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ADOLESCENT PERCEPTIONS OF DIGITAL PLAY: A STUDY IN THIRD-PERSON EFFECTS

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ADOLESCENT PERCEPTIONS OF DIGITAL PLAY
A STUDY IN THIRD-PERSON EFFECTS

In Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy
Rhetorics, Communication, and Information Design

by
Wendy L. Blanchard
August 2012

Dr. Bryan Denham, Chair
Dr. Andrew Billings
Fran Mainella
Dr. Dorothy Schmalz
ABSTRACT

With the third-person effect as a conceptual framework, this study examined perceived effects of digital media and electronic devices among charter high school students in the Southeastern United States. In studying third-person perceptions, the study built on research by Schmierbach, Boyle, Xu and McLeod (2011), who analyzed perceived effects of digital gaming among college students.

In addition to items addressing the positive and negative effects of digital media and electronic devices, participants in the current research responded to questions about time spent exercising and in the outdoors, time spent on video games, and participation in virtual social communities, as well as to questions about the presence of household rules governing media use.

Overall, results indicated a consistent presence of third-person effects among the high school students who agreed to participate in the study. Female students, in particular, indicated relatively unhealthy effects of digital media and electronic devices on others, while males tended to estimate slightly lower levels of negative effects. The study found limited support for the notion that individuals who spend more time outdoors perceive relatively negative effects of digital media and electronic devices, and females who spent time in virtual social communities identified slightly lower levels of adverse effects. Rules in the household, time spent on video games and time spent with family did not show significance as determinants. Implications of the findings as well as limitations and recommendations for future research are included in the discussion.
DEDICATION

To the South Carolina Botanical Garden employees who maintain a beautiful garden and hiking grounds, provided free of charge by South Carolina citizens, for all those willing to explore it.
ACKNOWLEDGMENTS

This dissertation is essentially about play. But for such a simple topic, it is rich territory, and I appreciate my committee members allowing me to explore this subject within the confines of the program itself. These committee members include Bryan Denham, who served as chair, Andrew (Andy) Billings, Fran Mainella, and Dorothy (Dart) Schmalz. I appreciate their willingness to help this dissertation reach its completion and I hope that it will prove beneficial for those pursuing future studies on the intersection of digital and natural play. I am particularly indebted to Bryan Denham for agreeing to steer this process and for recognizing the credibility of a project on play, and then for helping it reach its final product; to Andy Billings for offering IRB assistance and guidance overall, and for staying involved in the process even after transitioning to another university; to Fran Mainella for bringing a contagious love of play to this project and for her insights into play research and nature play in particular; and finally, to Dart Schmalz for her ability to help structure this project.

There were a group of people around this project who have given willingly of their time and energy, including Mr. Crawford and Ms. Loftis, who assisted with the IRB; Professor Jann Adams, who helped with statistics and gave invaluable guidance overall; DeAnna Heindel, for her assistance as copy editor in the midst of a series of regattas; and Lora Collins, for her editing skills.

I also wish to thank my family for their support throughout this graduate degree and writing process. They have been a fortress in the midst of this process. And finally, I wish to thank Mike for his determination that it be completed.
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I. Overview: Digital Play

In communication studies and public opinion, research on third-person effects is entering its fourth decade (see, originally, Davison, 1983). Focusing on perceived immunity from the content of mediated communication, research in this tradition has found that, relative to themselves, individuals perceive others as being more affected by media content. This dissertation examines third-person effects in the context of digital play among high school students, addressing the perceived effects of digital play on themselves as well as others. The study builds on research by Schmierbach, Boyle, Xu and McLeod (2011), who analyzed perceived effects of digital gaming among college students. In Schmierbach et al.’s research, college students perceived games as having a stronger impact on others than on themselves, although this perception was smaller for those who played regularly as well as those who saw its impact as generally positive.

This dissertation examines the attitudes and behaviors of individuals enrolled at a charter high school in the Southeastern United States who, at the time of data collection, were ages 15 to 18 years. Individuals in this age range often do not participate in survey research initiatives (Scott, 2000), and the current study therefore stands to make an important contribution to scholarship in third-person effects. In addition, video games remain one of the most frequently targeted media for various restrictions, as in a recent Supreme Court case (Brown v. Entertainment Merchants Association, 564 U.S. 08-1448, 2011). As video game companies are besieged by politicians and media who often play off the susceptibility of children to the negative aspects of these devices, it has important practical consequences for children, parents, educators, and video game corporations; also, there are both positive and negative consequences to increased reliance on electronic media in general, which this dissertation will explore.
Before addressing in greater detail the advantages and disadvantages of digital play, key concepts should be defined. For the purposes of this dissertation, digital play is defined as video game play and electronic media usage that is for recreational purposes (e.g. not school-related). Video game play is specifically a reference to video games but can be from a host of media platforms, including but not limited to Microsoft Xbox 360®, PlayStation 3 System, Nintendo Wii, and other older consoles. Digital media or electronic media refers to all media outlets that rely upon or can use a digital format, including but not limited to iPads, iPods, Android tablets, and digital computer software, such as Adobe Digital Publishing Suite, digital cameras, and so forth. Nature or natural play, which is also commonly referenced as free play, is defined as play where the activity occurs in the outdoors, and preferably without adult supervision. Here the child is able to navigate the natural world without the hindrance of electronic devices or other parameters that can limit creative exploration and dream time. The remaining pages in this chapter review both the advantages and disadvantages of digital play. As the respective segments demonstrate, the issues can be complex and nuanced, thus indicating a need for continued scholarship.

**Advantages of digital play.**

While critics have pulled few punches regarding video games and the sedentary lifestyles such games perpetuate, digital media also “[can] be leveraged in ways that bring about a tipping point when learning becomes more decidedly individualized, constructivist, situated, and social” (Weigel, James, & Gardner, 2009, p. 13). As an example, in their design of *Quest Atlantis*, game designers Barab, Gresalfi and Arici (2009) built a 3D virtual world that allows students to adopt a persona or avatar and then make choices that affect how the game transpires. This type of transformational play allows students to become invested in activities that engage them
intellectually, thus creating a potential benefit for digital play (Barab et al., 2009, p. 77; see also boyd, 2007; Gee, 2003; Ito et al., 2008; Jenkins et al., 2006).

Sasha Barab credits video designers, in general, with creating games specifically for children that avoid “drill and practice” in favor of becoming practitioners in a world of their making (Barab et al., 2009, p. 76). Researchers completed a case study on *Quest Atlantis* using four students, ages 9-12, and found that these students were actively engaged in online and real-world learning activities. Students built a “globally recognizable identity” without adult scaffolding and created a strong leadership identity (Dodge et al., 2008, p. 239).

Research by the Digital Youth Project indicates that students residing in a digital world drop barriers while concurrently increasing self-directed learning. After nearly 5000 online hours of observations, researchers found that this new world of online games and social networking had created a sphere where students thrived, and all while addressing their own coming of age (Ito et al., 2008). The study noted that students who opted to “geek out” and “dive into their topic or talent” were actually embraced by the social milieu around them, and found that adults who participated “are not automatically the resident experts by virtue of their age (Ito et al., 2008, p. 2). These students, in circumventing authority figures, appeared to become legitimate peripheral participants in a “lived-in” adult world.

Studies have also shown that children as young as toddlers to preschoolers (approx. ages 1 to 6) are coming into schools with new competencies (Rideout, Vandewater, & Wartella., 2003). They can use internet search engines, design rudimentary drawings and buildings, engage in social media, and their expectations and learning preferences differ from past students. These new learners are “more active based on real and simulated experience” (Dede, 2005), as well as “visually oriented, self-reflective, social, fluent in multiple media, adept at navigating diverse
information sources, and appreciative of co-designed learning experiences that are personalized to individual needs and preferences” (Weigel et al., 2009, p. 14).

In fact, some scholars argue that in a postmodern, integrated digital world, individuals will need the flexibility and skill to adjust to technological fluctuations in a rapidly shifting culture: “[A] capacity for independent learning,” J. S. Brown noted, “is essential to [students’] future well-being, since they are likely to have multiple careers and will need to continually learn new skills they were not taught in college” (Brown 2006, p. 18). Both situated learning and cognitive apprenticeship have their base in the notion of a traditional apprenticeship – a business model with proven success in scaffolding learning within the day-to-day world, and, when applied to a world that privileges new digital media and online participation, allows for an unprecedented level of individualized education. Thus, digital play stands to teach children and adolescents the types of “lessons” they will need to learn in order to function effectively in a digitalized world.

**Disadvantages of digital play.**

Apart from the advantages of digital play, societies require a sense of community built on shared knowledge and values. And the potential lack of autonomy and self-reflection (Turkle, 2007) that comes from an educational model built on digital play is the antithesis of what children derive from free play. Per Robin Moore (1997), children live through their sensory experiences and these experiences bind together their exterior and interior, hidden, emotional world. Here the natural environment offers children a principal source of sensory stimulation and the freedom to play, create and explore within an outdoor environment, which ultimately activates their senses in time and space. But in the United States, increased suburbanization has reduced walking and biking patterns (Sturm, 2005), and it seems correlated to increased sprawl
and decreased leisure time. Indeed, data from the National Household Travel Survey (NHTS) point to a clear and significant decline in walking trips to and from school for children aged five to 15 years, indicating yet another obstacle to children having enough time in a natural environment. This dissertation will explore the consequences of increased digital play time and decreased natural play time.

And while supporters point to the potential of engaging, on-going, socially mediated dialogues among peers, with a corresponding increase in participatory, self-directed learning from virtual worlds, games and online communities (boyd, 2007; Gee, 2003; Ito, 2009; Weigel et al., 2009), other scholars note that digital devices afford a shift where the wisdom of the crowd (Surowiecki, 2004) seems to have grown in proportion to networking capacities, and where the impact of augmented, contextualized learning within screen-based simulation -- resting on few senses -- has yet to be assessed long-term. How it plays out remains to be seen. For all its strengths, this type of education isolates students into a key relationship with a screen, and a social relationship with people they are likely never to meet. It is, as John Dewey (1902) warned a century ago, the worship of secondary experience at the risk of depersonalizing human life.

Indeed, there may be risks associated with those who conduct “the vast majority of their learning through devices” (Weigel et al., 2009, p. 13), particularly when an increasing connection to their peers has led to a new emphasis on shared feelings, with an ensuing drop in self-reflection and autonomy (Turkle, 2007). And, from the standpoint of this dissertation, this increased use of technology has impacted the body, as seen in longitudinal research from television use, thus creating health issues for children and adolescents.

In terms of physical health and the potential for obesity, one 30-year study in the United Kingdom found that increased television viewing on weekends predicted a higher body mass
index (BMI) by age 30, and each additional hour of TV on weekends at age 5 increased the risk of obesity for adults by 7% (Viner & Cole, 2005). One might extrapolate those findings to digital play. Additionally, the presence of a bedroom TV set also may impact the weight of a child: One study of 2343 children aged 9 to 12 years old found that a bedroom TV set increased the risk of obesity, regardless of other physical activity measures (Adachi-Mejia et al., 2007), while a New York study of 2761 parents with young children ages 1 to 5 years old found that a bedroom TV set correlated with 40% higher overweight or obese children in these homes (Dennison, Erb & Jenkins, 2002). And unhealthy food advertising is also impacting the health of children, with the fast food industry spending $4.2 billion annually on advertising, from which the average child views between 4000 and 7000 ads per year, with fewer than 165 of these ads geared towards healthy food (Council on Communication and Media, 2011; Gantz, Schwartz, Angelini, & Rideout, 2007).

In addition to obesity, children are also feeling the effects of increased stress (Rosenfeld, 2000; Elkind, 1984, 2001; Hirsch-Pasek & Golinkoff, 2003), and potential anxiety and fear from repeated exposure to violence, in addition to a more rapid progression to sexual behavior, and potential early substance abuse from media exposure. Even as obesity and sedentary behaviors have increased at an alarming rate, there are other health matters, all seemingly correlated with media use, that are also of concern. One Scottish study found that the increased use of media in the home also increased stress in children, and of nearly 1500 children ages 4 to 12 years old, they found greater psychological stress attributed to increased TV viewing -- independent of their total exercise time (Brownell, Schwartz, Puhi, Henderson, & Harris, 2009). Some scholars note that media violence impacts real-life aggression as strongly as the link between smoking and lung cancer (Singer & Singer, 2001; Strasburger, Jordan, & Donnerstein, 2010), while
repeated exposure to violence can lead to fear and anxiety (Strasburger, Wilson & Jordan, 2009) and overall desensitization to violence (Bushman & Anderson, 2009). Longitudinal studies indicate that more exposure to sexual content in mainstream media leads to earlier sexual activity (Bleakley, Hennessy, Fishbein & Jordan, 2008), and greater risk of sexually transmitted diseases (Wingood, DiClemente, Harrington, Davies & Hook, 2001). And one of the first studies to link television watching with ADHD – taken from the Children’s Hospital and Regional Medical Center in Seattle in 2004 -- asserted that each hour of TV viewing per day by preschoolers “increases by 10 percent the likelihood that they will develop concentration problems and other symptoms of attention-deficit disorder by age seven” (Louv, 2008, p. 102). And finally, longitudinal studies show that exposure to smoking through viewing it in movies at baseline (grades 5-8) predicts an increased smoking initiation by 1 to 8 years (Dalton et al., 2003; Dalton et al., 2009). Thus, the physical health of children can be compromised when they spend too much time in media use, particularly, as this dissertation will discuss in detail, if it impedes their time in nature.

In terms of adverse effects in video games, some of the most important issues to consider revolve around violence, cruelty and sexual content, in addition to the total time spent on electronics in general. To maintain a certain perspective on the amount of video game usage that children tend to play overall, on average, children aged 8-10 years old spend 1:01 hours a day on video games, children 11-14 years old spend 1:25 hours a day on video games, and children aged 15-18 years old spend 1:08 hours a day on video games (Strasburger, Jordan & Donnerstein, 2010, p. 759; Rideout, 2010). Ofcom, as part of the United Kingdom’s promotion of media literacy placed on it by UK Section 11 of the Communication Act of 2003, conducted a March/April 2009 quantitative survey of 797 face-to-face interviews with children aged 7-16 and
their parent/caregiver, and found that 90% of children own or use a game console and 74% have
or have use of a mobile phone. And though most parents/caregivers would consider some content
as inappropriate, only two types are mentioned by the majority: violence, cruelty, and dangerous
behavior, and sexual content. For parents of 7-12 year olds, 60% cite these types of behaviors as
a problem, compared with 50% of those with a 13-16 year old (Ofcom, 2009, p. 23). And while
more than half of games contain violence, including over 90% rated as appropriate for children
aged 10 years and older (Anderson, Gentile, & Buckley, 2007), some games exhibit more
violence than others.

The following video games, as ranked by PCmag.com, are the 10 most violent: Call of
Duty: Modern Warfare 2; Postal; Mortal Kombat; Grand Theft Auto III; MadWorld; Manhunt;
Splatterhouse; Soldier of Fortune; and God of War III (Wilson, 2011). Their compilation of
tactics, which would only be permissible in modern warfare by a limited group of essentially
trained personnel, is allowed with impunity in living rooms. These games sanction nearly
unlimited violence: Infinity Ward’s Call to Duty: Modern Warfare 2 puts players in the role of an
undercover CIA agent who joins a group of Russian terrorists to execute an airport massacre.
Gamers do not have to, but can, kill innocent civilians, and to stay in the game they must keep
pace with terrorists who commit violent acts. Banned in various countries, the video game
Postal requires players to kill enemy “hostiles” with machine guns, shotguns, Napalm launchers
and other weapons, and has bloody, wailing victims. NetherRealm Studios' 2011 Mortal Kombat
reboot has new X-Ray moves that let players shatter bone, tear muscle, and destroy internal
organs. Grand Theft Auto, which led Wal-Mart to require proof of age for purchasers of M-rated
titles, allows gamers to steal cars, beat hookers (and recoup money if they first have sex with
her), and kill police officers. Manhunt allows ultra-violent kills that leave victims gasping for
oxygen as they die, and awards big points for excessively violent kills. Soldier of Fortune, a game violent enough to be placed on Germany’s Federal Department for Media Harmful to Young Person’s Index, allows players to disembowel victims and blow their limbs from their bodies (Wilson, 2011).

Educators, physicians, legislators, and researchers are concerned about violence and aggression in video games, regardless of censorship issues. For example, first person shooter games have drawn attention from health personnel. One student trained through first person shooter games had an accurate and lethal shot at a West Paducah, KY school shooting, though he had never fired a real gun (Strasburger & Grossman, 2001). According to social learning theorists, children and adolescents learn by observing and imitating what they see on-screen, particularly when their behavior appears accurate or is rewarded (Bandura, 1994). It seems possible if not probable that these entertainment games could train students to enact violence with some degree of accuracy.

