an end point for the game. When players reach that end point, they may not want to continue playing the game. This would not be the case for games like DDR since their play is not influenced by a linear story. Exergames

focusing on replayability may encourage players to continue playing the exergame and also receiving health benefits.

Researchers found that adding additional sporting accessories such as a stationary bike to video games is effective for exergaming (de Vries, Simons, & Jongert, 2009; Epstein, 2008; Warburton, 2007). In this study, I found the pokéwalker to be an accessary to the main game. This case study participants played the Pokémon HeartGold and SoulSilver game while using the pokéwalker to measure their steps. The pokéwalkers made the DS pokémon games unique as exergames since they rewarded players' walking with economical benefits (i.e., pokémon and items) in the DS game. However, players can play the game without the pokéwalker. Setting the pokéwalker up was problematic for the participants because the pokéwalker is never mentioned in the main DS game and required players to have at least one pokémon deposited in their computer in the DS pokémon center. Additionally, setting up the pokéwalkers was complicated, and most of my participants needed my help doing so. As discussed in chapter 6, participants often misplaced or lost their pokéwalkers throughout the study period. However, interested players could continue playing without using a pokéwalker; Emma in the pilot study, for example, rarely wore her pokéwalker, but she continued to play the DS game. Making the pokéwalker more essential to gameplay would make the pokémon games stronger exergames.

While the girls' BMIs and physical activity levels did not change, particular girls changed their discourse about physical activity with their peer's social support in the group. Some girls who participated in the program regularly showed some positive changes in their attitude towards physical activity and walking. For example, Olivia in the pilot study showed strong resistance to walking outside at first in the program, but towards to the end of the program, she initiated going outside and play.

Consistent with previous literature (Taylor et al., 2000; Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003), social support is an important factor for girl's physical activity. This study highlighted how social support worked well and poorly among girls through their vignettes and stories in terms of improving physical activity. Girls who had negative attitudes towards physical activity at the beginning of the intervention changed after having social support during the program. This was especially true in Emily's case; social support positively affected both her attitude towards physical activity and her physical activity level. Having the opportunity to be physically active with social support seemed to be important.

The benefits of the pokémon games were the social aspects in the game. The in-game support functions like battling and trading pokémon with other players encouraged players to interact with each other. The pokéwalker also supported social interaction through the daily

connections to receive a gift item. Connecting to each other's pokéwalker became a social norm for the summer program group.

When I interviewed the girls again after eight weeks after the program ended, I found that the pilot group participants' relationships did not endure. After eight weeks, Olivia had dropped out of the Girls Inc. program. I could not reach Emma for the interview. Julia was visiting another state, and she told me that she did not keep in touch with other members.

On the other hand, some girls in the summer program kept in touch with each other. Only two girls, Molly and Nora, stayed in the same local community center's afterschool program and maintained their relationship through their attendance. The other girls who were not in the same program or school any longer also kept up their relationships outside of the program. Kirsten and Marta were good friends before joining the group, and their friendship continued even after the program ended. Kirsten became a good friend with Lanie during the program, and they still keep in touch with each other. Kirsten also told me that she often saw Emily on the bus stop because Emily's home is nearby and that they talked to each other. Emily and Lanie also kept in touch with each other.

Communities of practice (Wenger, 1998) as social learning theory was used to understand and analyze social support in this study. Wenger (1998) explains that communities of practice

are everywhere, including home, school, work, and even the playground (p. 6-7). I drew from two communities of practices: the walking community and the pokémon trainer community.

The walking community consists of people who are interested in and practice walking in their lives for reasons including transportation, for work, as exercise, or for charity event. As Lave and Wenger (1994) describe, people have different levels of participation and expertise in this group.

In this study, the participants had different levels of interest and practice in walking. For example, Emily wrote in the pre-program survey that, "Walking is something I don't really care for but I will do it anytime I have to." Her level of interest in walking was low before joining the group. She did not mention walking as a regular physical activity either. On the other hand, Molly told me that she likes walking especially with her mom, and she walks with her mom regularly. Molly's level of interest in walking and participation in the activity was higher than Emily's prior to joining the group. Molly, in fact, was practicing walking as part of that community as her mom conveyed the values and practices of walking. In Molly's pre interview, she described the view of walking as exercise.

