University of Kentucky
**UKnowledge**

2009

# THE ROLE OF PRAGMATIC LANGUAGE USE IN MEDIATING THE RELATION BETWEEN ADHD SYMPTOMATOLOGY AND SOCIAL SKILLS

Melinda Apel Leonard
*University of Kentucky*, melinda.leonard@louisville.edu

**Click here to let us know how access to this document benefits you.**

Recommended Citation

ABSTRACT OF DISSERTATION

Melinda Apel Leonard

The Graduate School

University of Kentucky

2009

THE ROLE OF PRAGMATIC LANGUAGE USE IN MEDIATING THE RELATION
BETWEEN ADHD SYMPTOMATOLOGY AND SOCIAL SKILLS

--------------------------------

ABSTRACT OF DISSERTATION

--------------------------------

A dissertation submitted in partial fulfillment of the

requirements of the degree of Doctor of Philosophy in the

College of Arts and Sciences

at the University of Kentucky

By

Melinda Apel Leonard

Lexington, Kentucky

Co-Directors:  Dr. Elizabeth P. Lorch, Professor of Psychology
 and          Dr. Richard Milich, Professor of Psychology

Lexington, Kentucky

ABSTRACT OF DISSERTATION


THE ROLE OF PRAGMATIC LANGUAGE USE IN MEDIATING THE RELATION
BETWEEN ADHD SYMPTOMATOLOGY AND SOCIAL SKILLS

The goal of the current study was to investigate the social skills of a community sample of children that would vary in their level of ADHD symptomatology (e.g., inattention and hyperactivity), with a specific focus on their communication patterns and pragmatic language use (PLU). The study explored whether PLU was associated with, and perhaps accounted for, the social skills problems children with different degrees of ADHD symptomatology experience. Pragmatic language use, ADHD symptomatology, and social skills were examined with traditional standardized measures as well as a detailed investigation of communication patterns and PLU obtained from sampling behaviors from a semi-structured dyadic communication task. A community sample of 54 children between the ages of 9 and 11 years participated.

Pragmatic language use partially mediated the relation between ADHD symptomatology and social skills. These results indicate that although the correlation between ADHD and social skills drops from $r = -.649$, $p < .01$ to $r = -.478$, $p < .01$, when PLU is entered in the model, the correlation between ADHD and social skills still remains significant. Further, ADHD symptomatology and PLU both predicted social skills scores, and although ADHD symptomatology and PLU were related to one another, PLU provided a unique contribution in the estimate of children's social skills of 10.5% above and beyond the contribution of ADHD symptomatology. However, ADHD symptomatology was the most influential predictor in uniquely accounting for approximately 19% of the differences in social skills outcomes above and beyond the contribution of PLU.

Possible explanations as to why PLU mediates the relation between ADHD symptomatology and social skills are discussed. Implications and future research are discussed in terms of children with ADHD and peer relations.

Melinda A. Leonard
Student's Signature

November 20, 2009
Date

THE ROLE OF PRAGMATIC LANGUAGE USE IN MEDIATING THE RELATION
BETWEEN ADHD SYMPTOMATOLOGY AND SOCIAL SKILLS

By

Melinda Apel Leonard

Elizabeth P. Lorch, Ph. D.

Co-Director of Dissertation

Richard Milich, Ph. D.

Co-Director of Dissertation

David T. R. Berry, Ph. D.

Director of Graduate Studies

RULES FOR THE USE OF DISSERTATIONS

Unpublished dissertations submitted for the Doctor's degree and deposited in the
University of Kentucky Library are as a rule open for inspection, but are to be used only
with due regard to the rights of the authors. Bibliographical references may be noted, but
quotations or summaries of parts may be published only with the permission of the
author, and with the usual scholarly acknowledgments.

Extensive copying or publication of the dissertation in whole or in part also requires the
consent of the Dean of the Graduate School of the University of Kentucky.

A library that borrows this dissertation for use by its patrons is expected to secure the
signature of each user.

Name                                                                    Date

_____

_____

_____

_____

_____

_____

_____

_____

_____

DISSERTATION

Melinda Apel Leonard

The Graduate School

University of Kentucky

2009

THE ROLE OF PRAGMATIC LANGUAGE USE IN MEDIATING THE RELATION
BETWEEN ADHD SYMPTOMATOLOGY AND SOCIAL SKILLS

———————————————

DISSERTATION

———————————————

A dissertation submitted in partial fulfillment of the
requirements of the degree of Doctor of Philosophy in the
College of Arts and Sciences
at the University of Kentucky

By
Melinda Apel Leonard

Lexington, Kentucky

Co-Directors:  Dr. Elizabeth P. Lorch, Professor of Psychology
and            Dr. Richard Milich, Professor Psychology

Lexington, Kentucky

Copyright © Melinda A. Leonard 2009

ACKNOWLEDGMENTS

The following dissertation while an individual work, benefited from the insights and direction of several people. First, my Dissertation Co-Chairs, Dr. Elizabeth Lorch and Dr. Richard Milich, both exemplify the high quality scholarship to which I aspire. In addition, they provided instructive comments and evaluation at every stage of the dissertation process. Next I wish to thank the complete Dissertation Committee, and the outside reader, respectively: Dr. Sharon Stewart, Dr. Christia Brown, and Dr. Jennifer Grisham-Brown. Each member provided insights that guided and challenged my thinking, substantially improving the finished product.

In addition to the technical and instrumental assistance above, I received equally important assistance from my family. I would like to thank my husband, Darrell, who has persisted with me these past six years, oftentimes holding me up and providing a shoulder to cry on.  He not only willingly moved and gave up our "dream home" (which we built together with our own hands), he suffered long hours commuting to and from work until he finally found a position commensurate of his experience. He also welcomed the opportunity to complete several hours of training to fulfill the IRB requirements of serving as my research assistant. He spent countless hours in the evenings and on the weekends collecting data from the parents, while I worked with the children. His assistance with this dissertation project was invaluable. I could not have completed it without him.

I would also like to thank my two sons, Michael and Devin, along with Marguerite and Jaqueline. Each provided on-going encouragement, support, and insight. I truly appreciated their willingness to adjust to my demanding schedule and my frequent

ups and downs. The arrival of my first grandson, Gabriel provided respite along the way to reenergize my thoughts, and stamina to complete the process. My family's abundant sacrifices and commitment to my success have sustained me throughout the dissertation process. I would also like to thank my parents for their continued love and support. The completion of my degree is a dedication to their love and encouragement during not only these past six years, but my entire life.

I would also like to thank Jesse Yule for the countless hours spent coding videos and transcripts. Thank you to the University of Kentucky's Women's Club for providing me with a fellowship to complete this research. Additionally, I would like to thank a fellow graduate student, Ursula Bailey, for her continued support and guidance. Her presence and helpful attitude carried me through the low periods and provided laughter and fellowship along the way.

Finally, I would like to thank the parents and children that participated in this study. Without their willingness to take part in developmental research, this dissertation project would not have been possible.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

**Chapter One: Introduction**

**Attention Deficit Hyperactivity Disorder**

Attention deficit hyperactivity disorder (ADHD) is a behavioral disorder characterized by developmentally inappropriate levels of inattention, hyperactivity, and impulsive behavior. It has been estimated that ADHD afflicts as many as 10% of elementary school children, the majority of whom are boys (Barkley, 1990). Children with ADHD are more likely to experience disturbed peer relationships, rejection by peers, and failure to attain peer acceptance (Erhardt & Hinshaw, 1994; Melnick & Hinshaw, 1996). In addition, social troubles of children with ADHD are among the most frequently listed problematic behaviors by parents and teachers (Whalen & Henker, 1985). Although evidence is more mixed, children with ADHD also have been found to demonstrate communication deficiencies (Cantwell & Baker, 1991; Cohen, Davine, Horodezky, Lipsett, & Isaacson, 1993). These communication deficiencies may exist in the form of pragmatic language use. According to Camarata and Gibson (1999), the pragmatic aspect of language may be particularly vulnerable to disruption in children with ADHD. The goal of the current study was to investigate the social skills of a community sample of children that would vary in their level of ADHD symptomatology (e.g., inattention and hyperactivity), with a specific focus on their communication patterns and pragmatic language use. The study explored whether pragmatic language use was associated with, and perhaps accounted for, the social skills problems children with different degrees of ADHD symptomatology experience.

Peer relationships are the primary context in which children learn the social skills (e.g., cooperation, negotiation, and conflict resolution) that are critical for effective social functioning throughout life (Rubin, Bukowski, & Parker, 1998). Childhood peer problems predict a wide variety of later negative outcomes including academic difficulties, delinquency, dropping out of school, substance abuse, and psychological maladjustment (Rubin et al.; Parker & Asher, 1987). Because the social skills difficulties of children with ADHD symptomatology may have important long-term consequences, a better understanding of factors related to these difficulties is critical.

One factor that may be related to social skills difficulties is problems in communication. Typically developing children who are good communicators also find it

relatively easy to establish and maintain friendships (Gottman, 1983). Communication in social interaction is part of the pragmatic aspect of language. The pragmatic domain refers to the practical use of language in social interaction and includes verbal utterances, paralinguistic utterances, and non-verbal behaviors (Prutting & Kirchner, 1987). The diagnostic criteria for ADHD include behaviors that suggest pragmatic dysfunction, such as talking excessively, interrupting others, not listening to what is being said, blurting out answers to questions before they are completed, and experiencing difficulty waiting for turns (*DSM-IV*, American Psychiatric Association, 1994). Frequent occurrence of such behaviors may impair social interaction and be associated with difficulties with peers. Thus, the proposed study will explore relations between the social skills difficulties of children with different degrees of ADHD symptomatology and pragmatic language use deficiencies, assessed both by standardized measures and in a semi-structured dyadic communication task.

**Social Skills among Children with ADHD**

The primary characteristics that define ADHD in children are socially disruptive behavior, inappropriate levels of attention, impulsiveness, hyperactivity, or a combination thereof (*DSM-IV*, American Psychiatric Association, 1994). These problematic characteristics may result in peer difficulties. According to Barkley (1997), children with ADHD have been found to display deficiencies in behavioral or response inhibition. The construct of behavioral or response inhibition is defined as the capacity to delay prepotent responses, to interrupt ongoing responses given feedback about performance, and to inhibit responding to sources of interference when engaged in tasks requiring self-regulation and goal-directed action (Barkley, 1999). Barkley stated that symptoms of this disorder could be conceptualized as representing a general inability to delay responding to the environment.

Individuals with ADHD respond relatively immediately to their environment, thus failing to consider the consequences of their actions. Specifically, those with ADHD have difficulties with the inhibition of prepotent responses to tasks when required to do so, are less able to delay gratification or to resist temptation, are less able to interrupt ongoing responses when signaled to do so, and are less able to shift their response patterns despite feedback concerning their errors (Barkley, 1997, 1999). Children's social competence

and later adjustment with peers may be influenced by inhibitory control deficiencies. Barkley reported that items on rating scales that pertain to excessive speech load on the same dimension as items pertaining to excessive motor activity and impulsiveness, suggesting excessive motor activity and speech/vocalization may be indicative of poor behavior inhibition in children with ADHD.

The diagnosis for ADHD does not include problematic peer relationships as an essential symptom; however, the symptomatology included under the diagnosis has major implications for peer relationships. Specifically, difficulty sustaining attention in tasks or play activities, difficulty waiting his or her turn, and talking and fidgeting excessively (Parker, Rubin, Price, & DeRosier, 1995) may compromise children's relationships with others. Undercontrolled, impulsive, and aggressive behavior is characteristic and predictive of peer rejection (Bates, Bayles, Bennett, Ridge, & Brown, 1991). Studies of peer interactions have found children with ADHD, compared to those without ADHD, to be more negative and emotional in their social communications with peers (Pelham & Bender, 1982).

