THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF PSYCHOLOGY

THE EFFECTS OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND COMORBIDITY ON SOCIAL SKILLS DEFICITS

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Spring 2011

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Psychology
with honors in Psychology

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Abstract

ADHD is one of the most commonly diagnosed disorders in children; a majority present with both a comorbid disorder, as well as social skills deficits and have poor relationships with peers. The aim of this present study was to determine whether or not the presence of comorbidity negatively affects social skills deficits over and above that of ADHD. **METHODS.** 32 children with ADHD and 26 non-ADHD controls were recruited for the study. A one-way ANOVA was first conducted to determine which dependent variables were significantly affected by ADHD. Then exploratory factor analyses were completed on relevant independent and dependent variables to justify the creation of summary variables. Finally, hierarchical regressions were completed using the summary variables, in which the dependent variable was social skills, the first step was a diagnosis of ADHD, and the second step was the presence of comorbidity.

**RESULTS.** Parent and teacher report of the presence of comorbid externalizing and internalizing problems were significantly predictive of parent and teacher report of social skills over and above that accounted for by ADHD. However, when social skills were indexed by observational behavior on a computerized simulated Chat Room task, parent and teacher report of externalizing and internalizing problems did not add predictive value above that of ADHD.

**DISCUSSION.** These results indicate that there may be an effect of comorbid disorders on social skills deficits above that of ADHD, but that results are dependent on how social skills are operationalized.
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Acknowledgements

Special thanks to my thesis adviser, Dr. Cynthia Huang-Pollock, for her constant support and encouragement during this process, as well as my honors adviser, Dr. David Rosenbaum, for his help and advising during my time at Penn State. I would also like to thank all those working in The Child Attention and Learning Lab (IRB#32136) as well as the children, families, and teachers who participated. Funding for this study was provided in part by NIMH grant R01 MH084947 to Dr. Cynthia Huang-Pollock.
Introduction

Attention-Deficit/Hyperactivity Disorder, known as ADHD, is a disorder that is very prevalent among school-aged children. ADHD is one of the most commonly diagnosed disorders in children (Nijmeijer et al., 2008; Solanto, Pope-Boyd, Tryon, & Stepak, 2009). About four to seven percent of school-aged children are affected by ADHD (Gillberg et al., 2004). Not only are the prevalence rates very high for ADHD, but statistics also show that about fifty percent of children who are diagnosed with ADHD continue to have problems in adulthood (Nijmeijer et al., 2008). Because ADHD is a chronic disorder that impacts children for the majority of their lives, it is important to learn about its various symptoms and subtypes.

The two main symptoms of ADHD include inattention and hyperactivity. These symptoms usually appear early in life, when the child is between three and six years old, and an actual diagnosis can usually be made as early as six or seven years old (“Attention Deficit Hyperactivity Disorder,” 2009; Nigg & Casey, 2005). Inattention is described as having trouble staying focused and paying attention, being easily distracted, making careless mistakes, being disorganized, not listening when spoken to, being forgetful, having problems following instructions, frequently losing things, and avoiding tasks that require mental effort. Hyperactivity is described as having difficulty controlling behavior, having difficulty remaining seated, fidgeting, running or climbing excessively, being driven by a motor, talking excessively, and having difficulty playing quietly. Hyperactivity also consists of impulsivity, which includes having difficulty waiting his or her turn, blurting out, and interrupting or intruding. In order to be diagnosed with ADHD, these symptoms must persist for longer than six months and at a greater degree than other children of the same age (“Attention Deficit Hyperactivity Disorder,” 2009; Nigg & Casey, 2005). The child should show significant impairment based on these symptoms.
across multiple settings, including the home, the school, and among peers.

There are three subtypes of ADHD. The first subtype is known as predominantly hyperactive. This subtype is characterized by six or more symptoms of hyperactivity and fewer than six symptoms of inattention (“Attention Deficit Hyperactivity Disorder,” 2009; Paternite, Loney, & Roberts, 1996). The predominantly hyperactive subtype, ADHD-H, is very rare. Usually it is only seen in younger, pre-school-aged children. The reason for this may be that children of this age have not yet encountered situations in school where attention is important. The next subtype is predominantly inattentive. This subtype is characterized by six or more symptoms of inattention and fewer than six symptoms of hyperactivity (“Attention Deficit Hyperactivity Disorder,” 2009; Paternite et al., 1996). The predominantly inattentive subtype, ADHD-I, is frequently identified in late childhood, as the social pressures aim to reduce the hyperactivity seen previously. The last subtype is the combined subtype. This subtype is the most common and is characterized by six or more symptoms of both hyperactivity and inattention (“Attention Deficit-Hyperactivity Disorder,” 2009; Paternite et al., 1996).

**Comorbidity**

As one of the most common disorders among school-aged children, ADHD also shows a high rate of comorbidity. About sixty to one hundred percent of children with ADHD have a comorbid disorder (Rommelse et al., 2009; Gillberg et al., 2004). ADHD is most comorbid with conduct problems, such as oppositional defiant disorder and conduct disorder, internalizing disorders, such as anxiety disorders and depression, in addition to many other disorders, including learning disabilities. Research has also shown that the more severe the ADHD is in the child, the more severe the comorbid disorders will be as well (Rommelse et al., 2009).

Conduct problems include disorders such as oppositional defiant disorder (ODD) and
conduct disorder (CD). ODD and CD are two of the most common comorbid disorders seen in children with ADHD. The overall rate for ADHD comorbid with conduct problems is between forty-two and ninety percent (Rommelse et al., 2009). ODD is a disorder where the child is stubborn, rebellious, argumentative, and shows a refusal to follow the rules. In children with ADHD, rates of ODD are between forty and seventy-five percent (Mayes, Calhoun, Chase, Mink, & Stagg, 2009). Children with CD demonstrate troubling behaviors, such as lying, fighting, cheating, and stealing, and are at risk for getting into trouble at school or with the police. In children with ADHD, rates of CD are about twenty percent, which tends to increase in adolescence (Nijmeijer et al., 2008).

In addition to ODD and CD, anxiety and depression are also very common comorbid disorders in children with ADHD. As opposed to conduct problems, which are externalizing disorders, anxiety and depression are internalizing disorders. The rate of internalizing disorders in children with ADHD are between thirteen and fifty-one percent (Rommelse et al., 2009). Anxiety disorders are characterized by an excessive, inappropriate amount of anxiety. Anxiety disorders include generalized anxiety disorder, obsessive-compulsive disorder, and various phobias. The rate of anxiety disorders in children with ADHD is about 33.3% (Mayes et al., 2009). Depression is characterized by extreme sadness or depression for most days. Depression includes major depressive disorder and dysthymic disorder. The rates of depression in children with ADHD are about thirty-three percent (Mayes et al., 2009).