During the study, I observed how Molly influenced Emily in how to think about and practice walking during the summer program meetings. In week three, Molly affirmatively answered without hesitation when I asked both Molly and Emily if they could meet 11,000 steps

per day. Emily initially said no to the question, but changed her response to, “I guess I can do the eleven thousand steps, but that will be a lot of work,” after listening to Molly’s answer. Molly also initiated walking with Emily. In this case, the more experienced walking community member (Molly) shared her attitudes with a newer member (Emily). Molly’s positive attitude acted as social support in conveying the value of walking. Even after the program ended and both Emily and Molly were not meeting through the summer program group, they both actively engaged in walking. Emily continued recording her daily pokéwalker step numbers and showed how she incorporated walking into her lifestyle.

There is also a community surrounding pokémon training. Individuals have varying levels of interests and participation within the community. A newcomer might have just bought a pokémon game and started to play it. Another might take it further to become a certified pokémon professor by taking pokémon knowledge exams (The Pokémon Company, 2012). The pokémon professors become judges for competitive pokémon tournaments including the card and video games.

In the summer program, Emily had never played a pokémon game before but was interested in playing one. Molly had previously played a version of pokémon, but she had never played Pokémon HeartGold or SoulSilver. She was also interested in playing the game when she joined the group. In this case, Molly had some knowledge of how pokémon games work from

her previous experience, but both of them started as new players for this specific game.

During the summer program, Molly figured out the battling and trading functions in the game on her own early in the program, and she shared it with other girls. She told Emily how to battle with her by connecting their DSs. Although Molly was not an expert in the pokémon game, she knew more about playing pokémon as a pokémon trainer relative to Emily. The other girls in the summer program asked for Molly's help because she was more experienced and knowledgable in pokémon game. Their seeking and sharing of knowledge within the group indicates developing social support in playing the games.

Although the communities of practice helped me to understand the social support in this study, it has some limitations as an explanatory theory in this study. The primary limitation is that the overlap between the walking community and pokémon trainer community was minimal. Although the pokéwalker combined both walking and pokémon trainer's activities in game to realize in real life, it was difficult to observe girls embracing the both idea and activity of walking with a pokéwalker to become better pokémon trainer. Emily might be the only girl who took on the identity of a pokémon trainer who walked with a pokéwalker and who continued walking and playing pokémon game. Even Molly, who was more interested in and also experienced in both walking and playing pokémon than Emily, did not wear the pokéwalker regularly during and after the program.

An implication of this study is that we need to better understand that society and culture fabricates childhood obesity, and childhood obesity is situated within that society and culture. In order to design interventions for the populations like African American girls from a low SES, learning about their culture is required and shapes the intervention.

The Pokémon HeartGold and SoulSilver game with pokéwalkers may not be suitable for the current physical education culture which expects to provide at least 50% of class time to moderate to vigorous physical activity. The game, as I discussed in chapter 6, requires at least of two hours of sedentary playing time for the tutorial before starting to use the pokéwalker. However, pokéwalkers might fit individuals needs as when an obese child like Emily chooses to pursue her daily physical activities using a pokéwalker.

Considering the current physical education culture, budget, and expectations, I would recommend exergames like Dance, Dance, Revolution, Just Dance, and Dance Central. They do not require as much funding as providing each student with a Nintendo DS if students are to play the game all together. These games also allows many students to be active at the same time. Students will need to take turns in class while the rest of students could follow the movements without using an input system such as the DDR pad or Wii mote. Although it limits the video games' affordance of providing just in time feedback to the players, this method would serve many students at one time.

For exergame designers, this study suggests that stronger exergames would require moderate to vigorous physical activity to be in the main game play. Since walking with a pokéwalker was not the main part of the games, some children played without wearing and using the pokéwalker.

To be able to sustain exergame play for a longer period of time, a stronger exergame should avoid game design with a strong linear storyline with an end point. If exergames allow players to join and leave the game anytime without having limitations, it may encourage players to continue playing the game.