Children with ADHD have been reported to display large social skills deficits. Their peers see them as intrusive, loud, annoying, and generally aversive. Blurting out incorrect verbal responses and disrupting the conversations of others with such intrusive responses are considered primary symptoms of impulsiveness in children with ADHD (*DSM-IV*, American Psychiatric Association, 1994). Furthermore, these children have been found to talk more than other children, whether to others or out loud to themselves, and make more vocal noises than do other children (Barkley, 1999). These children seem significantly less adaptive in their ability to adjust social communication behaviors, which may result in serious problems forming and maintaining friendships and peer acceptance (Henker & Whalen, 1999; Hoza, Waschbusch, Pelham, Molina, & Milich, 2000; Landau, Milich, & Diener, 1998). It has been suggested that children with ADHD act as "negative social catalysts," and elicit maladaptive behaviors from individuals (teachers, parents, and peers) around them (Whalen & Henker, 1985).

The social skills disabilities associated with ADHD have been viewed in terms of peer relationships and social ratings rather than communication skills (Greene, Biederman, Faraone, Ouellette, Penn, et al. 1996; Frederick & Olmi, 1994). However, as

noted above, several of the behaviors children with ADHD exhibit in social situations appear to reflect deficiencies in pragmatic language. Clarifying our knowledge of the language abilities of children with ADHD may further our understanding of the social difficulties experienced by these children (Mathers, 2006).

**Receptive and Expressive Language Abilities among Children with ADHD**

The bulk of work on language deficiencies among children with ADHD has been in the area of receptive and expressive language. Receptive language skill is the ability to understand or comprehend spoken language. Expressive language skill is the ability to communicate thoughts, needs, or wants. Children deficient in these skills are not able to communicate at the same level or with the same complexity as his or her peers.

Several studies of expressive language functioning among children with ADHD suggest pragmatic difficulties. Findings from Leonard (2005) utilizing the *Oral and Written Language Scales*: Listening Comprehension (LC) Scale (receptive language) and the Oral Expression (OE) Scale (expressive language) (*OWLS*; Carrow-Woolfolk, 1995) were consistent with several studies (Barkley, DuPaul, & McMurray, 1990; O'Neill & Douglas, 1991; Kim & Kaiser, 2000; Zentall, 1988) that obtained no difference in receptive language abilities between children with ADHD and typically developing children. However, Leonard (2005) found that children with ADHD scored significantly lower on the *OWLS* Oral Expression Scale than the nonreferred children. Further error analyses revealed that, within the constraints of the *OWLS*, the clearest evidence of oral expressive dysfunction within the semantic domain of children with ADHD was on pragmatic items. These language deficiencies as measured by the *OWLS* included inappropriate conversation and questioning.

These findings of expressive language dysfunction are consistent with the findings of Kim & Kaiser (2000) who also used a standardized language test as the primary measure of language abilities, and are consistent with studies using storytelling tasks as a measure of oral expression abilities (Purvis & Tannock, 1997; Tannock, Purvis, & Schachar, 1993; Zentall, 1988). Additional pragmatic difficulties with language use include the use of ambiguous references creating difficulty for the listener to follow the speaker's train of thought, difficulty in maintaining conversation, or difficulty in turn

taking during conversations (Humphries, Koltun, Malone & Roberts, 1994; Purvis & Tannock, 1997; Zentall, Gohs, & Culatta, 1983).

**Pragmatic Language Characteristics**

The pragmatic aspect of language refers to the practical use of language in social interaction and includes verbal utterances, paralinguistic utterances, and non-verbal behaviors (Prutting & Kirchner, 1987). According to Prutting and Kirchner, verbal utterances include topic initiation, topic maintenance, turn taking, use of context, interruptions, and amount of talk. Paralinguistic utterances include intensity, intelligibility, tone, and rhythm. Non-verbal behaviors include eye contact, facial expression, physical proximity, and gestures. Pragmatic impairments are not restricted to spoken language. Use of gesture is also impaired (Wetherby & Prutting, 1984; Ohta, 1987) as is the comprehension and production of communicative facial expression (Langdell, 1981). A broader definition of pragmatics incorporates behaviors that encompass social, emotional, and communicative aspects of social interaction (Adams, Baxendale, Lloyd, & Aldredge, 2005; Martin & McDonald, 2003). Assessment of pragmatics can provide a complementary window into aspects of social and cognitive functioning (Adams, Green, Cox, & Gilchrist, 2002) that observation of non-verbal behaviors alone cannot, and can make a sound contribution to communication and social intervention strategies for children with ADHD (Camarata & Gibson, 1999; Westby & Cutler, 1994).

Pragmatic language difficulties are specific to the use and comprehension of language in context, rather than problems with semantic or structural aspects of language (Bignell & Cain, 2007). In a study conducted by Bishop, Chan, Adams, Hartley, and Weir (2000), the term pragmatic language impairment was used in preference to "semantic-pragmatic disorder" to describe the group of children with language impairments because some of the children did not have evidence of semantic problems. Results indicated children who failed to use nonverbal responses also had a relatively high level of pragmatically inappropriate responses that were not readily accounted for in terms of limited grammar or vocabulary.

Pragmatic language development is an ongoing interaction in child and peer behaviors. The literature on normal children's language shows pragmatic competence at a

surprisingly early age. For example, 2-year-olds can adapt their message to what the listener knows or does not know, and respond to listener feedback (Wellman & Lempers, 1977; Mueller, Bleier, Krakow, Hegedus & Carnoyer, 1977; Furrow, 1984). From 2 years of age, children can maintain topic in interaction with an adult (Ervin-Tripp, 1979), and can adapt speech style to the listener (Dunn & Kendrick, 1982). Stabilization in turn taking occurs between 2 years, 6 months and 3 years, 6 months (Klecan-Aker & Swank, 1988). Additionally, use of early polite forms is variable from 2 years (Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979) and fully developed by 9 years (McTear & Conti-Ramsden, 1992). By age 5, children make turn-taking repairs (Ervin-Tripp, 1979), and between age 6 and 7 years, metapragmatic skills (the ability to reflect on one's own communication) are present (Andersen-Wood & Smith, 1997).

The school-age years bring new settings, audiences, roles, and experiences that provide the motivation for further refinement of language skills. Conversational skills mature as students improve their ability to perceive others' abilities and knowledge and their ability to shift topics in subtle ways (McLaughlin, 1998). Children are able to achieve their pragmatic goals such as asserting, denying, sharing information, and bonding with others, and learn forms that help them achieve these goals (Dore, 1974, 1975; Searle, 1969, 1975, 1979) As these children traverse the school system, their cognitive abilities have developed to the point that they are able to describe, compare and contrast, explain, analyze, hypothesize, deduce, and evaluate. Their ability to use more than one communicative function at the same time sets them apart from younger children (Halliday, 1973, 1975, 1977). The school-age years are characterized by growth in all aspects of language, although the development of pragmatics and semantics seems to be the most prevalent (Owens, 2001).

As children move from pre-school to upper-elementary school, conversation becomes more important for establishing and maintaining social relationships. Age-appropriate skill in carrying on conversations has been implicated in children's success at making friends and being accepted by peers (Hemphill & Siperstein, 1990). When interacting with peers, upper-elementary school children are able to maintain a topic of conversation, produce more topic continuations, topic invitations and responses, produce

fewer silent pauses, and become more proficient at controlling the processes of planning, production, and comprehension (Owens, 2001; McLaughlin, 1998).

Younger children's conversations are typically loosely organized, involving unrelated topics and abrupt topic shifts, and oftentimes irrelevant. According to Grice's (1975) principle of relevance, conversational participants should make their contributions relevant to their partner's immediately prior utterances or the overall topic. On the other hand, compared to younger children, older children appear to assume that speakers conform to Grice's first maxim of quantity, which infers that they will make their messages only as informative as is required for the current purposes of the exchange. The maxims established by Grice specify what participants have to do in order to converse in a maximally efficient, rational, cooperative way. Children should speak sincerely, relevantly and clearly, while providing sufficient information. Older children therefore, are more adept at utilizing these maxims correctly compared to younger children.

Appropriate pragmatic communication skills are critical in both academic tasks requiring cooperative group learning and nonacademic social occasions (Westby & Cutler, 1994). The children who are able to develop these skills are more successful in their social interactions with peers, family, and teachers (Bierman, 2004). Children who invite others to play and take turns in dyadic interactions are viewed as attractive friends (Gottman, 1983). Successful communicators are able to share information about themselves and their feelings and opinions, and they ask questions to elicit information from others. Thus, these children are able to establish and maintain effective friendships (Rubin et al., 1998).

**Pragmatic Language Abilities among Children with ADHD**

The criteria for ADHD imply pragmatic dysfunction in children with ADHD because these children experience difficulty waiting on turns, talking excessively, interrupting others, not listening to what is being said, and blurting out answers to questions before they are completed (*DSM-IV*, American Psychiatric Association, 1994).

Minimal research exists documenting the specific pragmatic abilities in children with ADHD. Even so, pragmatic language difficulties were documented over a decade ago in a study investigating the pragmatic (social use) and semantic (meaning) language abilities of children with ADHD with and without reading disabilities (RD). Purvis and

7

Tannock (1997) used three measures of language ability, a story retelling task that required the comprehension and use of extended stretches of language and two standardized measures of receptive and expressive abilities involved in the semantic aspect of language (The Word Test and the Language Processing Test). Two aspects of children's production of narratives were assessed. The first was overall productivity (total amount recalled) and the second was the adequacy of the children's organization and self-monitory of their output. Organization and self-monitory were assessed in terms of unrepaired errors made by children during their story reconstructions. According to Purvis and Tannock, unlike the narrative task, the two standardized measures did not require lengthy responses with demands for self-organization. In contrast to the RD groups (RD and ADHD + RD), the ADHD-only group did not show deficits in the receptive or expressive (semantic) aspects of language. The pragmatic language deficits demonstrated by the children with ADHD without RD seem to reflect difficulties with language use rather than deficits in the basis subsystems of language (i.e., phonology, semantics, and syntax). Purvis and Tannock suggest a systematic deficit in the cognitive processes underlying the social use of language by children with ADHD, as well as the accompanying impairment in the social skills of these children.

The review of pragmatic skills and ADHD behaviors conducted by Camarata and Gibson (1999) suggest that this aspect of language may be particularly vulnerable to disruption in these children. Although children with ADHD represent a highly heterogeneous group, a significant proportion presents with additional language and learning limitations, specifically pragmatic difficulties associated with inappropriate conversational participation (Purvis & Tannock, 1997). Observations of children with ADHD have revealed numerous behaviors related to pragmatic disorders (Baker & Cantwell, 1992). Children with ADHD were observed to be disfluent, wandered off topic in conversations, and experienced difficulty fluently retelling an organized story.

In a study closely related to the current study, Kim and Kaiser (2000) compared the receptive and expressive semantic and syntactic language skills and the pragmatic skills of children with ADHD to those of typically developing children. They reported that children with ADHD are more likely to have problems with expressive language rather than receptive language, as measured by the Peabody Picture Vocabulary Test-

Revised and the Test of Language Development-2 Primary, and that these expressive language deficits appear to be similar to those in children with learning disabilities. Further, children with ADHD compared to typically developing children produced significantly more inappropriate pragmatic behaviors as measured by the Pragmatic Protocol (Prutting & Kirchner, 1987) in an unstructured play interaction with an adult partner, although their pragmatic knowledge (ability to use language in social situations) as measured by the Test of Pragmatic Language (TOPL; Phelps-Terasaki & Phelps, Gunn, 1992) did not differ. The most inappropriate pragmatic behaviors observed in children with ADHD as measured by the TOPL, included no response to a question or request, interruption/overlap, feedback to the speaker, cohesion, and specificity. Kim and Kaiser suggest that children with ADHD may have fewer pragmatic knowledge deficits than pragmatic performance deficits. They may know how to communicate properly when alternative responses are presented, but they have difficulty when they have to produce their own responses in social situations (Westby & Cutler, 1994).