When game play, antisocial behavior, aggression and acceptance of violence are combined, the impact is registered on the body, as seen in functional magnetic resonance imaging (fMRI) research of the brain. Current research developments have examined whether media violence exposure (MVE) and aggressive behavior can be viewed through changes in the brain. One particular study examined the relationship between brain activation and history of media violence exposure in adolescents, using fMRI’s (Kalnin et al., 2011). Samples of adolescents with no psychiatric diagnosis or with disruptive behavior disorder (DBD) with aggression were compared to investigate whether the association of MVE (media violence exposure) history and brain activation is moderated by aggressive behavior/personality, and
found that fronto-limbic structures for processing emotional stimuli were impacted most among individuals with a predisposition towards aggressive traits (Kalnin et al., 2011):

Increases in the popularity, availability, and variety of violent media (e.g., television and video games) necessitate an understanding of how such exposure may affect both behavior and cognitive functioning. The General Aggression Model (GAM) posits that long-term exposure to violent media content alters internal states (arousal, cognition, and affect), leading to consolidation of aggressive mental schemas. Empirical support for the GAM emerged from research showing that viewing violence on television increases aggressive thoughts, feelings, and behaviors. In addition, individuals who play violent computer/console games also exhibit an increase in short-term aggressive behaviors, long-term aggressive traits, and desensitization as measured by a reduced P300 event-related brain potential to violent images (Kalnin et al., 2011, p. 13).

Lastly, research into video game play through the lens of a third-person effects hypothesis, as with Schmierbach et al. (2011), has found that college students generally perceived video games as having a stronger impact on others than on themselves. Third-person perceptions, per research documented within the literature review to follow, is primarily a negative phenomenon, and as Schmierbach et al. (2011) note, even the notion of censorship within the perceptual gap for third-person effects comes from negative rather than positive content and perceived effects. Positive content itself is “not influential” (Schmierbach et al., 2011, p. 324), and so while it might be difficult to tie the advantages of digital play to the third-

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1 Cites removed from passage. These include Kronenberger et al., 2005a; Anderson & Bushman, 2001; Carnagey et al., 2007; Uhlmann and Swanson, 2004; Bartholow et al., 2005; Carnagey & Anderson, 2005; Lemmens et al., 2006; and Bartholow et al., 2006.
person framework, perceived disadvantages of media use should meld with third-person theory and research.

Summary

Given the advantages and disadvantages of digital play, it is important to understand the attitudes and behaviors of those who engage in it. With research in third-person effects as a conceptual framework, this dissertation examines the perceived impact of digital play on the health of high school students and their peers. More specifically, the study examines whether students consider video games as having greater positive and/or negative effects on others than on themselves. In addition to basic controls such as gender, race and age, the study analyzes the extent to which exercise and time spent outdoors predict third-person perceptions, also examining the effects of time spent with family and time spent in virtual social communities. Again, because data gathered from high school students tend to be relatively difficult to obtain, the current research, approved by an Institutional Research Board, stands to offer a meaningful addition to current research on third-person perceptions.
II. Review of Literature

This chapter examines the scholarly literature associated with play, beginning with a historical overview and moving to more specific segments on the purpose of play for children, including sub-sections addressing rough and tumble play and social roles, exploration and self-control; the changing nature of play, including sub-sections addressing the decline of natural play and increase of digital play, with additional emphasis upon time in media and rules in the household; and the impact of decreased time in play, including sub-sections on obesity, psychopathology, connection with nature, and control. The chapter then addresses the third-person effect as a conceptual framework guiding the formation of hypotheses and research questions on the perceived impact of digital play, with a brief foray into the area of media enjoyment as a potential source of psychological satisfaction for game players.

Historical Overview of Childhood and Play

Childhood in transition.

Childhood in the 21st century has lost some of the central characteristics that once defined it as such, particularly as regards time in natural play (Cunningham, 2005; Konner, 2010; Mintz, 2004; Pellegrini, 2009). The 20th century saw several such shifts in the development of childhood, though one in particular helped shape some of the current 21st century issues. A significant shift in the history of childhood occurred in the first half of the twentieth century: Here children lost any productive role within the family economy, which altered the way parents viewed their children (Cunningham, 2005; Mintz, 2004). Because the child’s financial contribution to the family -- once understood as a norm -- was removed, parents shifted their valuation of their children to an emotional emphasis, and began having smaller families. But the transition, arguably “the most important to have occurred in the history of childhood” was not
necessarily received well by the child himself or herself, as “There is much evidence of children’s self-esteem rising at the point where they began to contribute to the family economy” (Cunningham, 2005, p. 185), with some children forging their certificates or lying about their age to gain employment.

By the Great Depression, school enrollment reached a peak, and as adult unemployment rose, children were expected to stay in school longer, with many state legislatures raising the minimum age for leaving school to sixteen; nearly half the nation’s seventeen year olds were high school graduates by 1940 – twice as many as in 1929 (Mintz, 2004; Reiman, 1992). One profound consequence was the institutionalization of the teenage years as a distinct period, and though the word *teenager* did not enter the vocabulary until the 1940s, it was apparent by the late 1930s (Mintz, 2004). By the 1970’s, the state of childhood began to shift again. This time it veered away from outdoor exploratory play and towards the interior home environment and a state of passive pleasure focused upon television and other electronic devices, all of which have become increasingly central to family life in the 21st century.

And so while scholars, educators and parents are noticing a 21st century shift in the norms of childhood as it is quintessentially defined, historical records indicate several such shifts throughout American history, with stability rising from the fragments of instability, and each shift emphasizing a new set of values, and with it, adjustments. What comes of this current shift has yet to be realized, but each major period has left its mark. This paper will examine the shifts in childhood within the following historical periods: the 17th century, American Revolution, Civil War, and 19th century.

Shifts in the recognized “norms” of childhood are part of American history -- including periods where children were treated as adults. The pre-modern childhood in seventeenth-century
Chesapeake, for example, included a life of dire circumstances: Here infant and child mortality was high due to malaria, and the relationship between parent and child was limited as most adults lived only to their mid-fourties, with the average marriage lasting seven years; as a result, the typical household was a mixture of family relations, and women whose husbands had died pushed their sons into apprenticeship and their daughters into household servitude (Mintz, 2004, p. 37-38). So several facets of a 21st century childhood in the U.S. share a striking resemblance to a pre-modern childhood, or colonial era childhood, in that the child is again regarded as a miniature adult capable of absorbing the realities of the world with little intervention: the notion of a protected childhood, once typical of a post-WWII norm, is dying out (Mintz, 2004, p. 4).

And in the 21st century, while parents have intensified the use of technology to monitor children’s movements (consider GPS embedded tracking-devices in phones or cars, or email account monitoring) it may only offer a perception of control. It appears that the child is to some degree allowed more physical freedom while parents likely maintain the perception of control through devices.

In terms of U.S. history, shifts in childhood norms have occurred as a result of several major U.S. wars. For example, two wars in particular were as harsh on childhood as 17th century Chesapeake had been but with certain advantages. The American Revolution would weaken apprenticeship, end indentured servitude, and contribute to a more egalitarian household critical of patriarchal authority (Mintz, 2004, p. 54). Yet more than one percent of the U.S. population died, making it the second costliest war in U.S. history relative to the size of the population, with a heavy toll paid by families and children (Lipartito, 1990; Mintz, 2004, p. 65). For the first time in American history, childhood would become part of political dialogue – the Revolution itself creating a shift in philosophies and behavior. Case in point, John Locke’s childrearing
philosophy had far-reaching consequences: He advocated, similar to his political theories, that parents should nurture children’s ability to reason so that they might become self-governing adults (Yazawa, 1985). This philosophy has had widespread influence on American childrearing, but some might argue that childhood is transitioning away from this attitude as more parents seek to control rather than create independence.

Another period important to the historical shift in childhood was the Civil War, which would force children to assume the responsibilities of absent adults. Indeed 5 percent of soldiers were children under 18, with some as young as 10, and as with the American Revolution, the Civil War impacted family life and produced large numbers of vagrant children. In one statistic, six thousand vagrant Boston children were homeless in 1865, while in New York the figure was closer to 30,000. Eight states created institutions for dead soldier’s orphans in 1865-66, though conditions were apparently horrible (Mintz, 2004, p. 131). Those families able to cope banded together to create an intensified commitment to a protected, prolonged childhood, but war had permanently altered the family: Men became more disengaged from the family and more likely to participate in activities outside the home, while the intensity of the mother-child dyad increased as a result of the war (Mintz, 2004, p. 132). And in its aftermath, the Civil War experience purportedly fueled an emphasis on professionalism, organization, and the intensity of war, which activated a postwar middle-class boyhood need for sports and a strenuous life (Mintz, 2004, p. 130). By the 1870s, urban middle-class children began participating in team sports and youth group activities, and such activities would wind their way across social-economic divides into the core of American childhood.

Childhood in the 19th century was diverse to a point never encountered before or since in the U. S., and the wrenching social and economic changes of this century produced patterns of
play, schooling and work that differed dramatically by race, class, ethnicity, gender and region. Class and regional differences were the defining characteristic of the family and school life in American life throughout the century, and it was not until the mid-20th century that the middle-class notion of an “extended, protected childhood” became the norm (Mintz, 2004, p. 135). Play also varied, and by the 1870s, middle-class children had use of a growing assortment of manufactured toys designed to teach moral values (Flanagan, 2009), while working-class and farm children continued to play with homemade toys. And though this group had the disadvantage of less privacy and space inside the family home, they had the advantage of more freedom from parental oversight outside the house (Mintz, 2004, p. 136). Today many eco-friendly families are returning to wooden toys made largely from non-toxic finishes, though the overall freedom to roam has come to an end through an intersection of competing forces.

And though play has continued to exist to some extent in nearly every child’s life, it was the advent of school that would curtail the freedom of play. The modern high school was devised by educational reformers to fill the vacuum left by the end of a system of labor that had relied upon mainly teenage boys. According to Cunningham (2005), as governments raised the school-leaving age, childhood became “progressively prolonged”: “. . . [G]overnments were ensuring that schooling was taking up more and more of a person’s life, and the more they did so the longer people thought of themselves and were treated as children” (p. 182). As schooling continued longer and longer, so did childhood.²

² According to sociologist Frank Furstenberg at the University of Pennsylvania, the impact of the economy has slowed children reaching adulthood, often into their thirties: “it takes at least an undergraduate education to achieve or maintain middle-class status today, and it takes time after that to find a full-time job that supports a family. In fact, nearly two-thirds of young adults in their early twenties are economically supported by their parents, even though they are working (Marano, 2008, p. 177).
Yet historically, although education helped stabilize the family, home life was far from ideal. Indeed, home has not always been the model of stability as commonly purported--family stability in the U.S. has been rather the exception to the rule, as Mintz (2004) explained: “At the beginning of the twentieth century, fully a third of all American children spent at least a portion of their childhood in a single-parent home, and as recently as 1940, one child in ten did not live with either parent – compared with one in twenty-five today” (p. 2; see also, Weissbourd, 1996). The notion, as published widely in 1980s research, that families were largely stable up until the late 20th century, is not actually part of the historical trajectory of American families. But, until the late 20th century, one area that did transition through several centuries of the American childhood was the freedom to play outdoors.

**Play in transition.**

Childhood can now be defined by a series of contradictions. It is a time of both innocence and exposure to adult media. It is a carefree time of exploration with more time in the house and less time in outside spaces. Exposed to adult spaces and yet more segregated than ever in peer culture, children are continuously pressured to be both children and adult. And one of the central components of childhood is time in natural play, though that too is undergoing a series of adjustments.

Play has existed since mankind’s first evolutionary steps: it is often preconscious, preverbal and derives from ancient biological structure. It is a form of communication. It is a basic necessity for survival of all age groups and yet there are those most adept at it who can apply it mentally to open new ways of thinking. Play in its true form is an act of freedom and a state of being. It is crucial to physical and mental balance and promotes strong social relationships (Brown, 2009). Definitions of play can persist for pages in some scholarly texts,
and as Pellegrini (2009) notes, nearly all scholarship in play acknowledges the difficulty of defining it (Burghardt, 2005; Fagen, 1981; Konner, 2010). Robert Fagen (1981), in his defining epoch *Animal Play Behavior*, lists five pages of play definitions in its appendix. Indeed much of the confusion enveloping the definition of play is connected to the fact that child development literature lists nearly all interaction children perform as play (Pellegrini, 2009).

Some play makes claims on its function or utility and necessity for healthy child development, but little is known of the amount of time spent in actual play or what amount might be necessary for healthy development (Pellegrini, Horvat, & Huberty, 1998; Pellegrini & Gustafson, 2005). Still, it seems evident that some amount of play is necessary (Brown, 2009; Sutton-Smith, 1997). Overestimation of the importance of play, however, is part of what developmental psychologist Peter Smith (1988) refers to as the “play ethos” (Pellegrini, 2009), but whether it is limited to the 2 to 10% energy expenditure noted by certain scholars (Pellegrini, Horvat, & Huberty, 1998; Pellegrini & Gustafson, 2005; Pellegrini, 2009) or more, most scholars acknowledge it is essential for development.

The lessoning of natural play – both in quality and quantity – can be traced to the late twentieth century, when many children’s lives became more urban (Chawla, 1994), yet they still spent the bulk of their recreation time outside in the “left over” spaces of urbanization, or the fields, forests, streams and yards of suburbia. Their ability to roam was largely unrestricted (Chawla, 1988) even into the 1970s, but as the economy, largely affected by oil prices, drove parents into the workforce (Tranter & Sharpe, 2007), children began to cope with more and more structure in after-school activities (Pyle, 2002). Alternatively, they dealt
with little structure but more “stranger danger” as latchkey children (Tranter & Sharpe, 2007), and were no longer free to roam (Moore & Wong, 1997).

Parents began to focus on sports or lessons that could make their children more successful adults (Moore & Wong, 1997; White, 2004), with the result that central elements deemed part and parcel of childhood began to vanish (Chawla, 1988), and along with it went a spontaneous contact with nature (Pyle, 2002). The notion of childhood and natural play no longer seemed linked, such that the ‘extinction of experience,’ as Pyle (2003) has noted, has bred a general apathy toward environmental concerns. One researcher has described the current shift in children’s lives and loss of natural, free play as the ‘childhood of imprisonment’ (Francis, 1995, p. 68). Yet when children are placed within nature, they connect with it -- and particularly through their powers of observation, as with the Montessori method of encouraging learning by placing kids outside (Crain, 2001).

Indeed Roger Hart’s (1997) investigation of the outdoor behavior of 4-to-12 year olds in a rural New England town in “Children’s Participation: The Theory and Practice of Involving Young Citizens in Community Development and Environmental Care,” indicates that children, though active in their play with one another, tend to show care when dealing with nature, including quiet time watching fish and salamanders swim in the creeks and ponds. Such simple observations increase their powers of perception and rather than complaining of boredom, which Moore and Wong (1997) noticed on the asphalt recess yards, they were deeply immersed in the activity. Chawla (1988) has observed that children know

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3 U.S. students begin school at age five and are immediately pressed with testing and assessment. In Finland, on the other hand, children start school at age seven, face less overall testing, and score significantly higher than American children. Finland spends less per capita than the U.S., and while teachers must meet national curriculum standards, they are still able to lead their own classes. Play and an environment-based classroom are a central component of the Finnish classroom, and in a 2003 Organization of Economic Cooperation and Development survey, Finland scored 1st in literacy and 5th in math and science out of 31 countries, while the U.S. scored in the middle (Louv, 2009, p. 204).
that their footprint affects the Earth on which they live. She also suggests, in her combined study of nature, poetry and childhood memory, that the human psyche is innately impacted by the sights and sounds of nature, which constantly induces exploration.

Yet few children are allowed the freedom to roam alone or explore nature in their home or school life. Not only have children’s lives changed drastically in the last few decades – in near defiance to thousands of years of biological necessity – but their free time in nature has also decreased. Between 1981 and 1997, children ages 6 to 8 spent 25% less time in the United States in play while their time in school increased by almost 5 hours. Few children seem aware of the woods in their own backyard: to them, nature is an abstraction. Much of the K12 curriculum has eradicated natural history class, so many do not hold rocks or turtles or learn the plants native to their area, in contrast to their parents (Louv, 2008). But then many of those born before 1964 had farms either in the family or were raised around farmland. That cultural link is now largely missing for American kids: US farms dropped from 40% in 1900 to 1.9% in 1990, according to the US Census Bureau; concurrently, the Census dropped its annual farm population report as of 1990 (U.S. Census Bureau, 2010). And it is not just farms that the U.S. is losing: forests are also decreasing. The Department of Agriculture projects, at the current rate of US deforestation, a 50% decrease in forests by 2022 (U.S. Department of Agriculture, 2005). At the same time, digital play time has increased, with the Kaiser Family Foundation study “Generation M” reporting that they now spend the equivalent of nearly 11 recreational hours a day on electronic devices when considering multitasking as part of media exposure (Rideout, Foehr & Roberts, 2010). And multitasking itself is important when considering media exposure: “Media exposure sums the time spent with each medium; but since a quarter of that time is spent using more than
one medium at a time, the actual number of hours out of the day spent using media is lower (for example, 6:21 among all 8- to 18- year-olds, on average, compared to an average of 8:33 of total media exposure)” (Roberts, Foehr and Rideout, 2005, p. 25).