ADHD is also comorbid with learning disabilities, which include problems with reading, writing, and math. About seventy percent of children with ADHD have a learning disability (Mayes et al., 2009). More specifically, about twenty-five to forty percent of children with ADHD have problems with reading or writing, and ten to sixty percent of children with ADHD...
have problems with math (Gillberg et al., 2004). It has also been noted in the research that children with ADHD may have slightly lower IQs than children without ADHD, and the rate of mental retardation is anywhere from five to ten times higher in children with ADHD (Gillberg et al., 2004).

In addition to learning problems, depression, anxiety disorders, and conduct problems, children with ADHD also have comorbidity with other disorders, although these are less common. Some of these disorders include bipolar disorder, which is characterized by mood swings from manic to depressive, Tourette syndrome, which is characterized by nervous tics and repetitive mannerisms, Autism Spectrum Disorders, motor coordination problems, sleep disorders, and enuresis and/or encopresis. Tourette syndrome is seen in about fifty percent of children with ADHD (Gillberg et al., 2004). The rate of children with ADHD who show symptoms on the Autism Spectrum is between sixty-five and eighty percent (Rommelse et al., 2009; Gillberg et al., 2004). Motor coordination problems are seen in about fifty percent of children with ADHD (Rommelse et al., 2009; Gillberg et al., 2004). Children with ADHD who also have sleep disorders are about twenty-five to fifty percent (Rommelse et al., 2009). Finally, enuresis and/or encopresis are seen in about thirty percent of children with ADHD (Rommelse et al., 2009).

Different disorders are found among the different subtypes of ADHD. For instance, conduct problems, ODD and CD, are more common in the combined subtype of ADHD than in the inattentive subtype (Mayes et al., 2009). However, there is no difference in the prevalence of anxiety disorders and depression between the subtypes (Mayes et al., 2009). In addition to varying amongst the different subtypes of ADHD, comorbidity has also been shown to increase social skills deficits.
Social Skills

Children with ADHD demonstrate social skills deficits and have poor relationships with peers (Nijmeijer et al., 2008). One of the main problems underlying the deficits that children with ADHD have in social skills is that they understand the proper way to interact in social settings but are unable to apply this knowledge (Nijmeijer et al., 2008; Barkley, 1997). The causes of these deficits are uncertain but are likely due to a combination of inattention, hyperactivity, impulsivity, and comorbid disorders.

It is possible that the social skills deficits seen in children with ADHD can be attributed to their inattention. Research has shown that children with ADHD have difficulties with maintaining attention (Rapport, Kofler, Alderson, Timko, & DuPaul, 2009; Hooks, Milich, & Puzzles Lorch, 1994). A lack of sustained attention can cause problems in social settings, such as an inability to maintain focus on and detect social cues in an interaction (Andrade, Brodeur, Waschbusch, Stewart, & McGee, 2009), which in turn may lead to social problems, including peer neglect, bullying, victimization, and rejection (Andrade et al., 2009), and ultimately withdrawal from social interactions (Nijmeijer et al., 2008).

In addition to being caused by inattention, social skills deficits may also be a product of the hyperactivity and impulsivity symptoms. Due to the hyperactivity and impulsivity components seen in children with ADHD, they are more socially intrusive, aggressive, disruptive, and impulsive, which often leads to peer rejection, and ultimately, unpopularity (Nijmeijer et al., 2008; Solanto et al., 2009).

Besides hyperactivity and inattention, some of the most important predictors of peer rejection are aggression and disruption (Nijmeijer et al., 2008; Solanto et al., 2009). These qualities reflect other disorders, such as ODD and CD, which are commonly comorbid with
ADHD. These characteristics are present in about forty to seventy percent of school-aged children with ADHD (Nijmeijer et al., 2008). When children with ADHD are also diagnosed with ODD and CD, their social skills deficits are worsened (Nijmeijer et al., 2008).

Although aggression and disruption can worsen social skills deficits seen in children with ADHD, it is unclear how comorbid disorders specifically affect social skills. There are a lack of studies that look at the effects of comorbid anxiety or mood disorders on social skills in children with ADHD (Matthys, Cuperus, & Van Engeland, 1999). In addition, it is also unclear whether comorbid ODD or CD are a direct cause of the social skills deficits or just worsen the deficits already seen in children with ADHD (Nijmeijer et al., 2008). Therefore, while there is some understanding that comorbid disorders do worsen social skills deficits in children with ADHD, more research needs to be done in order to determine the exact effect of these disorders.

Not only do children with ADHD have worse social skills with comorbid disorders, but social skills deficits also vary amongst the different subtypes of ADHD. Although both the inattentive subtype and combined subtype of ADHD show problems in social skills, they differ in the specifics of the issues. Children with the inattentive subtype of ADHD are more shy, passive, and withdrawn. These traits lead to problems with assertiveness, a quality that is important when making friends in social situations (Solanto et al., 2009). These children are subject to bullying and rejection. Children with the combined subtype tend to be more aggressive, and have deficits in their self-control (Solanto et al., 2009).

Unfortunately, children with ADHD do not outgrow their social skills deficits. These deficits are predictive of future problems in adolescence and adulthood, including academic issues, substance abuse, and other psychological problems. About seventy percent of children with ADHD continue to have problems in adulthood (Nijmeijer et al., 2008). Some future
problems that children with ADHD may experience in adolescence include social withdrawal, school dropout, drug use, and alcohol problems (Andrade et al., 2009). ADHD is also a risk factor in aggression, rule-breaking behavior, delinquency, criminality, and antisocial personality disorder in adolescence and adulthood (Nijmeijer et al., 2008). Overall, social skills deficits seen in children with ADHD can hinder their futures socially, academically, occupationally, martially, psychologically, and legally (Solanto et al., 2009).

Measurements of Social Skills

There are many different ways to measure social skills in children. Some of the most common questionnaires include the Social Skills Rating System (SSRS) and the Social Skills Scale on the Behavior Assessment System for Children – Second Edition (BASC-2). Another way to measure social skills is through an observational measure such as the Chat Room task.

The SSRS has been used in many studies to assess social skills in children with ADHD. The SSRS has two forms, including the parent form and the teacher form. The SSRS has many benefits, including a multi-rater format, good reliability and validity, and generalizability (Solanto et al., 2009). The main disadvantage of the SSRS is the low agreement found amongst the different raters of this scale. The authors of the SSRS, Gresham and Elliot (1990), have explained that this low agreement is a result of the fact that the raters are evaluating the children’s behaviors in different situations and settings (van der Oord et al., 2005). In addition, one of the main limitations to only using the SSRS as a measurement of social skills is the lack of direct observation of behaviors (Solanto et al., 2009).