There are few things to consider for researchers and practitioners who might be interested in using pokéwalker in the future. First, attaching a lanyard to the pokéwalkers will prevent children from losing them. Second, checking the DS game console's time if it is set to the current time will synchronize the daily physical activity level with their step numbers. Third, when a child loses their pokéwalker and a new pokéwalker is provided as a replacement, restoring the pokémon from the lost pokéwalker by holding Up, Select, and R keys on the DS console on the pokéwalker connection screen can ease transferring to the new pokéwalker. Without this procedure, the game does not allow using the new pokéwalker. Fourth, preparing extra pokéwalkers ahead of time is a good plan. The girls' lost, misplaced, and forgetting of the pokéwalker might be common behaviors at their age. Extra pokéwalkers are available at the

Nintendo online store. However, they only sell up to five per individual account. Ordering extras will be difficult if many children lose their pokéwalkers in the program.

This dissertation findings showed the social support mattered to the girls to become more active and become more positive towards to physical activity. It also suggests that a technology such as an exergaming might not be able to solve the childhood obesity by itself. However, the social support of people working with and around the students including their as families and friends is crucial in fighting childhood obesity.

When I observed some of these obese girls in the study, I learned that providing opportunities for and helping them to walk or play encouraged them to move more. Olivia in the pilot did not like the idea of going outside and had the most difficult time going outside of the building. Once she went outside of the building, she was active. She just had difficulties initiating the activity.

Trying to help obese children who have similar initial resistance like Olivia may be strengthened by doing the activity with them. You cannot just tell them to go outside and walk. Being there with them and motivating them to do the physical activity whether walking, biking, or exergaming would likely help them. Just as Molly influenced Emily in this study, showing that physical activity is not too difficult and is fun may be the most important contribution.

This dissertation's contribution is to describe the challenges girls in need face in their lives. Programs like Girls Inc. at this particular site served about 7 to 8 African American girls from low-income families each day. Afterschool programs that serve low income family children face challenges (e.g., a lack of facilities, human resources and financial support) to support their program (Halpern, 1999). Although this case study program had a small sample size, it uncovered the lives of girls who are at risk of obesity and their responses to the exergaming-based afterschool program.

A limitation of this study is that I was the only researcher and facilitator in the program due to a lack of financial and human resources for the study. It made it difficult to capture every social interaction due to leading the program at the same time. I used audio and video recording systems to prevent missing key moments. Although these systems were helpful, adding a few more researchers would reduce the difficulty of performing both roles at once. Bringing in outside co-observers, panelists, or reviewers with other theoretical viewpoints (Denzin, 1989) would also provide better triangulation to make the data more credible and trustworthy.

The issues of a small sample and lack of researchers suggest a next step for future research. Adding more sites and researchers would help address sample numbers. I have also received questions from younger children (1st through 3rd graders) during the summer program on why

they could not join the program. Pokémon seemed to appeal to younger children, and so it might be worthwhile to include a younger population as well to further address the small sample.

Other future research might compare girls with healthy BMIs and with overweight and obese BMIs. The girls with obese BMIs received social support from girls with healthy BMI in both the pilot and summer programs. They could be split into two groups, a prevention group of sedentary girls who are at risk of being obese mixed with girls having healthy or overweight BMIs and a treatment group solely of girls with obese BMIs to see if each group still develops social support.

Future exergame-based physical activity intervention studies should include social support aspects in the program. This case study described the complexity of the participating girls' lives and how it affected their health, including their physical activities. Lack of social support was the main reason these girls dropped out of the program. Girls who remained in the program had social support from their peers and showed positive changes in their attitudes. This study provides additional evidence that social support is important for girls to change their attitudes towards physical activity and, for this particular case, also physical activity levels. Ignoring social support in exergaming research and development may result in exergames that perform well in laboratories but are not played outside of them.

Appendix 1: Intake Interview Protocol

NOTE: Audiotape the interview. Sit down with the student. Keep the conversation open & encourage long answers. Don't make evaluative statements. The interview should last about 10-15 minutes.

I will do short interview with each person in the program for three times, at first week, 8th week, and 16th week. Today, I just want to ask a few questions in order to learn about you and physical activity. There are no right answers here at all. And everything you say is entirely confidential.

Physical Activity Attitude

Name: _____Grade: _____Age:_____

1) Help me get to know you a little bit: What kinds of things do you like to do for fun?
   - Do you like sports? Which ones?
   - Do you like playing video games? Which games do you like to play?
   - Do you play pokémon games?
   - (If answer for 7 is yes,) What have you learned from playing pokémon game?
   - (If answer for 7 is yes,) Who do you play pokémon games with?

2) Tell me about your friends. (Perhaps get a description of one or two individuals.)
   - What are their names?
   - Are they in this program?
   - What do you like to do with your friends?