What can a child gain from a computer that competes with learning the same skill by hand? In The Hand, F. R. Wilson (1998), neurology professor at Stanford University Medical Center, noted that computer experiences work against how people really learn, which is with their hands. The world is not readily available from a keyboard, though businesses will eventually transition more and more people to virtual experiences. Real-world experiences, such as working on a car, stitching a quilt, catching a fish, growing a garden, etc. have been traded for indirect learning. Add to that that biological absolutes seem to be fading, and children are increasingly growing up a world without a fixed reality. Consider that several hundred genetically engineered chimera have been patented, including a MIT/UM research project where a mouse was altered to grow a human ear from its back, or a robot with a brain stem melded to it, and it seems that the future has few boundaries. Per G. McKenny’s To Relieve the Human Condition: Bioethics, Technology, and the Body (1997), people assume that human action cannot radically change nature and that Nature will remain invulnerable to human intrusions. Yet at every step, they attempt power over it. It may be that digital play is mankind’s challenge to the human body: Can it function well in a world with more stress and less sunlight, with more “virtual” connection and less time in close proximity to one another.

**Purpose of Play for Animals: A Biological Need to Play**

In the animal kingdom, much as with human beings, play develops the skills that allow youngsters to defend themselves – to not become targets or bullies, and bullies-in-the-making instead learn to develop empathy and restraint when in play with one another (Brown, 2009;
Marano, 2008). Take play away, and conditions for abuse rise. One off-shoot of the rise of social skill deficiency is a growing burden for adults to monitor children for bullying and abusive behavior with one another. It is counterproductive, as the parent’s job is to help children function independently of them, which necessitates a certain degree of increasing, age-appropriate freedom from parent intrusion (Marano & Skenazy, 2011). By not allowing children to learn their boundaries on the playground, it increases the need for control over their behavior as they work through long years in school, and some of this control may be more perceived than actual. Animals allow researcher to study what seems potentially on its way to extinction among humans – the benefits derived from natural play.

Animal play research indicates that play serves to train young mammals to deal with the unexpected: Their motor play and rough-and-tumble play seems to deliberately serve as a challenge in a game of gaining and losing control of their bodily movements (Gray, 2011a, p. 455-456). Young rats self-handicap by intentionally choosing to play the subordinate and actively desire the physical and emotional challenge of allowing their playmates to wrestle to the top while they struggle to regain it. Experiments of young rats deprived of play during a critical development stage are illuminating in that the later overreact emotionally to stress and fail to adapt (Gray, 2011a).

Animal research gives insight into hunter-gather cultures and helps explain how prehuman ancestors usually engaged in play. Anthropologists (Konner, 1975) observe that hunter-gather cultures spent most of their time exploring and playing in age-mixed groups, and such groups helped scaffold learning from older to younger children from within their zones of proximal development (Gray & Feldman, 2004), thus increasing their learning. The Russian psychologist Lev Vygotsky noted in the 1930s that children, through a zone of proximal
development, can develop new skills by collaborating with others who are older and/or more skilled. It is difficult to study such patterns today as most children are age-segregated in both school yards and classrooms, and the dominant research prototype in developmental psychology continues to separate children by age in order to compare one age group to another (Gray, 2011b).

Hunter-gatherer groups, however, were often rather small and typically numbered twenty to forty children and adults, and such age-mixing was further compounded by the fact that the average child-bearing woman in this group gave birth every four years, which increased the likelihood that most playmates were of mixed ages (Gray, 2011b, p. 501). The development of an agrarian culture precipitated same-age play as a larger food supply allowed more children to be born within a closer period of time (Konner, 2010), and because family size also increased as a result of a more consistent food supply, children were then placed in age-appropriate schooling groups, which precipitated a loss of certain scaffolding skills normally learned in natural play. Animals, on the other hand, still learn largely in age-mixed play and therefore their learning is still supported in developmentally appropriate steps.

**Purpose of Play for Children**

As with animals, children also enjoy playing outdoors but part of the pleasure comes from placing themselves in fear-inducing situations that only they can modulate and control. Social play involves control – of the emotions of fear and anger, for example -- and cooperation reduces the struggle (Gray, 2009, p. 458). Losing emotional control is one of the greatest fears of those individuals suffering from anxiety disorders (Barlow, 2002) and trust in decision-making under emotional duress is tantamount to reaching an emotionally healthy adulthood. In certain stages of development, play is essential to healthy growth.
Rough and Tumble Play.

One area of play that, across developmental levels, changes is rough and tumble play (R&T), which Hamberg and van Lawick-Goodall characterize as pushing, chasing, and wrestling without intent to harm (DiPietro, 1981, p. 50). It was first discussed in the social sciences by Harlow (1962) and subsequently by Blurton (1972) as “playfighting,” that is characterized by soft hits and kicks, high-energy behavior and exaggerated movements (Pellegrini, 2009, p. 98). Exaggerated signaling is crucial to gesturing to another that no ill-will is meant by behavior with an overture of aggression. The cues must be interpreted accurately, and so children that know each other well have less misinterpretation of these overtures. In terms of structure, R&T is “characterized by reciprocal role-taking and self-handicapping” which also may maximize and sustain play by minimizing the boredom of limited role enactment (Pellegrini, 2009, p. 99).

Considering that players reciprocate roles and self-handicap, such playfighting follows a 50:50 rule where typically each animal has the upper-hand in 50% of contests, though this rule may not apply when social dominance is unclear (Pellegrini, 2009, p. 100).

More importantly, R&T play is a device by which individuals establish group cohesion, and is thus one of the main, assumed benefits of social play (Fagen, 1981). The ability to encode and decode social signals is tied to play and its ability to help the player modulate emotional responses to ambiguous, possibly provocative behaviors, and thus to self-regulate emotional states. Certain scholars suggest that play, and particularly social play, helps prepare youth for the unpredictable: to be less fearful of uncertainty and risks and thus more behaviorally flexible when confronted with novelty than typical found among youth with less social play (Pellegrini, 2009; Pellegrini, Dupuis & Smith, 2007; Pellis & Pellis, 2006; Spinka, Newbury, & Bekoff, 2001). It is interesting to observe that while young boys may use rough and tumble play to
establish dominance in relationships, it must be noted that within hunter-gatherer culture, children and adolescents were usually of such a wide age difference that such activity was not intended to be competitive (Gray, 2011). Many psychologists have remarked on the importance of play among peer groups: Jean Piaget championed peer interaction as a key method for young children to cast aside their egocentrism and learn emotion-regulation skills related to managing anger and aggression in their peer group, and hence they learn some perspective in role-taking (1902/1948).

R&T has different functions according to development stages: in childhood it is beneficial for peer affiliation and cooperative involvement, but during adolescence it is part of aggression and dominance. As de Waal (1985) notes, social dominance is crucial to group cohesion; indeed, once role hierarchy and power structure are arranged, aggression decreases and cooperation increases. But during periods when social groups and dominance are in flux, as when adolescents change schools or boys have growth spurts, R&T escalates among boys. R&T is also considered playful by young children when queried by adults, and children can clearly differentiate between aggression and R&T when shown videotapes of each (Pellegrini, 2009, p. 100). R&T seems more crucial for boys than girls, and indeed, in an extensive cross-cultural investigation by Whiting and Edwards (1973), it was found that boys engage in more R&T than girls across diverse cultures reflecting differing stages of technological development (DiPietro, 1981). Also, as per Darwin’s (1871) sexual selection theory, which accounts for the difference in gender characteristics, sex segregation, which begins at around age three, peaks at age eight (Maccoby, 1986), and thereafter declines in early adolescence (Pellegrini & Long, 2003; 2007) also accounts for why R&T develops within segregated groups and is related to adult male sexual roles (Pellegrini, 1989; 2009). For this research, rough and tumble play illustrates the
need for close physical bonds that cannot be replicated through virtual simulation, and the lack of it, per Brown’s (2009) research, can cause boys in particular to miss a key step in understanding boundaries — particularly when inflicting pain — in addition to working in harmony with a play group.

A. Pellegrini (2009) notes that different levels of physical activity and social interaction are important for both females’ and males’ conditioning as juveniles (p. 101). Males’ early bias towards physical vigorous and rough behavior benefits them in terms of motor training, by interacting with each other (Pellegrini, 1989; Pellegrini & Long, 2007). The physical benefit derived from R&T includes the following: “Motor training benefits, in turn, are related to both their immediate skeletal and muscular development and cardiovascular fitness, as well as to later adult reproductive social roles” (Pellegrini, 2009, p. 101). It also helps them learn how to navigate social relationships that rely upon cues gained from playing with other children.

**Social Roles, Exploration & Self-Control.**

One aspect that goes arm-in-arm with the notion of control is the concept of self-control that is central to acquiring skills essential for adulthood. In 1933, L. Vygotsky (1978) contended that players must exert cognizant control of their actions in order to follow the rules of place, and therein lies the value of children’s play in the practice of learning self-control. In order to play with peers, their actions must stop them from hurting one another, and it was from the desire to accept these restrictions in order to continue playing that they developed the capacity for self-control so essential to functioning as adults in a social world. According to P. Gray, a fundamental aspect of play is that it is “directed and controlled by the players themselves” (2011a, p. 454). Gray asserts that play deprivation could potentially lead to an external locus of control in that children robbed of their chance to control their own actions, to solve problems,
and to make their own choices through the freedom of their will potentially grow up feeling their lives and destiny are controlled by forces outside themselves (2011a, p. 455).

Social play itself is an egalitarian activity, and one fundamental aspect of play is that it is voluntary. Children have to succeed in creating an equal relationship with one another, in negotiating rules and staying attuned to the emotional reaction of others in the game, particularly if they wish to keep it going. Play teaches them that they must consider the needs of one another and that succeeding at it creates happiness (Gray, 2011a; Csikszentmihalyi & Hunter, 2003).

Mihaly Csikszentmihalyi and Jeremy Hunter studied over 800 public school students from ages sixth through twelfth grades for a week, and between 7:30 AM and 10:30 PM, sent them signals at random through a special wristwatch, which, when the signal indicated, asked participants to fill out a survey on what they were doing and how happy they were at that moment. The lowest levels occurred when children were at school or doing homework, but the highest levels were when out of school, and either talking or playing with friends. Time with parents and time alone, such as watching TV, were neutral indicators, but on average, children were happier in social play with friends. (Gray, 2009, p. 458).

The Changing Nature of Play: Decline of Natural Play.

Play historian Howard Chudacoff (2007) refers to the first half of the twentieth century as “the golden age of play.” During this period children’s play was largely unstructured and unsupervised and the more children were freed from labor the more time they had for play. By the mid-1950’s, adults began to control more of children’s play outside the world of labor, and particularly outdoor play with other children. According to P. Gray, the decline of free play has been hard to quantify but still relatively vast. One sixteen year study through the University of Michigan, conducted in 1981 and again in 1997, followed how children spent their time (2011a,
p. 448). By sampling a large, representative sample of parents in the U.S. they found that children not only played less in 1997 than in 1981 but also appeared to have less free time for all self-chosen activities in 1997 compared to 1981 (Gray, 2011a, p. 445). Six to eight year olds during this period had a 145% increase in time spent on homework, a 168% increase in time spent shopping with family, and a 25% decrease in play time, and a 55% decrease in time conversing with family members (Gray, 2011a, p. 445). And, according to Gray, the amount of decrease in outdoor play is potentially higher than 25% as this play time includes both indoor and outdoor play, and in 1981, computer usage would be nearly non existent.

One international survey noted that 69% of children surveyed in the US prefered to play outdoors, and that nearly 89% of children preferred outdoor play with friends to watching television, and 86% preferred it to computer play. Yet what children prefer and what they are actually doing illustrates the inherent conflict within this transition to increased digital play.

**Increase of Digital Media.**

According to P. Gray (2011a), Americans romanticize childhood in general while systematically over-organizing young people’s lives out of fear over the global economy. And schools are attempting to pick up the slack. But there is pressure on all sides for schools to compete, as Education Secretary Arne Duncan and FCC Chairman Julius Genachowski challenged schools in February 2012 to put digital books in student’s hands within the next five years (“Feds to Schools,” 2012). Yet the majority of digital time, as per the Kaiser Family Foundation Study, is coming out of the student’s recreational time, as most classes are still paper and pencil (Rideout et al, 2010). However, some states, as with South Carolina, are placing iPads

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4 All of the children surveyed had access to home computers and were knowledgeable of computers, per this IKEA Corporation survey, as published through Playreport: International Summary of Research Results (2010) at www.fairplayforchildren.org/pdf/1280152791.pdf
in most if not all students hands within the next three years, so total digital media exposure per day should increase soon.

**Time spent in media.**

So where is increased time in media derived from currently, and what impact does it have on children and adolescents? Research indicates that time spent playing video games, for example, is increasing, as with all aspects of media. According to Roberts and Barnard (2005), children aged 8 to 10 years spent an average of 65 minutes a day on video games. Yet recent data from the Kaiser Family Foundation’s “Generation M²: Media in the Lives of 8- to 18-year Olds” indicates that among all 8 to 18 year olds, amount of time spent on video games in 2004 was :49 minutes, and as of 2010, is now 1:13 hours per day (p. 11). Children aged 8 to 18 are spending 7:38 hours per day in total media exposure, however, when multitasking is taken into account, this figure rises by 29% to 10:45 hours per day in total media usage (Rideout et al., 2010, p. 7). And the total amount of media time per week averages 53 hours a week, such that a child spends more time on electronic devices than the typical adult does at work (Toppo, 2011). Internet usage has increased from 47% in 1999 to 84% in 2009, and 33% of these children have access to the internet in their bedrooms, with 25% of this time designated for social networking sites (“Pew Internet,” 2012, p. 26-27).

In considering age breakdown, the total amount of media usage for 8 to 10 year olds is 7:51 hours a day, for 11 to 14 year olds it is 11:53 hours a day, and for 15 to 18 year olds it is 11:23 hours a day (“Pew Internet,” 2012, p. 34). By race/ethnicity, White/Caucasian children are using media 8:36 hours a day, Black/African American children are using media 12:59 hours a day, and Hispanic/Latino children are using media 13:00 hours a day (“Pew Internet,” 2012, p.
Children self-report that 66% earn good grades as light users, 65% earn good grades as moderate users, and 51% earn good grades as heavy users (“Pew Internet,” 2012, p. 37-39).

Many parents are not aware of the potential impact caused by the overuse of electronic devices. In 2001, Alliance for Childhood published the report “Fool’s Gold: A Critical Look at Computers in Childhood,” which indicated that after nearly 30 years of technology, only one successful link between children’s learning and technology had been established, and that was its ability to raise scores in drill-and-practice exercises, though one-on-one tutoring was more productive. Subsequently, 85 experts in neurology, education and psychiatry asked for a moratorium on the use of computers in early childhood until the U.S. Surgeon General could determine if they threatened children’s health. After this study’s release, MSNBC polled subscribers via internet and found that 51% of the 3000 surveyed agreed to the moratorium (Louv, 2008, p. 137).

Kaiser Family Foundation notes the implication for families is that parents, while central to regulating their children’s “media diet,” must 1). Work with governmental and non-governmental organizations to put pressure on industry to “develop better content, create meaningful ratings systems, and cut back on inappropriate advertising” in addition to inventing better products to help screen content. 2). Parents should also educate themselves on good media and their child’s developmental stages and increase their monitoring of their child’s use of positive media (Rideout et al., 2010, p. 9). Yet according to this same research study, the use of media shows no signs of slowing, even when saturated:

Television has penetrated 99 percent of all households with children, and more than 95 percent of those same households have video players, radios, and compact disc and tape audio players. Seventy-eight percent of households with young
children (birth to six years) and 85 percent of those with eight- to eighteen-year olds have personal computers, and 50 percent of households with younger children and 83 percent of those with older children have a video game console. Moreover, most children live with several of these media. The typical U.S. eight-to eighteen-year-old lives in a household equipped with three TV sets, three video players, three radios, three PDMPs (for example, an iPod or other MP3 device), two video game consoles, and a personal computer. As table 1 illustrates, saturation or near-saturation levels have been reached for all but the newest electronic media, and those are likely to follow much the same pattern. Indeed, the presence of youngsters in a household stimulates early adoption of the new electronic media. (Rideout et al., 2010, p. 15)

In 2009, Pewinternet.org released data from their September 2009 survey indicating that 93% of American teens were active users of the internet, with 73% of users accessing the web for online social networking. It is now more critical than ever to balance nature and digital time, and one of the best methods for doing so is to establish rules for overall time in both in the home.