The BASC-2 is a behavior rating system used to measure children’s behavior, including social functioning. Similar to the SSRS, the BASC-2 also has parent and teacher forms. The BASC-2 has been shown to be valid and effective in measuring children’s behavior (Flanagan,
Alfonso, Primavera, Povall, & Higgins, 1996). In addition, the BASC-2 is a broader measurement of general social skills, whereas the SSRS is narrower, measuring more specific behaviors (Flanagan et al., 1996).

One of the biggest limitations of the BASC-2 and the SSRS is the lack of direct observable behaviors. In addition, there has been research that has shown an interpretive bias among adults who rate children’s social skills and behaviors on forms, including personal feelings of the children (Mikami, Huang-Pollock, Pfiffner, McBurnett, & Hangai, 2007). These are the main reasons for the development of the Chat Room task, which is a computer task where the children instant message with four computer programs designed to act like children (Mikami et al., 2007). This task has been shown to be beneficial because the children act in the Chat Room as they would in every-day situations, and it enables researchers to directly observe children’s social behaviors (Mikami et al., 2007).

Hypothesis

The current research demonstrates that children with ADHD have worse social skills and also demonstrate high rates of comorbidity. However, the research does not illustrate whether social skills deficits are a result of the diagnosis of ADHD or a comorbid disorder. Therefore, the aim of this study is to determine whether or not comorbid disorders affect social skills deficits above and beyond that of ADHD. It is also to determine which social outcomes are most affected by the presence of ADHD and its comorbid disorders. We hypothesized that the presence of externalizing and internalizing comorbid disorders would negatively affect social skills deficits above and beyond that of ADHD.
Methods

Screening Criteria and Procedures

The participants in this study consisted of 58 children ages 8-12 who were recruited from the general population in central Pennsylvania. The method of recruiting these participants consisted of three phases. First, a phone screen was completed to confirm that the child did not have an Autism Spectrum Disorder, the child was not mentally retarded, a sibling had not already participated, and the child was not taking any medications that would interfere with the results of the study. Children who were taking non-stimulant medications were excluded from participating in the study because those medications would remain in their system and could affect their behavior and cognitions; however, children who were taking stimulant medications could still participate if they stopped taking the medications 24-48 hours prior to coming in to the study for a laboratory visit.

After the phone screen, questionnaires were sent to both the child’s parent and teacher. These questionnaires included the Behavior Assessment Scale for Children – Second Edition (BASC-2), the Conners’ Rating Scale, the ADHD Rating Scale, and the Teacher Social Skills Rating System (SSRS). In order for the child to be considered a potentially ADHD subject, at least one parent and one teacher screen index must have exceeded the 84th percentile, or have a T-score equal to or above 61. The screen indices included the Hyperactivity, Aggression, Conduct Problems, and Attention Problems Scales on the BASC-2, and the Oppositional Problems, Cognitive/Inattention Problems, Hyperactivity, ADHD Index, and DSM-IV Total Subscales on the Conners’ Rating Scale. In order for the child to be considered potentially a Control subject, all of the screen indices must have been lower than the 80th percentile, or have T-scores equal to or below 58.
The BASC-2 has forms that both the parent and teacher must complete. The two forms relevant to this study were the child form for children ages 6-11 and the adolescent form for children age 12. All the forms have statements to be rated on a 4-point Likert Scale ranging from “never” to “almost always.” The composites on the BASC-2 consist of Adaptive Skills, Behavioral Symptoms Index, Externalizing Problems, Internalizing Problems, and School Problems (for the teacher forms). The primary scales on the BASC-2 include Adaptability, Activities of Daily Living (for the parent forms), Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Functional Communication, Hyperactivity, Leadership, Learning Problems (for the teacher forms), Social Skills, Somatization, Study Skills (for the teacher forms), and Withdrawal. The teacher form for both the child and adolescent forms have 139 total items. The test-retest reliability has a range from the .80s to the low .90s with 8-65 days between the ratings. The parent form has a total of 160 items for the child form and 150 total items for the adolescent form. The test-retest reliability also has a range from the .80s to the low .90s with 9-70 days between ratings (Reynolds & Kamphaus, 2004).

The Conners’ Rating Scale has both a long form and a short form for the parent and teacher to complete; in this study, the parent completed the long form and the teacher completed the short form. On the parent form, there were a total of 80 items and fourteen subscales. The subscales include Oppositional, Cognitive Problems/Inattention, Hyperactivity, Anxious-Shy, Perfectionism, Social Problems, Psychosomatic, Conners’ Global Index, Restless-Impulsive, Emotional Lability, ADHD Index, DSM-IV Symptoms Subscale, DSM-IV Inattentive, and DSM-IV Hyperactive-Impulsive. The teacher short form has a total of 28 items and four subscales. The subscales include Oppositional, Cognitive Problems/Inattention, Hyperactivity, and ADHD Index. For both the parent long form and teacher short form, the test-retest reliability
is between .6 and .9 (Conners, 2001).

The ADHD Rating Scale was also completed by both the parent and the teacher. This scale measures different symptoms of inattention, hyperactivity, and impulsivity, and the frequency at which these symptoms occur. The statements are rated on a Likert Scale including “never or rarely,” “sometimes,” “often,” or “very often” as the answers (DuPaul, Power, Anastopoulos, & Reid, 1998).

After confirming the child could participate in the study as potentially ADHD or Control, the child and parent came in to the laboratory for a visit. During this visit, the parent completed the Diagnostic Interview Schedule for Children Version IV (DISC-IV) to confirm the diagnosis. In order to be diagnosed with ADHD, the child had to meet the full criteria for the diagnosis based on this measurement. The DISC-IV first begins with a stem question that describes the symptoms of ADHD in a broad way so that most parents will endorse the question. Next there are contingent questions to measure the frequency, duration, and intensity of the disorder. Finally, if enough symptoms have been endorsed for the disorder to be clinically significant, then questions referring to the age of onset, impairment, and treatment are asked (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The final symptom count for meeting the diagnosis of ADHD followed the “or” algorithm, in which if either the parent, on the DISC-IV, or the teacher, on the ADHD Rating Scale, endorsed a behavior as present, it was counted as present.

While the parents completed the DISC-IV, children completed the Wechsler Intelligence Scale for Children (WISC-IV), the Chat Room task (described more fully below), and other tasks as part of the larger project in which this study was embedded. In order to come in to the laboratory for a second visit, no child could have an IQ below 80, and Control subjects could not have an IQ higher than 110; however, there was no maximum IQ for children with ADHD.
During the laboratory visit, parents also completed the Social Skills Rating System (described more fully below).

