XY Needs in Education

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This paper is dedicated to the boys in my 2nd grade class in Shelbyville, Kentucky who inspired me to understand who they are and all boys like them.

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Abstract

This project examined the unique needs of boys in education. Biologically and physically, male students' developmental needs differ from their female counterparts. As a result, their educational needs are typically underserved and misunderstood in the standard co-educational classroom. This misunderstanding has led to a gap in educational achievement with girls outperforming boys throughout their school careers, from kindergarten through college. The purpose of this study is to establish the validity of boys' differential needs.

Five elementary school teachers, awarded their teaching credential within the past six years and within their first six years of teaching, were recruited to participate in an interview examining their knowledge of the specific needs of boys in education and their experiences regarding such. Questions were semi-structured in nature. Consistent with the literature review, results indicated abundant experience with sex-related differences in behavior but generally without the knowledge of why and without informed strategies to address them.

Major findings included consistent conveyance of boys' behavior as immature, encompassing references to self-control, distractibility, talkativeness, and impulsivity. Additionally, teachers unanimously reported feeling unprepared by their teaching programs for the different challenges they face in the classroom surrounding the topic of boy related needs. Based on these findings, a review of teacher credential programs is recommended in order to incorporate training that better equips future educators to deal with relevant issues of classroom management as well as developmentally appropriate milestones in students' lives, biologically, cognitively and physically.

Chapter 1 Introduction

Personal Anecdote

During my second year of teaching I was fortunate to have five students who consistently exhibited excess energy throughout the school year. They were good, intelligent kids. Why, then, did they struggle with sitting still, and completing their assignments on time or in a neat manner? The unifying theme was that they were all male. My experience working with children has consistently yielded similar results; boys are noisy, have trouble sitting still, and may become bored quickly. Conversely the girls are quiet, interested, and generally well behaved. As an educator it is my job to educate all the students in my class effectively, so why the differences and how is the male brain effectively engaged in the classroom?

Statement of Problem

There is a pervasive gap in the educational achievement between boys and girls in our education system touching on every aspect of the school experience. Boys have active needs that are not typically met in the traditional, sedentary classroom. These needs being unmet tend toward disruption problems in the classroom resulting in student and teacher frustration alike. Many boys disengage from the learning experience, which is reflected in the national trends of underachievement persisting through college. This gap has societal and economic implications as fewer boys, who do graduate high school, go on to pursue higher education (Kleinfeld, 2009).

Purpose

The purpose of this study is to substantiate the unique differences of boys and find strategies for teaching that better engage their minds. Male students have active needs that are typically underserved and misunderstood in traditional classroom situations. To better equip teachers to

serve those needs, will result in educational success rather than the frustration that typically results from trying to fit a square peg (xy) into a round hole (xx).

Research Questions

What are the unique needs of male students? What are effective ways to educate male students in the classroom? How can teachers be equipped with this knowledge and training?

Theoretical Rationale

In answer to the above questions, three leading experts in the field of educational gender equity emphasize the need for differentiated instruction touching on the areas of biology, sociology, and classroom factors.

Sax (2007) addresses the biological factors in stating that boys and girls are biologically wired differently which results in different developmental needs. For example, the language centers in the brain of a three-and-one-half-year-old girl is similar to that of a five-year-old boy. Therefore, teachers need different strategies to effectively engage both.

Furthermore, Gurian (1997) identifies that as a culture, we have neglected the developmental needs of boys. He acknowledges that both, boys and girls need specific attention relative to their gender.

In relation to classroom factors James (2007) writes that, "Whether boys and girls think differently because their brains are wired differently or because of societal expectations, they enter the classroom thinking differently and teachers have to cope with the differences" (p. 22).

All three theorists make considerable mention in their writings that the female and male brain dynamics are not black and white but when studied are consistently different. While they are proponents for single-sex education, they understand that boys and girls have a variety of learning styles and single-sex education may not be for everyone.

Assumptions

New teachers are not knowledgeable of the different needs of boys and girls in their classroom. Therefore, they become frustrated early in their teaching careers when faced with typical boy behavior. This frustration can be avoided with proper training. Simultaneously, boys are becoming frustrated with school as a result of not being understood. Proper training would better engage boys in their specific learning processes helping them to better enjoy school.

Background and Need

Since the enactment of Title IX in 1972, a law requiring gender equity for boys and girls in every educational program that receives federal funding, the pendulum swung from an inequitable, gender stereotyped educational system which had favored boys to the favoring and focus of girls. Many great gains have resulted from this reform. However, since that time there has been a steady decline in the achievements of boys in the United States education system. The achievement gap has persisted over the past few decades and is a matter deserving of our attention.

Duckworth and Seligman report that boys are trailing girls in every subject as cited in Sax (2005). The National Assessment of Educational Progress (2009) reveals a significant gap between achievements at the twelfth grade levels with girls scoring eighteen points higher than boys in writing assessments. In reading, the gap is another testament to the gender gap with girls outperforming the boys at 42% to 31% in proficiency or advanced placements. According to the University of Alaska Fairbanks (n.d.) in 2006 there were 77 men enrolled for every 100 women enrolled in college. Another concerning element is in the arena of special education. Coutinho and Oswald (2005) report that, “Gender disproportionality in special education has been apparent for many years, as indicated by a male-to-female ratio of about 1.5:1 and 3.5:1 for the high-

incidence disability conditions" (p. 7). Additionally, in the National Longitudinal Transition Study (Marder, Levine, and Wagner, 2003) reported that during the 2000-01 school year, at the secondary level, nearly two-thirds of students with disabilities are boys (62%). To further complicate matters, researchers have consistently found that younger teachers have very high rates of departure from the profession (Ingersoll, 2001). Being that Ingersoll goes on to report that 42% of all departures report job dissatisfaction, with lack of administrative support, low salaries, student discipline problems, and lack of student motivation being the underlying causes – the latter two hint at the possibility that teachers are not properly prepared to deal with the issues underlying the achievement gap in education.

The achievement gap may be reflective of deeper needs, the cause of deeper needs, or a combination of both. Gurian (1997) examined the scientific based literature on the neurophysiology of boys and reported:

> Boys are twice as likely as girls to suffer form autism, six times as likely to be diagnosed with hyperkinesis, and more likely to suffer birth defects. The majority of children identified as schizophrenics and developmentally disabled are boys. Emotionally disturbed boys outnumber girls 4 to 1. Learning-disabled boys outnumber girls 2 to 1. Boys are twice as likely to be the victims of physical abuse. Twice as many boys as girls are injured and die from physical abuse at the hands of parents and caregivers. By age nine, most boys have learned to repress all primary feelings except anger. For many boys rage becomes the principle conduit for repressed pain, fear, sadness and grief.
>
> Boys are four times as likely as girls to commit suicide; even when rape and

> incest are figured into the statistics, boys are three times as likely as girls to be victims of violence. (pp. xvii-xviii).

The Diagnostic and Statistical Manual of Mental Disorders reports:

> (American Psychiatric Association [APA], 2000) indicates that overrepresentation of boys in child psychiatric conditions is most striking for autism, stuttering, and attention-deficit/hyperactivity disorder. Male overrepresentation also occurs for conduct and oppositional–defiant disorders, Tourette's syndrome, encopresis, and enuresis. Among the childhood disorders, more girls than boys are reported only for separation anxiety and selective mutism.

These numbers point to a growing need for an understanding of boys in our classrooms and society.

Chapter 2 Review of the Literature

Introduction

A literature review was conducted of current research regarding gender differences in education. Differences in gender-based behaviors were found to be common across cultural lines. The cause of these behaviors has been a source of debate for decades. Recent neurological medical research has yielded important findings demonstrating biologically based explanations. The purpose of this literature review is to establish the biologically different developmental needs of boys and girls, provide information regarding the different approaches to best serve those needs in an educational setting, and place that information into teachers' hands.

Historical Context

Since colonial times education in North America has undergone a myriad of transformations. One such transformation was the shift from education being the primary responsibility of parents to that of schools while another fundamental change was the shift from education being optional for those who could afford it, to becoming a compulsory institution paid for by tax dollars. Amongst many other reforms education has continued to change with the ebbs and flows of the times, reflecting the world of which it is a part. Through all of these changes co-educational classrooms, which were a result of convenience rather than ideological convictions, have always been prevalent although there have always been pockets of single-sex schools.