**Rules in household.**

Electronic devices, including computers, are not in and of themselves a problem, but their very ease of use has precipitated one: Children now spend less time in nature, less time with their peers, and less time learning lifelong skills. Children have become, in some ways, the life-blood for corporations earning billions of dollars annually on technology. Indeed, even as arts education has been reduced in public schools by nearly one-third, annual spending on school technology is now over $6 billion (Louv, 2008, 138). Per Kaiser’s “Generation M²: Media in the Lives of 8- to 18-year Olds,” of those households that had rules on electronic media usage, the

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5 See http://pewinternet.org/Trend-Data-for-Teens/Online-Activities-Toal.aspx
amount of total recreational media usage decreased from 12:43 to 9:51 hours a day for children, or a decrease of 2:52 hours a day (Rideout et al., 2010, p. 48). 64% of children say the TV is on during meals, 45% say the TV is on when no one is watching, and 71% say they have a TV in their bedroom (Rideout et al., 2010, p. 42-44).

Children who say they have no rules include the following: 85% have no rules for music usage, 68% have no rules for TV usage, 66% have no rules for video game usage, and 60% have no rules for the computer (Rideout et al., 2010, p. 45). In those households where the TV is left on whether or not anyone is watching, there is a 1:35 hour increase in TV watching per day, versus those homes where the TV is rarely left on with no one watching (Rideout et al., 2010, p. 46). Media saturation will, at some point, peak, but for now it is invading bedtime: Pew Internet & American Life Project (2010) has found that 78% of 12- and 13- year old sleep with their cell phones at their side, which increases to 86% for those 14 years and older. Oxygen Media (2010) found that 21% of those 18 through 32 are rising in the middle of the night to check Facebook.

Yet parents that establish rules are crucial to keeping screen time at a reasonable level. A balanced child needs time away from a steady dose of media, and that includes time outdoors in natural play.

The Impact of Decreased Time in Play

**Obesity.**

At a time when leisure activities are becoming more sedentary at home, children are exercising less in school, and people in industrialized countries are expending less energy in daily living and at work (Andersen, Crespo, Bartlett, Cheskin & Pratt, 1998; Prentice & Jebb, 1995; US Department of Health and Human Services, 1996). Regular physical activity contributes to disease prevention and long life. Yet nearly half of preschool children do not get
the ≥60 minutes per day of physical activity as prescribed by the American Academy of Pediatrics (Spear et al., 2007; Tucker, 2008). A recent YWCA survey of 1,630 parents indicated much the same: 89% of parents rated themselves good or excellent in providing a healthy home environment, yet 74% of these 1,630 parents indicated that their children did not get the required moderate to vigorous aerobic activity recommended by federal guidelines, and only 16% of these parents indicated that their kids were playing outdoors each day, with 14% of parents indicating that their children were getting the five fruits and vegetables recommended under federal guidelines (Hellmich, *USA Today*, 2011).

According to the U. S. Department of Health and Human Services website *The President’s Council on Physical Fitness and Sports*, nearly two-thirds of children cannot pass a basic physical: 40% of boys and 70% of girls ages six to seventeen cannot do more than one pull-up, and 40% showed signs of heart and circulation problems (U.S. Dept. of Health, 2012). Indeed, the authors of the Duke Well-Being Index note that the most alarming statistic in the 30-year index was not violence or abductions, but the increase of obese children (“Duke University Well-Being,” 2010).

Parents themselves are the gatekeepers of youth access opportunities, though studies indicate that children exercise more when watching and interacting with their peers in play than with their parents. Lack of physical activity is a well-known risk factor for chronic conditions of obesity, cancer, diabetes, and cardiovascular disease, with nearly 1.9 million premature deaths globally from these diseases (Biddiss & Irwin, 2010; Bauman & Craig, 2005). The American Academy of Pediatrics advocates physical activity from competitive, noncompetitive, individual and team activity and sports, and it is also essential that children and adults have access to unplanned activity for sustained weight loss (Spear et al., 2007). As sedentary activities and time
in general increases in the home, it is essential that physical activity be readily available, and that such activity lead to maintaining a stable weight.

As video game usage is on the increase, perhaps certain digital game play can increase time in active video gaming (AVG) versus passive sedentary screen behavior. In particular, there seems to be enthusiasm and enjoyment of AVG play (McDougall & Duncan, 2008; Maloney, Bethea & Kelsey, 2008; Paez, Maloney, Kelsey, Wiesen, & Rosenberg, 2009) among participants, but studies do not indicate changes in physiological measures (such as body mass index) due to AVG play, which could be due in part to the relatively short length of the studies themselves (from 10 to 28 weeks), according to Maloney et al. (2008). Dropout rate ranges from 0% (Ni Mhurchu et al., 2008) to 41% (Chin A Paw, Jacobs, Vaessen, Titze, Van Mechelen, 2008), according to Biddiss and Irwin (2010), and may confound the strength of the evidence given in studies that argue the use of AVGs to counteract sedentary screen time (p. 667).

AVGs allow group play that is both locally and globally based. Mueller, Stevens, Thorogood, O’Brien, and Wulf (2007) proposed the value of “sports over a distance” that allow the individual to participate and compete against friends regardless of location, a benchmark that AVGs meet. To see what benefit AVGs may allow in physical activity levels, one meta-analysis (Biddiss & Irwin, 2010) synthesized eighteen studies of youth (≤21 years) with the criteria that they reported activity patterns, energy expenditure, enjoyment and motivation associated with AVG use. This review then evaluated the studies of metabolic expenditure and changes in activity patterns associated with AVGs and found it enabled light to moderate physical activity, particularly among those using the lower body. And as most children age 8-10 spend 65 minutes a day in video game play, (Faith et al., 2001) a game that allowed physical activity could help counteract rising obesity among children. Baquet, Van Praagh, and Berthoin (2003) indicate that
aerobic fitness must include an intensity that exceeds 80% of the maximum heart rate (HR), but according to Biddiss and Irwin’s meta-analysis, AVG play generally raises heart rate to a mean of 61%; thus, “participation in AVG play should not be regarded as a replacement for vigorous physical activity but can increase energy expenditure from sedentary or passive video gaming levels to that associated with light to moderate physical activity.” (p. 669).

In general, getting children to exercise through effective physical activity programs, with or without AVG play, is difficult to accomplish. Yet children and adolescents with more physical activity exhibit less risk factor for obesity and cardiovascular disease, and are more likely to regulate their weight. One meta-analysis of 76 interventions (Salmon, Booth, Phongsavan, Murphy & Timperio, 2007) indicates the inherent complications of using an intervention method to deliver changes in children and adolescent’s lives. Many of these interventions studied did not deliver satisfactory results: Of the total interventions, 57 were conducted in school settings, nine through family settings, six from primary care, and four from community or internet-based settings. The most productive of these interventions was delivered in the school setting, and focused on physical education, family strategies and activity breaks, and the least effective were those conducted in family settings, though these were pilot studies (p. 144). Only two of the 11 curriculum-only studies among children or adolescents were effective, suggesting that curriculum strategies were not as effective at promoting physical activity. Two programs (Cardiovascular Health in Children, and Go For Health) that combined physical education and curriculum were effective, with the first program showing no intervention effects on activity level for the individual but a small positive effect at the school level, and the second one showed positive results while also illustrating the short duration of physical activity time delivered in successful physical education programs:
The second study, Go For Health, targeted third and fourth grade children and incorporated a new physical education program over two semesters (6-8 weeks each), a 6-week physical activity curriculum program, and a 4-week nutrition program (77). According to observation of physical activity during physical education lessons compared with physical education lessons in the control schools (5 percent of class time being active), physical activity increased from less than 10 percent of class time at baseline to 40 percent at posttest in the intervention schools. The children obtained an average of 16 minutes of physical activity per physical education period (80 minutes/week) . . . children from both intervention and control schools increased their physical activity over time, and the mean differences between intervention and control schools decreased over time (78) (Salmon et al., 2007, p. 146).

Internet or web-based physical activity programs tended to have weak response, though the number of studies purporting to use this method was low overall. Palmer, Graham, and Elliott (2005) targeted tobacco use, nutrition, physical activity and cardiovascular function through a Web-based curriculum program of 50 minutes/twice a week, but had no reported impact on children’s physical activity level (Salmon et al., 2007, p. 146). Marks et al. (2006) assigned random girls in grades 6-8 with home Internet access to a website with quizzes, games, charts and strategies, or print intervention with content similar to the web site, but over the 2-week evaluation period, only the print intervention showed significant physical activity increase.

Without a doubt, businesses will increase the activity level of games and conceivably shift game play into vigorous activity that children will do, but whether they will sustain it across longer periods of time remains uncertain. As it is presently conceived, intervention seems a weak
substitute for shifting behavioral patterns, especially throughout the child’s life span.

Unfortunately most of this active game play still stays relegated to a living space that is usually far from ideal: the person attempting to exercise by video game must complete with the daily activities of eating, reading, and watching TV for family members, in addition to vying for space with furniture (Bogost, 2007). This type of exercise also lacks several fundamental aspects crucial to time in nature, including the stress relief of being outdoors with birds chirping, sunlight streaming and hills waiting to be climbed. Even as physical education classes are cut from schools and obesity levels continue to rise, nature-based play can help children who are suffering from a lack of exercise and stress relief. Parents may feel that schools are picking up where they are leaving off, but in fact, between 1991 and 2003, students attending physical education (PE) class dropped from 42 percent to 28 percent across the United States, and concurrently, over 40 percent of schools eliminated recess (Louv, 2008, p. 99). In South Carolina, where this federal IRB was conducted for this dissertation, PE requirements have dropped to one semester as part of a high school degree.

**Psychopathology and Social Play.**

Students are under stress and they are not responding well to it. Standardized assessment questionnaires given to adolescents and teenagers in schools and colleges over several decades reveal the rise of anxiety, depression, hopelessness and narcissism (Gray, 2011a, p. 447). For example, Taylor’s Manifest Anxiety Scale has identified the levels of anxiety in college students since 1952, and another version of this test has been used with elementary-school students since 1956. Another larger questionnaire, the Minnesota Multiphasic Personality Inventory (MMPI) has been given to college students since 1936, and a version for adolescents (MMPI-A) came into use in 1951. Jean Twenge, a scholar at San Diego State University, has been a leader in
researching the mental health decline of children and adolescents. Twenge, with her colleagues, examined these scores over decades of research and found consistent results in a continued, dramatic increase of depression from 1950 to the present in both children and college students (2000). Their findings reveal that nearly 85% of young adults have depression and anxiety scores greater than the same age group in 1950, and that in analyzing MMPI and MMPI-A scores, clinically significant anxiety or depressive disorder has appeared nearly five to eight times higher than seventy years previous (Gray, 2011a, p. 448).

And the impact can be felt in states across the U.S. For example, the Centers for Disease Control and Prevention (CDC) Youth Online High School “Your Online Source for Credible Health Information” (YRBS) Test for South Carolina 2009 indicates that 31.3% of girls and 18.8% of boys felt sad or hopeless almost every day for 2 or more weeks in a row, which impacted usual activities during the 12 months before the survey, while 15.1% of girls and 10.3% of boys considered suicide during this same time period. To view this or another state’s YRBS test see http://apps.nccd.cdc.gov. It seems that the curtailment of time outdoors is dovetailing with increased pressure from schooling, and the impact is creating long-term health repercussions.

Connection with Nature.

Unorganized traditional play is now transitioning into digital play and sedentary activity, which has resulted in several health hazards, including, as previously discussed, obesity (Anderson, Crespo, Bartlett, Cheskin, & Pratt, 1998; Morbidity and Mortality Weekly Report, 2010; Sturm, 2005a and 2005b), and general psychopathology, including anxiety, depression, feelings of helplessness, and narcissism (Twenge, 2008; Gray, 2011a). Survey results, including this digital/natural play survey, indicate that children prefer being outdoors to indoor digital play,
and they are not alone. One Norwegian study by E. B. Hansen in 1999 (as cited in Fjortoft, 2001) found that four out of every ten children wished for more time outside but had few choices in suitable climbing, building, sliding and skiing areas. Rivkin’s (1995, 1997) research indicates that children’s access to outdoor play habitats is vanishing, though several studies of kindergarten students in Scandinavian countries have indicated positive results from being in natural environments (Fjortoft, 2001). Few studies have followed the results to determine how a natural environment affects learning in children, though some pilot work has been done (Clements, 2004).

Pioneer children’s natural play scholar M. Rivkin once termed the natural habitat as children’s “former habitat” that has, as addressed previously, disappeared through the intersection of several concerns, including schooling and lower parental supervision:

The idea of universal public schooling absorbing perhaps a third of a child's waking hours is historically very new, basically an idea of the twentieth century. . . The institutionalizing of children, beginning with school, and now child care, has been extended to include team sports, lessons, and camps. The hours spent transporting children among institutions also reduce children's time for outdoor exploration and play. Accompanying the institutionalization of children has been the fragmentation of neighborhood play supervision. Parents who used to keep their eyes on children outdoors are very frequently today not at home but working elsewhere. Children's access to their own neighborhoods is curtailed for lack of adequate supervision (Rivkin, 1997, p. 62).
Rivkin notes Kaplan & Kaplan’s (1989) research on “nearby nature” – defined as a range of walking-distance parks, home gardens, or views of trees and an opportunity to interact and observe. Ultimately what this nearby nature affords is inestimable to quality of life:

The immediate outcomes of contacts with nearby nature include enjoyment, relaxation, and lowered stress levels. In addition, the research results indicated that physical well-being is affected by such contacts. People with access to nearby-natural settings have been found to be healthier than other individuals. The longer-term indirect impacts also included increased levels of satisfaction with one's home, one's job, and with life in general. Surely this is a remarkable range of benefits . . . (p.173) (Rivkin, 1997, p. 62).

And more and more research indicates that there are physical repercussions to the loss of natural play: it is more than the poignancy and strength of memories as defined by childhood play in natural settings, per research conducted by Cobb (1977) and Chawla (1994). Current research specifies illnesses specific to the body and mind that come from a disconnection with what may be termed a source of happiness for both children and adults.

As Richard Louv observes in Last Child in the Woods, both organized sports participation and childhood obesity have continued to rise. There is little time left for participation with nature, and even parks when they are offered focus on liability issues and creating what Robin Moore terms the “commercialization of play,” rather than the self-directed play that children enjoy most, which includes disappearing into natural vegetation and climbing trees on the rough edges of the park (Louv, 2008, p. 117). As the U.S. culture loses connection with creativity and wonder, children are losing their unstructured dreamtime and instead have increasingly structured lives.
Other countries recognize that an asset of an American childhood has been these free spaces: that the ability to roam and wonder and dream is part of growing up in the U.S., and it has influenced a natural ability to design and create. When Louv interviewed Jerry Hirschberg, founding director and president of Nissan Design International, and asked him why these Japanese car manufacturers had design houses along the California coast, Hirshberg noted that “the Japanese know their strength and ours: their specialty was tight, efficient manufacturing; ours was design. The Japanese, said Hirschberg, recognized that American creativity comes largely from our freedom, our space – our physical space and our mental space” (Louv, 2008, p. 97).

And one area that beckons Americans and their need to roam is the National Park System (NPS), yet between 1987 to 2000, visits to the NPS dropped a quarter of their attendance, with Yosemite National Park drawing 20% fewer visitors; And though the State of California increased by 7 million, Carlsbad Caverns National Park visitors plummeting by 50%, with many other parks also reporting significant drops in visitors (Louv, 2008, p. 148). Some researchers note that there is a correspondence between increased screen time and decreased time in nature: For example, Oliver Pergrams, a conservation biologist at the University of Illinois in Chicago, and researcher Patricia Zaradic noted that “97.5% of the drop in attendance was due to the increased time Americans have spent with electronics: Americans spent 327 more hours on electronics in 2003 than in 1987” (Louv, 2008, p. 148). Additional barriers include increased entrance fees to parks, decreased and shorter family vacations, and less interaction with nature.

Physical activity increases when parents make it part and parcel of childhood. Camping statistics reveal that eight to ten campers became interested in the outdoors, per a survey conducted by Oregonian reporter Michael Milstein, through their families or recreational
activities (Louv, 2008, p. 148). It is crucial for parents to serve as a gateway to physical activity for their children, the results of which are felt for a lifetime.

**Control.**

Ultimately it is the nature of control to increase the power of one person over another, but as previously examined, childhood should be a balance between creating a safe environment for children and concurrently, letting them explore at a developmentally appropriate level. Rhonda Clements conducted an investigative study of 830 mothers in the U.S. and asked them to compare their children’s play to their own.

85% of the mothers agreed with the statement that their own children (ages three to twelve) played outdoors less than they themselves had when they were their children’s age. In fact, 70% of the mothers reported that, as children, they had played outdoors daily, and 56% said that when they did play outdoors they generally played for periods of three hours or more at a time. In response to the same questions regarding their children’s play, these percentages were, respectively, just 31% and 22%. Similar results, documenting parents’ perceptions that their children play outdoors much less than they [the parents] did when they were children, have been found in smaller-scale surveys conducted in the United Kingdom (Gray, 2011, p. 446).

What parents are failing to ask themselves is if, in keeping their children safe from harm, they are affecting their mental and physical health and thereby nullifying the benefits derived from such a safety net.