3) How would you describe yourself?
   - What do you like best about yourself?
   - What don't you like about yourself?

4) How did you come to Goodman community center?
   - Did you walk to here? How long does it take?
   - Do you walk in general?
   - Who do you walk with?

5) Do you like school?

(if no, What don't you like about school?)

- What do you like about school?
- What are your favorite subjects?
- What are your least favorite subjects?
- What do you think about physical education?

6) What is being physically active?

- Are you physically active?
- What physical activity did you do yesterday? How long? With who?
- What do you think the benefits of being physically active are?
- What are the barriers for you to be physically active?

7) What are your summer plans?

- Do you plan to go somewhere?
- What physical activities are you going to do?

I hope you have fun in this program. Thank you!

Appendix 2: Exit Interview Protocol

Participant Name _____

At the beginning of program, we briefly interviewed you so we could get to know you a bit better. Now that the program is ending, I'd like to ask you a few more questions to wrap things up. There are no right answers, of course, and I'll keep it pretty brief.

Program (& Game) Evaluation

1) How do you feel about this pokémon exergaming program overall?

- What were your favorite parts of the program? Why?
- What were your least favorite parts? Why?
- If you could change anything about the program, what would you change?

2) How do you feel about playing Pokémon?

- What was your favorite part of playing Pokémon?
- What was your least part of playing Pokémon?
- If you could change anything about Pokémon, what would you change?
- Do you think you'll continue to play Pokémon?

3) How do you feel about the Pokéwalker?

- What was your favorite part of using the pokewalker?
- What was your least part of using the pokewalker?
- If you could change anything about the pokewalker, what would you change?
- Do you think you'll continue to use the Pokéwalker?

4) How do you feel about our group?

- Who are your good friends in this group?
- Who became a good friend through this program?

- Have you played games together in this group outside of our meetings? (with who? When?)
- Have you walked together in this group outside of our meetings?(with who? When?)

Personal Assessment

5) How do you think you've changed in your physical activity over the last eight weeks?

- How do you think you've changed in your physical activity in general over the eight weeks? If you aren't physically active, What are the barriers for you to be physically active?
- How do you think you've changed your walking over the eight weeks?
- Do you walk in general? When? Who do you walk with?
- What do you think of physical activity?
- What do you think of physical education?
- What have you learned about physical activity?

6) How do you think you've changed by playing pokémon over the last eight weeks?

- Can you tell me about your pokémon?
- Can you tell me about your pokémon that you carried with you in your pokéwalker?
- How do you think of yourself as pokémon trainer?
- How do you think you've changed as a pokémon trainer over the eight weeks?
- What makes a good pokémon trainer?
- What have you learned on Pokémon and about being a Pokémon trainer?

Friend, Family

7) How do you think you've changed over the last eight weeks in your relationships with your friends?

8) How do you think you've changed over the last eight weeks in your relationships with your family?

Imagining the Future

9) Is there anything you got out of the games program that you think will help you in later life?

10) Is there anything else you want to share with me?

I would like to check in with you in the two months to see how things are going for you, what games you're playing, etc. Is it okay to contact you for a follow-up interview?

Appendix 3: Follow Up Interview

Participant Name _____

It's been two months since we finished our program. I'd like to ask you a few more questions to follow up. There are no right answers, of course, and I'll keep it pretty brief.

1) How have you been since the program ended?

2) Have you been playing pokémon game since our program finished? (Why?)

- Can you tell me about your pokémon?
- Can you tell me about your pokémon that you carried with you in your pokéwalker?
- How do you think of yourself as pokémon trainer?
- How do you think you've changed as a pokémon trainer since the program finished?
- What makes a good pokémon trainer?
- What have you learned about Pokémon?
- What have you learned about being a Pokémon trainer?

3) How do you feel about playing Pokémon?

- What was your favorite part of playing Pokémon?
- What was your least part of playing Pokémon?
- If you could change anything about Pokémon, what would you change?
- Do you think you'll continue to play Pokémon?

4) Have you been using pokéwalker since our program finished? (Why?)

- How do you feel about the Pokéwalker?

- What was your favorite part of using the pokewalker?
- What was your least part of using the pokewalker?
- Do you think you'll continue to use the Pokéwalker?