As a sign of the times one could understand how that in the Colonial Era many girls were not educated, some were fortunate to learn to read, and few were well-educated as a result of their upper class status. Women's roles were often viewed as that of wife, mother, and possibly teacher. After 1776 the emphasis on women's education began to change as a result of the writings of Lydia Maria Child, Catharine Maria Sedgwick, and Lydia Sigourney who

emphasized the important role of women in our newly born country (Robbins, 2002). These authors discussed the critical role of women as mothers who, due to the closeness to their children, had the task of 'nation building', i.e. educating their young people in the ways of a new nation. Over the next few decades this attitude became very popular and women were beginning to be educated in the same subjects as their male counterparts. Education typically took place in a one-room schoolhouse for all ages with one teacher.

While girls made great gains accessing education throughout the nineteenth century a gender bias in culture was still prevalent in curriculum and in social life as men went on to have careers in the public sector and women stayed home. The early twentieth century reinforced these gender stereotypes with a surge of the number of vocational schools reflecting the time of the industrial revolution.

Vocational instruction was meant to prepare students for their adult lives. Home economics were geared towards girls while industrial education was geared towards boys. These gender stereotypical roles played out mainly in extra-curricular activities such as physical education and sports while the core subjects were still taken by both boys and girls. This type of education largely remained in place until the late 1960s and early 1970s when education underwent a major change.

The feminist movement had laid the groundwork for societal ideologies to shift. As a result, an awareness of the gender gap that had favored boys in educational achievement was seen and gender bias in education became an issue in society at large. Women and men were seen as equals and women were to be given the same rights to a rigorous and challenging education that would prepare them for rewarding careers in the public sector, the same as their male counterparts.

To accomplish this, the 1970s and 1980s released an overwhelming amount of work focused on girls needs in the field of education (Younger, 2007). Deem, Griffin, Sharma & Meigham and Sharpe (as cited in Warrington &Younger, 2000) found that, "researchers demonstrated that career expectations and subject choices were structured along traditional gender lines, to the disadvantage of girls" (p. 493). Title IX came into effect in 1972, a law requiring gender equity for boys and girls in every educational program that receives federal funding.

Great gains were made for girls as a result of this time; new textbooks were written to remove gender stereotyping, programs were put in place to encourage girls to take on subjects once viewed as 'male dominant' such as science and math, and girls were encouraged to take physical education classes and go to college. Girls were finally paid the attention they were long overdue. Unfortunately, with such a drastic swing in the pendulum, the needs of boys faded in the shadows.

The 1990s revealed the need for balance in our educational approach as boys began lagging behind girls academically. The attention girls received was very effective as they began outperforming boys in standardized testing, graduation rates, and college enrollment. A new need has to come to the forefront of our educational system: the need for gender equity in the classroom. No Child Left Behind (NCLB), signed into law 2002, loosened the limitations of Title IX restrictions, resulting in the ability to provide more options to educators in the public sector.

Review of the Previous Research

The goal of this literature review was to establish the different needs of boys and girls in the classroom. The literature revealed an ongoing discussion regarding the role of sex and gender

influences in regards to the following three arenas: biological factors, the educational factors in the classroom, and gender theory.

Biological Factors

The literature revealed an abundance of research pointing to the biologically based sex differences of boys and girls. This information brings a wealth of practical application in the classroom as information is primarily given and received via the senses.

Hearing and sight are two prominent examples of this and science has shown that the eye and ear are structured differently in males and females carrying fundamental weight in classroom dynamics. The way in which the human eye is structured, works, receives information and sends it to the brain is substantially different amongst the sexes (Sax, 2005). These differences in the eye play out in several ways. Men see motion better than women, color blindness is more common in men, and women have a higher tolerance for light (James, 2007). If a teacher is sedentary they risk the possibility of the losing the attention of the male students in their class to something else that catches their eye. Lutchmaya and Baron-Cohen (2002) conducted a study of sixty twelve-month-old babies (33 boys and 27 girls) to assess looking preferences to social or non-social stimuli. The subjects were shown video clips including human interaction (a man and woman talking/a man reading a storybook) or quick moving objects (race cars/windshield wipers). Seventy-nine percent of the boys stares demonstrated a non-social preference, whilst only 37% of girls did and 56% of girls demonstrated a strong social preference. Lutchmaya and Baron-Cohen (2002), conclude that there is some degree of biological differences, "influencing how attention is deployed by the male and female brain" (p. 325).

The ear is another of the senses that shows sex differences. Overall, the construction of the ear is very similar, however, it has been demonstrated that females hear better than males.

James (2007), reports that, "the innermost part of the ear, the cochlea, shows significant sex differences" (p.18), and James (2007) cites, Don, Ponton, Eggermont, & Masuda, and McFadden, stating that, "the cochlea is longer in boys, and consequently boys have longer cochlear response times" (p.18). Many researchers state that girls are more sensitive to sound than are boys. Janel Caine (as cited by Sax, 2005) researched the effects of music therapy on premature babies. She found that playing music for premature babies resulted in earlier release times. Caine had not set out to study gender however, it turns out that girl babies were the only ones who benefitted from the music therapy. Sax (2005) reported psychologist Colin Elliott's demonstration of eleven-year-old girls being more distracted by noises ten times softer than noise levels boys find distracting.

The remaining senses, although not central to traditional methods of teaching can also be utilized as effective learning tools. The olfactory sense is directly connected to the amygdala and according to Cahill, Uncapher, Kilpatrick, Alkire, & Turner, (2004) is one place where memories are formed. While the amygdala is bigger in males, girls sense of smell, along with touch and taste, have been demonstrated to be more sensitive (Gurian, 1997; James, 2007).

The achievement gap has not been demonstrated to be a difference in intellectual capability as there have been no significant differences found in IQ (Gibb, Fergusson, Horwood, 2008; James, 2007). In fact, on the Wechsler Intelligence test boys score slightly higher than girls (James, 2007). However, many studies have been conducted on the activity and structure of the brain revealing that female and male brain structures are intrinsically different. (Gurian, 1997; James, 2007; Sax, 2007). One difference is not superior compared to the other, simply a different way of processing information.

The brain, which is doing the learning, is a complex organ involving decades of extensive study where much is yet to be discovered. In his book, *Why Gender Matters*, Sax (2005) reports the findings of one such study conducted in 2004 by a team of fourteen neuroscientists from the University of California, the University of Michigan, and Stanford University. Their findings demonstrated that female and male brain tissue is intrinsically different based on analysis of unidentified samples of brain tissue from thirty different individuals. In every case, brain tissue was correctly identified as being male or female. The proteins within the male brain tissue are made up of different proteins based on the presence of the Y chromosome, beginning at conception.

There have been consistent findings regarding portions of brain structure and functioning that give insight regarding the ways in which the male and female brains are inclined to work. One example of this is the corpus callosum, the largest tract of nerve fibers in the brain, which connects both hemispheres (Beers & Merck, 2003). The corpus callosum and anterior commissure, another set of connecting fibers, are larger in girls than in boys (Gurian, 2003; James, 2007), and with more connecting fibers it is thought that there is more cross talk between the two sides of the brain. The prefrontal cortex, the area of the brain right behind the eyes which continues to develop through adolescence, is thought to be the area of the brain that regulates decision making and self-control, and develops faster in girls than in boys (James, 2007; Brizendine, 2010, Sax, 2005). Additionally, the National Association of Single Sex Public Education (2010) discusses research conducted by neuroscientists at the National Institute of Mental Health (NIMH), stating that,

> These researchers found that while the areas of the brain involved in language and fine motor skills mature about six years earlier in girls than in boys, the areas of the brain

> involved in targeting and spatial memory mature about four years earlier in boys than in girls. These researchers concluded that the areas of the brain involved in language, in spatial memory, in motor coordination, and in getting along with other people, develop in a different order, time, and rate in girls compared with boys (para. 4).