*Independent Variable – Comorbidity*

The different comorbid disorders looked at in this study included both internalizing and externalizing disorders. Internalizing disorders consist of problems with anxiety and depression. Internalizing disorders in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) are classified as either mood disorders or anxiety disorders (Ollendick & King, 1994). Externalizing disorders consist of behavioral deficits directed toward the external environment, including aggression, noncompliance, and disruptive behaviors (Olympia, Heathfield, Jenson, & Clark, 2002). In the DSM-IV-TR, externalizing disorders are classified as Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), and ADHD (Hudziak, Copeland, Stranger, & Wadsworth, 2004). In order to measure these different types of comorbid disorders, the Internalizing Disorders and Externalizing Disorders composite scales on the BASC-2 were used. The Internalizing Disorders composite scale consists of the Anxiety, Depression, and Somatization scales. The Externalizing Disorders composite scale consists of the Hyperactivity, Aggression, and Conduct Problems scales (Manning & Miller, 2001). In addition, the Oppositional, Anxious-Shy, and Emotional Lability scales on the Conners’ Rating Scale were also used (Aebi et al., 2010).

*Dependent Variable – Social Skills*

In order to measure social skills in children with ADHD, three different measurements were used, including two questionnaires and one observational measure. The two questionnaires used were the Social Skills Scale on the Parent and Teacher Behavior Assessment Scale for Children – Second Edition (BASC-2) and the Parent and Teacher Social Skills Rating System.
The Teacher SSRS consists of three subscales including Cooperation, Assertion, and Self-Control (van der Oord et al., 2005; Flanagan et al., 1996). There were a total of thirty items on this scale, with ten items for each of the subscales (van der Oord et al., 2005; Flanagan et al., 1996). The Parent SSRS included the same three subscales as the Teacher SSRS, in addition to a fourth subscale of Responsibility (van der Oord et al., 2005; Flanagan et al., 1996). There were a total of thirty-eight items on this questionnaire, with ten items for each of the subscales; two of the items fell under two subscales each, which accounted for the thirty-eight items (van der Oord et al., 2005).

The observational method used was the Chat Room task. This was an instant messaging system in which the child interacted with four computer programs made to act like four children. In this task, the child was instructed to help the computer children plan a birthday party by finding out whose birthday it was, what they liked to eat, where they wanted to have the party, in addition to many other relevant questions. The computer children responded to the child to make the interaction as realistic and natural as possible. After the conversation ended, the child was asked about some of the likes and dislikes mentioned by the computer program during the conversation, and then the interviewee had to rate how much the child participated in the conversation, how often the child asked the interviewee for help in formulating questions, and whether or not the child interacted with the computer program children as if they were real children (Mikami et al., 2007). After the Chat Room task was completed, the transcript was printed out and coded by a team of research associates who were trained for reliability on 30% of the transcripts. The different Chat Room variables included the total number of responses made by the child, the total number of one-word responses made by the child, how much the child joined in the conversation on a seven-point Likert Scale of “never” to “always,” how well the
child incorporated knowledge from previous parts of the conversation into his or her comments and questions on a seven-point Likert Scale of “never” to “always,” how much the child shared things about himself or herself on a seven-point Likert Scale of “never” to “always,” how well the conversation flowed on a seven-point Likert Scale of “never” to “always,” whether or not the child interacted with the computer program children as if they were real children on a seven-point Likert Scale of “never” to “always,” the total number of prosocial responses made by the child, whether or not the child disengaged from the conversation at any point, and the total number of hostile responses made by the child.
Results

A one-way ANOVA on all dependent variables was first conducted to determine which measures of social skills were significantly affected by a diagnosis of ADHD. Exploratory factor analyses were then conducted on relevant independent and dependent variables to justify the creation of summary variables for ease of interpretation. For the dependent variables that demonstrated group differences, hierarchical regressions were conducted with the summary variables in which the first step was a diagnosis of ADHD, and the second step the presence of comorbidity.

One-Way ANOVA

A one-way ANOVA was completed to determine which measures of social skills were significantly affected by a diagnosis of ADHD. The different measurements of social skills included the Chat Room variables, parent and teacher standard scores on the Social Skills Index of the SSRS, and parent and teacher T-Scores on the Social Skills Scale of the BASC-2.

The measures that were significantly affected by a diagnosis of ADHD included the total responses made by the child (p=.016), how well the child incorporated knowledge from previous parts of the conversation into his or her comments and questions (p=.012), how much the child shared things about himself or herself (p=.034), how well the conversation flowed (p=.038), the parent standard score on the Social Skills Index of the SSRS (p<.001), the teacher standard score on the Social Skills Index of the SSRS (p<.001), the parent T-Score on the Social Skills Scale of the BASC-2 (p<.001), and the teacher T-Score on the Social Skills Scale of the BASC-2 (p<.001). (See Table 1).

The measures that did not demonstrate an ADHD difference included the total amount of one-word responses (p=.149), how much the child joined in the conversation (p=.144), whether
or not the child interacted with the computer program children as if they were real children ($p=.087$), the total number of prosocial responses made by the child ($p=.189$), whether or not the child disengaged from the conversation ($p=.343$), and the total number of hostile responses made by the child ($p=.372$). (See Table 1).

**Factor Analyses**

Summary variables were created for the various measures of social skills and comorbid disorders. In order to create these summary variables, exploratory factor analyses were completed.

**Factor Analyses for Comorbid Disorders**

In the first exploratory factor analysis, the various parent and teacher reports of externalizing problems were examined. The different measures included the parent T-Scores on the BASC-2 for Aggression and Conduct Problems, as well as the parent T-Score on the Conners’ Rating Scale for Oppositionality. Teacher ratings included the T-Scores on the BASC-2 for Aggression and Conduct Problems and the T-Score on the Conners’ Rating Scale, Short Form for Oppositionality. Communalities ranged from .797-.931, and two factors with eigenvalues over 1.0 were extracted, one representing parent report of aggressive behaviors, and one representing teacher report of aggressive behaviors (eigenvalue=3.727, eigenvalue=1.517; Factor loadings=.797-.931). The first factor accounted for 62.124% of the variance, and the second factor accounted for 25.281% of the variance. We therefore re-analyzed the indices separately for parent and teacher report.

For the parent report, only one factor was extracted (eigenvalue=2.54; Factor loadings=.797-.901). This factor accounted for 84.677% of the variance and the factor score was saved as a composite index of externalizing behavior for future analyses. The second factor only
had an eigenvalue of .313 and only accounted for 10.430% of the variance.