5) How do you think you've changed in your physical activity since our program finished? If you aren't physically active, What are the barriers for you to be physically active?

- How do you think you've changed your walking since our program finished?
- Do you walk in general? When? Who do you walk with?
- What do you think of physical activity?
- What do you think of physical education?
- What have you learned about physical activity?

6) How do you feel about our group?

- Have you been in touch with members in our group? (List names)
- Who are your good friends in our group? (List names)
- Who became a good friend in our group?
- Who are still good friends?
- Have you played pokémon or pokéwalker games together since the program finished? (with who? When?)
- Have you walked together with anyone from this group since the program finished? (with who? When?)

7) How do you think you've changed in your relationships with your friends since the program is over?

8) How do you think you've changed in your relationships with your family since the program is over?

9) Is there anything else you want to share with me?

Appendix 4. Pilot Study Daily Physical Activity Log

Date:		
Pokewalker Steps: *Write down steps before you go to bed		
Physical activities I did today… (List moderate (such as walking) to vigorous (such as running) physical activities)		
Physical activities	Intensity	How long did you do it? (minutes, hours)
Journal reflections (Write your reflections on your physical activity and playing Pokemon today.)		

Appendix 5. Pilot Study Four Week Daily Step Log

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
10	11	12	13	14	(15)	16
					Pokéwalker Steps:	Pokéwalker Steps:
17	18	19	20	21	22	23
Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps: Total 1st wk steps:	Pokéwalker Steps:
24	25	26	27	28	29	30
Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps: Total 2nd wk steps:	Pokéwalker Steps:
1	2	3	4	5	6	7
Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps: Total 3rd wk steps:	Pokéwalker Steps:
8	9	10	11	12	(13)	TOTAL STEPS:
Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps:	Pokéwalker Steps: Total 4th wk steps:	

Appendix 6. Summer Program Student's Packet

Pokémon Exergaming Program

1. Your name:
2. Birthday: Month_____ Day_____ Year_____
3. School:
4. Grade:
5. Age:
6. Phone#:
7. Email:
8. Which one or more of the following would you say is your race? (Check all that apply)
   - ☐ White
   - ☐ Black or African American
   - ☐ Asian
   - ☐ Native Hawaiian or other Pacific Islander
   - ☐ American Indian or Alaska Native
   - ☐ Hispanic or Latino
   - ☐ Other_____

9. Who are your best friends? (List their names)

10. What do you like to do with you best friends listed above?

11. Who do you know in this group? (List their names)

12. Who are your good friends in this group? (List their names)

13. Complete the following sentences. Say as much as you like:

- Physical Activity is

  _____

- Physical Education is

  _____

- Walking is

  _____

- Playing computer and video games is

  _____

14. Below is a list of statements dealing with your general feelings about yourself.

- On the whole, I am satisfied with myself.

  Strongly agree Agree Disagree Strongly disagree

- At times, I think I am no good at all.

  Strongly agree Agree Disagree Strongly disagree

- I feel that I have a number of good qualities.

  Strongly agree Agree Disagree Strongly disagree

- I am able to do things as well as most other people.

  Strongly agree Agree Disagree Strongly disagree

- I feel I do not have much to be proud of.

  Strongly agree Agree Disagree Strongly disagree

- I certainly feel useless at times.

  Strongly agree Agree Disagree Strongly disagree

- I feel that I'm a person of worth, at least on an equal plane with others.

  Strongly agree Agree Disagree Strongly disagree

- I wish I could have more respect for myself.

  Strongly agree Agree Disagree Strongly disagree

- All in all, I am inclined to feel that I am a failure.

  Strongly agree Agree Disagree Strongly disagree

- I take a positive attitude toward myself.

  Strongly agree Agree Disagree Strongly disagree

15. Below is a list of statements dealing with your general feelings about Physical activity.

- I enjoy physical activities (e.g. walking, running, playing sports, riding bicycles etc.)

  Strongly agree Agree Disagree Strongly disagree

- Physical activities are boring

  Strongly agree Agree Disagree Strongly disagree

- Being physically active is important to me

  Strongly agree Agree Disagree Strongly disagree

- Being physically active helps me to be healthy.