These studies attest to the different developmental trajectories of the male and female brain and support pediatric endocrinologists Dr. Gaya Aranoff and Dr. Jennifer Bell from Columbia University, as cited in Sax (2005). They say "there is increasing evidence to suggest that the brain is a sexual organ, that brain sex [i.e., the sex of the brain] is paramount in determining human gender identity"(p.11).

The amygdala and hippocampus are yet other sections of the brain associated with sex differences. The amygdala, the driver of emotional impulses and the place attributed to memory, is larger in men than women (Brizendine, 2010; Cahill, et al., 2004; Gurian, 2003) and in males is less connected to a verbal part of their brain (Gurian, 2003). The hippocampus, "is involved in the formation and retrieval of memories" (Beers & Merck, 2003, p.434) and is larger in women than men (Gurian, 2003; James, 2007).

The dynamics of how the brain and senses work together influence ways in which we communicate. Based on different developmental trajectories and intrinsic differences, girls begin speaking sooner and more often than their male counterparts (James, 2007). They also outperform males in reading and writing throughout their school career (U.S. Department of Education, 2011). James (2007) cites many sources and various studies when discussing the verbal advantage women have as they utilize both sides of their brains language centers comparatively to males who have been found to primarily utilize only one in the left hemisphere.

Supporting this idea she states that damage to the left side of the brain in men is likely to cause disruption of language skills whereas similar damage in women are likely to recover some language skills. Sax (2005) supports this in his discussion of the different effects of strokes on men and women. If a man suffers from a stroke affecting the right hemisphere of his brain it essentially makes no difference in his verbal IQ, whereas if it affects his left hemisphere his verbal IQ suffers about 20 percent. Conversely, for a woman, it does not matter which hemisphere is affected, she will suffer an average loss of 9-11 percent of her verbal IQ. These reports make it clear that men do not use both sides of their brain for language while women do.

Language is considered to be the female advantage while spatial skills (mental rotation, spatial perception, and spatial visualization) are considered the strongest male advantage (James, 2007). Many studies have been done that reveal boy babies prefer looking at moving objects whereas girl infants look at faces longer (Sax, 2005; James, 2007).

The primary chemicals at work in the brain are fundamentally different in males and females giving insight into the types of behaviors typically exhibited by them. Brizendine (2010), writes, "in the female brain, the hormones estrogen, progesterone, and oxytocin predispose brain circuits toward female-typical behaviors. In the male brain, it's testosterone, vasopressin, and a hormone called MIS (Mullerian inhibiting substance) that have the earliest and most enduring effects" (p3,4). Vasopressin and testosterone are found in larger quantities in males (Gurian, 2003) and are said to be aggression hormones (Brizendine, 2010, Gurian, 2003). Contrastingly, serotonin, estrogen, progesterone, and oxytocin are the dominant hormones in women and are said to be calming and nurturing (Gurian, 2003).

These differences in hormones play an important role in activity levels exhibited by boys and girls. While a wide variety of behaviors is normal it has long been known that, "boys show

more aggression than do girls" (James, 2007, p.49). James goes on to cite Neall, "it is the aggressive and competitive nature of boys that creates problems in the schoolroom, but giving them plenty of opportunity to be active will allow them to use their energy positively" (p.49). Brizendine (2010), summarizes the above information on biological differences well:

> The vast new body of brain science together with the work I've done with my male patients has convinced me that through every phase of life, the unique brain structures and hormones of boys and men create a male reality that is fundamentally different from the female one and all too frequently oversimplified and misunderstood (p. 2).

Teachers aware of these biological differences can differentiate instruction to engage all learners.

Classroom Factors

There are numerous dynamics and a variety of factors contributing to the success, mediocrity, or failure of learning in the classroom. It is noted that teachers are given a tremendous responsibility and great challenge to educate a group of diverse students with different backgrounds, interests, and needs. However, in consideration of the biological differences of boys, are there best practices that should be employed in classrooms that would better engage them, thereby reducing the gender gap in academic achievement?

There is a grim picture painted regarding the performance and behavior of boys in the classroom. The majority of behavioral issues in a classroom come from boys (Gibb, et al., 2008), they are academically trailing their female counterparts (U.S. Department of Education, 2011), and many report boys to be lazy and unmotivated (Kleinfeld, 2009; Martin, 2003). However, Reichert and Hawley (2010) report that, "in schools of all types in all regions of the globe, many boys are thriving. Boys of limited, ordinary, and exceptional tested aptitude, boys

of every economic strata; boys of all races and faiths - *some* of them – are appreciatively engaged and taught well every day" (p 35).

Reichert and Hawley (2010) conducted an international study of effective teaching practices for boys, without any intention of finding a, 'boy-specific pedagogy'. The participating schools were all boy schools in the United States, Canada, New Zealand, Great Britain, South Africa, and Australia. All boy schools were chosen for the study as they were looking to see what practices work best with boys and apply those practices generally. All teachers in grades 7-12 were asked to share, on a voluntary basis, "an example of a lesson that worked especially well and provide reasons for its effectiveness" (p.36). Additionally, boys were asked anonymously to share a class experience that stood out for them as especially memorable. Researchers were surprised at the overwhelming response they received from each group. Over 1,000 teachers responded with great care and detail and over 1,500 students replied with personal stories of teachers who had impacted them and why. The common theme found in the teachers lessons, and confirmed by the boys themselves, was that effectiveness in engaging boys academically is found in a "pedagogy fitted to boys' experience and interest" (p.37), and, "nearly every reported lesson included multiple elements, as when a teacher devises a game in which boys form teams to create a product that will be judged competitively" (p.36). Furthermore, amongst the categories of submission there were none that included quiet seatwork. Conversely, they were all active in nature. Kindlon and Thompson (2000), support this finding in their book, *Raising Cain: Protecting the Emotional Lives of Boys* stating that, "When normal boy activity levels and developmental patterns are accommodated in the design of schools, curricula, classrooms, and instructional styles, an entire stratum of "boy problems" drops from sight" (p.47).

Another key finding in the literature was that boys are relational learners (Hubbard & Datnow, 2005; James, 2007; Reichert and Hawley, 2010; Wills, R., Kilpatrick, S., & Hutton, B., 2006). The boys' responses in Reichert and Hawley's (2010) study, revealed that it was difficult for them to resist engaging in the learning process when their teachers were open, humorous, fair, and caring. James (2007) attests to the importance of the relational learning style of boys in her writing as well and states that they, "need to be actively involved and to feel positively about school in order to be engaged in the learning process" (p.118). Andrew Martin's (2003) work, which has centered on school motivation, concluded, "particularly critical to students' engagement and motivation in a particular subject was their relationship with their teacher" (p.54).

Being that relationship is a critical component to students' engagement Myhill and Jones' (2006) study is relevant to the issue of engaging boys in learning. They conducted a study regarding students' perceptions of how teachers treat them and the predominant perception is that boys are treated more negatively. One hundred forty-four students were asked the following question, "Do you think boys and girls are treated the same?" The theme of response was almost unanimously related to behavior issues and discipline with, "a significant perception that teachers treated boys more negatively than girls" (p.106). Whether or not this perception is the result of disruptive behavior or the cause of it, it does not foster a positive relational element between student and teacher. Interestingly, Younger & Warrington (1996) reported that few teachers acknowledged treating boys and girls differently.

According to a study conducted by Gibb, et al., (2008), the gender achievement gap is directly related to disruptive behavior, something they found to be a clear distinction in classroom behavior with boys. When those behaviors are adjusted for, the achievement

differences reduce substantially. They conclude that one way of reducing differences in academic achievement is to improve classroom behavior.

> There is a small but growing literature on school-based programs that are effective in reducing disruptive behavior… "in particular, group reward contingencies in which reinforcement depends on the collective behavior of the group have been shown to be highly effective and are less time-consuming than individual reward contingencies" (Gibb, et al., 2008, p.75).