And parents are not unwitting victims in this increased screen time: According to this same survey, television and computers do play a part in the increase in indoor play: Here 85% of
mothers cited television viewing and 81% cited computer play as the reason for an increase in indoor play; however, 82% of mothers also cited fear of crime and other safety concerns as their reason for holding their children indoors (Gray, 2011, p. 446). Cell phone usage, according to the Kaiser Family Foundation’s “Generation M²: Media in the Lives of 8- to 18-year Olds” has also increased from 39% in 2004 to 66% in 2009 (Rideout et al., 2010). In an average day, 33 minutes are spent talking on the cell phone, while 49 minutes are spent consuming media through the cell phone (17 minutes on music, 17 minutes on games, 15 minutes on television shows) (Rideout et al., 2010, p. 10). R. Louv notes that in 2000, only 38% of college students had cell phones, but by fall of 2004, it was 90% (Louv, 2008, p. 180). So the time that children and young adults could spend outdoors is generally going towards increased time on electronic devices.

Often parents and children feel that they are safer with cell phones. Studies indicate, however, that cell phone usage is altering not only families, but “single-handedly reversing the conventional pattern of adolescents lessening their interaction with family as they get older,” as noted by University of Zurich sociologist H. Geser, whose research outlines the impact of technology on private and public spaces as part of a larger trend towards transforming the quiet interstices of everyday life (Marano, 2008, p. 180). And as older teens are more likely than younger ones to stay intertwined with their parents, it benefits the parents to buy cell phones for their children, for it allows “a certain control on the whereabouts of their offspring,” and assures them of their children’s safety, for which children pay the price: “it is the children who wind up paying the bill for parental security. The cost is their autonomy” (Marano, 2008, p. 180). As H. E. Marano notes, invasive parenting has a more acute effect than most parents realize, as “It’s
hard to become independent when you’re on the phone with people who make decisions for you several times a day” (2008, p. 181).

One consequence of the increased need to control childhood through intense schooling, intertwined with amplified emotional reliance on parents and decreased social bonding with peers, is the formation of an enlarged “no-man’s–land of post-adolescence from twenty to thirty,” which University of Pennsylvania’s Frank Furstenberg and a team of sociologists label “early adulthood”:

Using the classic benchmarks of adulthood—leaving home, finishing school, getting a job, getting married, and having children—65 percent of males had reached adulthood by the age of thirty in 1960. By contrast, in 2000, only 31 percent had. Among women, 77 percent met the benchmarks of adulthood by age thirty in 1960. By 2000, the number had fallen to 46 percent. (cited by Marano, 2008, p. 176).

And the keys to creating a middle-class life seem tied to becoming emotionally differentiated from parents, which includes financial solvency—as historically found in establishing a financial base with a partner and raising a family with them, thus transforming emotional and financial roles with parents.

Control is part of the 21st century childhood, and the need to control in order to create a safety net around the young has had potentially serious consequences on children, resulting in an elongated early adulthood. It is difficult for parents to monitor their own need to control their children when their inflated fears are fanned by media hype. These potentially misplaced public fears that periodically arise within a society tend to create a “moral panic” where the “trumpeting of a dire crisis proves a highly effective way of gathering attention” (Mintz, 2004, p. ). There is a
tendency to read certain horrific but isolated events in terms of the downfall of a young person’s well-being. Yet such a tendency is not new to American childhood.

A fear of children being out of control is deeply rooted in American society, and the post-war society of the 1960’s acknowledged the fear of parents raising children both spoiled and too competitive in nature (Mintz, 2004). Texts such as *Parents on the Run* and *The Vanishing Adolescent* argued that the exploration period of adolescence was disappearing as this postwar society was impeding their development. Much as with H. E. Marano’s text *A Nation of Wimps* (2008), P. Goodman’s *Growing Up Absurd* (1960) critiqued how Americans had neglected their children’s well-being by raising them in contradictions that inherently created stress on the children attempting to navigate them. For example, children are taught to be dependent on adults while still valuing their independence, and they are pushed to achieve in school in spite of being denied opportunities to explore freely. As with Marano’s notion of “helicopter parenting” (defined as a hovering, emotionally intense style of parenting), Goodman notes much the same nearly 50 years earlier when he “contended that the smothering love and hovering attention of postwar parenting made it more difficult for the young to assert their independence or to establish a unique identity” (Mintz, 2004, p. 315). In a sense, this type of parenting is quintessentially American.

**Conceptual Framework for Empirical Analyses**

To this point, the Review of Literature has discussed issues associated with natural and digital play. While the latter has certain advantages, the movement away from natural play has important implications for the physical and psychological health of children. Given these implications, it becomes important to gauge the attitudes of children and adolescents about digital and natural play, examining those attitudes in the context of reported behaviors. To that
end, the dissertation draws on research in third-person effects, complementing that research with scholarship on media enjoyment.

**The Third-Person Effect.**

The third-person effect is a hypothesis that, in its broadest sense, predicts that people will tend to overrate the influence of mass communication on the attitudes and behaviors of others (Davison, 1983). More specifically, individuals tend to believe that media communication has a greater impact on others than on themselves and to rate themselves as somehow immune to its effect. According to Davison, its greatest impact “will not be on ‘me’ or ‘you,’ but on ‘them’ -- the third persons,” (p. 3). It is this belief that others are more gullible or reactive than themselves that leads them to take action. In some instances, a communication leads to action based upon not what it does to its supposed target, but because others believe it will have an impact on “others,” and this potential impact leads them to protect the weak (Davison, 1983).

This hypothesis can be used to explain various aspects of social behavior, including why some students may consider video games and other electronic devices as possibly more harmful to other students than themselves, and perchance why adults and even students may support regulation of digital play and electronic devices. This third-person effect is generally limited to negative media effect. For positive media effects, Schmierbach et al. (2011) note that “studies show either that there is no self-other difference in perceived effects or a so-called first-person effect in which effects on self are perceived as being greater” (p. 308). In making that observation, Schmierbach and his colleagues draw on earlier work by Chia, Lu and McLeod (2004), Eveland and McLeod (1999), Neuwirth and Frederick (2002), and Neuwirth, Frederick and Mayo (2002).
Some current research indicates that a third-person effect exists in the social behavior found in video game usage and digital play. Yet this third-person effect research posits that positive and negative game effects are viewed differently based on the degree to which those surveyed in fact play video games (Schmierbach et al., 2011). According to these same researchers, video games exhibit evident third-person perceptions and this awareness helps underscore the nature of public support for potential policies to limit exposure to such games. Censorship is at the heart of third-person perceptions and ramifications, as Davison’s (1983) ground-breaking work on third-person effect notes:

The phenomenon of censorship offers what is perhaps the most interesting field for speculation about the role of the third-person effect. Insofar as faith and morals are concerned, at least, it is difficult to find a censor who will admit to having been adversely affected by the information whose dissemination is to be prohibited. Even the censor’s friends are usually safe from pollution. It is the general public that must be protected. (p. 14)

Video games themselves offer a rich field for those acting as harbingers against the social ills of violent media play. And though there should be serious considerations to the potential ramifications of both the violence in such play and the total amount of hours spent on digital games as opposed to nature play, it remains a consistent study among researchers that the desire to censor it may be the attempt to contain a third-person effect. Also, it should be noted that the desire to protect others from themselves is not specific to a third-person effect, and Schmierbach et al. (2011, p. 311) indicate that even if paternalism is linked to an actual perceptual gap, it acts as an antecedent variable; it appears that paternalistic individuals are more prone to third-person perceptions.
And indeed there are flaws to the third-person’s perception (Davison, 1996; Perloff, 1993), though it has generated considerable research (for reviews, see Lasora, 1992; Perloff, 1996). As Paul, Salwen and Dupagne (2000) note, it has certainly created “robust empirical findings;” and yet this research “has yet to adequately explain how people perceive themselves as smarter and less resistant to media messages than others. Research has also failed to identify the contingent factors that might enhance or diminish the perception” (p. 58).

Schmierbach et al. (2011) focused on the positive and negative effects of games by individuals who play differing amounts. All data was collected from a nonrandom sample of college students; Schmierbach and his colleagues found that across all levels of players, individuals saw negative effects of games as being stronger for other people. Heavy players appeared more willing to acknowledge stronger negative effects on themselves, but they also saw stronger positive effects on themselves and adults; thus, in sum, the third-person perception held for all but appeared weakest among heavy players (p. 319).

Schmierbach et al. (2011) observed that video games provide a logical place for third-person research as these games are frequently stigmatized and penalized for restriction. The authors cited scholarship that has demonstrated third-person effects among both children and adults (see Boyle, McLeod, & Rojas, 2008; Ivory & Kalyanaraman, 2009; Scharrer & Leone, 2006, 2008).

Methodologically, Schmierbach et al. (2011) noted that a weakness of their own study, though consistent with prior research on third-person effects, was that it violated a fundamental assumption of randomness in parametric statistics. The study therefore could not be generalized to a larger population. They pointed to scholars such as Banning (2001), who suggested that third-person perceptions likely operate much differently in the “real world” than among student-
based convenience samples. Paul et al. (2000) also noted that third-person perceptions are higher both in college student samples and nonrandom samples than in random and non-college students, and that research indicates that those with reported superior self-assessed knowledge exhibit higher third-person perception because they evaluate themselves as more intelligent than others, and thus less susceptible to harmful media messages (p. 78). Recognizing the statistical limitations in the research of Schmierbach and his colleagues, the current study initially relies on nonparametric statistics to examine third-person perceptions.

It may also be that other constructs, such as media enjoyment, best encapsulate the psychological appeal of media that draws the student initially to the game; however, even within this theory more research is needed into “what it actually means to enjoy media programming (Nabi & Krcmar, 2004, p. 289). Of particular note is that “enjoyment” comprises a generally positive feeling or attitude toward media content of all genres and allows an experiential connection to the viewing experience (Hoffner, 1996; Zillmann, 1988; Zillmann & Bryant, 1994). Often it is treated as synonymous with the term “liking.” Nabi and Krcmar (2004) differentiate enjoyment and liking – terms that are often substituted for one another, in the following manner: “whereas liking reflects reactions (cognitive, affective, or both) to a media message, enjoyment can reflect reaction to both the message as well as the fuller media experience, including situational and contextual elements,” such that one can like the media message without necessarily enjoying the act of watching, for example, the scene (p. 289).

In combining the central element of media enjoyment with third-person effect, scholars might postulate the following: students are drawn to video games because they enjoy the media experience, but they may wish to protect weaker individuals through a paternalistic desire to decrease the manipulation of the “other,” i.e., the third-person effect. They view themselves as
capable of containing the manipulation inherent in mass communication and to a certain extent, best able to judge when this communication could potentially harm another. Hence they can enjoy even violent video games while, for example, subscribing to a rating system to protect others from injury.

**Hypotheses**

Based on the literature reviewed for this dissertation, the study first advances a general hypothesis regarding third-person effects:

H1: High school students will indicate that digital media and electronic devices have a more negative effect on the health of other students than their own.

Beyond that central hypothesis, the study anticipates significant explanatory effects for a series of variables related to time spent on video games, time spent exercising as well as time spent outdoors, time spent with family members in specific contexts, and participation in virtual social communities. The following hypotheses specify differences expected within response measures:

H2: Relative to students without rules in the house, students who indicate the presence of rules regarding digital media and electronic devices will report (a) comparatively positive effects of these media and devices on themselves, and (b) comparatively negative effects on others.

H3: Relative to students who do not spend time exercising outdoors with family, or spend only some time doing so, students who report outdoor exercise during family time will report (a) comparatively unhealthy effects of digital media and electronic devices on themselves, and (b) comparatively negative effects on others.
H4: Students who spend more hours outdoors will report (a) comparatively unhealthy effects of digital media and electronic devices on themselves, and (b) comparatively unhealthy effects on others.

H5: Students who spend more hours exercising during the school week will report (a) comparatively unhealthy effects of digital media and electronic devices on themselves, and (b) comparatively unhealthy effects on others.

H6: Students who take part in a virtual social community will report (a) comparatively healthy effects of digital media and electronic devices on themselves, and (b) comparatively healthy effects on others.

H7: Students who spend more hours playing video games during the school day will report (a) comparatively healthy effects of digital media and electronic devices on themselves.

The purpose of this dissertation is to address the shift from natural to digital play and its impact upon the social, mental and physical life of a child through the lens of a third person effects hypothesis.
III. Methods

This dissertation examines third-person effects through analyses of digital media use among adolescents. Building on research by Schmierbach et al. (2011), who identified third-person effects among players of video games at the college level, the current research explores how students enrolled at a high school in the Southeastern United States rated the relative positive and negative effects of video games and other electronic media on themselves and on high-school students in general. This chapter explains the methods used in testing for third-person effects among multiple explanatory measures.

Participants

The sample derived for this study included 100 students enrolled in a charter high school in the Southeastern United States. Survey participants were recruited through posters, student announcements via email and intercom, and a newsletter to parents. Written permission forms were distributed to parents during parent-teacher conferences, and signatures were obtained in accordance with the policies of the Institutional Research Board at Clemson University. As approved by the IRB, “(P)articipants [were] identified by demographic data only, and not by name. The specific location of the school [was not] given, though a reference to an ‘accredited, public K12 charter South Carolina high school with rigorous standards and exemplary parent participation’ [was allowed].”

The South Carolina state report card for the high school used lists its population as 82% Caucasian, 13% African American, 3% Hispanic/Latino, and 2% Asian/Pacific Islander; survey results replicate these demographics to a close degree. The demographic terms in this particular

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6 This data was gathered from the South Carolina Department of Education website at http://ed.sc.gov/data/report-cards/2011/district.cfm?ID=2301. IRB confidentiality guidelines prohibit the disclosure of location for minors.
study were designed according to U. S. Census racial categories, and these categories consisted of the following:

- **American Indian or Alaska Native**: Persons with documented tribal descendancy or with a federally recognized tribe.
- **Asian or Pacific Islander**: Origins in the Far East, SE Asia, Indian Subcontinent, or Pacific Islands.
- **Black/African American**: Origins in any of the black racial groups of Africa.
- **Hispanic/Latino/Spanish Origin**: Of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture/origin, regardless of race.
- **White/Caucasian**: All persons having origins in Europe, North Africa, or the Middle East.

Among the participants in this research, 77.3% were White/Caucasian, 13.4% were Black/African American, 5.2% were Hispanic/Latino/Spanish origin, 2.1% were American Indian or Alaska Native, 2.9% were Asian or Pacific Islander, and two students chose to not respond the race/ethnicity question. In terms of gender, 49.5% were male and 50.5% were female. Broken down by age, 36.5% were younger than 15 years of age, 43.8% were 15-16, and 19.8% were 17-18. No students indicated they were 19 years of age or older, although three students did not respond to the age item.

Overall, while students who participated in this study did not constitute a random sample, the sample was representative of the school population itself, per the South Carolina state report card as obtained through the South Carolina Department of Education. The gender of participants was nearly equal, and while some bias might have existed given that only those students whose parents signed the permission form were allowed participate, no systematic bias was created in the construction and implementation of this survey.
Materials

As indicated on the Parent Permission Form, the purpose of this research was “to understand the impact that electronic media, and particularly digital exercise games, are having upon the overall physical health of the student, as well as how these games are contributing to an expanded social community/friendship base.” The instrument for this research, constructed within www.surveymonkey.com, was designed to be completed in 10 to 15 minutes and featured a combination of open-ended and closed-ended questions about digital and natural play. Pilot tests on the survey were conducted with family, friends and colleagues to gauge the time needed to complete the survey, the clarity of the questions as provided, and the redundancy of particular topics. A copy of the entire instrument is included in the Appendix of this dissertation, but only those questions used in analyses of third-person effects are reviewed here. The following section reviews the measures that served as dependent variables.

Dependent Variables

In order to systematically examine determinants of third-person effects, analyses included the following two questions.

• Are video games and other electronic devices (TV, iPods, computers, etc.) positively or negatively affecting your health?

• Are video games and other electronic devices (TV, iPods, computers, etc.) positively or negatively affecting the health of other students in general?

Both questions included seven-point response options, with 1 signaling “Healthy” and 7 indicating “Unhealthy.” Scores in the middle range indicated perceptions of moderate effects.
Independent Variables

First, regarding demographics, the survey instrument asked respondents to indicate their gender, race / ethnicity, and age. Gender and race were nominal categorical variables and age was a three-category ordinal measure. While demographics often serve as control measures in quantitative studies, their explanatory effects were of interest in the current research, and the measures were thus conceptualized as independent variables.

In terms of digital media and electronic devices, a nominal measure (yes/no) asked respondents whether rules existed in their households regarding time spent on video games and computer usage beyond that reserved for schoolwork.

A second item asked study participants about exercise in the context of time spent with family. The question, “Does your weekly family time include exercise outdoors?” included three response options: “Yes,” “No,” and “Sometimes.” A third, somewhat related item asked respondents to indicate the number of hours they spent outdoors each week, and responses were rounded to the nearest whole number.