Bignell and Cain (2007) investigated pragmatic aspects of communication and language comprehension in relation to poor attention and/or high hyperactivity in a nondiagnosed population of 7- to 11-year olds. Classroom teachers rated their pupils' attention and hyperactivity/impulsivity on the ADD-H Comprehensive Teacher Rating Scale. Three groups were formed: children with poor attention and low hyperactivity (poor attention group), children with good attention and high hyperactivity (high hyperactivity group), and children with both poor attention and high hyperactivity (poor attention/high hyperactivity group). Their performance was compared with that of same-age controls in two studies: Study 1 investigated the comprehension of figurative language in and out of context and Study 2 investigated the pragmatic aspects of communication using the Children's Communication Checklist – Second Edition. These researchers reported that the poor attention and the attention/high hyperactivity groups were impaired in both their comprehension of figurative language and in pragmatic aspects of communication. The high hyperactivity group was impaired in their comprehension of figurative language but they did not exhibit communication impairments. These results extend work with clinical populations of children with

ADHD, even in a nondiagnosed sample of children, in that poor attention and elevated levels of hyperactivity are associated with pragmatic language weaknesses.

**Pragmatics and Peer Difficulties among Children with ADHD**

To date, virtually no empirical research has been published documenting the relation between pragmatic language use and the social skills difficulties among children with ADHD; although, Cohen et al., (1998) suggested that language impairments could possibly cause the social problems of children with ADHD. A possible link may be that children with ADHD seem significantly less adaptive in their ability to adjust social communication behaviors (Landau & Milich, 1988). Deficiencies in these skills have been documented to result in negative consequences such as being teased, victimized, and rejected by their peers (Bierman, 2004). These children experience difficulty in establishing and maintaining friendships (Bryan, Donahue, Pearl, & Sturm, 1981), which could result in lower social status within a peer group. Understanding the complexities of pragmatic language development, specifically the use of language in communicative contexts in children who vary in the degree of ADHD symptomatology and its association with establishing and maintaining successful peer relationships was the focus of the current study.

**The Current Study**

The goal of the current study was to investigate the social skills of a community sample of children that would vary in their level of ADHD symptomatology (e.g., inattention and hyperactivity), with a specific focus on their communication patterns and pragmatic language use. The study explored whether pragmatic language use was associated with, and perhaps accounted for, the social skills problems children with different degrees of ADHD symptomatology experience. Pragmatic language use was examined with traditional standardized language tests, as well as a detailed investigation of communication patterns and pragmatic language use obtained from sampling behaviors from a semi-structured dyadic communication task.

Utilizing a community sample of children, the following questions and hypotheses were investigated. First, is ADHD symptomatology correlated with social skills? Second, is ADHD symptomatology correlated with pragmatic language use? Third, is pragmatic language use correlated with social skills? Fourth, does pragmatic language use mediate the relation between ADHD symptomatology and social skills? It is

predicted that ADHD symptomatology will be negatively correlated with social skills and pragmatic language use, pragmatic language use will be positively correlated with social skills, and pragmatic language use will mediate the relation between ADHD symptomatology and social skills.

## Chapter Two: Method

**Recruitment**

The University of Kentucky's Institutional Review Board (IRB) and Public Relations Department (PR) approved the recruitment flyer. Written approval for the distribution of the recruitment flyer was obtained from the superintendent of the county public school district and from the principal of the private school. Copies of the recruitment flyer (Appendix A) were delivered to the respective schools for distribution to the children. Interested parents initially were screened over the phone for whether their child had a history of speech or hearing problems, or whether their child had a confirmed diagnosis of ADHD. The telephone script used during the screening process can be found in Appendix B. Only two children were reported as having a speech problem. Based on the parent's report that their child should have no problem completing the required tasks, these two children were allowed to participate in the study. There was one child reported as having a confirmed diagnosis of ADHD. This child also was allowed to participate in the study. As requested by the school district, teachers were informed of the purpose of the research study by their respective school principals.

**Participants**

The sample included 54 children from 1 private and 11 public schools in southeastern communities, ranging in age from 9 to 11 (M age = 10 years, 6 months, SD = 0.81). There were 29 boys (53.70%) and 25 girls (46.30%). Fifty-one children were Caucasian (94.45%), one was African American, one was Hispanic, and one was Biracial. Demographic characteristics are presented in Table 1.

Parental consent for the study was obtained prior to each child's participation (Appendix C). Due to the age of the children, verbal assent was obtained from each child prior to the administration of the testing session (Appendix D). Children completed one testing session lasting approximately one and a half hours. In order to maintain participants' interest and motivation during the session, each child was offered frequent breaks and tasks were interspersed within the session such that the child did not participate in two similar tasks in a row. Participating families were paid $15.

Upon completion of each session, the child's primary teacher as reported by the parent was mailed a letter explaining the purpose of the research study (Appendix E)

along with an informed consent form (Appendix F) and the standardized measures. Teachers were only required to complete one informed consent form regardless of number of students participating. Once a teacher's completed informed consent form had been received and another of their student's had completed the study, a different letter (Appendix G) was mailed along with the standardized measures. Participating teachers were paid $10 for each student completing the study. Only 20 of the 54 teachers (37%) chose to participate.

**Description of sample: Standardized measures.** The measures selected for the current study's main mediational analyses were based on standardization, and included: (1) the ADHD Index score from the Conners' Parent Rating Scales-Revised: Short Version (CPRS-R:S; Conners, 2001), (2) the GCC (General Communication Composite) from the Children's Communication Checklist – 2 U.S. Edition (CCC-2; Bishop, 2003), and (3) the CARS (Social Skills Standard Score) from the Social Skills Rating System (SSRS; Gresham & Elliott, 1990). Means and standard deviations describing the sample on each of the following standardized measures are listed in Table 1. As is evident in Table 1, the group scored somewhat above the mean on IQ status (range = 81 to 137), receptive and expressive language abilities (range = 78 to 144), and social skills (range = 59 to 131). The ADHD Index scores revealed the group mean fell in the "Average" or "No Concern" category, with considerable variation in symptomatology (range = 40 to 77), while group scores were convincingly above the mean on pragmatic language use (range = 88 to 152) and problem behaviors (range = 84 to 133). These ranges represent enough variability in the distribution of scores to expect to find relations.

**IQ testing**. The Kaufman Brief Intelligence Test -2 (KBIT-2; Kaufman & Kaufman, 2004) is administered individually to obtain a quick estimate of intelligence for ages 4 through 90. KBIT-2 measures two distinct cognitive abilities through two scales – Crystallized and Fluid. The Crystallized (Verbal) Scale contains two item types: Verbal Knowledge and Riddles. This scale includes receptive and expressive vocabulary items that do not require reading or spelling. The Fluid (Nonverbal) Scale is a Matrices subtest. Scores were provided on a familiar scale where mean = 100 and standard deviation = 15. Norms were independently established on a national standardization sample selected to

match U. S. census data. The KBIT-2 is documented as having high reliability and validity. Completion time was approximately 20 minutes.

**Receptive and expressive language abilities.** The assessment of receptive and expressive language abilities provided a broad picture of the children's language abilities. Children completed the *Oral and Written Language Scales*: Listening Comprehension (LC) Scale (receptive language) and the Oral Expression (OE) Scale (expressive language) (Carrow-Woolfolk, 1995). The items in the LC Scale are lexical, syntactic, and supralinguistic receptive language tasks. The items in the OE Scale are lexical, syntactic, supralinguistic, and pragmatic expressive language tasks. The lexical domain includes tasks requiring comprehension of nouns, verbs, modifiers, personal and demonstrative pronouns, prepositions, idioms, words with double meanings, and words that represent direction, quality and spatial relations. The syntactic domain includes tasks requiring comprehension of noun and verb modulators (i.e., number, tense, gender, voice, person, and case) and syntactic constructions (i.e., embedded sentences, coordination, subordination, negation, direct/indirect object, etc.). The supralinguistic domain includes tasks requiring language analysis on a level higher than lexical or syntactic decoding (i.e., comprehension of figurative language and humor; deprivation of meaning from context, logic, and inference; and other higher-order thinking skills). The pragmatic domain includes tasks requiring appropriate responses in specific situations (i.e., questions, courtesy responses, reasonable explanations, etc.).

OWLS' scoring is based upon correct response (e.g., Preferred, Acceptable, or No Differentiation) and incorrect response (e.g., Grammatical Error, Semantic/Pragmatic Error, or No Response). Three standardized scores are calculated: Oral Expression (OE) Standard Score, Listening Comprehension (LC) Standard Score, and a combined OE and LC Standard Score (OLS). Scores were provided on a familiar scale where mean = 100 and standard deviation = 15. Because scoring combines semantic and pragmatic errors into one category, a separate unstandardized Pragmatic Average Score (PAS) averaging the 20 items specific to pragmatics also was computed. By categorizing and coding correct and incorrect responses as "1" and "0" respectively, the examiner can gain a better understanding of the child's pragmatic skills. For example, Item 11 contains one picture representing two girls, one presenting a gift to the other and one holding her

hands out in a gesture of acceptance. The examiner asks the child, "Sarah gave Mary a present. What should Mary say to Sarah?" A correct response might be "Thank you"; a grammatical error might be "Thank", whereas, a pragmatic error might be "Happy Birthday". Although the unstandardized PAS was substantially correlated with the OE and OLS standard scores, $r(54) = .626$, $p < .001$, and $r(54) = .472$, $p < .001$, respectively, it was determined the PAS would be dropped from further analyses because a standardized measure of pragmatic language use was included in another measure being used in the study.

The LC and OE subtests of the OWLS are administered individually to children and young adults, aged 3 to 21. LC is measured by asking the examinee to select one of four pictures that best depicts a statement (e.g., "In which picture is she not walking to school") made by the examiner. Oral expression is assessed by asking the examinee to look at one or more line drawings and responding verbally to a statement made by the examiner (e.g., "Tell me what is happening here and how the mother feels"). The OWLS provides reliable and valid scores for determining the language competence of individual children. However, the LC subtest appears to be best suited as a screening device for children 6 to 9 years of age (Conoley, Impala, & Murphy, 1995). The average completion time for ages 6-9 is 11 minutes, and 14 minutes for ages 10-13.

To determine the consistency of parent and available teacher ratings from the three remaining standardized measures, substantial positive correlations between the following parent and teacher ratings were found: *CRS-R:S* (ADHD Index), $r(20) = .570$, $p < .01$, *CCC-2* (GCC), $r(20) = .585$, $p < .01$, *SSRS* (Problem Behavior Standard Score), $r(20) = .743$, $p < .001$, with the exception of the *CCC-2* (SIDI), $r(20) = .434$, $p = .056$. Due to these substantial correlations and the low response rate of the teachers [only 20 of the 54 teachers (37%)], teacher ratings were dropped from further analyses.

**ADHD symptomatology.** Parents completed the 27-item *Conners' Parent Rating Scales-Revised: Short Version* (CPRS-R:S; Conners, 2001); an instrument that uses parent ratings to help assess attention deficit hyperactivity disorder (ADHD) and evaluate problem behavior in children 3- to 17-years old. The Scales include: Oppositional, Inattention, Hyperactivity, and an ADHD Index. The CPRS-R has many advantages, including a large normative database to help support the instrument's reliability and

validity, and multidimensional scales that help assess ADHD and comorbid disorders with links to *DSM-IV* diagnostic categories. Norms were based on a sample of 8,000+ children and adolescents, males and females ages 3 to 17. Minority group samples were represented. Standardized data were based on the means and standard deviations for groups of children with ADHD and children without psychological problems. Scoring is based on the following scale: 44 and below = "No Concern", 45-55 = Average, 56-60 = "Slightly Atypical – Should Raise Concern", 61-65 = "Mildly Atypical – Possible Significant Problem", 66-70 = "Moderately Atypical – Significant Problem", and 70 and above = Markedly Atypical – Significant Problem". Results from the current study represent a normal distribution of scores with the average score being 52.81. Scores ranged from 40 to 77, with 12 children scoring "No Concern", 23 children scoring "Average", and the remaining 19 scoring in the range of "Slightly Atypical" to "Markedly Atypical". Completion time for the CPRS-R:S was approximately 10 minutes. Because all four subscales were substantially correlated with one another and with pragmatic language use and social skills (Table 2), it was determined the ADHD Index would be used to represent ADHD symptomatology in all further analyses. Reliability analysis of the questions comprising the ADHD Index from this sample revealed an excellent Cronbach's alpha of .92.