  Strongly agree Agree Disagree Strongly disagree

- I enjoy playing video games and computer games

  Strongly agree Agree Disagree Strongly disagree

- Playing video games and computer games is a waste of time

  Strongly agree Agree Disagree Strongly disagree

- I am physically active everyday

  Strongly agree Agree Disagree Strongly disagree

Pokémon Activity & Homework: Week 1

This week's homework: Put one pokémon into Pokéwalker and walk with it at least one day before coming on June 30th. Fill out physical activity and attitude log everyday before going to sleep. Bring DS, game, Pokéwalker, and Log

Here is how to do:

1) Play pokémon game on DS
2) Catch at least 3 pokémon.

3) Visit Pokémon Center in any city (closest city: Cherry Grove city)
4) Use PC (see below in the circle) to deposit one pokémon in Someone's PC box

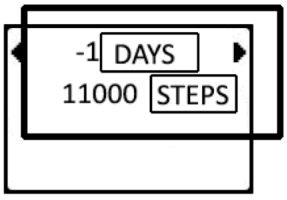
5) Save the game
6) Turn off DS
7) Turn on DS again
8) See the main menu where you have the option to either continue or start a new game. Select the one that says "Connect to pokewalker"
9) Follow the directions.
10) Once you have a pokémon in your pokéwalker, clip it on your waist (line it up with your thigh) and use another clip to protect it. Wear it almost everywhere everyday except when you take a shower, swim, or sleep.
11) Fill out the physical activity and attitude log everyday before going to sleep.
12) If you need a help to get connected, you can email me or call me.

How to find yesterday's step numbers from Pokéwalker

1. Press and hold down middle button

2. Select Trainer Card
by pressing middle button

3. Press right button to continue



4. -1 DAYS' Step numbers are total steps
you took yesterday

Pokémon Activity: Week 2 (7/5)

Your name:

1. Did you play pokémon last week? Yes, No

2. Who did you play pokémon with last week? (List names)

3. Did you participate in physical activity last week? Yes, No

4. How do you feel about your physical activity last week?

5. Did you walk with the pokéwalker? Yes, No

6. How was walking with the pokéwalker?

7. Who do you know in this group? (List names)

8. Who are your new friends in this group? (List names)

9. Who encouraged you to walk more?(List name)

10. What did you learn from playing pokémon?

11. Is there anything else you want to share with me?

Pokémon Activity & Homework: Week 2

How much physical activity do I need?

You need to be active 60 minutes everyday. You can also count your daily activity steps using a pokéwalker (girls' goal: 11,000).

What can I do to be active?

> Brisk walking, rollerblading, skateboarding, running, chasing, tag, bicycle riding, jump rope, soccer, swimming, martial arts, basketball, hiking, tennis, volleyball, gymnastics, modified push-ups (with knees on the floor), sit-ups, jump roping, swinging on playground equipments, hop-scotch, hopping, skipping, jumping, and etc.

This week's homework:
Can you meet 11000 steps everyday guidelines? If you meet 11000 steps on the day, draw a smiley face!

Fill out physical activity and attitude log everyday before going to sleep. Bring your DS, game, Pokéwalker, and Log

Pokémon Activity: Week 3 (7/12)

Your name:

1) Did you play pokémon last week? Yes, No

2) Who did you play pokémon with last week?
(Circle names and write name if it is not listed)
Molly, Lanie, Emily, Nora

3) Did you participate in physical activity last week? Yes, No

4) Did you reach 11,000 steps per day? Yes, No

5) How do you feel about your physical activity last week?

6) Did you walk with the pokéwalker? Yes, No

7) How was walking with the pokéwalker? (Do you like it or dislike it? Why?)

8) Who do you know in this group? (Circle names)
Molly, Lanie, Emily, Nora

9) Who are your good friends in this group? (Circle names)
Molly, Lanie, Emily, Nora

10) Who encouraged you to walk more?(Circle names and write name if it is not listed)
Molly, Lanie, Emily, Nora

11) Did you learn anything new from playing pokémon? Yes, No
If Yes, what did you learn?

12) Is there anything else you want to share with me?

Pokémon Activity & Homework: Week 3

We learned that you need to be active 60 minutes everyday. You can also count your daily activity steps using a pokéwalker (girls' goal: 11,000 steps per day).