Although Title IX states that education is to be gender equitable there appears to be a lack of literature regarding the preparation of teachers in knowledgeably dealing with sex-related, developmental issues pertaining to boys. King, Gurian, and Stevens (2010) who have worked with hundreds of schools in a training capacity from the Gurian Institute report that, "Most of the teachers we work with realize that the preparation they received in graduate school and teacher certification programs to teach "all students" was in fact training for verbal and sedentary learning"(p.40). However, those reporting success with boys in education are attributing it to strategies directly related to sex/gender related training or professional development. A boy-friendly curriculum including things like longer recesses, fidget toys, seating arrangements, hands on activities are basic things covered in these types of training which also provide a deeper understanding of how the male brain functions and best ways to engage it and what boys physical activity levels are during different periods of his development (James, 2007).

Single-sex education classes are growing rapidly. According to the National Association for Single-Sex Public Education (2010), "In March 2002, when NASSPE was founded, only about a dozen public schools offered single-gender classrooms. As of January 2011, there are at

least 524 public schools in the United States offering single-sex educational opportunities" (para. 1). Many of these schools are co-educational but offer the choice of a single-sex classroom setting, which according to Sax (2007), is very important as children from the same family may thrive in different settings.

A testament to their success, a co-educational school in England has been offering single-sex classes for sixteen years and as such was able to provide a long-term study regarding its effectiveness. Through the analysis of achievement levels of students over the history of the schools existence this study suggests that boys and girls benefit from having their own learning space (Younger & Warrington, 2002). Younger and Warrington reported that achievement scores consistently improved, "at rates significantly above the national average" (p.371).

Teachers equipped with and using tools based on this training are experiencing higher rates of job satisfaction, seeing classroom management issues significantly reduced, more confidence in girls, more self-discipline in boys, better social skills, and an overall improvement in academics (Wills, et al., 2006; Younger and Warrington, 2002). Teacher training is therefore a critical component of student success.

Students report a higher level of school satisfaction in single-sex classrooms. They are less distracted with impressing the opposite sex and focus more on the learning at hand. Hubbard and Datnow (2005) interviewed students who had moved from a co-educational setting to a single-sex setting and reported that, "when boys did not have girls present, they felt less need to show off, act out, or engage in attention-getting behavior" (p.121). For girls they reported that, "the single-sex setting was a safe haven that offered them a chance to concentrate on their academic work" (p.122). Additionally, administrators expressed that the single-sex setting helped to reduce gender stereotypical notions regarding subject content.

Researchers have shown that boys' learning is enhanced when competition is utilized as a strategy (James, 2007). However, when girls are around they will often engage in direct competition where only one emerges as the victor. This type of competition is not recommended in the classroom. Remove this element, and boys can focus their energies elsewhere.

The literature addresses the idea that boys learn better from males and therefore, we need more male teachers. While males are underrepresented in the teaching profession, especially in primary and elementary education, (Carrington, B., Tymms, P. & Merrell, 2006) it was found that the sex of the teacher is not as important as the relationship established between teacher and student. Martin's (2003) study supported this finding as well. Out of 65 boys in the qualitative portion of his study, only one or two students (unprompted) report the sex of the teacher as being a factor. When students were directly asked whether the sex of their teacher made a difference, the majority reported that it did not.

The gender achievement gap is deserving of our attention as educators. Fortunately, the problem, as Reichert and Hawley (2010) put it, is "identifiable and correctible" (39). The literature clearly acknowledges that many boys are not thriving in our contemporary education system and proper training changes that. Gibb, et al., (2008), Gurian (1997), James (2007), Myhill and Jones (2006), Reichert and Hawley (2010); Sax (2005), (2006), Wills, et. al. (2006), among others, point to practical solutions that are working everyday in schools employing these boy-friendly methods.

Gender Theories/Social Role Model Theory

'Gender Theory' is the notion that behavior that can be classified as male or female is solely the result of social training. In other words, when a child is born it is born with a blank slate and all behaviors therefore are learned from the society around them.

While there are debate, theory, and conjecture regarding the cause of the achievement gap, its existence is never called into question. Rather, surrounding this issue are two key questions, why does it exist and how can we fix it? It has already been noted that the gap is not the result of cognitive ability. Biology plays a distinct role – to what level is another question. Gurian (1997) states it well when he writes, "Brain research does not mean biology is destiny. It means biology is proclivity. The brain is so wonderful a mechanism that anyone can be most anything,… Opportunity need not be curtailed to anyone based on sex or gender" (p.13). An awareness and understanding of what female and male brains are predisposed towards benefits the teachers working with them.

There are those who fear that single-sex classrooms encourage macho attitudes. Interestingly, (as cited by Costa, Terracciano & McCrae, 2001) the National Institute of Health (NIH) conducted a cross-cultural study where they found gender differences persisting across cultures including China, Zimbabwe, Japan, South Korea, India, Russia, Italy and many more countries. They found that, "Gender differences are most marked among European and American cultures and most attenuated among African and Asian cultures" (p.327), which is contrary to predictions from social role model theories. In other words, this finding simply states that in western cultures which believe themselves to be more liberal in their views of the sexes and not driven by stereotypical notions of gender, are in fact more so than cultures that are

perceived as captive to gender roles. The National Association of Single-Sex Public Education (2010, para. 2) interestingly points out that these differences appear greatest in young children where many believe they have not been as 'socialized' into these modes and yet they demonstrate it the most.

The roles of social role model theories are of great importance as teachers knowingly or unknowingly take their ideas with them into the classroom. The U.S. Department of Education, (2011) reported that in 2007-2008, 76% of teachers in public schools were women. What views and expectations of 'proper classroom behavior' do these teachers bring with them? Are boys supposed to express their feelings in the same way that their teachers do? Are they to sit quietly, for extended periods of time drawing colorful, detailed pictures of themselves playing at the park?

All of the experts are clear in stating that no one person can be absolutely put into a box because there are a range of personalities and preferences on the learning spectrum. However, many studies reveal that amongst this differentiation existing within the sexes, girls will still be more like girls than their male counterparts and visa/versa (Sax, 2005; Gurian, 2006; James, 2007). King, et.al, (2010) reiterates this when they state,

> Learning styles and preferences fall along a wide spectrum and there can be overlap… and every child is unique in their own way… As a group, however, boys are much more likely than girls to be graphic thinkers and kinesthetic learners and to thrive under competitive learning structures. Some of the gender differences are undoubtedly linked to societal influences, but some also stem from physical differences in the brain identified by neuroscientists (p. 39).

In academic achievement there is a clear divide amongst the genders. Some of the literature states that social class, sexuality and ethnicity are perhaps more important than gender in determining achievement levels in schools – while these issues also merit attention, the literature strongly demonstrates that effective pedagogy addressing gender related issues have been successful regardless of social class, race, and ethnicity (Younger & Warrington, 2002; Reichert & Hawley, 2010). Oswald, Best, Coutinho, and Nagle (2003) report on the role of ethnicity/race and gender pertaining to representation in special education. Their results indicated that gender was the consistent, prevalent factor when looking at disproportionate placement, stating that, "National gender odds ratios vary only slightly by race/ethnicity" (p. 9).

Administrative Records

When the No Child Left Behind (NCLB) act was signed into law in 2002 it loosened the limitations of Title IX restrictions thereby resulting in the ability to provide more options to educators in the public sector (Hughes, 2007). Prior to NCLB, public schools receiving federal monies were not authorized to offer single-sex classrooms. With the growing, sex-related achievement gap, policy makers became aware that offering a single-sex class as an option was not a failure to provide equal opportunity but an enhancement of options for schools willing to make this a viable option for interested parents.

Special Collections

Center for the Study of Boys' and Girls' Lives

The Center for the Study of Boys' and Girls' Lives was founded as a research collaboration between the University of Pennsylvania's Graduate School of Education and what has now become 9 independent schools. Historically, the Center was created to help schools address concerns related to boys: amidst a politically-charged discourse about boys' and girls' relative

school performance, schools acknowledged problems—moral, behavioral, academic—with boys and wished to develop evidence-based improvements in their educational practice. In the course of this work, it became evident that to consider boys was always also to consider girls, not to mention the school overall. (Center for the Study of Boys' and Girls' Lives, 2011).