For the teacher report, only one factor was extracted (eigenvalue=2.693; Factor loadings=.869-.932). This factor accounted for 89.769% of the variance and the factor score was saved as a composite index of externalizing behavior for future analyses. The second factor only had an eigenvalue of .206 and only accounted for 6.866% of the variance.

Another exploratory factor analysis was completed to look at parent and teacher reports of internalizing problems. The different measures looked at were the parent T-Scores on the BASC-2 for Anxiety, Depression, and Somatization, as well as the T-Scores on the Conners’ Rating Scale for the Anxious-Shy and Emotional Lability Scales. Teacher ratings included the T-Scores on the BASC-2 for Anxiety, Depression, and Somatization. There were no T-Scores for the Anxious-Shy and Emotional Lability Scales on the teacher form of the Conners’ Rating Scale because the short form was used, which does not include these scales. Communalities ranged from .379-.725, and two factors with eigenvalues over 1.0 were extracted, one representing parent report of internalizing problems, and one representing teacher report of internalizing problems (eigenvalue=3.499, eigenvalue=1.173; Factor loadings=.379-.725). The first factor accounted for 43.732% of the variance, and the second factor accounted for 14.663% of the variance. Similar to the first factor analysis that looked at parent and teacher reports of externalizing problems, we therefore re-analyzed the indices separately for parent and teacher report of internalizing problems.

For the parent report, only one factor was extracted (eigenvalue=2.389; Factor loadings=.453-.721). This factor accounted for 59.73% of the variance and the factor score was saved as a composite index of internalizing behavior for future analyses. The second factor only had an eigenvalue of .775 and only accounted for 19.378% of the variance.
For the teacher report, only one factor was extracted (eigenvalue=1.535; Both Factor loadings=.767). This factor accounted for 76.737% of the variance and the factor score was saved as a composite index of internalizing behavior for future analyses. The second factor only had an eigenvalue of .465 and only accounted for 23.263% of the variance.

*Factor Analyses for Social Skills*

Exploratory factory analyses of parent and teacher reports of social skills were conducted next. This analysis included the parent standard score on the Social Skills Index of the SSRS, the parent T-Score for the Social Skills Scale of the BASC-2, the teacher standard score on the Social Skills Index of the SSRS, and the teacher T-Score for the Social Skills Scale of the BASC-2. Only one factor was extracted (eigenvalue=2.557; Factor loadings=.472-.725). This factor accounted for 63.922% of the variance and the factor score was saved as a composite index of parent and teacher reports of social skills for future analyses. The second factor only had an eigenvalue of .826 and only accounted for 20.652% of the variance.

The final exploratory factor analysis that was conducted looked at all the significant Chat Room variables, including the total responses made by the child, how well the child incorporated knowledge from previous parts of the conversation into his or her comments and questions, how much the child shared things about himself or herself, and how well the conversation flowed. Only one factor was extracted (eigenvalue=2.895; Factor loadings=.54-.853). This factor accounted for 72.386% of the variance and the factor score was saved as a composite index of Chat Room variables for future analyses. The second factor only had an eigenvalue of .57 and only accounted for 14.242% of the variance.

*Hierarchical Regressions With Summary Variables*

After the summary variables were created using the exploratory factor analyses,
hierarchical regressions were completed to determine whether or not the parent and teacher reports of externalizing and internalizing problems had a significant effect on the parent and teacher reports of social skills as well as the Chat Room variables, above and beyond that of ADHD. ADHD was marginally predictive of parent and teacher report of social skills ($p=.087$, $R^2=0.044$). Parent and teacher report of externalizing and internalizing problems predicted parent and teacher report of social skills above that of ADHD (all $p<.001$, all $\Delta R^2>.232$). ADHD was not predictive of the Chat Room variables ($p=.701$, $R^2=.002$). Parent and teacher report of externalizing and internalizing problems did not predict Chat Room variables above that of ADHD (all $p<.85$, all $\Delta R^2>.000$). (See Figures 1-8).
Discussion

The aim of this present study was to determine whether or not comorbid disorders affect social skills deficits above and beyond that of ADHD. First, a one-way ANOVA was completed to establish which social skills variables were significantly affected by the presence of ADHD. Children with ADHD had lower scores on the parent and teacher T-Scores on the Social Skills Scale of the BASC-2 as well as parent and teacher standard scores on the Social Skills Index of the SSRS. In addition, children with ADHD had lower scores on several of the Chat Room variables, including the total responses made by the child, how much the child incorporated knowledge from previous parts of the conversation into his or her comments and questions, how much the child shared things about himself or herself, and how well the conversation flowed.

These findings are consistent with previous literature, which has found that children with ADHD are consistently rated as having worse social skills deficits than children without ADHD when rated by parents and teachers on the SSRS (Solanto et al., 2009, van der Oord et al., 2005). In addition, research has shown that there is some evidence of convergent validity of the Social Skills Scale on the BASC-2 to the SSRS (Flanagan et al., 1996), meaning that these two measures are similar to each other. This could explain why children with ADHD also had lower scores on the parent and teacher T-Scores on the Social Skills Scale of the BASC-2.

Previous research has also found that children with ADHD tend to make fewer total responses on the Chat Room task than non-ADHD controls (Mikami et al., 2007). Specifically, a study done by Mikami et al. in 2007 found that children with the inattentive subtype of ADHD made fewer total responses than children with the combined subtype of ADHD and comparison children, yet there were no differences between children with the combined subtype of ADHD and comparison children (Mikami et al., 2007). The present study did not find subtype
differences; however, since there were differences between children with ADHD and non-ADHD controls, this still shows children with ADHD make fewer responses overall, regardless of subtype. Children with ADHD also incorporated less previous knowledge from previous parts of the conversation into his or her comments and questions, shared less about himself or herself, and the conversation did not flow as well compared to non-ADHD controls. These three Chat Room variables were not examined in the previous study, but suggest that children with ADHD are not as engaged in the conversation as children with ADHD, and would be an interesting direction for future research.

The Chat Room variables that were not significant included the total number of one-word responses made by the child, how much the child joined in the conversation, how much the child interacted with the computer program children as if they were real children, the total number of prosocial responses, whether or not the child disengaged from the conversation, and the total number of hostile responses. The reason that how much the child joined in the conversation and how much the child interacted with the computer program children as if they were real children may not have shown significance could be a result of the format of the Chat Room task. Since children were instructed by the testers to join in the conversation, the majority of children would participate, regardless of whether or not they have ADHD. In regards to the total number of one-word responses, the total number of prosocial responses, whether or not the child disengaged, and the total number of hostile responses, these are variables that occur less frequently among children than some of the other variables, and this could account for why children with ADHD did not differ from non-ADHD controls.