1. What physical activities worked the best for you to take more steps? (List activity names and explain why)

2. What physical activities did not work the best for you to take more steps? (List activity names and explain why)

3. Collect pokéball each day when you reach 11000 steps. Collect at least __ pokéballs until next week.

Date	7/12 (Tues)	7/13 (Wed)	7/14 (Thu)	7/15 (Fri)	7/16 (Sat)	7/17 (Sun)	7/18 (Mon)
Step #							
Pokéball							

4. Fill out physical activity and attitude log everyday before going to sleep. Bring your DS, game, Pokéwalker, and Log

Pokémon Activity: Week 4 (7/19)

Your name:

1. Did you play pokémon last week? Yes, No
2. Who did you play pokémon with last week?
3. (Circle names and write name if it is not listed)

   Molly, Lanie, Emily, Nora, Kirsten, Marta
4. Did you participate in physical activity last week? Yes, No
5. Did you reach 11,000 steps per day? Yes, No
6. How do you feel about your physical activity last week?
7. Did you walk with the pokéwalker? Yes, No
8. How was walking with the pokéwalker? (Do you like it or dislike it? Why?)
9. Who do you know in this group? (Circle names)

   Molly, Lanie, Emily, Nora, Kirsten, Marta
10. Who are your good friends in this group? (Circle names)

    Molly, Lanie, Emily, Nora, Kirsten, Marta
11. Who encouraged you to walk more?(Circle names and write name if it is not listed)

    Molly, Lanie, Emily, Nora, Kirsten, Marta
12. Did you learn anything new from playing pokémon? Yes, No

    If Yes, what did you learn?
13. What is your Favorite Pokémon? (List pokémon original name, name you gave, type

    (grass,electr, fire, normal, water, & etc))

14. Do you put your favorite in your pokéwalker or DS? Why?

15. Can you tell me a story about your pokémon?

16. List your six favorite pokémon.

17. What makes a good pokémon trainer?

18. Do you think you are a good pokémon trainer? Why.

19. Is there anything else you want to share with me?

Pokémon Activity: Week 5 (7/26)

Your name:

1. Did you play pokémon last week? Yes, No
2. Who did you play pokémon with last week? (Circle names and write name if it is not listed)
   Molly, Lanie, Emily, Nora, Kirsten, Marta
3. Did you participate in physical activity last week? Yes, No
4. Did you reach 11,000 steps per day? Yes, No
5. How do you feel about your physical activity last week?
6. Did you walk with the pokéwalker? Yes, No
7. How was walking with the pokéwalker? (Do you like it or dislike it? Why?)
8. Who do you know in this group? (Circle names)
   Molly, Lanie, Emily, Nora, Kirsten, Marta
9. Who are your good friends in this group? (Circle names)
   Molly, Lanie, Emily, Nora, Kirsten, Marta
10. Who encouraged you to walk more?(Circle names and write name if it is not listed)
    Molly, Lanie, Emily, Nora, Kirsten, Marta
11. How did they encourage you to walk more
12. Did you learn anything new from playing pokémon? Yes, No

    If Yes, what did you learn?
13. Is there anything else you want to share with me?

Pokémon Activity: Week 6 (8/2)

Your name:

1. Did you play pokémon last week? Yes, No
2. Who did you play pokémon with last week?(Circle names and write name if it is not listed)
   Anita, Sienna, Shawna, Qarly, Calista, Andrea
3. Did you participate in physical activity last week? Yes, No
4. Did you reach 11,000 steps per day? Yes, No
5. How do you feel about your physical activity last week?
6. Did you walk with the pokéwalker? Yes, No
7. How was walking with the pokéwalker? (Do you like it or dislike it? Why?)
8. Who do you know in this group? (Circle names)
   Molly, Lanie, Emily, Nora, Kirsten, Marta
9. Who are your good friends in this group? (Circle names)
   Molly, Lanie, Emily, Nora, Kirsten, Marta
10. Who did you connect your pokéwalkers with last week? (Circle names)
    Molly, Lanie, Emily, Nora, Kirsten, Marta
11. Who encouraged you to walk more?(Circle names and write name if it is not listed)
    Molly, Lanie, Emily, Nora, Kirsten, Marta
12. How did they encourage you to walk more?
13. Did you learn anything new from playing pokémon? Yes, No
    If Yes, what did you learn?
14. Is there anything else you want to share with me?