National Association for Single Sex Public Education

NASSPE is a 501(c)(3) non-profit organization founded in 2002, dedicated to the advancement of single-sex public education for both girls and boys. We do NOT believe that every child should be in a single-sex classroom. We DO believe that every parent should have a CHOICE of formats, single-sex vs. coed. In many American cities, affluent parents can choose whether to send their child to a coed private school or a single-sex private school; but less wealthy parents, who cannot afford private school, don't have a choice. We believe that parents are the best-qualified people to decide which format would be best for their child (National Association for Single Sex Public Education, 2010).

International Boys School Coalition

Founded in 1995, the International Boys' Schools Coalition is a not-for-profit coalition of independent, parochial and public schools from around the world dedicated to the education and development of boys worldwide, the professional growth of those who work with them, and the advocacy and the advancement of institutions that serve them (International Boys School Coalition, 2011).

Boys Project

The mission of The Boys Project is to help young males develop their capabilities and reach the potential that their families and teachers know they have. The Boys Project seeks to accomplish for young men what the Girls Project so successfully accomplished for young women - to

increase academic skills, to increase college success, and to develop the confidence, drive, and determination to contribute to American society (University of Alaska Fairbanks, n.d.).

Statistical Information

According to the National Center for Education Statistics (NCES) the drop out rate of males is higher than females at 53.4% to 46.6% (Chapman & KawalRamani, 2010). At the end of students' basic education we see a widening gap nationwide among twelfth graders tested in reading. Recent data released by the National Center for Education Statistics, in February 2007 revealed that in 1992, girls scored 297 and boys, 287. Then in 2005 the girls' score dropped five points to 292 and boys dropped eight points, to 279. The NCES reported that "Female Students Outperform Male Students by a Wider Margin in 2005 than in 1992" Sax (2007), reports that, "This gap is roughly equivalent to one grade level." (237)

In the summary section of their 2005 Report the NCES listed the following:

Comparisons by gender

- Male and female graduates' GPAs overall and in mathematics and science have increased since 1990. Female graduates' GPAs overall and in mathematics and science were higher than the GPAs of male graduates during each year the HSTS was conducted.
- In 2005, a higher percentage of female than male graduates completed a rigorous or midlevel curriculum, compared to 1990 when there was no significant difference in the percentage of males and females completing at least a midlevel curriculum.
- Among those who have taken higher level mathematics and science courses, male graduates had higher National Assessment of Educational Progress (NAEP) scores than female graduates. There was no significant difference in scores between males and females who had not taken these higher level courses (Shettle et al., 2007).

Interview with an Expert

Sample

To gain a deeper understanding of the world of boys, their ideal learning environment, and the potential benefits of single-sex education, an interview with an expert was conducted. Abigail Norfleet James, author of *Teaching the Male Brain: How Boys Think, Feel, and Learn in School*, is a psychologist with an undergraduate degree from Duke and a Ph.D in Education from the University of Virginia. Coupled with her educational background Dr. James is considered to be an expert in the field of gendered education. She was immersed in the world of boys from childhood as her parents were teachers at an all boys' school, she is an experienced teacher in co-educational and single-sex classrooms for boys and girls, and she is the mother of a son. Additionally, she has published several reports of research regarding gendered instruction, has presented workshops and conducted seminars on the topic, and her expertise is sought out internationally. Furthermore, she is professionally affiliated with the American Educational Research Association, the American Psychological Association, the Association for Supervision and Curriculum Development, the Gender and Education Association, the International Boys' School Coalition, and the National Association for Single-Sex Education (advisory board member).

Considering her expertise and unique insight I requested an interview with her via email to which she responded favorably. A time was set to interview via Skype, as Dr. James is located in Virginia. The interview with Dr. James took place in January 2011. It was informal in nature, beginning with a question regarding her background in education.

With her extensive background in education, research and counseling experience, Dr. James is a wealth of knowledge regarding the male brain educationally as well as

developmentally. Her personal story is similar to many moms who convinced of the weight of social engineering, set out to raise their son(s) in a non-gendered fashion only to reveal that despite their efforts to keep their boys from stereotypical 'boy' toys and give them 'girlish' or neutral ones, they find their sons inventing or creating toy guns and playing some version of cops and robbers. As Dr. James took notice of her sons' typical 'boy' behavior and put it together with trends in education and her psychology background she began to research and consider that boys may be biologically different than their female counterparts. She has since become immersed in the world of gender equitable education and is a leading expert on the topic.

In our discussion, Dr. James (personal communication, January 17, 2011) keyed in on a crucial piece of the puzzle effecting a majority of boys. Boys, due to their nature, have more physical needs that are not conducive to the traditional classroom approach of sitting still for hours at a time. They are what she refers to as, 'active learners.' They need to move and interact on a variety of levels with what they are learning. She referenced a study conducted by Reichert and Hawley, asking male students and teachers to submit their favorite and most effective lessons. The result, astoundingly pointed to the reality that boys need hands on lessons. Active learners, like herself and her son, are often categorized as having ADD or ADHD. Rather than medicating these active needs, teachers can be equipped with insights and strategies, and students can be taught coping methods to help them succeed. Throughout her book she references practical ways in which to support active learning needs.

I asked Dr. James if there is a developmentally appropriate time for single-sex classes. Her first response was middle school due to the obvious physical differences, but then shifted her focus to 3rd grade. There is reading shift that takes place from learning to read, to, reading to learn and it is during this time that boys begin lagging behind. In her mind, she added, the ideal

school would have two single-sex schools on the same campus where non-graded activities such as lunch could be co-educational for social purposes.

Dr. James shared a story about her son going to an all boys school and later transferring to a co-educational one for high school as an example of the freedom children have to explore subjects and activities they enjoy at single-sex schools. She attributes this freedom as a benefit of single-sex schools where students do not develop stereotypical attitudes. At the single-sex school her son was in choir and learned to sing very well (not something you see a lot of boys pursue in a co-educational setting). When he transferred to the co-educational school he tried playing football but was not very big at that time. He continued with choir where he made a lot of friends who were 'girls'. The boys on the football team eventually observed this dynamic of making 'girl' friends in choir and began joining (this after having teased her son, of course). By his senior year the makeup of his choir class had changed dramatically. When he first joined during his freshman year he was one, or one of very few boys in that class and by senior year there were an equal number of boys and girls in the choir. In this story, single-sex schooling accomplished the opposite of reinforcing 'macho' attitudes.

I asked Dr. James what she felt was missing in U.S. educational practices in its approach to teaching boys. She replied that, "We need to understand what learning is. Learning is not memorization. Learning changes behavior." She continued to elaborate and discussed the complications of how the idea of memorization has taken hold and now that it's failing our system, businesses are logically stepping in and pointing to a need for accountability. This is problematic with NCLB as learning requires non-structured answers and allowing children the space to solve problems, rather than just giving them the answers. This is also apparent socially as we step in whenever children disagree. Dr. James pointed out that when children are young is

the developmentally appropriate time for them to learn to work through problems on their own, otherwise when they are older what will they resort to? Will they know how to deal with conflict? Dr. James also suggests that we need to teach children to learn to debate and gave an example of a time she attended a debate that was completely 'boring'. She noted that no one got hot under the collar or demonstrated any passion. Her question was, "Isn't that the point of a debate?"

A large portion of research conducted on the effectiveness of single-sex schooling takes place in Australia and New Zealand and I asked her if she new why that was the case as she has spent time in both countries and is aware of the educational dynamics there. In New Zealand every city has a coeducation school, an all girls school and an all boys school. In Australia there are a lot more single-sex schools but they are usually private. She made and interesting observation in reference to this. In the United States, 10% of students are diagnosed with ADHD whereas in Australia, where there are more all boy schools the numbers of students with ADHD is dramatically lower, only .08 of 1%. This potentially points to a benefit of single-sex education as an option.

Video games have become an area of concern in recent years, some speculating they are causing boys to disengage from school. When asked about this potential correlation Dr. James responded that, "Video games are not teaching anything. Even recent research points out that Baby Einstein videos are not teaching anything." Her concern is that students need to engage with people to learn and that video games are not supportive of this and teach nothing.

Dr. James advocates gender equity in the classroom believing that when the student is fully understood and appreciated for who they are, learning can truly take place. Learning for a majority of boys requires attention to their unique needs. One example we discussed was the use

of rites of passage, where boys demonstrate they have earned certain privileges or status. She believes this can be highly effective along with many other strategies fine-tuned to the needs of boys. Her book addresses the male brain extensively and offers numerous suggestions like these that can be incorporated into every classroom.