Out of all the non-significant Chat Room variables, only two have been evaluated previously, including the total number of prosocial and hostile responses, and only the number of
prosocial responses was consistent with previous findings. Research has shown that children with ADHD did not differ from comparison children in the amount of prosocial responses made (Mikami et al., 2007). However, with regards to the total amount of hostile responses made, previous research showed that children with the combined subtype of ADHD made more hostile responses than comparison children (Mikami et al., 2007). These results were not consistent with the present study, in which children with ADHD did not differ from non-ADHD controls in the number of hostile responses made. Because this variable occurred so infrequently, this could explain why children with ADHD did not make more hostile responses than non-ADHD controls. The total number of one-word responses, how much the child joined in the conversation, how much the child interacted with the computer program children as if they were real children, and whether or not the child disengaged from the conversation are new variables that have not been evaluated previously. These variables should be further examined by future studies to determine why children with ADHD did not differ from non-ADHD controls.

After the one-way ANOVA, exploratory factor analyses were completed on relevant independent and dependent variables to justify the creation of summary variables. These summary variables included parent and teacher report of externalizing problems, parent and teacher report of internalizing problems, parent and teacher report of social skills, and Chat Room variables. Finally, hierarchical regressions were completed using the summary variables created in which the dependent variable was social skills, the first step was a diagnosis of ADHD, and the second step was the presence of comorbidity.

The results of the hierarchical regressions indicated that parent and teacher report of externalizing and internalizing problems significantly predicted parent and teacher report of social skills above that of ADHD, whereas parent and teacher report of externalizing and
internalizing problems did not predict the Chat Room composite score above that of ADHD. Because of this variability in the results, it is difficult to determine which set of hierarchical regressions is applicable to the real world.

The Chat Room task has been shown to be a reliable measure that is similar to interactions children have in the real world (Mikami et al., 2007). Thus, it may be that comorbidity does not affect social skills above and beyond that of ADHD. However, with that said, the Chat Room is a novel task that needs future studies to confirm its validity (Mikami et al., 2007). On the other hand, because parents and teachers observe children in their natural settings, they may be a more reliable source to measure social skills than the Chat Room task, for which good performance also depends on a child’s typing skill and familiarity with computers more generally. Thus, a compelling argument could also be made that comorbidity does affect social skills above and beyond that of ADHD. However, certain components of these hierarchical regressions need to be examined more closely, including how accurate parents and teachers are in reporting social skills, as well as any halo effects or rater biases that may exist.

It is important to determine whether parents and teachers can accurately report social skills of children. Parents and teachers reported social skills through the SSRS and BASC-2. Both of these measures have been shown to be very reliable and valid measures of social skills. Specifically, the SSRS has content validity, in that it measures what it is supposed to, social validity, in that the behaviors measured are considered socially significant, and construct validity, in that it measures a construct in the real world (Gresham & Elliot, 1990). In fact, the SSRS is one of the more objective and valid measures of social skills, and because of its focus on observable behaviors, it is known as a low-inference measure (Gresham & Elliot, 1990). Since parents and teachers do not have to make many inferences when reporting social skills of
children, this seems to be a legitimate measure to use when determining social behaviors. In addition, because teachers have multiple experiences with children, they have been shown to be good judges of children’s behavior (Abikoff, Courtney, Pelham, & Koplewicz, 1993).

However, though the SSRS has strong psychometric properties, potential rater biases and halo effects may explain why parent and teacher report of externalizing and internalizing problems significantly predicted parent and teacher report of social skills, but not performance on the Chat Room task. A halo effect is defined as the presence of one behavior that affects ratings of a different behavior (Schachar, Sandberg, & Rutter, 1986). If halo effects were present in the current study, then if a parent or teacher had a negative rating of a child for externalizing or internalizing problems, they might also rate that child negatively for social skills, which would then appear to result in a significant correlation between the presence of comorbid problems and social skills. The use of the Chat Room task as an independent index of social skills does not lead to this problem.

There have been a few studies over the years examining halo effects of teachers when rating children with ADHD. One study compared teacher’s ratings on the Conners’ Rating Scale with observed behaviors and found that a rating of hyperactivity was influenced by observed defiant and inattentive behaviors, and a rating of inattentiveness was influenced by observed defiant behavior (Schachar et al., 1986). Another study determined the presence of a unidirectional bias among teachers, meaning that children who were rated as conduct disordered or aggressive on the Conners’ Rating Scale were also rated as hyperactive, but children who were rated as hyperactive were less likely to be rated as conduct disordered or aggressive (Abikoff et al., 1993). However, a later study determined that this was not the case and a bidirectional halo effect did in fact exist for ADHD and ODD (Hartung et al., 2010). Children
who were rated as inattentive or hyperactive/impulsive were also rated as oppositional, and children who were rated as oppositional were also rated as inattentive or hyperactive/impulsive (Hartung et al., 2010). Thus, previous research has suggested that comorbidity may actually be a result of halo effects (Hartung et al., 2010).

There have been some inattentive symptoms that have been previously found to be more susceptible to halo effects, including “doesn’t listen when spoken to directly” and “avoids, dislikes, or is reluctant to engage in work that requires sustained mental effort.” There have also been some hyperactive/impulsive symptoms more susceptible to halo effects, including “blurs out answers before questions have been completed,” “has difficulty awaiting turn,” and “interrupts or intrudes on others” (Hartung et al., 2010). Some of these symptoms could also represent various aspects of social skills, and could explain why parent and teacher ratings of comorbid problems and social skills were correlated.

In addition to halo effects, teachers have also been shown to have biases based on certain characteristics of students, including ethnicity and socioeconomic status, as well as the presence of certain behaviors, such as ADHD (Stevens, Quittner, & Abikoff, 1998). Diagnostic labels specifically have been shown to negatively impact teacher ratings; for instance, children who have been diagnosed with ADHD are rated less favorably than children without ADHD on behavior, personality, and IQ (Batzle, Weyandt, Janusis, & DeVietti, 2010). In addition, teachers’ first impressions of children with ADHD are more negative than children without ADHD (Batzle et al., 2010). Because previous research has shown the potential for teachers to rate children with ADHD more negatively, this may also explain the high correlation between teacher report of externalizing and internalizing problems and parent and teacher report of social skills.
Not only do teachers show biases when rating children, but parents show some biases as well. Parents may have biases due to personal history, education, demographic characteristics, or psychological functioning (Youngstrom, Izard, & Ackerman, 1999). One specific bias that has a negative effect on parental ratings of children is the depressive bias, in which the mother has been diagnosed with depression, and therefore reports more negative behaviors among her child. In fact, negative maternal affect has been shown to influence reports of the child’s behavior in a negative way (Youngstrom et al., 1999; van der Toorn et al., 2010). Not only does maternal depression influence the ratings of their children in a negative way, but fathers who have depression also rate their children more negatively (Mulvaney, Mebert, & Flint, 2007). Also, mothers and fathers who are angrier rate their children more negatively than parents who are less angry (Mulvaney et al., 2007). Parental stress may also have a negative effect on parents’ ratings of their children (Langberg et al., 2010; van der Oord, Prins, Oosterlaan, & Emmelkamp, 2006). Because the current study did not obtain data on the parental rater’s psychological functioning, it is difficult to determine whether this had an effect on how they rated their children’s behaviors. However, because it is known that parents may have biases, this could have impacted the way in which they rated their children, for both comorbid disorders as well as social skills.