Pokémon Trainers (8/2)

Your Name:_____

1. Connect your pokéwalker with your friends in this group. Record their pokémon's name below

Pokémon trainer's name	Pokémon name in their pokéwalker	What gift did you get?
Molly		
Lanie		
Emily		
Nora		
Kirsten		
Marta		
Yoonsin		

2. Battle against everyone in this group. Come up with an idea (e.g. walking or chasing) to get 400 extra steps within 5 minutes on both of your pokéwalkers after each battle.

Who did you battle with?	What physical activity did you do	Steps before	Steps after	Step differences
Molly				
Lanie				
Emily				
Nora				
Kirsten				
Marta				
Yoonsin				

* When you are done, see Yoonsin.

Pokémon Activity: Week 7 (8/9)

Your name:

1. Did you play pokémon last week? Yes, No
2. Who did you play pokémon with last week? Circle names and write name if it is not listed)

   Molly, Lanie, Emily, Nora, Kirsten, Marta
3. Did you participate in physical activity last week? Yes, No
4. Did you reach 11,000 steps per day? Yes, No
5. How do you feel about your physical activity last week?
6. Did you walk with the pokéwalker? Yes, No
7. How was walking with the pokéwalker? (Do you like it or dislike it? Why?)
8. Who do you know in this group? (Circle names)

   Molly, Lanie, Emily, Nora, Kirsten, Marta
9. Who are your good friends in this group? (Circle names)

   Molly, Lanie, Emily, Nora, Kirsten, Marta
10. Who did you connect your pokéwalkers with last week? (Circle names)

    Molly, Lanie, Emily, Nora, Kirsten, Marta
11. Who encouraged you to walk more?(Circle names and write name if it is not listed)

    Molly, Lanie, Emily, Nora, Kirsten, Marta
12. How did they encourage you to walk more?
13. Did you learn anything new from playing pokémon? Yes, No
14. If Yes, what did you learn?

15. Complete the following sentences. Say as much as you like:
    - Physical Activity is

      _____
    - Physical Education is

      _____
    - Walking is

      _____
    - Playing computer and video games is

      _____

16. Below is a list of statements dealing with your general feelings about yourself.
    - On the whole, I am satisfied with myself.

      Strongly agree Agree Disagree Strongly disagree
    - At times, I think I am no good at all.

      Strongly agree Agree Disagree Strongly disagree
    - I feel that I have a number of good qualities.

      Strongly agree Agree Disagree Strongly disagree
    - I am able to do things as well as most other people.

      Strongly agree Agree Disagree Strongly disagree
    - I feel I do not have much to be proud of.

      Strongly agree Agree Disagree Strongly disagree
    - I certainly feel useless at times.

      Strongly agree Agree Disagree Strongly disagree
    - I feel that I'm a person of worth, at least on an equal plane with others.

      Strongly agree Agree Disagree Strongly disagree
    - I wish I could have more respect for myself.

      Strongly agree Agree Disagree Strongly disagree

- All in all, I am inclined to feel that I am a failure.

  Strongly agree Agree Disagree Strongly disagree

- I take a positive attitude toward myself.

  Strongly agree Agree Disagree Strongly disagree

17. Below is a list of statements dealing with your general feelings about Physical activity.

- I enjoy physical activities (e.g. walking, running, playing sports, riding bicycles etc.)

  Strongly agree Agree Disagree Strongly disagree

- Physical activities are boring

  Strongly agree Agree Disagree Strongly disagree

- Being physically active is important to me

  Strongly agree Agree Disagree Strongly disagree

- Being physically active helps me to be healthy.

  Strongly agree Agree Disagree Strongly disagree

- I enjoy playing video games and computer games

  Strongly agree Agree Disagree Strongly disagree

- Playing video games and computer games is a waste of time

  Strongly agree Agree Disagree Strongly disagree

- I am physically active everyday

  Strongly agree Agree Disagree Strongly disagree

18. Is there anything else you want to share with me?



Pokémon Trainer's Training Log

Name:_____


Pokémon Trainers walk around to catch pokémons. Please fill in the blank and bring this log on 6/30

Date	6/23	6/24	6/25	6/26	6/27	6/28	6/29
Pokéwalker Steps #							
Did you do any physical activity (e.g. walking, running)? If yes, what did you do? For how long? (in min) With Who? (list names and relationship)							
Did you play pokémon game on DS? If yes, How long? (in min) With Who? (list names and relationship)							
How do you feel about physical activity and playing pokémon game today?							

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