Ethical Standards

The interview with an expert and subsequent interviews with teachers study followed the protocols established in the Publication Manual of the American Psychological Association (2009) on preserving the rights of human subjects. Additionally, this research study was reviewed by the Dominican University of California Institutional Review Board for the Protection of Human Subjects, approved and assigned a number, 8238. As a part of the requirements of IRBPHS, Dominican University faculty and interview participants were given a document, signed by the researcher, alerting them to the nature of the research project, questions they would be asked, and the process for maintaining confidentiality. Participants were also informed of the timeline for completion of this project and when they would receive the results.

Summary

The literature, administrative records, special collections, and interview with an expert reveal growing attention to sex-related issues in and around academic success. While there remain those who fear that acknowledging differences between the sexes will result in reinforcing gender stereotypes research has shown that with proper training the reverse is true. For example, more girls participate in competitive sports at all girls' schools. Additionally, and of particular interest to this project, the literature review reveals that where sex differences are acknowledged and integrated into teaching methodologies academic scores increase, behavior problems decrease and teacher satisfaction is enhanced.

Chapter 3 Method

Methodology

This is a qualitative study using teacher interviews to gather information on teacher knowledge of the developmental differences in learning between boys and girls.

Description of Sample/Participants

The individuals participating in this study have graduated from a teaching credential program within the past six years and are within their first six years of teaching in an elementary classroom. Newer teachers were selected to determine their knowledge of gender related issues arising in their classrooms. These five teachers were selected as a purposive sample of convenience; two graduated from the same teacher credential program as myself and the remaining five were selected from a nearby elementary school where, through volunteer work at that school, I was acquainted with the principal and asked for recommendations of newer teachers who might be willing to participate in this study.

Access and Permissions

I requested two former classmates from my credential program if they would volunteer to be interviewed for this project and they agreed. The remaining three participants were contacted via email, based on the recommendations I received from their principal. In order to contact an expert in the field, an email request for an interview was sent to two prominent names in the field of gender equity and one responded positively.

Participants were given a letter of consent at the time of the interview when they reviewed and signed it with the exception of Participant 4 who was interviewed via phone. The

consent form was discussed and a time and place was set for her to sign it. An email with a consent form attached was also sent to the expert interviewed ahead of time. She signed and faxed it back. Confidentiality was assured by the researcher referring to interview participants as Participants 1, 2, 3, etc. rather than using their names. The expert granted permission to use her name in the study.

Data Gathering Strategies

Appointments were set up to meet with Participants and interviews lasted between 40 minutes to one hour. All interviews were conducted in like manner. Participants were asked to respond to semi-structured interview questions, as well as a few multiple-choice questions. It was a question-answer format where I asked the questions verbally and answers were given verbally. No tape recorder was used – all answers were recorded by hand.

Data Analysis Strategies

Responses to questions were reviewed and characterized according to trends and/or themes. Accompanying these was an analysis of similarities and differences.

Chapter 4 Findings

Analysis of Site, Individuals, Data

Two of the interviews took place in the teachers' classrooms, two at different cafés and the fifth took place via telephone. Following is a brief description of each of the Participants numbered 1-5.

Participant 1 is a 5th grade teacher this year who began her teaching experience as a paid intern for two years; .4 as a Kindergarten teacher and the remainder as an aide to English Second Language Learners (ESL) at the same school where she also completed her student teaching, while pursuing her teaching credential. Upon earning her credential she taught 4th grade, then a 4/5 combo the following year. There have been no breaks in her teaching career thus far. Her ability to stay with many of her students in two-year stretches is unique to the teaching profession and something she feels has benefitted herself and her students as well.

Participant 2 is in the first year of her teaching career. She experienced a rocky road to settling into her permanent placement as a 3rd grade teacher as she began the year as a long term 1st grade substitute teacher, whose stay in that role was continually extended from a few weeks to several months. Upon completion of that assignment she subbed in a variety of grades and then began her experience as a 3rd grade teacher.

Participant 3 pursued his teaching credential through an alternative credential program closely associated with a California University. Teaching is a second career for this individual. He was an assistant for two years at a private school in Kindergarten and 1st grade. From there he worked as a 2nd grade lead teacher at a different private school for two years. He is now a 5th grade teacher at a public school.

Participant 4 is in her first year of teaching as a 1st grade teacher. She earned her teaching credential last year, May 2010. Upon completion of her credential program, this participant benefitted from additional hands on experience as she received a long-term substitute teaching position in the 1st grade.

Participant 5 is in her sixth year of teaching. She began as a Kindergarten teacher, moved to 1st grade for one year and returned to Kindergarten where she has been ever since.

Interviews began by getting acquainted with the teachers' backgrounds in education. The format was semi-structured in nature while incorporating open-ended questions as well as yes/no and multiple-choice questions.

Data

Participants were asked if they have encountered any thematic challenges or behavior issues in their teaching experience. Four of five responded that boys have more active needs.

All Participants have heard something about a gender gap in education with 3/5 teachers reporting that they don't see it in their classrooms, as all of their students are capable of producing the same quality of work. Additionally, two participants referred to the stereotype that boys are smarter in math and both of these reported that they did not see it.

Four of five participants were females who graduated from the same credential program; two graduated in the same year while the other two graduated independently of the remaining participants. All five participants stated that their programs did not prepare them for these issues, as were discussed in the interview, while two acknowledged that the current teacher credential preparation programs are limited in the ability to train teachers for the reality they will face.

Due to the importance of how information is given and received in the classroom questions were asked to ascertain knowledge regarding biological and physiological differences about the senses. The responses indicated an overall lack of awareness regarding these important elements. The following results were influenced by one participant, who had recently been involved in a professional development at her school led by Dr. Leonard Sax.

Regarding hearing, only 20% of the participants answered affirmatively. The number of knowledgeable answers increased for how the eye works differently in males and females to 40%, and was followed by 30% affirmative responses for smell and taste, and dropped again to 20% pertaining to touch.

A similar set of yes/no questions followed regarding knowledge relating to the male and female strengths; verbal and spatial skills. The participants demonstrated a score of 33% about the female advantage in verbal skills and a score of 30% of the male strength in spatial relations.

The following set of questions were open-ended asking the participants to discuss their observations. The purpose of using open-ended questions was to get a pure sense of what the teachers see in their classrooms and thereby, avoiding the power of suggestion. Three out of five participants acknowledged a clear difference in the learning styles of boys and girls. These three touched on a similar theme of boys being physical, active, and kinesthetic. In regards to the girls learning styles these are the types of answers supplied: “girls can be talked through the steps,” “girls can sit longer,” and “girls are typically more artistic and more attentive to activities requiring fine motor skills”. Participants also reported that when they do not use hands-on activities they see a difference in participation. Depending on the subject matter boys were reported to lose focus or perhaps run into behavior issues.

The participants were then asked about their observations regarding the activity levels of the boys and girls in their classes. The results were overwhelmingly unanimous. The boys were reported to be more active, have more energy, touchy-feely, and always wanting to be the class clowns (farting, burping, etc). The girls were reported to be calm, subdued, incredibly more social, with one participant stating that the girls are also active but the boys have more energy.

Organizational skills appeared to be a reflection of developmental maturity. Only Participant 5, the Kindergarten teacher, reported a noticeable difference. Some theorists believe that typically, boys are not ready for formal schooling at this age. She reported that the girls take great care in organizing, protecting, and being responsible for their school supplies whereas the boys are constantly breaking or losing theirs. This finding was reiterated when asked whether there was a difference in the neatness of work submitted. While the other participants noted that girls are generally neater participant 5 replied that there is a marked difference. She stated that 9/10 times if she were to look at an assignment involving handwriting she could determine whether a girl or a boy completed it.