A question specific to exercise asked respondents the following: “How many hours of exercise a day do you average Monday-Friday, including designated PE time in school?” Respondents could enter both hours and minutes, and for quantitative analyses, answers were rounded to the nearest whole number (i.e., hour).

Next, a question asked respondents about time spent on the computer with friends. The first question, “Do you have your own virtual social community?” included three response options: “Yes,” “No,” and “Unsure.”
Lastly, an item asked respondents to indicate the number of hours per day they spent on video games, and respondents could enter both hours and minutes; for quantitative analyses, answers were rounded to the nearest whole number (i.e., hour).

**Procedure**

The survey for this dissertation research was conducted in a large computer room on a high school campus. Students with permission forms signed by their parents and/or legal guardians were removed from class in groups throughout the school day, and they were able to submit their completed survey instrument within 15 minutes, as anticipated. Computer “cookies” were cleared after each survey was completed. In addition to computer-based responses, one survey was submitted via a paper-based method as that student was absent from school on the day the survey was administered. One student decided to withdraw after two attempts to load the first page of the questionnaire. He inquired whether he had to take the survey, and as the IRB allowed the student to halt participation at any time, he chose to return to class. Therefore, there were 99 completed questionnaires, although certain items may have been missing on some.

**Statistical Analyses**

Data analyzed in this research were gathered from a convenience sample of high school students. Because the data were not random, they did not meet one of the assumptions of parametric statistics, and accordingly, the study first used nonparametric analyses to examine third-person effects (i.e., whether statistically significant differences existed between the two survey items that constituted the dependent variables). Schmierbach, Boyle and McLeod (2008) endorsed such an approach for examining *determinants of* third-person effects, as opposed to the *effects of* third-person effects.
For categorical explanatory measures with two and three levels, the study used Wilcoxon signed ranks tests for related samples (Conover, 1999, pp. 352-353). This technique required that the data be split based on each explanatory measure, and the statistical output indicated whether or not statistically significant differences emerged within each category of the independent variables.

After examining the stability of third-person effects using nonparametric statistics, the second approach was to use the multivariate analysis of variance (MANOVA) (Reinard, 2006). In SPSS for Windows, MANOVA has the capacity to simultaneously examine the effects of categorical factors and continuous-level covariates on two or more continuous-level response measures. In the current study, the categorical factors examined using the Wilcoxon signed ranks tests of related samples were examined first, and the demographic measures that showed significance in the Wilcoxon signed ranks tests were retained as controls for additional models.
IV. Results

Descriptive Statistics

In testing the seven hypotheses advanced in this dissertation, the study extracted three demographic items, seven potential explanatory measures, and two response variables from the larger survey instrument (see Appendix). Table 1 offers a descriptive report of the two variables that served as dependent measures. In assessing the impact of digital media and electronic devices on themselves, students averaged 3.29 on a seven-point scale, where 1 was “Healthy” and 7 was “Unhealthy.” For the item assessing the effects of digital media and electronic devices on others, student respondents averaged 4.10. A Wilcoxon signed ranks test for related samples indicated significant differences between the two scores ($p < .001$), thus supporting the general hypothesis of third-person effects.

<table>
<thead>
<tr>
<th>Perceptions of video games and other electronic devices on self</th>
<th>Perceptions of video games and other electronic devices on others</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>93</td>
</tr>
<tr>
<td>Mode</td>
<td>4</td>
</tr>
<tr>
<td>Median</td>
<td>4.0</td>
</tr>
<tr>
<td>Mean</td>
<td>3.29</td>
</tr>
<tr>
<td>SD</td>
<td>1.364</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value</th>
<th>N</th>
<th>Percent</th>
<th>Value</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>12.9</td>
<td>1</td>
<td>5</td>
<td>5.4</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>14.0</td>
<td>2</td>
<td>5</td>
<td>5.4</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>22.6</td>
<td>3</td>
<td>19</td>
<td>20.4</td>
</tr>
<tr>
<td>4</td>
<td>37</td>
<td>39.8</td>
<td>4</td>
<td>35</td>
<td>37.6</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>6.5</td>
<td>5</td>
<td>9</td>
<td>9.7</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1.1</td>
<td>6</td>
<td>16</td>
<td>17.2</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3.2</td>
<td>7</td>
<td>4</td>
<td>4.3</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>100</td>
<td>Total</td>
<td>93</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 2 offers a descriptive report of the two- and three-level categorical variables that served as controls and explanatory measures in this study. In addition to basic frequencies and corresponding percentages, the table reports on the results of Wilcoxon signed ranks tests for related samples. These tests, designed to examine the stability of third-person perceptions indicated by the scores in Table 1, required that the dataset be split based on the respective measures. Thus, the first item, gender, contains results for both male and female respondents. As the mean scores reveal, both males and females estimated significantly more unhealthy effects on others, with female estimates on the latter measures especially high (4.42).

For the race demographic, results were derived from the following categories: Black, Other Race (see demographics in Chapter 3), and White. Per the mean scores, both Black and White respondents differed in their estimates of effects on the self and effects on others. Both estimated more unhealthy effects on others. The lack of significance shown for members of Other Race likely reflects the small number of respondents (N = 8).

For the age demographic, results were as follows: Each of the three age groups (under 15, 15 to 16, and 17 to 18) reported significantly more unhealthy effects on others, with the under-15 group showing especially strong differences.

For the variable “Rules in House,” the mean results showed that students who indicated the presence of rules and students who indicated no presence both estimated more negative effects from digital media and electronic devices on others than themselves. Those who indicated not having rules in the house showed a slightly higher difference.
Table 2

Categorical Variable Frequencies and Results of Wilcoxon Signed Ranks Tests for Related Samples

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>N</th>
<th>Pct</th>
<th>Self Mean (SD)</th>
<th>Others Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>48</td>
<td>51.6</td>
<td>3.29 (1.557)</td>
<td>3.79 (1.543) *</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>45</td>
<td>48.4</td>
<td>3.29 (1.141)</td>
<td>4.42 (1.270) ***</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>93</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>Black</td>
<td>12</td>
<td>13.2</td>
<td>3.08 (1.443)</td>
<td>4.33 (1.557) *</td>
</tr>
<tr>
<td></td>
<td>Other Race</td>
<td>8</td>
<td>8.8</td>
<td>2.63 (1.188)</td>
<td>3.63 (0.518)</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>71</td>
<td>78.0</td>
<td>3.42 (1.370)</td>
<td>4.13 (1.511) ***</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>91</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Under 15</td>
<td>35</td>
<td>38.5</td>
<td>3.17 (1.403)</td>
<td>4.20 (1.410) ***</td>
</tr>
<tr>
<td></td>
<td>15-16</td>
<td>38</td>
<td>41.8</td>
<td>3.45 (1.446)</td>
<td>4.13 (1.474) **</td>
</tr>
<tr>
<td></td>
<td>17-18</td>
<td>18</td>
<td>19.9</td>
<td>3.28 (1.179)</td>
<td>4.00 (1.414) *</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>91</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rules in House</td>
<td>Yes</td>
<td>29</td>
<td>31.5</td>
<td>3.21 (1.634)</td>
<td>3.97 (1.546) **</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>63</td>
<td>68.5</td>
<td>3.32 (1.242)</td>
<td>4.13 (1.397) ***</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>92</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor Exercise</td>
<td>Yes</td>
<td>16</td>
<td>17.2</td>
<td>3.25 (1.732)</td>
<td>4.44 (1.632) **</td>
</tr>
<tr>
<td>In Family Time</td>
<td>No</td>
<td>38</td>
<td>40.9</td>
<td>3.32 (1.317)</td>
<td>4.08 (1.217) **</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>39</td>
<td>41.9</td>
<td>3.28 (1.276)</td>
<td>3.97 (1.581) **</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>93</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participate in</td>
<td>Yes</td>
<td>78</td>
<td>84.8</td>
<td>3.27 (1.345)</td>
<td>4.05 (1.432) ***</td>
</tr>
<tr>
<td>Virtual Social</td>
<td>No</td>
<td>14</td>
<td>15.2</td>
<td>3.43 (1.555)</td>
<td>4.36 (1.598)</td>
</tr>
<tr>
<td>Community</td>
<td>Total</td>
<td>92</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

For the variable indicating whether student respondents exercised outdoors with family members, each of three response categories proved significant, with individuals in all three groups estimating more negative effects on others than themselves.

Lastly, for the variable indicating whether or not respondents participated in a virtual social community, students who indicated belonging to such a community differed significantly in estimating more unhealthy effects of digital media and electronic devices on others than
themselves. Those who did not participate in a virtual social community estimated greater adverse effects on others, but the results were not significant.

Table 3 offers a descriptive report of the metric variables used as explanatory measures in the current study. For the variable measuring hours of daily exercise during the school week, students averaged 3.81 with a standard deviation of 1.937. Regarding the number of hours per week spent outdoors, students averaged 4.95 with a standard deviation of 2.308.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of daily exercise during school week</td>
<td>91</td>
<td>3.81</td>
<td>1.937</td>
<td>3.00</td>
<td>2</td>
</tr>
<tr>
<td>Hours per week outdoors</td>
<td>92</td>
<td>4.95</td>
<td>2.308</td>
<td>5.00</td>
<td>8</td>
</tr>
<tr>
<td>Hours per school day spent on video games</td>
<td>84</td>
<td>1.89</td>
<td>1.481</td>
<td>1.00</td>
<td>1</td>
</tr>
</tbody>
</table>

Lastly, for the variable measuring hours per school day spent on video games, the mean was 1.89 and the standard deviation was 1.481. It should be noted here that one hour was the dominant response, and to generate stable parameter estimates in multivariate analyses, this variable was collapsed from eight categories to a three-level interval measure indicating one, two and three hours, respectively.

**Inferential Statistics**

To this point, the study has reported descriptive statistics as well as the results of one-sample Wilcoxon signed ranks tests for related samples, confirming Hypothesis 1 and the presence of third-person effects. The study now reports MANOVA statistics, first examining
whether differences existed across categories in the three demographic variables and then reporting statistical results for hypotheses 2 through 7.

**Demographics**

**Gender.** A MANOVA tested the explanatory effects of gender on the two dependent measures concerning perceived effects of digital media and electronic devices on the self and on other students. The test showed significance for the gender demographic $F(2, 90) = 3.166, p < .05$, Wilks’ $\Lambda = .934$. Regarding perceived effects on the self, males ($N = 48, M = 3.29, SD = 1.557$) and females ($N = 45, M = 3.29, SD = 1.141$) did not differ in their average assessments. Concerning perceived effects on others, however, males ($N = 48, M = 3.79, SD = 1.543$) appeared to see healthier effects than females ($N = 45, M = 4.42, SD = 1.270$), whose mean score was notably higher than the others.

**Race.** A second MANOVA retained gender and tested the explanatory effects of it and race on the two dependent measures. Here, gender again showed significance as a predictor $F(2, 84) = 5.393, p < .01$, Wilks’ $\Lambda = .886$, but race did not.

**Age.** A third MANOVA tested the effects of gender and age on the two dependent measures, and in this analysis, neither predictor showed significance.

**Hypothesis 2**

This hypothesis predicted that relative to students without rules in the house, students who indicated the presence of rules regarding digital media and electronic devices would report (a) comparatively positive effects of these media and devices on themselves, and (b) comparatively negative effects on others. With gender entered as a control measure, MANOVA did not show significant results. Regarding rules in the house, while the means moved in the direction anticipated for effects on the self, with those who identified rules in the house
indicating a slightly lower average score (N = 29, M = 3.21, SD = 1.634) than those without rules (N = 63, M = 3.32, SD = 1.242), differences were not significant. Regarding perceived effects on others, averages between those with rules in the house (N = 29, M = 3.97, SD = 1.546) and those without rules (N = 63, M = 4.13, SD = 1.397) again moved in the direction anticipated but were not significant. Thus, the second hypothesis was not supported.

**Hypothesis 3**

The third hypothesis predicted that relative to students who indicated not spending time exercising outdoors with family members, or spending only some time doing so, students who reported exercising with family would indicate (a) comparatively unhealthy effects of digital media and electronic devices on themselves, and (b) comparatively negative effects on others. A MANOVA showed significance for gender as a control measure $F(2, 86) = 4.053, p < .05$, Wilks’ $\Lambda = .914$, but significant effects were not observed for exercising with family. In analyzing the descriptive statistics, females who reported exercising with family reported especially negative health effects of digital media and electronic devices on others, although the exercise variable did not, in itself, show significance as a determinant. Regarding effects on the self, mean scores were similar across the three groups: those who reported exercising outdoors with family members (N = 16, M = 3.25, SD = 1.732), those who did not report such exercise (N = 38, M = 3.32, SD = 1.317), and those who exercised with family members sometimes (N = 39, M = 3.28, SD, 1.276). Concerning perceived effects on others, while students who exercised with family members reported comparatively unhealthy effects of digital media and electronic devices on others (N = 16, M = 4.44, SD = 1.632), differences were not significantly different from those who did not exercise with family (N = 38, M = 4.08, SD = 1.217) or did so sometimes (N = 39, M = 3.97, SD = 1.581). Therefore, the third hypothesis was not supported.
Hypothesis 4

The fourth hypothesis predicted that students who spent more hours outdoors would report (a) comparatively unhealthy effects of digital media and electronic devices on themselves, and (b) comparatively negative effects on others. With gender included in the model, time spent outdoors approached significance as a determinant $F(14, 150) = 1.634, p < .08, \text{Wilks’ } \Lambda = .753$. In examining average scores in the outdoors measure, only a modest amount of variance emerged for the dependent variable measuring effects on the self. Greater variance existed for the measure examining perceived effects on others, especially among females who spent the most hours outdoors. Those who reported seven and eight hours outdoors averaged, respectively, 4.50 (SD = 1.732) and 5.11 (SD = 1.167) on the second dependent measure, leading it in the direction anticipated. Overall, while a conventional level of statistical significance was not observed for the explanatory measure, the data did offer limited support for the fourth hypothesis.

Hypothesis 5

This hypothesis predicted that students who spent more hours exercising during the school week would report (a) comparatively unhealthy effects of digital media and electronic devices on themselves, and (b) comparatively unhealthy effects on others. A MANOVA showed a significant effect for gender $F(2, 75) = 3.220, p < .05, \text{Wilks’ } \Lambda = .921$, and hours of exercise approached significance $F(14, 150) = 1.753, p = .051, \text{Wilks’ } \Lambda = .739$. Two noteworthy trends emerged: opposite what was expected regarding effects on the self, those who exercised more reported more positive effects of digital media and electronic devices; and consistent with what was anticipated, females who exercised more estimated markedly higher unhealthy effects on
others. Again, while a conventional level of statistical significance was not observed for the exploratory measure, the data did offer limited support for the fifth hypothesis.

**Hypothesis 6**

The sixth hypothesis predicted that students who took part in a virtual social community would report (a) comparatively healthy effects of digital media and electronic devices on themselves, and (b) comparatively healthy effects on others. A MANOVA again showed significance for gender $F(2, 87) = 5.515, p < .01$, Wilks’ $\Lambda = .887$. While participation in a social community did not show significance as a determinant, it did approach significance in an interaction with gender $F(2, 87) = 2.593, p < .09$, Wilks’ $\Lambda = .944$. For effects on the self, males who participated in a virtual social community averaged 3.20 (SD = 1.506) while those who did not averaged 3.75 (SD = 1.832). For effects on others, males who participated averaged 3.80 (SD = 1.539), while those who did not participate averaged 3.75 (SD = 1.669). Among females, differences in mean scores were greater – as they were throughout the statistical analyses – with those who participated in virtual social communities and those who did not averaging 3.34 (SD = 1.169) and 3.00 (SD = 1.095), respectively, on the first dependent variable. On the second dependent variable, females who participated in virtual social communities averaged 4.32 (SD = 1.276) and those who did not averaged 5.17 (SD = 1.169). While the sixth hypothesis was not supported outright, statistical patterns involving females lent limited support to it.

**Hypothesis 7**

This hypothesis predicted that students who spent more hours playing video games during the school day would report (a) comparatively healthy effects of digital media and electronic devices on themselves, and (b) comparatively healthy effects on others. With gender included in the model, a MANOVA did not show significant effects. In general, mean scores
moved in the directions anticipated, with those who played video games more hours per day observing slightly more positive effects. Overall, though, the seventh hypothesis was not supported.