    **Pragmatic language use.** Parents completed the 70-item *Children's Communication Checklist – 2 U.S. Edition* (CCC-2; Bishop, 2003). The CCC-2 was revised in 2003 to provide a general screen for communication disorder and to identify pragmatic/social interaction deficits in children from 4- to 16-years old. The assessment was check-normed on 111 children from Western Australia across three age bands: 6 years, 9 years, and 12 years. The CCC-2 distinguished children with communication impairments from non-impaired peers. The questionnaire covers mainly pragmatic skills. The CCC-2 contains 70 items that are grouped in 10 scales: (a) Speech, (b) Syntax, (c) Semantic, (d) Coherence, (e) Inappropriate Initiation, (f) Stereotyped Language, (g) Use of Context, (h) Nonverbal Communication, (i) Social Relations, and (j) Interests. The General Communication Composite (GCC) is used to identify children likely to have clinically significant communication problems. The GCC scores were provided on a familiar scale where mean = 100 and standard deviation = 15. The checklist provides a

simple and cost-effective method for obtaining systematic information about pragmatic difficulties from parents and professionals. It allows one to quantify severity of impairment in aspects of communication that is not easy to assess using conventional tests (Bishop & Baird, 2001). The CCC-2 is documented as having strong reliability and validity. This measure also had good interrater agreement ($r = .79$). Administration time is 5 to 15 minutes.

A second composite score from the CCC-2, the Social Interaction Deviance Index (SIDI) can assist in identifying children with a communicative profile characteristic of an autistic spectrum disorder (ASD). ADHD and autism are two persistent developmental disorders that show overlap both symptomatically (Clark, Teehan, Tinline, & Vostanis, 1999; Roeyers, Keymeulen, & Buysse, 1998) and theoretically (Pennington & Ozonoff, 1996). Both children with ADHD and those with ASD encounter problems with communication (Cantwell & Baker, 1991; Cohen et al., 1993) and problems in their social relationships (Geurts et al., 2004). Furthermore, the SIDI identified children with disproportionate pragmatic and social difficulties in relation to their structural language impairments. The SIDI scoring is based on the following scale: -10 to 10 = "Normal", 11+ = "Specific Language Impairment" (SLI), -11 = "Autistic Spectrum Disorder" (ASD). The SIDI was scored on a curvilinear scale; therefore, negative scores were changed into absolute values. Correlations between the SIDI and ADHD symptomatology, pragmatic language use, and social skills can be found in Appendix H. The use of the SIDI was dropped from further analyses.

The standardized Pragmatic Composite included in the CCC is no longer available, although the six subscales (E through J) relating to pragmatic language skills are retained. An unstandardized Pragmatic Composite was calculated by averaging the six subscales to determine whether this score was associated with the ADHD Index score (compare with Bishop & Baird, 2001; Geurts et al., 2004). Scoring from the original Pragmatic Composite is based on mean = 60 and standard deviation = 18. Reliability analysis of the questions comprising the unstandardized Pragmatic Composite from this sample revealed a good Cronbach's alpha of .88. Because this unstandardized score and the GCC from the same measure (CCC-2) were highly correlated, $r(54) = .954$, $p < .001$, and both scores were substantially correlated with the ADHD Index, $r(54) = -.467$, $p <$

.001, and $r(54) = -.508$, $p < .001$, respectively, it was determined the standardized GCC would represent pragmatic language use in all further analyses.

**Social skills.** Parents completed the *Social Skills Rating System* (SSRS; Gresham & Elliott, 1990). The *SSRS* is used to evaluate a broad range of socially validated behaviors including those behaviors that affect peer acceptance in children 3- to 18-years old. The *Social Skills Scale (CARS)* measures positive social behaviors: Cooperation, Assertion, Responsibility, and Self-Control and results in the Social Skills Standard Score. The *Problem Behaviors Scale (EIH)* measures externalizing and internalizing problems, as well as hyperactivity and results in the Problem Behavior Standard Score. Externalizing problems are inappropriate behaviors involving verbal or physical aggression toward others, poor control of temper, and arguing. Internalizing problems are behaviors indicating anxiety, sadness, loneliness, and poor self-esteem. Hyperactivity behaviors are those involving excessive movement, fidgeting, and impulsive reactions. The *SSRS* Social Skills (CARS) and Problem Behavior (EIH) Standard Scores were provided on a familiar scale where mean = 100 and standard deviation = 15.

The *SSRS* is backed by extensive research and was standardized on a national sample of over 4,000. It is also the first social skills rating scale to provide separate norms for boys and girls ages 3-18 and for elementary students with and without disabilities. The SSRS is documented as having high reliability and validity. Administration time is 10 to 25 minutes. The Social Skills Standard Score (CARS) and the Problem Behavior Standard Score (EIH) from this community sample of children were significantly correlated, $r(54) = .-.672$, $p < .01$. Correlations between the EIH and ADHD symptomatology, pragmatic language use, and social skills can be found in Appendix I. Reliability analysis of the questions comprising the Social Skills Standard Score (Cooperation, Assertion, Responsibility, and Self-Control) from this sample revealed a good Cronbach's alpha of .81. In this study, the Social Skills Standard Score (CARS) was used as the primary measure of social skills.

Table 1

*Description of Sample: Demographic and Diagnostic Information*

| Factor | *n* | % | *M* | *SD* |
|---|---|---|---|---|
| (N = 54) | | | | |
| **Gender:** | | | | |
| Male | 29 | 53.70% | | |
| Female | 25 | 46.30% | | |
| | | | | |
| **Ethnicity:** | | | | |
| Caucasian | 51 | 94.45% | | |
| African American | 1 | 1.85% | | |
| Hispanic | 1 | 1.85% | | |
| Biracial | 1 | 1.85% | | |
| | | | | |
| Age (years) | | | 10.50 | 0.81 |
| | | | | |
| *KBIT-2:* IQ Composite Standard Score | | | 109.20 | 11.78 |
| Verbal Standard Score | | | 110.85 | 11.73 |
| Nonverbal Standard Score | | | 104.59 | 14.00 |
| | | | | |
| *CPRS-R:S:* | | | | |
| Oppositional | | | 51.17 | 11.37 |
| Inattention | | | 51.48 | 9.87 |
| Hyperactivity | | | 54.30 | 10.11 |
| ADHD Index | | | 52.81 | 9.26 |
| | | | | |
| *OWLS:* Standard Score (OLS) | | | 106.98 | 15.46 |
| Listening Comprehension Standard Score (LC) | | | 104.00 | 15.98 |
| Oral Expression Standard Score (OE) | | | 109.00 | 15.83 |
| Pragmatic Average Score (PAS - unstandardized) ^ | | | .83 ^ | .08 ^ |
| | | | | |
| *CCC-2:* | | | | |
| General Communication Composite (GCC) | | | 120.89 | 14.86 |
| Social Interaction Difference Index (SIDI*)* ~ | | | *4.91*~ | *4.88*~ |
| Pragmatic Composite (PC - unstandardized) | | | | |
| (Scales E through J) | | | 59.54 | 11.44 |
| | | | | |
| *SSRS:* | | | | |
| Social Skills Standard Score (CARS) | | | 108.81 | 17.20 |
| Problem Behaviors Standard Score (EIH) | | | 98.72 | 15.35 |

Note. *KBIT-2 = Kaufman Brief Intelligence Test, 2nd ed.; CPRS-R:S = Conners' Parent Rating System Revised – Short Version; OWLS = Oral and Written Language Scales; CCC-2 = Children's Communication Checklist, 2nd ed.; SSRS = Social Skills Rating System,* ^ = percent correct, ~ = original scores were converted to absolute values.

Table 2

*Intercorrelations among ADHD Subscales, Pragmatic Language Use, and Social Skills*

| Subscale | Opposition | Inattention | Hyperactivity | ADHD Index | Pragmatic Language Use | Social Skills |
|---|---|---|---|---|---|---|
| *CPRS-R:S* | | | | | | |
| Opposition | --- | .636** | .511** | .633** | -.501** | -.661** |
| Inattention | .636** | --- | .370** | .837** | -.426** | -.654** |
| Hyperactivity | .511** | .370** | --- | .699** | -.411** | -.462** |
| ADHD Index | .633** | .837** | .699** | --- | -.467** | -.649** |
| *CCC*-2: GCC | -.501** | -.426** | -.411** | -.467** | --- | .590** |
| *SSRS:* CARS | -.661** | -.654** | -.462** | -.649** | .590** | --- |

*Note.* ADHD = Attention deficit hyperactivity disorder; *CPRS-R:S – Conners' Parent Rating System Revised: Short Version*; *CCC-2 = Children's Communication Checklist, 2ⁿᵈ ed.;* GCC = General Communication Composite (measure of Pragmatic Language Use); *SSRS: Social Skills Rating System;* CARS = Social Skills Standard Score (measure of Social Skills).

\*\**p* < .01 two-tailed.

**Procedure**

All study procedures were approved by the University of Kentucky's IRB. One child with a confirmed diagnosis of ADHD as reported by the parent was medication free 24 hours prior to participation in this study. This is considered an acceptable washout period for stimulant medication and is the standard procedure in studies involving children with ADHD. During the initial scheduling phone calls, a parent was asked not to give their child medication on the day of the study. A parent was reminded during reminder phone calls the day before testing to discontinue medication for the following day. A reconfirmation of the suspension of the drug was obtained on test day.

Each child participated individually and was brought to the principal investigator's home-office by a parent. Conducting the study in this location eliminated the need for parents to commute over one hour to the university setting and provided a consistent testing location. Before beginning the experiment, the Experimenter established rapport by talking to the parent and child briefly before introducing the research assistant (RA).

The RA obtained informed consent from the parent and provided instructions on completing the following standardized measures: *Conners' Parent Rating Scales Revised – Short Version* (CPRS-R:S; Conners, 2001), *Children's Communication Checklist – 2 U.S. Edition* (CCC-2; Bishop, 2003), and the *Social Skills Rating System* (SSRS; Gresham & Elliott, 1990). The RA remained in the waiting area with the parent to answer any questions.

While the RA was assisting the parent, the Experimenter escorted the child to the testing room where the child was seated at a table across from the Experimenter. The child was read the Child Assent Form and verbal assent for participation was obtained from the child prior to the start of session.

**Cognitive ability testing.** Children completed the Kaufman Brief Intelligence Test-2 (KBIT-2; Kaufman & Kaufman, 2004). Completion time was approximately 20 minutes. After completion, the child was offered a break.

**Semi-structured dyadic communication task.** Children were engaged in a dyadic interaction with an adult partner. As children get older, they increasingly confront situations typical of adult sociability, where there is no appropriate activity other than

'making conversation,' with no clear topic of discussion or message that needs to be conveyed (Schley & Snow, 1992). Further, this adult-child dyadic partnering maintained standardization so that each child was interacting with the same person. Although it was always the same examiner partnered with the children, it was expected the children would evoke different responses. Such partnering eliminated the possibility that the child would know their peer from school which could have effected the interaction, and provided greater likelihood that a solicitating utterance by an adult would be responded to (Bishop et al., 2000).

The **"*TV Talk Show"*** task (Bryan et al., 1981; Landau & Milich, 1988; Schley & Snow, 1992) is a social role-playing procedure in which the task requires different strategies for the roles of "Host" and "Guest". The "TV Talk Show" task was employed by Landau and Milich to compare the social communication patterns of attention-deficit-disordered (ADD) and normal boys. Their results support the hypothesis proposed by Whalen, Henker, Collins, McAuliffe, and Vaux (1979) in the context of a "TV Talk Show" that boys with ADD/H failed to modulate their social communication according to the differing demands of the host and guest roles.

This task was chosen rather than naturalistic conversation because it clearly enforces the constraint that talk must occur while requiring the child to assume major responsibility for the flow of the conversation. When the child assumes the "Host" role he must initiate topics, plan, control, and direct the conversation while the child assuming the "Guest" role has the opportunity to use spontaneous language and behaviors to communicate with the "Host" but needs to respond to the host's questions and stay on topic.