Each participant touched on at least one element of boy-friendly learning environments when discussing how they keep the attention of the boys in their classrooms. Participant one has been fortunate to have some students in two-year stretches with her grade changes and mixed classes. She has developed a relational style that has resulted in powerful bonds that she states work especially well with the boys. Participants' 2, 4, and 5 discussed being developmentally appropriate regarding their age capacity for paying attention and needing to move. Participant 3, a male teacher, if the students are demonstrating learning he is able to "ignore" typical boy behaviors. He was the only participant to offer this unique perspective.

As a follow up to this question, participants were asked where they learned these strategies. The participant who participated in an alternative teacher credential program was the only one to attribute learning a strategy in his program along with one other participant who referenced a theory she heard of during a class that was later emphasized in a professional development setting.

During the multiple-choice segment participants were asked to describe the overall behavior of boys and girls. Boys were generally described as outspoken whereas no girls were described in this manner but rather, were consistently rated as co-operative. Teachers were asked how often either sex interrupted their instruction on typical day. As a semi-structured interview, it was noted that participants did not feel that the 10-15 range was high enough for the number of times boys interrupted them. As a result, the number was increased to 20+, still including the 10-15 option. Regardless of the numbers every participant chose the highest number to reflect how often boys interrupt their instruction while girls were generally below the 10 mark.

Except for Participant 4 who had attended a workshop regarding specific information covering the topic of boys developmental needs, none of the participants were aware of two key neurological developments in boys that effect behavior and none were aware of the portion of the brain development effecting communication. Only 1/5 participants were aware that reading disparities begin in the 3rd and 4th grades which is when many male students report being diagnosed with learning problems.

Research has shown that for boys the appropriate use of competition helps academic performance (James, 2007). Two of the participants had not heard of indirect and co-operative competition and Participant 3 did not know that it had been demonstrated to help academic

performance. That being the case, Participant 5 commented that, "It is not surprising because boys are naturally more competitive." She continually hears her male students make comments referring to competition with remarks like, "It's a race." Although there was some unfamiliarity with the topic on an academic level all of these participants incorporate the use of competition either indirectly or co-operatively on some level in their classrooms to assist in motivation.

At the end of the interview, participants were asked if they felt their teacher preparation programs had prepared them effectively. Participant 3 gave a slightly favorable answer. It is important to remember that Participant 3 is male and may have a different feeling of these types of issues than a female teacher would. His response was that his program "Did as well as they could." He felt that the program gave plenty of tools but until you have the hands on experience it's a lot of trial and error. He also stated that he felt his particular program, which was different from the other participants, relied to heavily on theory. Furthermore, he noted that teaching at the elementary level you are dealing with a wide age bracket and any given thing can arise. In that respect, the program did the best they could. But overall, he didn't feel totally prepared.

The remainder of participants responded to this question with a resounding, No. These participants were all women who had graduated at different times from the same teacher preparation program. Their comments were similar in nature. A few quotes are as follows: "No. They gave us nothing on classroom management or gender but taught us how to read the standards. It was not helpful." Participant 2 said, "No." and that she was not prepared for behavior management. Participant 4 replied, "Not at all. They never talked about differences about boys and girls." Participant 5's response was, "Oh it didn't. I mean really, it didn't."

Themes

Participants consistently reported observing gender-based behaviors amongst their students. When asked about biological differences in how the mind and senses work, despite a general lack of data-related-knowledge there was a uniform response of, 'No, but that makes sense.' All of the teachers were passionate about discussing how active their male students are. They further supported the notion that there are gender-based behaviors taking place in their classrooms when they all expressed a level of frustration with the social dynamics of the girls. The girls were reported to be, "Caddy, mean to one another, and hold grudges for long periods of time," while the boys may hit each other but are quickly on friendly terms again.

Another common theme was that all of the participants use some form of incentive program to motivate the work of their students. Overall, participants' knowledge of classroom strategies were reflective of positive, boy-friendly learning environments which seemed to be reflective of professional development. Nevertheless, the majority of behavior issues were reported to be boy-related.

Chapter 5 Discussion

Summary of Major Findings

Different. In a word that is the major finding of this research. The potential for success is present in all students however; the learning process and activity levels of boys and girls are generally different. There is a consistent finding of a clear distinction of classroom behavior between boys and girls; with boys being described as immature, fidgety, and outspoken while girls are generally described as co-operative. Boys need more physical outlets throughout the day than girls do. All of the participants encountered and acknowledged the different behavior styles represented within their classrooms. However, the participants generally were unaware that there are biological explanations underlying the behaviors they see. The assumption of this paper was that teachers are not prepared to deal with sex-related behaviors upon graduation of their credential programs and that was the case with these participants.

Relationship of Findings to Previous Literature

Consistent with the literature review it was found that teachers are not aware of the perspectives they bring with them. All of the female participants expressed a level of accepted frustration when dealing with typical, noisy, interrupting boy behaviors. Whereas the male participant stated that as long as learning is taking place, he ignores these 'typical boy behaviors'. Also, supporting the literature review was the finding that the participants were not knowledgeable of the biological differences of the boys and did not feel prepared by their preparation programs, to deal with the issues they face in the classroom that result from typical boy behavior. Additionally, when the participants were presented with statistical information regarding the gaps in achievement levels they expressed an element of surprise, as they were generally unaware.

There was a promising relationship found at play amongst these participants and the literature. All participants are teaching at coeducational schools and except for one first year teacher, they have all had the privilege of years of teacher observations and/or professional development. These developments included TRIBES, a process focusing on creating a positive school environment being utilized in the United States, Canada, and Australia, and Project GLAD (Guided Language Acquisition Design). GLAD involves the total physical response (TPR) component as a core strategy. Both of these organizations build on an awareness of the variety of needs of learners. TRIBES specifically recognizes the importance of acknowledging the different genders and relational learning.

Limitations/Gaps in the Research

There were several gaps in the research. One such gap was the amount of participants due to limited time. The study would have benefited by interviewing teachers currently involved in single-sex education. Further gaps in the research included not knowing or measuring the long-term development of student academic scores in the participants' classrooms. Within the interviews themselves, there was a lack of discussion of job satisfaction and feelings related to the behavior of the boy students. Student interviews and classroom observations would have enhanced the research as well.

Implications for Future Research

Children are segregated on the basis of age without hesitation. However, science has clearly demonstrated that the brains of boys and girls develop on two different trajectories and it is more complex than stating girls mature faster than boys. Research is encouraged to understand, or perhaps rethink the best way to educate these diverse minds. When is the best time for girls and conversely, boys, to learn math, science, reading, writing, etc.?

Need for Teacher Training

Caseau et al., (as cited by Oswald, et al., 2003) reported that more girls than boys were identified through mental health services as a result of private therapist referrals, whereas more boys were identified as a result of school-based referrals. Younger & Warrington (1996) reported that few teachers acknowledged treating boys and girls differently. King, et. al., (2010) state, "Most of the teachers we work with realize that the preparation they received in graduate school and teacher certification programs to teach "all students" was in fact training for verbal and sedentary learning." (p. 40). Professional groups such as NASSPE, IBSC, and CSBGL all point to academic and social success when incorporating sex-related training. Younger (2007) finds too much focus on teaching to standards rather than, 'theoretical considerations which underpin practice and relationships," (p. 388). The research involved in this project revealed a general lack of knowledge pertaining to neurological and physical differences between the sexes. Beyond equipping teachers with this knowledge to enhance their instructional strategies, "Teachers are key players in children's evolving understanding of gender issues" (Younger & Warrington, 2008, p. 431). Therefore, in light of these considerations, there is an imperative need for sex-related training in teacher preparation programs.

Overall Significance of the Literature

Boys across the globe are sending a clear message to their teachers, parents, and administrators; they have different needs than their female counterparts. Whether these differences are the result of biology or social training, there is a growing body of literature substantiating the influence of both to varying degrees. The conclusion is that there is a significant difference in the ways that boys and girls learn. Furthermore, these needs have been identified and it is encouraging that a variety of effective teaching pedagogies have been demonstrated to address them and close the

gap. It is clearly documented that the reason for this gap is in no way related to a lack of intelligence. Myhill and Jones (2006) make an interesting spin on the boys' achievement gap when considering that boy differences are identifiable and with proper adjustments the gap can be fixed. What they see is no longer a negative gap but the term 'underachievement' reveals positive potential to achieve. This perspective is at the heart of what is motivating educators everywhere to research how the achievement gap can be closed. The success of programs offering gender training in coeducational and single-sex classrooms indicate that when boys are properly engaged, their needs understood, and discipline problems removed they do as well as girls. The stereotypes of boys being immature, lazy, and ill behaved are a misunderstanding and can be removed when boys are better understood. Students everywhere have demonstrated that they live up to expectations, therefore, let the expectations of teachers now, and all future teachers be accurate, stimulating and challenging of who boys truly are.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR.* Washington D.C. American Psychiatric Association.