Summary

Data analyzed in this research demonstrated a consistent presence of third-person effects among the high school students who agreed to participate in the study. Female students, in particular, indicated relatively unhealthy effects of digital media and electronic devices on others, while males tended to estimate slightly lower levels of negative effects. The study found limited support for the notion that individuals who spend more time outdoors perceive relatively negative effects of digital media and electronic devices on others. Additionally, females who spent time in virtual social communities estimated slightly more positive effects, and females who exercised more hours each week estimated slightly more negative effects on others. Time spent on video games did not show consistent significance as a determinant, although individuals who spent more time on video games did indicate slightly more positive effects. The dissertation now turns to a discussion of its quantitative results.
V. Discussion

Key Findings

This dissertation examined third-person perceptions among students enrolled in a charter high school in the Southeastern United States. Survey questions explored the influence of household rules, the time students spent on video games and in virtual social communities, as well as time in the outdoors and in exercise. Overall, the results indicate that students estimated more negative effects from digital play on others than on themselves. This study also found some support for the notion that individuals who spend more time outdoors tend to perceive relatively negative effects from digital media and electronic devices. Additionally, females who spent time in virtual social communities and who exercised less frequently identified more positive effects. Time spent on video games did not show significance as a determinant, although individuals who spent more time on video games indicated slightly more positive effects. The results of this study offer theoretical and practical contributions to the scholarly literature on third-perceptions, building on the recent work of Schmierbach et al. (2011).

Theoretical Contributions

This study sought to advance the literature on third-person perceptions, investigating conceptual processes through a sample of high school students. The study supports the results of several previous studies and suggests that third-person research applies to games as well as persuasive messages and/or censorship restriction. In summarizing the findings, it should first be noted that both males and females estimated more negative effects on others than on themselves, but females appeared especially concerned about effects on others. This may have been due to sampling variation, but it also may suggest that female students see themselves as more capable
of balancing media use with other tasks and responsibilities. Race and age did not show significance as controls, but both measures also contained a limited number of categories.

The data did not support the second hypothesis, which predicted that students without rules in the house would report relatively positive effects from digital media and electronic devices on themselves and comparably negative effects on others. The literature suggested that households without rules governing media tend to have more media use, but the issue may be more nuanced than what was tested in the current study. Additionally, relatively few students indicated the presence of rules, and therefore the results for that group may have been somewhat idiosyncratic. A larger sample may have helped to create greater variance.

The third hypothesis also was not supported, although statistical analyses did show significant effects for gender regarding exercising outdoors with family. The literature suggested that those who spend more time in outdoor exercise also tend to spend less time with media, and the current study assessed whether students would view unhealthy effects from media if they also spent more time outdoors exercising specifically with family; that did not appear to be the case. Research does indicate that children prefer to exercise with peers rather than parents, so a stronger hypothesis in the future might be to test whether high school students who exercise more with peers outdoors will perceive greater harm from electronic devices than those who do not exercise as much with peers outdoors.

The fourth hypothesis predicted that students who spent more hours outdoors would report comparatively unhealthy effects of digital media and electronic devices on themselves and comparatively negative effects on others. With gender included in the model, time spent outdoors approached significance. The literature review had suggested that those who spend more time outdoors tend to spend less time with media, and it appears that a segment of high
school students perceived the importance of balancing digital play with natural play. Those who spent more time outdoors appeared slightly more concerned about the effects of digital media and electronic devices. Future research might explore specific outdoor activities, examining their respective effects on attitudes about digital media and electronic devices.

The fifth hypothesis predicted that students who spent more hours exercising during the school week would report relatively unhealthy effects of digital media and electronic devices on themselves and relatively unhealthy effects on others. Statistical analyses showed a significant effect for gender, and hours of exercise approached statistical significance as a determinant. Contrary to expectations, those who exercised more reported more positive effects of digital media and electronic devices on themselves. Consistent with what was expected, females who exercised more projected markedly higher unhealthy effects on others. It may be that students are exercising using a range of both natural and digital options. For example, a student who uses Zumba as an exercise option might view this material as healthy, but when considering the range of electronic media in general, subscribe to the notion that much of it is unhealthy for others. A more specific hypothesis in the future might test whether specific exercise videos are perceived as being as healthy for oneself as they are for others – and vice versa.

The sixth hypothesis predicted that students who took part in a virtual social community would report comparatively healthy effects of digital media and electronic devices on themselves and relatively healthy effects on others. Statistical analyses showed a significant effect for gender, and while participation in a social community did not show significance as a determinant, it did interact significantly with gender. Research has shown an association between gender and a preference for certain types of video and exercise games; a future study might explore the gender interaction more precisely. Why, for instance, would males and females differ
in their perceptions of effects, such that females appear especially concerned about effects on others while perceiving relative immunity for themselves? Might the specific amount of time spent in virtual social communities explain perceived effects more precisely than a categorical variable indicating basic participation?

Finally, the seventh hypothesis predicted that students who spent more hours playing video games during the school day would report relatively healthy effects of digital media and electronic devices on themselves and relatively healthy effects on others. This hypothesis was not supported, although averages moved in the directions anticipated. In the future, researchers may want to compare hours per day with hours per week as survey items, as there might be more variance in time, yielding more precise and informative results. The issue of time spent on video games will likely become increasingly important as video game design companies find ways to make video games and massive multi-player games more appealing to youth and barriers regarding violence continue to drop. Research has shown that heavier game players, though more willing to concede the negative aspects of gaming, also see a more positive side as well, and as health indicators continue to slide for the age group in general, it could potentially become harder to ask students to self-assess their health as it is often compared to the health of those around them.

In general, the findings of this study are consistent with research by Schmierbach et al. (2011), who identified third-person effects among players of video games at the college level. Focusing on the positive and negative effects of games by individuals who played divergent amounts, Schmierbach and his colleagues found that across all levels of players, individuals saw negative effects of games as being stronger for other people. Heavy players appeared more inclined to acknowledge stronger negative effects on themselves, but they also saw stronger
positive effects on themselves and adults. The authors also noted that video games provide a logical place for third-person research as these games are frequently castigated and penalized with restriction, and the authors cited scholarship that has shown third-person effects among both children and adults (see Boyle, McLeod, & Rojas, 2008; Ivory & Kalyanaraman, 2009; Scharrer & Leone, 2006, 2008; Schmierbach et al., 2011). The current research focused on the perceptions of high school students, as opposed to those at the college level, but support for third-person effects was consistent. As evidenced in the discussion of hypotheses, the more challenging issues rest in the direction of effects given behavioral determinants such as time spent in virtual social communities and time spent outdoors.

Indeed, there are theoretical limitations to the application of third-person frameworks in current scholarly research. As observed earlier, while research in this tradition has unquestionably generated “robust empirical findings,” the research “has yet to adequately explain how people perceive themselves as smarter and less resistant to media messages than others,” in addition to failing to identify the elements that increase or decrease the perception (Paul, Salwen & Dupagne, 2000, p. 58). To move in the direction of explaining why individuals perceive themselves as relatively immune to media messages, researchers should continue to position third-person measures as dependent variables, working to understand how attitudinal and behavioral determinants interact toward explaining differences.

**Practical Contributions/Research**

Research in third-person perceptions is part of a larger body of work in media effects, and the findings of the current study add to that body of knowledge. In considering the potential problems of video games, one must balance approaches to regulation with overt censorship. It may be that censorship of game play is less necessary when parents serve as a gateway to
recreational activities, and thus provide direct and frequent contact with peers. The Supreme Court has consistently acknowledged that there are very few instances in which censorship is desirable, so it is unlikely, given their 2011 ruling on video games, that it will allow censorship to protect minors from exposure to violence, aggression and hostile sexual actions. In addition, research psychologists have shown a connection between video game violence and harmful effects upon children and adolescents, but courts have rejected these studies largely because they do not prove that these games actually caused minors to behave aggressively, and as verification, the Supreme Court opinion cited *Video Software Dealers Association* 556 F. 3d, at 964 (Brown v. Entertainment Merchants Association, 564 U.S. 08-1448, 2011 p. 13).

Still, there is little doubt that people learn best when actively taking part in rehearsing the activity and particularly if it scaffolds learning with increased skill level, as with any potent apprenticeship program. Therefore, just as video games can serve to teach, as evidenced by the Armed Forces use of them for military training (CNN, 2001), it makes sense that children can learn from video game play. If the behavior is exceedingly violent, there must necessarily be some type of transfer of information and potential increase of skill level in enacting said violence -- the exact mechanics of which are still debated. It serves everyone’s best interest for parents to keep an eye upon the areas of most concern to them and balance their child’s diet of digital play with natural play and a steady dose of community and recreational activities with peers.

This study provides practical support for parents and teachers who wish to understand how and why play has transitioned for children and families, and the potential ramifications of a childhood with less and less nature time. It gives parents a historical lens in which to view childhood that helps situate the transition into digital play amongst other transitions in American childhood. It also helps them weigh the cost of less exercise and outdoor play with the benefit of
increased social interaction and access to information through digital media. It gives adults – whether parents or educators – access to data on health indicators from media use for children and the conceivable repercussions of a life lived primarily through secondary experiences. Through third-person effect, it also illuminates potential defense mechanisms that children may use in sanctioning their own use of media and the possible duplicity inherent in views toward media use for others. Ultimately it lends a hand to those attempting to understand how children can conceivably convince themselves that media use is negative for others but not for themselves and helps parents and children/adolescents balance a media diet with time outdoors, “unplugged” from electronic devices. For educators, as computers and iPads become increasingly central to accountability standards measured by test scores and grades, it is crucial to understand what electronics and media can and cannot provide for students.

Implications

The purpose of this dissertation -- as initially defined in Chapter II: Literature Review -- was to address the shift from natural to digital play and its impact upon the social, mental and physical life of a child through the lens of third person effect. What this study does potentially contribute for parents and educators is an understanding of the ways that play is integral to the life of a child. At its base, it does not assume that all play is equal.

There are several ways that this research can be used by the practitioner. For example, teachers can use this data to introduce programs educating students on the positive and/or negative aspect of media on everyone in an effort to address misperceptions highlighted by the third person effect. Also, as more time on computers correlates with less reading time, educators can use the research to encourage less time on computers and more time on scholastic pursuits. And, as more time in media correlates with less time outdoors, it may be best for parents to begin
monitoring not just the quality, but the quantity of media used in the household. If resources for free play are low within the community, parents and adults in general can advocate for more recreational activities for children and adolescents and potentially spearhead natural play through hiking, biking, camping, fishing, and/or nature observatory trips. Parents can work together to set up opportunities for children and adolescents to be outdoors and with peers, in addition to working with local governments to increase access to bike and walking paths throughout the community, and potentially ask recreational and park managers for guidance in exploring potential play areas that can be introduced to the children in their community. Also, they can ask community leaders for help in purchasing small plots of land to set up nature gardens and vegetable gardens for children – areas that can serve to both teach and allow exploration and play.

To decrease the amount of time in digital media, parents can set and enforce rules in the household for media use, including limiting time watching television per week, setting rating approvals for video games, and mandating that clock alarms be used instead of cell phones. Parents can also limit the time that children may be on cell phones and require that phones be turned off at bedtime. They may also wish to become more digitally aware of the types of media and games available to their children and serve as a buffer for certain material.

The purpose of this study was to explore the intersection of digital and natural play, and particularly to consider the influence of third person effect upon decisions regarding media, the very nature of which may make it harder for video game players to understand that they too are impacted by the media they vow has little effect. In terms of third-person effects, problems stand to occur when teenagers and adults view media as a potent influence on everyone except themselves and their children and/or peers. To the extent that video games can change attitudes
and behavior, individuals may be more affected than they realize. At a minimum, it is prudent for parents to help alter the sedentary lifestyle of their children, and in fact, it may be more essential than parents realize.

**Limitations & Future Research**

The results of this study offer several contributions to research in digital and natural play; however, the results should be interpreted within the inherent limitations of the study. This research was conducted at a smaller than average high school within a school district that did not control field research experiments for charter schools. Instead, it allowed the principal to authorize permission, which facilitated an easier process. However, IRB rules regarding opt-in permission for minors remained in place, and access to students, through parent permission and the restricted access given by the school itself, kept the overall number of participants limited. While studies based on convenience samples are generally not considered generalizable, a higher number of participants in subsequent research might increase the overall representativeness of high school students as a research demographic. More participants would also allow for more determinants of third-person effects to be examined simultaneously, such that sufficient cell counts would appear for each combination of predictor variables in multivariate equations. Demographically, a larger sample might facilitate analyses involving race and ethnicity, urban versus rural environments, and participation in school-sponsored activities.

Additionally, the study was limited by the initial ideas behind its conception. Initially, the study was conceived as an examination of the intersection of digital and natural play, and this look at natural play took a degree of precedence in the literature review. However, it was the digital play aspect that took precedence in this empirical analysis, with the natural play angle providing secondary support. If the study were to be conducted again, it would ask more
questions involving “you” versus “the other” in the context of both digital and natural play. The study would be built with less choice in time and location(s), and more time would be given to gaining parent permission for students to be in the study – possibly even several months. The research would ideally involve students from differing high schools at differing grade levels, allowing for the kinds of comparisons noted in the previous paragraph.

Closing

Ultimately computers and electronic devices are transforming relationships – whether between people or between people and their connection to nature. This study illuminates the third-person effect and the belief that one is immune to the impact of digital media while others are less so and the potential impact that can have upon support for restriction of media -- particularly, as in this study, for high school students. This method of protecting others, which seems endemic to third-person effect, appears less effective in protecting children than, for example, taking them outdoors camping or in general recreation activities. Such measures continue to pay forward generation after generation. Parents looking for a response to media in the lives of their children may find that they can balance their child’s digital and natural play appetite if they incorporate each while staying mindful of the ways that media can, in equal turns, diminish and enrich the life of a child.
APPENDICES
Appendix A

Institutional Review Board (IRB) Approval

November 2, 2011

Dr. Bryan Denham
Clemson University
Department of Leadership, Counselor Education, Human & Organizational Development
316 Tillman Hall
Clemson, SC 29634

SUBJECT: IRB Protocol # IRB2011-226, entitled "Digital/Natural Play"

Dear Dr. Denham:

The Institutional Review Board (IRB) of Clemson University reviewed the above-mentioned study using Expedited review procedures and has recommended approval. Approval for this study has been granted as of October 3, 2011. Please find enclosed with this letter your original, stamped consent document to be used with this protocol.

Your approval period is October 3, 2011 to October 2, 2012. Your continuing review is scheduled for September 2012. Please refer to the IRB number and title in communication regarding this study. Attached are handouts regarding the Principal and Co-Investigators’ responsibilities in the conduct of human research. The Co-Investigator responsibilities handout should be distributed to all members of the research team. The Principal Investigator is also responsible for maintaining all signed consent forms (if applicable) for at least three (3) years after completion of the study.

No change in this approved research protocol can be initiated without the IRB's approval. This includes any proposed revisions or amendments to the protocol or consent form. Any unanticipated problems involving risk to subjects, any complications, and/or any adverse events must be reported to the Office of Research Compliance immediately. Please contact the office if your study has terminated or been completed before the identified review date.

The Clemson University IRB is committed to facilitating ethical research and protecting the rights of human subjects. Please contact the Office of Research Compliance at 656-6460 if you have any questions.

Sincerely,

Laura A. Moll, M.A., CIP
IRB Administrator

Enclosures

www.clemson.edu/research/compliance

Appendix B
Parent Consent Form

Parent Permission Form
Clemson University

The Impact of Digital and Natural Play Upon the Body

Description of the Research and You/Your Child’s Part in It

Both Professor Bryan Denham, as Principal Investigator, and Wendy Blanchard, as Ph.D. candidate at Clemson University, are inviting you and your child to take part in a research study on the impact of digital and natural play. Bryan Denham is the Campbell Professor of Sports Communication at Clemson University in the Department of Communications. Wendy Blanchard is a Ph.D. candidate at Clemson University and she is running this study with the help of Professor Denham. The purpose of this research is to understand the impact that electronic media, and particularly digital exercise games, are having upon the overall physical health of the student, as well as how these games are contributing to an expanded social community/friendship base. We are also interested in how these games may be contributing to a withdrawal from time in nature, or natural play.

Your part in the study will be to complete the parent survey and your child’s part in the study will be to complete the student survey. They may also volunteer for the 3-4 small discussion groups of 8-12 students that take place for 30-40 minutes at ________, and we will ask for parent volunteers of 8-12 parents for one small discussion group on campus in Fall 2011.

It will take you about 15 minutes to answer approximately 40 questions as part of this study. Many of these questions require little time in order to answer them quickly. The group discussion will take approximately 30-40 minutes.

Risks and Discomforts

We do not know of any risks or discomforts to you or your child in this research study. All collected data will be locked when not in use and the surveys themselves will be destroyed by August 2012. The only known risk is a potential breach of confidentiality but measures have been put in place to protect all subjects of this research study.

Possible Benefits

This survey may allow you and your child to question their time on electronic devices and the positive/negative impact it is having on their health, and it may create a way to open discussion between you and your child, as well as between peers and other adults. Otherwise, we do not know of any way that you or your child may benefit directly from taking part in this study. However, this research may help us to understand whether there are potential health benefits or risks to the overall time spent on electronic media, and the overall health benefits or risk to the overall time spent in nature/outdoors.