The testing room was designed to resemble a television studio. The room contained two chairs, placed at an angle to facilitate conversation, which faced a Canon FS11 Flash Memory - 37x Optical Zoom Camcorder mounted on a tripod. The camera was focused between the faces and upper bodies of the dyadic pair. A small table was positioned between the two chairs and contained a GE 3-5027 Portable Cassette Recorder/Player and a Taylor TruTimer 5809 Two Event Big Digit Timer/Clock. Each child participated in both roles, each of four minutes' duration, with the order of role counterbalanced between the three age groups (9-, 10-, and 11-year-olds). A total of 28

22

children (51.9%) assumed the Host role first while 26 children (48.1%) assumed the Guest role first.

The Experimenter provided these instructions to the child engaging in the "Host" role, as adapted from the research groups named above:

> Today, we're going to put on a talk show together. Have you ever seen a TV show like Oprah, or Ellen? You know how Oprah and Ellen have guests on the program, and ask them lots of questions? Well, we want you to pretend that you have *your* own show. We'll call it "The (child's name) Show"! We are going to talk with each other about television programs, cartoon, or movies. So you can ask questions and we will talk to each other about the programs you really like – the story, the people, and so on – the programs you don't like, and things like that. But you have to keep asking me questions for four minutes before it's time for a commercial break. It's your job to keep the show going until the four minutes are up because we don't have our first commercial break until then. When the timer rings, it will be time for a commercial break. Don't forget to introduce yourself and me (Experimenter's first name) to your audience. Any questions? Now, what are you supposed to do?

If the child was unable to summarize the instructions, the Experimenter repeated them.

The specific instructions given to the Experimenter prior to the session were:

> Please allow the child to guide the interview and take responsibility for maintaining the flow of the conversation. Respond to the child's questions without a lot of elaboration, unless specifically asked to do so. If long pauses persist, you may initiate a question.

The Experimenter then started the video camera, the audiotape recorder, set the timer for four minutes, and announced, "You may begin." The dyadic interaction continued for four minutes at which time the timer rang.

The Experimenter then offered a break to the child prior to administration of a separate standardized language measure. Once the standardized measure was completed, a break was offered.

The Experimenter then announced to the child that they would conduct the TV Talk Show again, but this time they would switch roles. The Experimenter provided these instructions to the child engaging in the "Guest" role, as adapted from the research groups named above:

Now we're going to do the TV Talk show again, but this time, we are going to switch roles. This time it will be "The (Experimenter's name) Show" and I will ask you questions about television programs, cartoon, or movies, instead of you asking me questions. So be sure to talk a lot! I will introduce you and then we will talk for four minutes. When the timer rings, it will be time for a commercial break. Do you understand what we are going to be doing?

If the child was unable to summarize the instructions, the Experimenter repeated them.

The specific instructions given to the Experimenter prior to the session were:

You are responsible for maintaining the flow of the conversation as host. Ask as many questions as necessary to keep the interview going for the entire four minutes.

The Experimenter then started the video camera, the audiotape recorder, set the timer for four minutes and then said, "Okay, ready to start?"

**Receptive and expressive language testing.** Participation in each role of the TV Talk Show was separated by the administration of the *Oral and Written Language Scales*: Listening Comprehension (LC) Scale (receptive language) and the Oral Expression (OE) Scale (expressive language) (Carrow-Woolfolk, 1995), with an average completion time for ages 6-9 of 11 minutes, and 14 minutes for ages 10-13 as stated by the author.

All together, the testing and TV Talk Show task lasted approximately 1 hour and 30 minutes. Following the testing, the child was returned to his parent. Each family was paid $15 for participating in the study.

**Dyadic interaction transcription and coding.** All sessions were video- and audiotaped and transcribed verbatim to facilitate coding of communication patterns and language use displayed during the TV Talk Show (separate for each role). Specific transcription and coding instructions can be found in Appendix J. Coding to determine pragmatic language deficiencies during the dyadic interactions included: (1) Verbal Utterances, (2) Rules of Conversation categories established by Prutting and Kirchner (1987) and Bishop (1998) (Appendix J, Sections 3, 4, and 5), and (3) Cooperative Principles (e.g., Maxims of Quantity, Quality, Relation, Manner, and Politeness) established by Grice (1975) (Appendix J, Sections 6, 7, and 8). Verbal utterances were based on number of occurrence which included all verbal output (i.e., um, huh, ah, etc.).

The fourteen Rules of Conversation were coded using two methods: a global rating and frequency count. The following eight Rules of Conversation categories were scored based on a global rating utilizing a Likert scale of 1 = poor, 2 = low, and 3 = good: (1) Verbal: Topic Maintenance, (2) Verbal: Use of Context, (3) Paralinguistic: Intensity, (4) Paralinguistic: Intelligibility, (5) Nonverbal: Eye Gaze, (6) Nonverbal: Facial Expressions, (7) Nonverbal: Physical Proximity, and (8) Nonverbal: Body Posture. The remaining six Rules of Conversation categories were scored based on frequency of occurrence (1) Verbal: Turn Taking, (2) Verbal: Topic Initiation, (3) Verbal: Repairs, (4) Verbal: Interruptions, (5) Nonverbal: Gestures, and (6) Nonverbal: Back-Channels (noninterrupting feedback from the listener such as "mmm", head-nodding, or a laugh). Cooperative Principles were scored based on a global rating utilizing a Likert scale of 1 to 5 (lowest to highest) to establish the child's conformity to each Maxim. Two independent coders reached the following interrater reliabilities on 20% of the total dyadic interactions: Rules of Conversation 96.1% and Cooperative Principles 93.0%. Interrater reliabilities for each category are presented in Table 3.

A manipulation check was conducted to verify whether the children from the sample performed differently in each role (host and guest) of the semi-structured dyadic communication task. Children were expected to perform comparably within Host and Guest roles in all areas, with the following exceptions. While engaged in the Host role, they were expected to score higher in (1) the number of topic initiations and (2) the production of back-channels as they were instructed to keep the show going until the four minutes had elapsed. While engaged in the Guest role, they were expected to score higher in (1) number of utterances, (2) Maxim of Quantity, and (3) number of turns taken.

Means and standard deviations, as well as paired samples t-tests and correlations between Host and Guest roles are presented in Table 4. As expected, children engaged in the Host role scored higher in the number of topic initiations and the production of back-channels compared to when they were engaged in the Guest role. While engaged in the Guest role, they produced significantly more utterances, scored significantly higher in the Maxim of Quantity, and took more turns compared to when they were engaged in the Host role. Unexpectedly, while engaged in the Guest role, they scored significantly higher in the Maxim of Relation and Manner compared to when they were engaged in the

Host role. Children engaged in the Host role produced significantly more number and length of pauses, and produced more interruptions, compared to when they were engaged in the Guest role.

Table 3

*Interrater Reliability Coefficients*

|  | Interrater Reliability |
|---|---|
| **Cooperative Principles:** | |
| Maxim of – | |
| Quantity | .94 |
| Quality | .90 |
| Relation | .93 |
| Manner | .95 |
| Politeness | .93 |
| | |
| **Rules of Conversation:** | |
| Verbal Utterances – | |
| Turn Taking | .89 |
| Topic Initiation | .98 |
| Topic Maintenance | .96 |
| Repairs | 1.00 |
| Use of Context | 1.00 |
| Interruptions | 1.00 |
| | |
| Paralinguistic Utterances – | |
| Intensity | .98 |
| Intelligibility | 1.00 |
| | |
| Nonverbal Behaviors – | |
| Eye Gaze | .94 |
| Facial Expressions | .92 |
| Physical Proximity | 1.00 |
| Body Posture | .96 |
| Gestures | .92 |
| Back-Channels | .91 |

*Note.* All utterances and behaviors are scored based on
appropriateness of use.

Table 4

*Manipulation Check:*
*Semi-structured Dyadic Communication Task Global Ratings and Frequency Counts*

| Factor | Host | | Guest | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | *M* | *SD* | *M* | *SD* | *t* value | *r =* |
| Utterances | 255.81 | 94.78 | 320.39 | 80.84 | 6.39** | .65** |
| Cooperative Principles: | | | | | | |
| Maxim of – | | | | | | |
| Quantity (R) | 3.15 | 1.50 | 4.24 | 1.10 | 6.28** | .55** |
| Quality (R) | 2.46 | 1.42 | 2.56 | 1.40 | .65 | .72** |
| Relation (R) | 3.61 | 1.20 | 4.72 | .68 | 7.72** | .49** |
| Manner (R) | 3.17 | 1.18 | 3.57 | 1.18 | 3.68** | .76** |
| Politeness (R) | 3.28 | 1.28 | 3.28 | 1.20 | .00 | .16** |
| Rules of Conversation: | | | | | | |
| Verbal Utterances – | | | | | | |
| Turn Taking (#) | 25.13 | 7.04 | 27.43 | 8.24 | 2.02** | .41** |
| Topic Initiation | | | | | | |
| Pos./Neg. Av.(#) | 5.00 | 2.06 | .06 | .29 | 17.60** | .06 |
| Topic Maintenance | | | | | | |
| Positive (G) | 1.80 | .41 | 1.98 | .14 | 3.47** | .27* |
| Pauses  (#) | 3.37 | 3.51 | 1.83 | 1.98 | 3.41** | .38** |
| Pauses in Seconds (#) | 19.85 | 25.84 | 8.67 | 11.04 | 3.65** | .50** |
| Repairs (#) | 1.19 | 2.48 | .89 | 1.86 | 1.23 | .70** |
| Use of Context (G) | 2.31 | .86 | 3.00 | .00 | 5.82** | |
| Interruptions (#) | 3.59 | 2.18 | 2.96 | 1.81 | 2.39** | .54** |
| Paralinguistic Utterances – | | | | | | |
| Intensity (G) | 2.83 | .47 | 2.80 | .49 | .70 | .67** |
| Intelligibility (G) | 2.91 | .29 | 2.89 | .37 | .44 | .60** |
| Nonverbal Behaviors – | | | | | | |
| Eye Gaze (G) | 2.24 | .75 | 2.19 | .80 | .77 | .77** |
| Facial Expression (G) | 2.57 | .72 | 2.72 | .60 | 2.06* | .69** |
| Physical Proximity (G) | 2.93 | .26 | 2.91 | .29 | .44 | .40** |
| Body Posture (G) | 2.35 | .73 | 2.44 | .63 | 1.22 | .67** |
| Gestures (#) | 4.19 | 5.85 | 4.94 | 5.70 | 1.20 | .67** |
| Back-Channels (#) | 3.28 | 4.59 | 1.80 | 2.20 | 2.55* | .38** |

*Note.* All utterances and behaviors are scored based on appropriateness of use.
     (R) = Global Rating (1 = Lowest, 2 = Low, 3 = Average, 4 = High, 5 = Highest)
     (#) = Frequency Count
     (G) = Global Rating (1 = Poor, 2 = Low, 3 = Good)
**$p < .01$ two-tailed. *$p < .05$ two-tailed.

**Analyses**

      Analyses proceeded in two steps using the Statistical Packages of Social Sciences (SPSS, 1999). First, Pearson product-moment correlation coefficients were calculated to reveal associations among language measures, ADHD symptomatology, and social skills. Second, following procedures established by MacKinnon, Krull, & Lockwood (2000), a series of regressions were computed to test the prediction that pragmatic language use would mediate the relation between ADHD symptomatology and social skills. An alpha level of 0.05 was used for all statistical tests. Power analysis using an alpha of .05, an effect size r of .5, and a total sample size of 54 reveals a power of .9862 to find a large effect (Faul, Erdfelder, Lang, & Buchner, 2007).

**Chapter Three:  Results**

**Intercorrelations among Language Measures**

Results presented in Table 5 indicate there were significant positive correlations between the *KBIT-2*: Verbal Standard Score (VSS) and the *OWLS*: Listening Comprehension (LC) Standard Score, Oral Expression (OE) Standard Score, and the combined OE/LC (OLS) Standard Score. These expected correlations indicate the higher the child's verbal intelligence as measured by the *KBIT-2*, the higher the score obtained on the receptive and expressive domains as measured by the *OWLS*.