Even though halo effects exist among teachers and biases may occur among parents and teachers, it does not seem as though these were the sole causes of the significant hierarchical regressions. The summary variable of parent and teacher report of social skills did not separate the teacher ratings from the parent ratings; yet the summary variables measuring externalizing and internalizing problems did separate parent and teacher reports. This study did not examine the effect of teacher report on teacher report, or parent report on parent report; it looked at the effect of parent report on parent and teacher report, and teacher report on parent and teacher.
report. This makes it unlikely that the only reason the hierarchical regressions were significant were due to halo effects and rater biases. However, because parent and teacher ratings were used in both variables, this also explains the high correlations. Overall, it can be concluded that in this current study, halo effects and potential biases were not the sole cause of the significant effect of parent or teacher report of externalizing and internalizing problems on parent and teacher report of social skills.

Limitations

One main limitation of this study is the homogeneity of the sample. The population of children in this study were recruited from the central Pennsylvania area, were between the ages of eight and twelve, and the majority of which were Caucasian. This is not a diverse sample, in age or race, so these conclusions might not generalize to other groups. Previous research has shown that teachers do rate children differently based on ethnicity and socioeconomic status. For instance, African Americans and children of low socioeconomic status are rated more deviant than Caucasians and middle-class children (Stevens et al., 1998). On the other hand, a later study demonstrated teacher ratings of children with ADHD were more accurate compared to direct observations of behavior for ethnic minority students, including African American and Hispanic students, than for Caucasian students, demonstrating a bias for Caucasian students with ADHD (Hosterman, DuPaul, & Jitendra, 2008). Although these studies differ drastically in their results, they both demonstrate group differences for ethnicity, which illustrates the importance of a varied sample.

Another limitation in this study is the use of parent and teacher reports as the only measure of comorbid disorders. Because previous research has illustrated that halo effects occur among teachers, and biases may be present for both teachers and parents, using only parent and
teacher reports to determine the presence of comorbid disorders may not be the most successful measure. Future studies should use another measure to determine the presence of comorbid disorders, or even obtain official diagnoses of depression, anxiety, ODD, and CD. This could be completed by having structured interviews between the children and mental health professionals, who may not be subject to the same biases and halo effects as parents and teachers (Hartung et al., 2010). By doing this, future studies eliminate the problem of halo effects and rater biases that may present through only using parent and teacher reports.

In addition, the summary variables created may not have been good summaries of the data. For instance, when looking at each dependent variable separately, ADHD significantly predicted some of the Chat Room variables, including the total responses made by the child, how much the child incorporated knowledge from previous parts of the conversation into his or her comments and questions, how much the child shared things about himself or herself, and how well the conversation flowed. However, when these variables were combined to make a summary variable, ADHD no longer significantly predicted these Chat Room variables. The results may have been different if the Chat Room variables were analyzed separately. Each of the Chat Room variables – the total responses made by the child, how well the child incorporated knowledge from previous parts of the conversation into his or her questions and comments, how much the child shared things about himself or herself, and how well the conversation flowed – examine different aspects of social skills. Perhaps comorbidity may have significantly predicted these variables above that of ADHD if they were analyzed individually.

In addition to the Chat Room variables, ADHD significantly predicted the parent and teacher reports of social skills when they were analyzed individually, but not when they were combined into summary variables. Individually, these variables included the parent standard
score on the Social Skills Index of the SSRS, the teacher standard score on the Social Skills Index of the SSRS, the parent T-Score on the Social Skills Scale of the BASC-2, and the teacher T-Score on the Social Skills Scale of the BASC-2. Because ADHD no longer significantly predicted social skills when the variables were combined into summary variables, this illustrates a problem with the summary variables used. Future studies should try to examine each measure of social skills separately, so the effect of a diagnosis of ADHD remains significant, even when further examining the effects of comorbidity.

Creating summary variables of comorbid disorders may also not have been the best way to analyze comorbidity. These summary variables combined comorbid disorders into externalizing and internalizing disorders, but the results may have been different if each comorbid disorder was analyzed separately. For instance, within the internalizing problems, depression may have a different effect on social skills than anxiety disorders. Within the externalizing problems, aggression, oppositionality, and conduct problems may all have different effects on social skills as well. It may be necessary to examine all these comorbid problems separately, in order to determine the specific effects comorbid disorders have on social skills.

In addition to the summary variables, there are also some limitations with the actual Chat Room task. One limitation includes the lack of validation because of the novelty of the Chat Room task. Also, it is unclear what the effects of the computer program children in the Chat Room have on children’s responses (Mikami et al., 2007).

Conclusion

In conclusion, although there are limitations, this study does present some initial findings that comorbid disorders may affect social skills deficits above and beyond that of ADHD. Future studies should further look into these results in order to determine the specific effects of the
various comorbid disorders on social skills deficits above that of ADHD. It is important to
determine the specific effects of each comorbid disorder separately, as well as the areas of social
skills most affected, in order to develop effective treatments and intervention strategies.
### Tables and Figures