Protection of Privacy and Confidentiality

Collected data will be locked when not in use; it will also be destroyed when the study is completed. We will do everything we can to protect both you and your child’s privacy and confidentiality. We will not tell anyone outside of the research team that you or your child were in this study or what information we collected about you or your child in particular.
Choosing to Be in the Study

Neither you nor your child must be in this research study. You may tell us at any time that you do not want you or your child to be in the study anymore. Your child will not be punished in any way if you decide not to let your child be in the study, nor will your child’s grades will not be affected by any decision you make about this study.

You may choose to have your child stop being in this study after today. If you do, we will not collect any more information from your child. However, we would keep and use the information we had already collected from your child.

We might be required to share the information we collect from your child with the Clemson University Office of Research Compliance and the federal government’s Office for Human Research Protections. If this happens, the information would only be used to find out if we ran this study properly and protected your child’s rights in the study.

Contact Information

If you have any questions or concerns about this study or if any problems arise, please contact Professor Bryan Denham or Wendy Blanchard at Clemson University at 864.656.3151 or wlblanc@clemson.edu.

We also need your input at our Parent Survey:

Consent

I have read this form and I have been allowed to ask any questions I might have. I give my permission for my child to be in this study.

Parent’s signature: ________________________________ Date: ________________

Child’s Name: ________________________________

A copy of this form will be given to you.
Appendix C

Student Consent Form

Student Assent/Agreement to Be in a Research Study
Clemson University

The Impact of Digital and Natural Play Upon the Body

You are being invited to be in a research study. Below you will find answers to some of the questions that you may have.

Who Are We?

Both Professor Bryan Denham, as Principal Investigator, and Wendy Blanchard, as Ph.D. candidate at Clemson University, are inviting you to take part in a research study on the impact of digital and natural play. Bryan Denham is a Campbell Professor of Sports Communication at Clemson University. Wendy Blanchard is a Ph.D. candidate at Clemson University running this study with the help of Professor Denham.

What Is It For?

The purpose of this research is to understand the impact that electronic media, and particularly digital exercise games, are having upon the overall physical health of the student and the way they may be impacting social community. We are also interested in how these games may be contributing to a withdrawal from time in nature, or natural play.

Why You?

- You are being selected as you are part of the _____ student body.

What Will You Have to Do?

- Take a survey of approximately 40 questions, which should take about 15 minutes as part of this study. Many of these questions require little time in order to answer them quickly. Students may also be asked to take part in a group discussion of 8-12 students for 30-40 minutes on the ____ campus.

What Are the Good Things and Bad Things that May Happen to You If You Are in the Study?

- This survey may allow you to question your time on electronic devices and the impact it has on your life, including your physical body and your social community, and it may create a way to open discussion with peers and other adults about the subject matter.

What If You Want to Stop? Will You Get in Trouble?

- You do not have to be in this study. You may choose not to take part and you may choose to stop taking part at any time. You will not be punished in any way if you decide not to be in the study or if you stop taking part in the study, nor will your grade be affected in any way.
Do You Have Any Questions?

- If you have any questions or concerns about this study or if any problems arise, please contact Professor Bryan Denham or Wendy Blanchard at Clemson University at 864.656.3151 or wlblanc@clemson.edu.

By being in this study, I am saying that I have read this form and have asked any questions that I may have. All of my questions have been answered and I understand what I am being asked to do. I am willing and would like to be in this study.

A copy of this form will be given to you.
Appendix D

Digital & Natural Play Student Survey

Digital & Natural Play STUDENT Survey

Demographics

This survey takes a quick 10 minutes. This study begins with a few short questions that are identifiers for the researchers but will not be included as individual identifiers as part of the published study. In other words, no single person will be distinguishable from the data he/she enters.

We appreciate your contribution to this study, which is conducted through federal Institutional Research Board (IRB) approval gathered by Clemson University. This particular survey is for students only at the school selected (GTC85) and all questions for this study are based primarily off of the student’s perception of the impact of digital play and natural play on their own emotional, social, mental and physical health.

If you need to send me additional information, I am at wblanc@clemson.edu. I thank you for your participation.

Wendy Blanchard

*1. DEMOGRAPHICS (Please note that all information is confidential and no identifying markers may be used in the publication of this data):

| Student’s Name: |   |
| Parent’s Name: |   |
| Their Family Group |   |
| Teacher: |   |
| Parent’s Contact Number: |   |
| Student’s Email Address: |   |

2. DEMOGRAPHICS: These answers remain confidential with this study.

<table>
<thead>
<tr>
<th>GENDER</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
</table>

3. DEMOGRAPHICS: These answers remain confidential with this study.

<table>
<thead>
<tr>
<th>AGE</th>
<th>Younger than 15</th>
<th>15-16</th>
<th>17-18</th>
<th>19+</th>
</tr>
</thead>
</table>

4. DEMOGRAPHICS: These answers remain confidential with this study.

- American Indian or Alaska Native: Persons with documented tribal descent or with a federally recognized tribe.
- Asian or Pacific Islander: Origins in the Far East, SE Asia, Indian Subcontinent, or Pacific Islands.
- Black/African American: Origins in any of the black racial groups of Africa.
- Hispanic/Latino/Spanish Origin: Of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture/origin, regardless of race.
- White/Caucasian: All persons having origins in Europe, North Africa, or the Middle East.
5. Has your parent completed the Parent Permission Form for you so that they may take the same survey, with minor adjustments, and has it been returned to their Family Leader/Group to Greenville Tech Charter High School (GTCHS)? It was initially sent thru e-loop and then through the student. It can be returned either to the Family Leader/Family Group at GTCHS or via electronic signature to wblanc@clemson.edu.

- Yes
- No
- It's on its way!
Digital & Natural Play STUDENT Survey

Survey Questions

You are now entering the survey portion of this study. We estimate that it will take approximately 10 minutes to answer the remaining 46 questions.

This system allows respondents to leave the survey and resume it later. However, this functionality is dependent on the settings you allow, including allowing cookies for a web link survey. If you click "Done" at the end, it will NOT allow you back into the survey.

The system saves responses through either a cookie or by the actual survey link. In either case, the [Next] button on a page or the [Done] button at the end of the survey must be clicked to save the page(s) of answers.

If a person exits the survey early, then s/he must come back to the same computer and use the same browser in order to pick up and finish.

NOTE: Cookies must be enabled. The cookie placed by us tracks the page where a respondent exited. If the respondent's browser is set to dump cookies each time it is closed, the cookie will be refreshed. A new or blank survey will open every time the survey is accessed.

6. Are video games and other electronic devices (TV, iPods, computers, etc...) positively or negatively affecting your health. Choose the degree from 1 to 7 that it is either healthy or unhealthy for you.

   1 HEALTHY  2  3  4  5  6  7 UNHEALTHY

7. Do you have rules in your household for the amount of time allowed on video games or computer usage outside of school work?

   ○ Yes
   ○ No

8. If you answered YES to the last question (Question #7), please give the amount of time that you use video game(s)/the computer at home doing non-school work outside of homework. This time would be for personal/social use. (If it is approx. 2 hours, 30 minutes, then use the first pull down menu for 2 hours, and the second pull down menu for 1-30 minutes. If it is just 10 minutes, then just pull down the 1st drop down menu and fill in "0 hours + ___ mins" and the 2nd drop down menu and fill in the minutes).

   Daily Video Game & Computer Usage

   Hours  Minutes

9. Are video games and other electronic devices (TV, iPods, computers, etc...) in general positively or negatively affecting the health of children in general?

   1 HEALTHY  2  3  4  5  6  7 UNHEALTHY
**Digital & Natural Play STUDENT Survey**

10. How much time do you spend each day, on average, on the computer doing school work while at home? Select from the following range of light to heavy.

- 1 LIGHT
- 2
- 3
- 4
- 5
- 6
- 7 HEAVY

11. Do you ever multi-task on another electronic device while studying/reading? (iPod, TV, Digital devices, etc...)

- Yes
- No
- Sometimes
- Not sure

12. If you answered YES to Question #11, how frequently do you multi-task on electronic devices while studying/reading? (Choose from the following degrees: 1-7).

- 1 NEVER
- 2
- 3
- 4
- 5
- 6
- 7 ALWAYS

13. How many hours of exercise a day do you average Monday - Friday, including designated PE time in school?

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. How many hours of exercise per weekend do you receive Saturday-Sunday? (Hours ___ Minutes ___)

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. On average, do you consider your daily exercise to be:

- 1 LIGHT
- 2
- 3
- 4
- 5
- 6
- 7 HEAVY

MODERATE
Digital & Natural Play STUDENT Survey

16. Where does your daily exercise take place (check all that apply):
   - [ ] At school
   - [ ] After school
   - [ ] After school program
   - [ ] Sports program affiliated with school
   - [ ] Sports program not affiliated with school
   - [ ] Summer (primarily)
   - [ ] At home
   - [ ] Other (please specify)

17. How IMPORTANT to your overall health do you consider your time spent exercising at school?
   - [ ] 1 IMPORTANT
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [ ] 6
   - [ ] 7 NOT IMPORTANT

18. If you exercise in the home, what type of exercise do you do? Check all that apply.
   - [ ] a. Exercise tapes/DVD's
   - [ ] b. Exercise equipment
   - [ ] c. Exercise video games

*19. If you answered Exercise Videos/DVD’s or Exercise/Video Games to Question #18, please specify which video/DVD that you use: (Ex.: The Firm Videos; XBox 360 - Your Shape Fitness Evolved; Kinect - Zumba Fitness; Kinect - The Biggest Loser Ultimate Fitness, etc...)

   [ ]
Digital & Natural Play STUDENT Survey

20. On a typical school day, approximately how many hours a day do you spend on video games?

Hours

Minutes

21. Regarding #20, if you spend time using video games, what percentage (%) of your time in video games goes towards either recreational gaming or exercise gaming, of your total video game usage? (Ex.: Recreational Gaming 10% of Total Time; Exercise Gaming 90% of Total Time: the combination of gaming and exercising should equal 100%). Please skip this question if you do not use video games.

Gaming: ___% (out of 100%) of Video Game Usage

Exercise: ___% (out of 100%) of Video Game Usage

22. To what degree is the exercise you do on video games as active as the same game in real life? For example, does the Wii Fitness tennis game, in your opinion, create a daily energy expenditure equal to or greater than playing tennis on a real court for you (to what degree)?

1. The “real” game requires MORE energy expenditure

2. The “real” game and the “virtual” game are EQUAL

3. The “real” game requires LESS energy expenditure

23. Do you meet government guidelines for exercise (daily energy expenditure) per day?

Yes

No

Unsure

24. What is the government guideline for daily energy expenditure?

30 minutes

1 hour

2 hours

3 hours

Not sure

Daily Energy Expenditure

25. Which of the following do you seem to enjoy more?

Indoors activity

Outdoors activity

26. Does your weekly family time typically include exercise outdoors?

Yes

No

Sometimes
Digital & Natural Play STUDENT Survey

27. If you answered yes or sometimes to Question #26, please give the degree to which your family exercises outside per week.
   ○ 1 LIGHT ○ 2 ○ 3 ○ 4 MODERATE ○ 5 ○ 6 ○ 7 HEAVY

28. Does your weekly family time include exercising through video games together?
   ○ Yes
   ○ No
   ○ Sometimes
   ○ Rarely

29. Where in the house do you exercise? Check all that apply.
   a. Living room
   b. Family room
   c. Exercise room
   d. Children's playroom
   e. Basement
   f. Bedroom
   g. None of the above
   Other (please specify)

30. Does the time you spend on video games overall seem, in your opinion, to have the potential to impact on your body POSITIVELY or NEGATIVELY?
   ○ 1 ○ 2 ○ 3 ○ 4 NEUTRAL ○ 5 ○ 5 ○ 7 NEGATIVELY

31. Does the time you spend in nature overall seem, in your opinion, to have the potential to impact your body POSITIVELY or NEGATIVELY?
   ○ 1 ○ 2 ○ 3 ○ 4 NEUTRAL ○ 5 ○ 5 ○ 7 NEGATIVELY

32. How much time per week do you spend outdoors?

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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33. Has your parent ever told you that you are spending too much time on video games or computers?
   - Yes
   - No
   - Not sure
   - Might have

34. In your opinion, can the time you spend exercising using video games in a particular sport replace learning that activity in “real life?”
   - Yes
   - No
   - Somewhat

35. If you answered YES to the previous question (Question #34), to what extent can it replace learning the activity in real life?
   - 1 NO REPLACEMENT
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7 FULL REPLACEMENT

36. Do you play games or interact as part of a virtual social community, such as Facebook or World of Warcraft, for example?
   - Yes
   - No
   - Unsure

37. If YES to Question #37, what game or social network do you use for social community?
   - Facebook
   - My Space
   - World of Warcraft
   - Other (please specify)
Digital & Natural Play STUDENT Survey

39. Do you feel that you would be better served by time in a “real life” social community, such as through a community sport, hobby or church group? (If yes, please answer #40).

☐ Yes
☐ No

40. What in particular are some of the hindrances (things that stop you) to creating more of a “real life” social community for you? Check all that apply.

☐ a. Time in general
☐ b. Interference from work schedule
☐ c. Neighborhood location, including issues with the following:
  ☐ a. Safety
  ☐ b. Isolation
  ☐ c. Few children their age
  ☐ d. Few places for free play activities
  ☐ e. Few adults to watch children
  ☐ f. New to area
  ☐ g. Unfamiliar with possible community activities available
  ☐ h. Have not been able to find strong support groups, inc. sports, church or other activities
  ☐ i. Living away from extended family

Other (please specify)

41. Do you feel that the level of friendship you create through social media is as strong as the level of friendship created in “real life”?

☐ 1 WEAK ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 STRONG

42. Do your parents have rules in place for the level of violence you may watch on TV or while playing video games?

☐ Yes
☐ No
☐ Somewhat

43. If you answered yes or somewhat to the last question (Question #42), what is the degree to which these rules are observed in the home?

☐ 1 ALWAYS ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 5 ☐ 7 NEVER
Digital & Natural Play STUDENT Survey

44. Of the homes that you visit, are there rules in place for the level of violence they may watch on TV or video games?
   ○ Yes
   ○ No
   ○ Unsure

45. If you were to eventually play professional sports, would the time you spend exercising to video or digital games be a contributing factor in your success?
   ○ Yes
   ○ No
   ○ Unsure

46. If #45 is YES, then to what degree?
   ○ 1 ALWAYS ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 NEVER

47. Do you have an aptitude (natural ability) for sports?
   ○ Yes
   ○ No
   ○ Unsure

48. Does the time you spend, if any, practicing this sport in real life increase your ability to play the same sport through a digital game?
   ○ 1 ALWAYS ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 NEVER

49. Does the time you spend, if any, practicing this sport on a digital game increase your ability to play the same sport in real life?
   ○ 1 ALWAYS ○ 2 ○ 3 ○ 4 ○ 5 ○ 5 ○ 7 NEVER

50. Where do you prefer to exercise?

   ○ Indoors
   ○ Outdoors
   ○ No preference

51. Do you feel safe visiting neighborhood areas outside your backyard alone or with your peers?
   ○ COMFORTABLE ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 UNCOMFORTABLE
Digital & Natural Play STUDENT Survey

52. Do you have your own cell phone? If not, skip the next three questions and begin again at Question #54.

☐ Yes
☐ No

53. What are the reasons that you are allowed to have a cell phone? Check all that apply.

☐ Safety
☐ Convenience
☐ Pressure from my peers
☐ Pressure from other adults
☐ Cell phone company's financial incentives/rewards
☐ Another parent/guardian gave it to me
☐ Helps my parent keep track of me
☐ Helps my parent maintain a closer bond with me

Other (please specify)

54. Are your parents concerned about you having a cell phone at this age, and if so why? If yes, answer Question #55.

☐ Yes
☐ No
55. What are some of the reasons your parent might be concerned with you having a cell phone at this age? Check all that apply.

- Potential medical repercussions
- Too much social time spent on phone
- Too much texting
- Takes me away from family time
- Decreases personal growth time
- Impacts school work
- Harder to control my dating/social networks
- Harder to control me in general
- Sleeping with phone at night
- Distracts me easily/Harder to keep them present

Other (please specify)

56. At what age do you expect to reach adulthood, which typically includes at least two of the following three items: Marry, buy a house, start a family

- Younger than Age 20
- Ages 20-29
- Ages 30-34
- Ages 35-39
- Ages 40-44
- Ages 45+
- Unsure
57. What might be the consequences of your parent attempting to “unplug” you from excessive time with the TV, cell phone, iPad/iPod, computer or other electronic device? Check all that apply.

- None
- Resentment/anger/emotional outburst
- Boredom
- Would need another form of entertainment
- Might want to spend more time outside the house
- Might need more time with parent
- Might need more time with siblings or other children
- Might affect overall happiness or contentment
- Might isolate me from peers

Other (please specify) 

58. Would you be interested in volunteering for a group discussion of approximately 8-12 students for 30-40 minutes at Greenville Tech Charter High School campus? If YES, we will contact you via the email address and phone number you listed as part of the demographic information on the front page. We apologize that we may not be able to contact all volunteers, and we appreciate your time and effort on this survey.

- Yes
- No


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