There were no significant correlations between the *KBIT-2*: VSS and the *CCC-2*: General Communication Composite (GCC) nor between the *CCC-2*: General Communication Composite (GCC) and the *OWLS*: Listening Comprehension (LC) Standard Score, Oral Expression (OE) Standard Score, and the combined OE/LC (OLS) Standard Score. These results are not surprising given the design and specific use of each of these standardized measures: *KBIT-2* measures cognitive abilities, the *OWLS* measures receptive and expressive language ability (with an unstandardized calculation of pragmatic language ability), and the CCC-2 measures communication skills, specifically pragmatic language use. This confirms the need to utilize multiple instruments to gather a broad knowledge of children's communication and social skills abilities.

Table 5

*Intercorrelations among Standardized and Unstandardized Language Measures*

| Scale | VSS | LC | OE | OLS | PAS~ | GCC | PC~ |
|---|---|---|---|---|---|---|---|
| *KBIT-2* | | | | | | | |
| VSS | --- | .488** | .438** | .550** | .055 | .205 | .148 |
| | | | | | | | |
| *OWLS* | | | | | | | |
| LC | .488** | --- | .453** | .851** | .190 | .075 | .083 |
| OE | .438** | .453** | --- | .853** | .626** | .262 | .256 |
| OLS | .550** | .851** | .853** | --- | .479** | .199 | .198 |
| PAS~ | .055 | .190 | .626** | .479** | --- | .134 | .144 |
| | | | | | | | |
| *CCC-2* | | | | | | | |
| GCC | .205 | .075 | .262 | .199 | .134 | --- | .954** |
| PC~ | .148 | .083 | .256 | .202 | .144 | .954** | --- |

*Note.* KBIT-2 = Kaufman Brief Intelligence Test, 2$^{nd}$ ed., VSS = Verbal Standard Score; OWLS = Oral and Written Language Scales, LC = Listening Comprehension Standard Score, OE = Oral Expression Standard Score, OLS = OE and LC combined Standard Score, PAS = Pragmatic Average Score; *CCC-2 = Children's Communication Checklist 2$^{nd}$ ed.*, GCC = General Communication Composite, PC = Pragmatic Composite; ~ = unstandardized measure.

**$p < .01$, two-tailed.

**Test of the Mediational Model**

As hypothesized and reflected in Table 6, a set of preliminary correlations demonstrated the expected predictive relations between the following: (1) ADHD symptomatology and social skills such that as the ADHD Index scores increased social skills scores (CARS) decreased, (2) ADHD symptomatology and pragmatic language use such that as the ADHD Index scores increased pragmatic language scores (GCC) decreased, and (3) pragmatic language use and social skills such that as pragmatic language scores (GCC) increased social skills scores (CARS) increased.

Multiple linear regression analysis was used to develop a model for predicting children's social skills from their ADHD symptomatology and pragmatic language use. The ADHD symptomatology and pragmatic language use scores were centered at their means for these analyses. Basic descriptive statistics and regression coefficients are shown in Table 6. The predictor variable (ADHD Symptomatology) and the mediator variable (Pragmatic Language Use) each had a significant ($p < .01$) zero-order correlation with the outcome variable (Social Skills), and both ADHD symptomatology and pragmatic language use had significant ($p < .01$) partial effects in the full model. These results indicate that although the correlation between ADHD and social skills drops from $r = -.649$, $p < .01$ to $r = -.478$, $p < .01$ when pragmatic language use is entered in the model, the correlation between ADHD and social skills still remains significant. Additionally, ADHD symptomatology provided a unique contribution in the estimate of children's social skills of approximately 19% above and beyond the contribution of pragmatic language use, $sr^2 = .189$, $p < .01$, and pragmatic language use provided a unique contribution in the estimate of children's social skills of 10.5% above and beyond the contribution of ADHD symptomatology, $sr^2 = .105$, $p$ , .01. The full model was able to account for 52.7% of the variance in children's social skills, $F(2, 51) = 28.37$, $p < .001$. A 95% confidence interval for $R^2$ extends from .171 to .677. Figure 1 illustrates the full mediational model. These findings represent the role of pragmatic language use as a partial mediator in the relation between ADHD symptomatology and social skills in this community sample of children. Similar mediational patterns were observed for the three subscales of Inattention, Hyperactivity, and Opposition from the *CPRS-R:S* (Appendix K).

Table 6

*Multiple Regression Analyses Predicting Social Skills from ADHD Symptomatology and Pragmatic Language Use*

| Variable | Zero-Order $r$ | | | $\beta$ | $sr^2$ | $B$ |
|---|---|---|---|---|---|---|
| | ADHD-S | PLU | SS | | | |
| PLU | | | .590** | .367** | .105 | .424 |
| ADHD-S | | -.467** | -.649** | -.478** | .189 | -.888 |
| Mean | 52.81 | 120.89 | 108.81 | | | |
| *SD* | 9.56 | 14.86 | 17.20 | $R^2 = .527$ | | |

*Note.* ADHD = Attention deficit hyperactivity disorder; ADHD-S = ADHD Symptomatology as measured by the *CPRS-R:S* – ADHD Index (*Conners Parent Rating System Revised: Short Version)*; PLU = Pragmatic Language Use as measured by the *CCC2* – GCC (*Children's Communication Checklist, 2$^{nd}$ edition* - General Communication Composite)*;* SS = Social Skills as measured by the *SSRS* – CARS (*Social Skills Rating System* – Social Skills Standard Score); ADHD-S and PLU were centered at their means for the mediational analyses.
**$p < .01$, one-tailed.

-.649** (-.478**) [.189**]

| ADHD Symptomatology | -.467** → | Pragmatic Language Use | .590** (.367**) [.105**] → | Social Skills |

A = $X_1$ (Predictor)          B = $X_2$ (Mediator)                    C = Y
(Outcome)
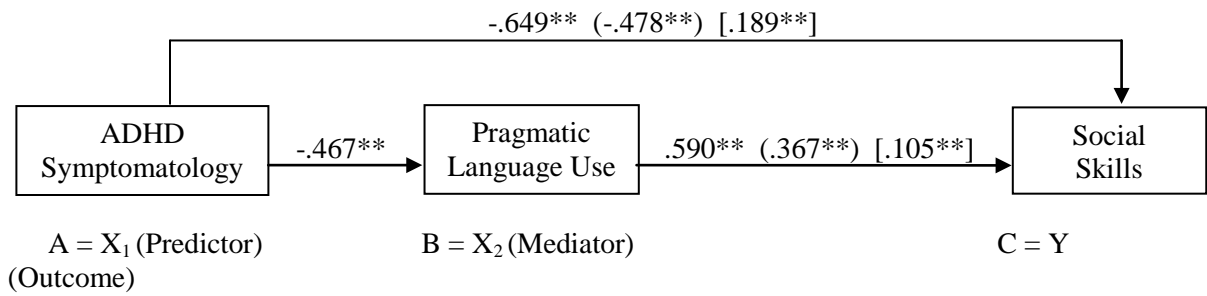
Figure 1.  Mediational Model with Pragmatic Language Use as a Partial Mediator of the Relation between ADHD Symptomatology and Social Skills. Coefficients outside of parentheses are zero order correlations. Values in parentheses are standardized path coefficients ($\beta$). Values in brackets are standardized semi-partial correlations squared ($sr^2$), which represent the unique contribution in the estimate of Y (Social Skills) of $X_1$ (ADHD Symptomatology) or $X_2$ (Pragmatic Language Use) above and beyond the contribution of $X_1$ or $X_2$.

*Note:*  ADHD = Attention deficit hyperactivity disorder; ADHD Symptomatology and Pragmatic Language Use were centered at their means for the mediational analyses.
**$p < .01$, one-tailed.

**Semi-Structured Dyadic Communication Task: TV Talk Show**

A second purpose of this study was to conduct a detailed investigation of communication patterns and pragmatic language use obtained from sampling behaviors from a semi-structured dyadic communication task in which the children participated in both Host and Guest roles. Table 7 represents the three dimensions of ADHD symptomatology, pragmatic language use, and social skills and the correlations between Host variables. Surprisingly, none of the Host role variables were significantly correlated with ADHD symptomatology. Significant positive correlations were found between the Maxim of Politeness and both pragmatic language use and social skills, indicating that the use of politeness as Host is positively correlated to both pragmatic language use and the social relationship with a dyadic partner.

Table 8 represents findings based on the Guest role. The three dimensions of ADHD symptomatology, pragmatic language use, and social skills were significantly correlated with the appropriate use of intensity. These results indicate more appropriate use of intensity while engaged in the Guest role is positively related to pragmatic language use and social skills and negatively related to ADHD symptomatology. Additionally, significant positive correlations were found between both the Maxim of Politeness and topic maintenance and pragmatic language use, and the use of eye contact and social skills. These findings indicate more appropriate use of politeness, topic maintenance, and eye contact while in the Guest role is positively related to pragmatic language use and/or social skills. These findings represent the importance of maintaining topics, being polite, conversing using a calm, friendly voice, not talking too loud or soft, not talking in a sarcastic manner, and maintaining eye contact with a dyadic partner.

Table 7

*Intercorrelations between ADHD Symptomatology, Pragmatic Language Use, Social Skills and Host Role Variables*

| Factor | ADHD Symptomatology | Pragmatic Language Use | Social Skills |
|---|---|---|---|
| Utterances | .154 | -.231 | -.058 |
| Cooperative Principles | | | |
| Maxim of – | | | |
| Quantity (R) | -.193 | .130 | .170 |
| Quality  (R) | -.072 | .023 | .064 |
| Relation (R) | -.208 | .083 | .191 |
| Manner (R) | -.132 | -.055 | .115 |
| Politeness (R) | -.215 | .352** | .352** |
| Rules of Conversation: | | | |
| Verbal Utterances – | | | |
| Turn-Taking (#) | .024 | -.095 | .046 |
| Topic Initiation (#) | .125 | -.246 | .011 |
| Topic Maintenance (G) | -.136 | .152 | .152 |
| Pauses in Seconds (#) | .042 | .075 | -.011 |
| Interruptions (#) | .126 | -.125 | .055 |
| Paralinguistic Utterances | | | |
| Intensity (G) | -.095 | .084 | .243 |
| Intelligibility (G) | -.083 | .050 | -.048 |
| Nonverbal Behaviors – | | | |
| Eye Gaze (G) | -.219 | .116 | .198 |
| Body Posture (G) | .007 | -.125 | .146 |
| Gestures (#) | .173 | -.261 | -.138 |

*Note.* All utterances and behaviors are scored based on appropriateness of use.

ADHD = Attention deficit hyperactivity disorder

(R) = Global Rating (1 = Lowest, 2 = Low, 3 = Average, 4 = High, 5 = Highest)

(#) = Frequency Count

(G) = Global Rating (1 = Poor, 2 = Low, 3 = Good)

\*\**p* < .01, two-tailed.

Table 8

*Intercorrelations between ADHD Symptomatology, Pragmatic Language Use, Social Skills and Guest Role Variables*

| Factor | ADHD Symptomatology | Pragmatic Language Use | Social Skills |
|---|---|---|---|
| Utterances | .241 | -.100 | -.084 |
| Cooperative Principles | | | |
| Maxim of – | | | |
| Quantity (R) | -.090 | .041 | .040 |
| Quality  (R) | -.094 | -.042 | .086 |
| Relation (R) | .013 | -.059 | .044 |
| Manner (R) | -.205 | .031 | .181 |
| Politeness (R) | -.195 | .300* | .260 |
| Rules of Conversation: | | | |
| Verbal Utterances – | | | |
| Turn-Taking (#) | -.085 | .111 | .031 |
| Topic Initiation (#) | .147 | -.033 | -.029 |
| Topic Maintenance (G) | -.183 | .303* | .188 |
| Pauses in Seconds (#) | .081 | -.008 | -.057 |
| Interruptions (#) | .262 | -.125 | -.152 |
| Paralinguistic Utterances | | | |
| Intensity (G) | -.312* | .351** | .387** |
| Intelligibility (G) | .120 | -.132 | -.106 |
| Nonverbal Behaviors – | | | |
| Eye Gaze (G) | -.259 | .206 | .310* |
| Body Posture (G) | -.044 | -.007 | .151 |
| Gestures (#) | .181 | -.136 | -.040 |

*Note.* All utterances and behaviors are scored based on appropriateness of use.