Beers, M.H., & Merck Research Laboratories. (2003). *The Merck manual of medical information*. Whitehouse Station, N.J.: Merck Research Laboratories.

Brizendine, L. (2010). *The male brain.* New York: Broadway Books.

Cahill, L., Uncapher, M., Kilpatrick, L., Alkire, M., & Turner, J. (2004). Sex-related hemispheric lateralization of amygdala function in emotionally influenced memory: An fMRI investigation. *Learning and Memory, 11* (3), 261-266. doi: 10.1101/lm.70504

Carrington, B., Tymms, P. and Merrell, C. (2006). Role models, school improvement and the 'gender gap'—do men bring out the best in boys and women the best in girls? *British Educational Research Journal, 34* (3), 315–327. doi: 10.1080/01411920701532202

Center for the Study of Boys' and Girls' Lives. (2011). *Home.* Retrieved March 21, 2011 from http://www.csbgl.org

Chapman, C., Laird, J., and KewalRamani, A. (2010). Trends in high school dropout and completion rates in the United states: 1972-2008 (NCES 2011-012). *National Center for Education Statistics*, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved from http://nces.ed.gov/pubs2011/2011012.pdf.

Costa, P., Terracciano, A., and McCrae, R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, *81* (2), 322-331. doi: 10.1037//0022-3514.81.2.322.

Coutinho, M.J., & Oswald, D.P. (2005). State variation in gender disproportionality in special education. *Remedial and Special Education, 26* (1), 7-15. Retrieved from http://web.ebscohost.com

Gibb, S.J., Fergusson, D.M., & Horwood, L.J. (2008). Gender differences in educational achievement to age 25. *Australian Journal of Education, 52* (1), 63-80. Retrieved from http://web.ebscohost.com

Gurian, M. (2003) *What could he be thinking? How a man's mind really works.* New York: St. Martins Press.

Gurian, M. (1997). *The wonder of boys*. New York: Penguin.

Hubbard, L. & Datnow, A. (2005). Do single-sex schools improve the education of low-income and minority students? An investigation of California's public single-gender academies. *Anthropology & Education Quarterly, 36* (2) 115-131. Retrieved from http://www.csub.edu

Hughes, T.A. (2007). *The advantages of single-sex education*. (ED49200). Retrieved from http://eric.ed.gov/

Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38* (3), 499-534. Retrieved from http://www.jstor.org/stable/3202489

International Boys' Schools Coalition. (2011). *Announcements.* Retrieved February 3, 2011 from http://www.theibsc.org

James, A. N. (2007). *Teaching the male brain: How boys think, feel, and learn in school*. Thousand Oaks: Corwin Press.

Kindlon, D., & Thompson, M. (2000). *Raising Cain: Protecting the emotional life of boys.* New York: Ballantine Books

King, K., Gurian, M., & Stevens, K. (2010). Gender-friendly schools. *Educational Leadership, 68* (3), 38-42. Retrieved from http://web.ebscohost.com

Kleinfeld, J. (2009). No map to manhood: male and female mindsets behind the college gender gap. *Gender Issues, 26* (3/4), 171-182. doi: 10.1007/s12147-009-9083-y

Lutchmaya, S. & Baron-Cohen, S. (2002). Human sex differences in social and non-social looking preferences, at 12 months of age. *Infant Behavior and Development, 25* (3), 319-325. doi: 10.1016/S0163-6383(02)00095-4

Martin, Andrew J. (2003). Boys and motivation. *The Australian Educational Researcher, 30* (3), 43-65.

Marder, C., Levine, P., & Wagner, M. (2003). Demographic characteristics of youth with disabilities. In M. Wagner, C. Marder, P. Levine, R. Cameto, T. W. Cadwallader, & J. Blackorby (with D. Cardoso & N. Newman), *The individual and household characteristics of youth with disabilities. A report from the National Longitudinal Transition Study-2 (NLTS2).* Menlo Park, CA: SRI International. Retrieved from http://www.nlts2.org/pdfs/indiv__house_chars.pdf

Myhill, D., & Jones, S. (2006). She doesn't shout at no girls': Pupils' perceptions of gender equity in the classroom. *Cambridge Journal of Education, 36* (1), 99-113. Retrieved from http://web.ebscohost.com

National Assessment of Educational Progress. (2009). Summary of major findings. *The nation's report card.* Retrieved March 16, 2011 from http://www.nationreportcard.gov/reading-2009/summary_g12.asp

National Association for Single Sex Public Education. (2010). *Single-sex education/Schools with single-sex classrooms/What's the difference?* Retrieved November 3, 2011 from http://www.singlesexschools.org/schools-schools.htm

National Center for Education Statistics. (2007). *The nation's report card: 12th-grade reading and mathematics 2005.* Retrieved February 12, 2011 from http://nces.ed.gov/nationsreportcard/pdf/main2005/2007468.pdf

Oswald, D., Best, A., Coutinho, M., & Nagle, H. (2003). Trends in the special education identification rates of boys and girls: a call for research and change. *Exceptionality, 11* (4), 223-237. Retrieved from http://web.ebscohost.com

Reichert, M., Hawley, R. (2010) Reaching boys. *Phi Delta Kappan, 91* (4), 35-40. Retrieved from http://web.ebscohost.com

Robbins, S. (2002). The future good and great of our land. *The New England Quarterly, 75* (4), 562-591. Retrieved from http://www.jstor.org

Sax, L. (2005). *Why gender matters: What parents and teachers need to know about the emerging science of sex differences.* New York: Broadway Books.

Sax, L. (2007). *Boys adrift: The five factors driving the growing epidemic of unmotivated boys and underachieving young men.* New York: Basic Books.

Shettle, C., Shep. R., Mordica, J., Perkins, R., Nord. C., Teodorovic, J., Brown, J., Lyons, M., Averett, C. & Kastberg, D. (2007). America's high school graduates: Results from the 2005 NAEP high school transcript study. *National Center for Education Statistics*. Retrieved November 18, 2011 from http://nces.ed.gov/nationsreportcard/pubs/studies/2007467.asp

University of Alaska Fairbanks. (n.d.). *Boys project.* Retrieved March 16, 2011 from http://www.boysproject.net

U.S. Department of Education, National Center for Education Statistics. (2010). *Projections of education statistics to 2011: Chapter 4: Earned degrees conferred.* Retrieved November 3, 2011 from http://neces.ed.gov/pubs2001/proj01/chapter4.asp.

Warrington, M. & Younger, M. (2000). The other side of the gender gap. *Gender and Education 12* (4), 493-508. doi: 10-1080/09540250020004126

Wills, R., Kilpatrick, S., & Hutton, B. (2006). Single-sex classes in co-educational schools. *British Journal of Sociology of Education. 27* (3), 277-291. doi:10.1080/01425690600750452

Younger, M. (2007) The gender agenda in secondary ITET in England: Forgotten, misconceived or what? *Gender and Education 19* (3), 387-414. doi: 10.1080/09540250701295528

Younger, M., & Warrington, M. (1996). Differential achievement of girls and boys at GCSE: Some observations from the perspective of one school. *British Journal of Sociology of Education 17* (3), 299-313. doi: 0142-5692/96/030299-15

Younger, M., & Warrington, M. (2002). Single-sex teaching in a co-educational comprehensive school in England: and evaluation based upon students' performance and classroom interactions. *British Educational Research Journal (28)* 3, 353-374. doi: 10.1080/0141192022013744 9

Younger, M., & Warrington, M. (2008) The gender agenda in primary teacher education in England: fifteen lost years? *Journal of Education Policy 23* (4), 429-445. doi: 10.1080/02680930802054396