**Means and Standard Deviations of Social Skills Indices by Group**

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Control (n=26)</th>
<th>ADHD (n=32)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chat Room</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Responses</td>
<td>24.62 (15.171)</td>
<td>16.56 (9.381)</td>
<td>.016</td>
</tr>
<tr>
<td>Total 1 Word Responses</td>
<td>2.42 (2.671)</td>
<td>1.56 (1.795)</td>
<td>.149</td>
</tr>
<tr>
<td>Join In</td>
<td>4.96 (2.2)</td>
<td>4.13 (2.091)</td>
<td>.144</td>
</tr>
<tr>
<td>Incorporate Knowledge</td>
<td>3.38 (2.08)</td>
<td>2.09 (1.729)</td>
<td>.012</td>
</tr>
<tr>
<td>Share Things</td>
<td>4.77 (2.084)</td>
<td>3.59 (2.014)</td>
<td>.034</td>
</tr>
<tr>
<td>Responses Flow</td>
<td>4.77 (1.904)</td>
<td>3.66 (2.042)</td>
<td>.038</td>
</tr>
<tr>
<td>Interact as if Real Children</td>
<td>5.19 (2.173)</td>
<td>4.16 (2.316)</td>
<td>.087</td>
</tr>
<tr>
<td>Prosocial</td>
<td>.42 (.857)</td>
<td>.19 (.471)</td>
<td>.189</td>
</tr>
<tr>
<td>Disengage</td>
<td>.08 (.272)</td>
<td>.16 (.374)</td>
<td>.343</td>
</tr>
<tr>
<td>Hostile</td>
<td>0</td>
<td>.03 (.177)</td>
<td>.372</td>
</tr>
<tr>
<td><strong>Questionnaires</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Standard Score on SSRS</td>
<td>108.48 (15.621)</td>
<td>86.613 (14.546)</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Teacher Standard Score on SSRS</td>
<td>113.6 (12.453)</td>
<td>88 (11.336)</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Parent T-Score for Social Skills on BASC-2</td>
<td>54.35 (8.935)</td>
<td>44.72 (9.709)</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Teacher T-Score for Social Skills on BASC-2</td>
<td>57.36 (8.495)</td>
<td>45.32 (8.109)</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>
Table 2

*Demographics*

<table>
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<tr>
<th></th>
<th>ADHD</th>
<th>Non-ADHD Control</th>
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<tbody>
<tr>
<td>Male: Female</td>
<td>17:15</td>
<td>11:15</td>
</tr>
<tr>
<td>Mean Age (SD)</td>
<td>9.5 (1.32)</td>
<td>10.12 (14)</td>
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</table>

*Figure 1.* Parent Report of Externalizing Problems on Parent and Teacher Report of Social Skills
Figure 2. Parent Report of Externalizing Problems on Chat Room Variables

Figure 3. Teacher Report of Externalizing Problems on Parent and Teacher Report of Social Skills
Figure 4. Teacher Report of Externalizing Problems on Chat Room Variables

Figure 5. Parent Report of Internalizing Problems on Parent and Teacher Report of Social Skills
Figure 6. Parent Report of Internalizing Problems on Chat Room Variables

Figure 7. Teacher Report of Internalizing Problems on Parent and Teacher Report of Social Skills
Figure 8. Teacher Report of Internalizing Problems on Chat Room Variables

Figure 9. Chat Room Computer Screen (Mikami, Huang-Pollock, Pfiffner, McBurnett, & Hangai, 2007)
References


Ollendick, T.H. & King, N.J. (1994). Diagnosis, Assessment, and Treatment of Internalizing


Academic Vita

**Education**
Penn State University, University Park, Pennsylvania 8/2007-Present  
Major: Psychology  
Graduation: May 2011  

**Honors and Awards**
Penn State’s University-Wide Undergraduate Research Exhibition 4/13/2011  
Information Literacy Award, First Place  3/21/2011  
Psi Chi Research Exhibition, Honorable Mention  2/2011  
Costello Family Scholarship in Psychology, Honorable Mention  6/2008-Present  
Schreyer’s Honors College  2007-2010  
National Latin Honor Society

**Presentations**
Penn State’s University-Wide Undergraduate Research Exhibition 4/13/2011  
Penn State’s Psychology Department’s Psi Chi Undergraduate Research Exhibition 3/21/2011

**Research Experience**
Child Attention and Learning Lab 9/2009-Present  
Research Assistant  
Supervisor: Cynthia Huang-Pollock, Ph.D.  
- Trained to administer and score selected subtests of the WISC-IV and WIAT-II for children ages 8-12 with and without clinical disorders  
- Fluent in SPSS statistical software  
- Recruit and screen potential participants  
- Develop skills in doing backups, Chat Room coding, developmental history forms, BASC-2, Conners’, SSRS, ADHD Rating Scales, Peer Rating Scale, DISC-IV  
**Honors Thesis**  9/2010-Present  
“The Effects of Attention-Deficit/Hyperactivity Disorder and Comorbidity on Social Skills Deficits”

**Related Psychology Experience**
Mental Health Practicum With Children 9/2010-3/2011  
Coach  
Supervisor: Janet Welsh, Ph.D.  
- Worked with five first-grade girls with different disabilities  
- Developed appropriate social skills through teaching, practicing, and applying the skills  
- Managed various behavioral issues that may arise during our sessions  
- As coach, supervised twenty students and twenty children and organized different activities among the team  
- Community service consisted of working with a developmentally challenged child and helping him develop appropriate social skills and participate in group activities
<table>
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<tr>
<th>Employment</th>
<th>Marlboro Recreation Day Camp</th>
<th>Marlboro, NJ</th>
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<tr>
<td>Travel Camp Counselor</td>
<td></td>
<td>6/2007-8/2010</td>
</tr>
<tr>
<td>• In charge of fifteen 14-year old children</td>
<td></td>
<td></td>
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<tr>
<td>• Responsible for children on daily trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Assisted with children with Asperger’s and ADHD</td>
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<table>
<thead>
<tr>
<th>Volunteer &amp; Work</th>
<th>Sigma Delta Tau Sorority</th>
<th>10/2007-Present</th>
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<tbody>
<tr>
<td>Secretary</td>
<td></td>
<td>1/2009-12/2009</td>
</tr>
<tr>
<td>• Member of the executive board, made decisions for the well-being of the members and sorority as a whole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• As secretary of the sorority, took minutes at weekly chapter meetings and updated the national advisor by sending chapter minutes and weekly e-mails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Raise money for the Penn State IFC/Panhellenic Dance Marathon (THON), Cure Autism Now, and Prevent Child Abuse America</td>
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</tr>
</tbody>
</table>

**THON Donor and Alumni Relations Committee** 10/2010-2/2011

**Inspiration Chair**

• During the year, working as a committee to fundraise for THON and maintain relationships with the contributors to THON

• As inspiration chair, provide weekly motivational videos and family stories to the members of the committee

• Help to organize and implement the letters to be distributed to the volunteers throughout the university

**THON Morale Committee** 10/2009-2/2010

• During the year, worked as a committee to plan the health, safety, and fun of the dancers at THON

• At THON, supported the dancers physically and emotionally to ensure they dance throughout the entire weekend

• Sent letters to family and friends in hopes of donations for THON


• Worked as a committee to enforce security at THON and ensure the safety of dancers, children, family, and students

• Sent letters to family and friends in hopes of donations for THON