ADHD = Attention deficit hyperactivity disorder

(R) = Global Rating (1 = Lowest, 2 = Low, 3 = Average, 4 = High, 5 = Highest)

(#) = Frequency Count

(G) = Global Rating (1 = Poor, 2 = Low, 3 = Good)

*p < .05, two-tailed, **p < .01, two-tailed.

## Chapter Four:  Discussion

The primary purpose of this study was to examine whether pragmatic language use was associated with, and perhaps accounted for, the social skills problems among children with different degrees of ADHD symptomatology. The results of this study provide evidence that: (1) ADHD symptomatology was associated with social skills, (2) pragmatic language use was shown to have a significant negative relation with ADHD symptomatology, (3) pragmatic language use was shown to have a significant positive relation with social skills, and (4) the relation of ADHD symptomatology and social skills was partially mediated by pragmatic language use. It is not surprising that ADHD symptomatology and social skills deficits are associated as current literature clearly has established this relation. What is unique about this study is that in a community sample of children, ADHD symptomatology is associated with pragmatic language difficulties, and the latter partially mediates the relation between ADHD and social skills problems.

**Why is ADHD Symptomatology Associated with Pragmatic Language Difficulties?**

Theoretical models of the relations between inattention, hyperactivity, and pragmatic language skills have come from the ADHD literature. These models propose that children with ADHD may experience pragmatic language difficulties because ADHD may result from poor behavioral inhibition, which affects executive control and leads to problems with attention, impulsivity, and hyperactivity (Barkley, 1997, 1999). Pragmatic language difficulties are specific to the use and comprehension of language in context, rather than problems with semantic or structural aspects of language (Bignell & Cain, 2007). Pragmatic language use taps into executive skills such as planning, organizing and/or monitoring behaviors. Thus, pragmatic language deficits seem to reflect difficulties with language use rather than deficits in the basis subsystems of language (i.e., phonology, semantics, and syntax) (Purvis & Tannock, 1997). Purvis and Tannock suggest a systematic deficit in the cognitive processes underlying the social use of language by children with ADHD, as well as the accompanying impairment in their social skills. According to Bignell and Cain, this theory might explain the difficulties with figurative language in context experienced by all groups in the Purvis and Tannock work. An inability to monitor and evaluate the appropriate context could lead to the literal interpretation of a figurative expression. Adding to these findings, Tannock and

Schachar (1996) hypothesized that children with ADHD have problems in pragmatic and narrative discourse skills because these are tied to executive function capabilities, and that it is only children with ADHD and language-based reading disabilities who exhibit structural language impairments. The poorest pragmatic skills were not associated with ADHD but with having three comorbid conditions, ADHD, language impairment (LI), and reading disability (RD). It is noteworthy that this hypothesis entails the view that pragmatic dysfunction and language impairment may be separately occurring entities (Mathers, 2006).

Although the current study did not incorporate a measure of response inhibition, Barkley's (1997, 1999) assumption of defective behavioral inhibition has become a current view of ADHD and has had an impact on new intervention programs focusing on pragmatic and meta-cognition (Bruce, Thernlund, & Nettelbladt, 2006). Because ADHD consists of developmental deficiencies in the regulation and maintenance of behavior by rules and consequences, these deficiencies give rise to problems with inhibiting, initiating, or sustaining responses to tasks or stimuli and adhering to rules or instructions (Barkley, 1990). Thus, children presenting with ADHD symptomatology may experience elevated levels of social and pragmatic dysfunction.

Flory and colleagues (2006) counter the response inhibition and executive function hypotheses proposed by Barkley (1997, 1999) and Tannock and colleagues (1997, 1996). The Flory et al. study was designed to identify the degree to which the core deficits of ADHD (e.g., EF planning/working memory, inattention, and disinhibition) account for the problems children with ADHD experience in producing coherent story narrations. Results indicated difficulty sustaining attention clearly was the most influential mediator. Flory and colleagues went on to say that it may well be that these inhibitory and executive functioning deficits are especially important in accounting for the disruptive, difficult-to-manage behavior associated with this disorder. However, when encountering complex academic tasks, problems in sustaining attention may become primary.

Advancing the Flory et al. (2006) findings, Huang-Pollack and colleagues (2009) examined the ability of executive functions to account for the relationship between ADHD status and social performance problems using parent and teacher report, as well as

a structured, observational "chat-room" task. Results indicate EF did not mediate the relationship between ADHD status and parent or teacher report of social skills deficits and peer acceptance, nor did EF mediate the relationship between ADHD and the number of prosocial, hostile, or on-topic statements that were made on the chat-room task. EF did partially mediate the ability of children to follow up on verbal cues (accounting for 40% of path variance) as well as memory for the conversation in the chat room task (accounting for 50% of path variance). According to Huang-Pollak et al., these relationships were primarily driven by the presence of inattention rather than hyperactivity/impulsivity, suggesting the role of EF deficits in the production of social skills deficits in ADHD may not be as prominent as is typically assumed. Because the current study did not incorporate measures of EF planning, working memory, disinhibition, or attention, this alternative cannot be addressed.

Another possible explanation as to why ADHD symptomatology is associated with pragmatic language difficulties is that children with ADHD experience general language problems, of which pragmatic language use is one. To disentangle this association, it is important to distinguish between pragmatic deficits and those arising in other language domains. The pragmatic domain includes any disruptions in the social interaction that do not arise from the structural aspects of language (Camarata & Gibson, 1999). Evidence exists that receptive language abilities (Baker & Cantwell, 1992), and oral expressive language abilities (Kim & Kaiser, 2000; Purvis & Tannock, 1997; Tannock et al., 1993; Zentall, 1988) are impaired in children with ADHD. Because results from the current study indicate there was no relation between receptive and expressive language ability (Oral Expression, Listening Comprehension, or the combined OE/LC Standard Scores), and either pragmatic language use or social skills, nor did the OE or LC Standard Scores mediate the relation between ADHD symptomatology and social skills, a general language deficiency in this sample of children can be ruled out as an explanation.

A fourth alternative explanation as to why ADHD symptomatology is associated with pragmatic language difficulties is that the behavioral characteristics themselves could be interfering in pragmatic language development. The *DSM-IV* criteria for ADHD reveal a set of communication issues characteristic of pragmatic dysfunction (e.g.,

difficulty awaiting turns, talking excessively, interrupting others, not listening to what is being said, and blurting out answers to questions before they are completed). Specifically, short attention span and insensitivity to social cues may contribute to pragmatic difficulties of children with ADHD (Kim & Kaiser, 2000). According to Whalen and Henker (1985), children with ADHD have been reported to miss verbal, nonverbal, and situational cues and to fail to notice social contexts.

In addition, problematic behavioral characteristics associated with ADHD influence the quality and the frequency of their interactions with caregivers, which adversely affects their pragmatic language development (Camarata & Gibson, 1999). Mothers of children with ADHD and language delays are likely to respond to their children's lack of rule-governed self-regulatory behavior and relatively immature language levels by becoming more directive and negative and less responsive during play and interactions than are mothers of normal children (Barkley, 1990). As stated by Westby and Cutler (1994), this parent communication style provides children with fewer opportunities to hear the high-level distancing language that encourages the development of representational skills necessary for the development of self-regulatory language.

Taking this alternative one step further, from their parents, young children are dependents, receiving support, guidance, and discipline. In contrast, peers interact more often as equals, providing each other with play opportunities, entertainment, and companionship. Thus, it is in the context of peer relations that children practice and master critical social skills (Bierman, 2004). When examining children with ADHD, the core symptoms of ADHD, inattention and hyperactivity/impulsivity, by their very nature would be expected to make effective functioning with peers difficult (Hoza, 2007). As a result, social difficulties are extremely common in children with ADHD (Hoza, Mrug, Gerdes, et al. 2005), and rejection by peers causes them to lose the opportunity to learn socialization skills critical to successful interaction (Westby & Cutler, 1994).

**Why is Pragmatic Language Use Associated with Social Skills?**

Regardless of ADHD symptomatology, the quality and the frequency of children's interactions with caregivers and peers also may explain why pragmatic language difficulties and social skills deficits are related. Pragmatic language skills are important for developing relationships with others, and for communicating with a range

41

of interlocutors in a variety of contexts (Hyter, 2007). The way in which a child's language is used in the important contexts and encounters in their social environment (e.g., home, school, peer environments) may be more relevant to adjustment and social success than their competence in the more traditionally assessed language areas (Russell & Grizzell, 2008). Children expressing a low degree of pragmatic competence may not comprehend the contextual norms of the public context where peer group influence is the predominant force of children's play and interaction. This underdeveloped pragmatic competence may lead to disruption in the development of appropriate social skills.

In a study conducted by Hadley and Rice (1991), preschool children from integrated classrooms manifesting specific language impairment and primary speech impairment were ignored by their peers twice as often as children who had language skills in the normal range. These children participated in proportionately fewer interactions with other children and were addressed half as frequently. Hadley and Rice concluded preschoolers behave as if they know who talks well and who doesn't and they prefer to interact with those who do. Children experiencing communication disorders may be less likely to respond to peers as a history of interactive failures develops, and peers may increasingly ignore the child's attempts at initiation interaction. Because the design of the current study did not measure the quality and frequency of the children's interactions with caregivers or peers, this alternative explanation as to why pragmatic language and social skills are related cannot be addressed.

Another explanation addressing the relation between pragmatic language difficulties and social skills deficits may be the manner in which children with communication disorders manage disputes. Stevens (1992) examined the conflict resolution abilities among 8- to 12-year-olds with and without specific language impairment using interviews about hypothetical disputes and role enactments. She found that children with language problems, like the controls with normal language, used a variety of strategies during role play, but, unlike the children with normal language, they used a more restricted set in the hypothetical context. Preferred strategies for the children with language problems in the hypothetical task included formulating threats or taking physical action. In contrast, the children with normal language preferred persuasion and explanation and questioning to enable joint decision making. It is not surprising that

42

verbally based strategies are used less frequently by children with communication deficits. According to Craig (1993), this finding appears consistent with the pragmatic evidence that children with specific language impairment do not use their verbal skills in the same ways as children with normal language.

An alternative explanation could be that low self-esteem, social withdrawal, shyness, or any other socioemotional problem may develop as a result of pragmatic language impairment alone, which could be accounting for the social skills deficits experienced by children with ADHD. Redmond and Rice (1998) provide a conceptual framework to guide studies of the developmental relationship between language ability and socioemotional behaviors. They proposed the social adaptation model (SAM). The SAM holds that individuals with specific language impairment have intact psychosocial mechanisms but develop negative adaptive social behaviors, such as being withdrawn, as a result of their difficulties with language in social situations. In this model, socioemotional problems may follow from language impairment. The processes, however, are dependent not on inherent psychosocial deficits but on how the child deals with the communicative demands of different situations and the reactions of others. Different situations make different demands, and different observers may hold different biases and expectations about the same child. Hence, in early childhood, as children are faced with the task of adjusting to different social settings (e.g., home, school), the relationship between language impairment and social behaviors should be unstable, varying with context.

Redmond and Rice (1998) found support for the SAM in a small longitudinal study of children with specific language impairment focusing on the period of transition into formal schooling. First, parent and teacher ratings of the same children's socioemotional functioning differed significantly, indicating that the children's social competencies varied with context and/or that different interactants evoked different behaviors. Second, there was very little stability of congruence between teacher and parent ratings across two time points (separated by a year), suggesting that the children were adjusting to their early school setting. Wadman, Durkin, and Conti-Ramsden's (2008) study to determine if lower global self-esteem, shyness, and low sociability are outcomes associated with specific language impairment in adolescence extend the

Redmond and Rice findings regarding the SAM. An initial step of the mediation analysis revealed that core language ability was a significant predictor of shyness. This association is consistent with an adaptive framework, where shyness may be an accommodation to poor language ability and the demands of the social environment.

**Why might Pragmatic Language Mediate the Relation between ADHD Symptomatology and Social Skills?**

Perhaps it is not surprising that a measure of pragmatic language use would be important in accounting for the deficits children with different degrees of ADHD symptomatology have in developing social skills. Much, if not most, social interaction is achieved through the use of language. A competent language user knows not only rules of social interaction, but also how and when to apply them, and how to vary communicative style and content according to moment-by-moment changes in the social environment (Lapadat, 2001).

Children with ADHD may engage in a social context with an interactional goal in mind. However, due to an ineffective filtering mechanism, steps are skipped (e.g., a shortcut is taken) to achieve the interactional goal. Rather than taking the path to social competence, the filtering mechanism redirects the child such that pragmatic language difficulties occur. These children then fail to follow the subtle nuances associated with appropriate pragmatic language use, which results in disruptive social skills. Stressors that may cause the filtering mechanism to drop may include prior experience of, and anticipation for name calling, insults, rejection, victimization, peer alienation, and rudeness from their social partner(s). As stressors are encountered, the filtering mechanism fails, or at best drops off, and social relations suffer.

Once children with ADHD establish a history of ineffective social experiences, these children take longer to learn and require additional practice to incorporate appropriate pragmatic language utterances and behaviors, while at the same time attempting to control the behaviors specific to inattention and hyperactivity/impulsivity. If children with ADHD encounter those already knowledgeable of their pragmatic difficulties, an offensive stance (e.g., aggressiveness) or defensive stance (e.g., withdrawal) may ensue dependent on the specific social group. Over the years and through the process of trial and error (potentially more error than trial), children with ADHD must either learn how to effectively manage their pragmatic language abilities

44

through this learned filtering process, or suffer the long-term consequences of problematic social relations.

**Unique Contribution to Social Skills Outcome**

In the current study, ADHD symptomatology and pragmatic language use both predicted social skills scores, and although ADHD symptomatology and pragmatic language use were related to one another, pragmatic language use provided a unique contribution in the estimate of children's social skills of 10.5% above and beyond the contribution of ADHD symptomatology. However, ADHD symptomatology clearly was the most influential predictor in uniquely accounting for approximately 19% of the differences in social skills outcomes above and beyond the contribution of pragmatic language use.

Implications from the current study indicate pragmatic language use represents a different domain of skills that add incremental information to the prediction of social skills in children with different degrees of ADHD symptomatology. These findings demonstrate that children's pragmatic language use is a separate but intimately related factor to inattention and hyperactivity/ impulsivity, and contributes to the prediction of the social developmental outcomes in children.

**Semi-Structured Dyadic Communication Task: TV Talk Show**

A second purpose of the current study was to conduct a detailed investigation of communication patterns and pragmatic language use obtained from sampling behaviors from a semi-structured dyadic communication task. Few discoveries were uncovered utilizing the TV Talk Show format, with the exception that the three dimensions of ADHD symptomatology, pragmatic language use, and social skills were significantly correlated with the appropriate use of intensity while in the Guest role. Other discoveries identified represent the importance of maintaining topics, being polite, conversing using a calm, friendly voice, not talking too loud or soft, not talking in a sarcastic manner, and maintaining eye contact with a dyadic partner. The children's utterances and behaviors during the TV Talk Show task did not suggest they intended to be rude, but simply that they may not have executed the social rules governing what is acceptable in conversation. According to Westby and Cutler (1994), not only must children understand rules but they also must retrieve, organize, and express them.

Being an effective conversationalist requires combining control over the psycholinguistic processes of utterance planning, production, and comprehension with control over conversational and interactive rule systems – rules for turn-taking, procedures for establishing, maintaining, and recognizing topic relevance, procedures for repairing misunderstandings or breakdowns in comprehension, the local system of proxemics and kinesics, and the complexities of interpersonal politeness (Schley & Snow, 1992). Factors leading to appropriate pragmatic language development include the development of self-regulatory behavior, which is dependent on the internalization of rule-governed language (Vygotsky, 1962). Successful development of internalized language for self-regulation requires adequate receptive and expressive language skills. Children must comprehend the rules that they hear, and they must later be able to retrieve, organize, and verbalize the rules. By the time children enter school, task-relevant and prescriptive forms of self-directed speech are essential for mental representations of plans and goals, and responses to rules and instruction (Cohen, et al., 2000). When broadening these results to children with different degrees of ADHD symptomatology, they may know how to communicate properly when alternative responses are presented, but they have difficulty when they have to produce their own responses in social situations, resulting in potentially problematic peer relationships.

Implications from the current study indicate children demonstrating deficiencies in pragmatic language use with an adult partner may also experience a diminished ability to function appropriately in social settings. Because pragmatic functions vary according to context and audience (Perkins, Crisp, & Walshaw, 1999), it may have been that this dyadic interactive format was inadequate in revealing the nuances associated with pragmatic language use. The assessment of pragmatics is complex in that it encompasses not only utterances, but behaviors that accompany such utterances, or lack thereof. It requires sampling and analysis of behaviors, some of which are overt, some of which must be inferred and some which represent a synthesis of different levels of processing (Adams, 2002).  Coding these behaviors on a macro- or micro-level can also be problematic. Although coders from the current study reached adequate levels of inter-rater reliability, subtle difficulties may not have been detected when making the global judgment whether pragmatic behaviors or utterances were impaired or adequate, or when

coding the frequency of occurrence. Further, according to Adams, the assessment of pragmatics in spoken language remains problematic due to the complex interaction of social, linguistic, cognitive, and cultural influences on pragmatics.

## Chapter Five: Limitations

Three key limitations must be addressed. First, given the complexity of the objective assessment of the pragmatic aspects of children's communication, this study is limited in the measurement of pragmatic language use through a single standard measure (*CCC-2*, Bishop, 2003) and a single semi-structured dyadic communication task with an adult partner (TV Talk Show). Although only a handful of standardized pragmatic language assessments exist, none are entirely satisfactory for evaluating the range of pragmatic abnormalities described in clinical accounts (Bishop). The comprehensive assessment of pragmatic language should be able to identify the strengths and weaknesses of a child's pragmatic abilities (Adams, 2002). In a selective review and critique of current formal and informal testing methods and pragmatic analytic procedures, Adams states the *Children's Communication Checklist* developed by Bishop (1998) appears to be the only pragmatics checklist which has provided satisfactory estimates of internal consistency and inter-rater reliability, and has rapidly become the instrument of choice for the identification of pragmatic language impairment.

Although the *Children's Communication Checklist – 2: U.S. Edition* utilized in the current study was provided for completion to both parent and teacher, an unacceptable response rate from teachers prevented combined and differential analyses between parent and teacher, which may have resulted in different findings. The selection of parent/teacher report as outcome measures may not capture the full range of behaviors important for both pragmatic language use and social skills. Reports from peer-reported variables, not the perspectives of adults, have been shown to predict more strongly to later adjustment (Cowen, Pederson, Babigian, Izzo, & Trost, 1973). Further, evaluating pragmatic language use through observational and behavioral coding of peer interactions in an unstructured task rather than the use of a semi-structured dyadic communication task with an adult partner may have resulted in a different pattern of results; although implementation of this methodology would limit the ability to fully control or standardize the behavior of the peer partner.

The current study exposed perplexing results in that the unstandardized Pragmatic Average Scores derived from the *Oral and Written Language Scales* was not associated with the standardized Pragmatic Composite derived from the *Children's Communication*

*Checklist – 2 U.S. Edition*. Further, the **"**TV Talk Show" task may have been ineffective in capturing the specific pragmatic language characteristics of interest [e.g., cooperative principles by Grice, (1975) and rules of conversation by Prutting and Kirchner (1987) and Bishop (1998)].

What might it take to capture these nuances in pragmatic language use? Systematic and detailed clinical evaluation of pragmatic language use in this population would appear to be warranted. Because the assessment of pragmatics is complex and problematic, multi-method, multi-source assessment procedures are desirable. According to Deater-Deckard (2001), multi-method, multi-source assessment procedures allow the estimation of highly reliable composite measures as well as the examination of data source and method differences within the same sample. Additional, pragmatic language assessment using natural social contexts may provide greater sensitivity in detecting language and social-communicative abilities. Language assessment needs to be far more broadly based than the formal testing or analysis of spoken narrative that is commonly thought to suffice (Mathers, 2006) or the structural (grammatical) aspects of language often assessed on standardized tests (Camarata & Gibson, 1999).

A second limitation exists in that results are based solely on the symptomatology of ADHD as rated by the parent. It is not known whether the relations among ADHD symptomatology, pragmatic language use, and social skills uncovered in the current study would generalize to children with high levels of inattention, hyperactivity, or a clinically diagnosed population. In addition, because, children classified into unique ADHD subtypes, predominately inattentive, predominately hyperactive – impulsive, and combined types, have been shown to display different behavioral profiles (Barkley, 1990, 1997; Milich, Balantine, & Lynam, 2001), it is crucial that future researchers inspect these relations more meticulously. Children with ADHD and children with pragmatic language deficits are a relatively heterogeneous population (Tirosh & Cohen, 1998). Because the most predominate finding among ADHD Combined (ADHD/C) subtype is that they tend to perform more poorly than non-ADHD controls on cognitive processing and academic achievement tasks (Milich et al.; Hinshaw, 2002), relationships between these behaviors and individual characteristics of pragmatic language deficits should be examined. Although Bignell and Cain (2007) have begun to disentangle how

hyperactivity/ impulsivity and poor attention are separately related to school children's pragmatic language skills, future research should also incorporate methodology to further our understanding of these children's peer difficulties as they relate to pragmatic language use.

Third, the correlational nature of the data limits interpretation of directionality within family and peer processes. It is likely the predicted relations are bi-directional in that the social problems experienced by children with different degrees of ADHD symptomatology result in an inability to learn appropriate pragmatic skills, and their pragmatic language deficiencies may limit their ability to become good conversational and social partners. When extending this interpretation to children with a clinical diagnosis, being socially inept is not ordinarily considered a clinically relevant issue except in extreme cases, but for many individuals with ADHD, pragmatic deficits may synergistically interact with and aggravate other behavioral problems (Baird et al., 2000). This synergistic interaction may also lead to difficulties in forming and maintaining successful peer relationships in that children with ADHD displaying pragmatic deficits may act in aggressive or anti-social manners based on on-going problematic exchanges with their peers.

**Chapter Six: Future Directions**

In summary, this is the first known study directly evaluating the relations among ADHD symptomatology, pragmatic language use, and social skills utilizing a community sample of children. Pragmatic language use was associated with ADHD symptomatology and social skills, and partially mediated the relation between ADHD symptomatology and social skills. These findings are consistent with and add to existing literature regarding ADHD. A clear direction for future research may be inferred from this study.

Poor peer relationships have been found to predict serious difficulties in later life, including truancy, antisocial behavior, social anxiety, and an increased need for mental health services (Parker & Asher, 1987). Hence, developing a deeper understanding of how pragmatic language use and ADHD symptomatology affect developing peer relationships during the early school years may be important to guide early intervention and prevention efforts. Not only should future research focus on the individual differences among children with ADHD symptomatology, but should extend our focus on coalescing our understanding to groups clinically diagnosed. Children with ADHD often present with comorbid disorders such as aggression, conduct disorder, oppositional defiant disorder, and multiple learning disabilities. Because empirical evidence exists documenting problematic peer relationships in children presenting with these difficulties (Hinshaw & Melnick, 1995; Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994; Barkley et al., 1990; Freitag et al., 2009), it is critical that research continues to disentangle these relations.

Utilizing longitudinal methodology will assist in identifying these individual differences and disentangling the likely bi-directly relations between various psychopathologies, pragmatic language use, and social skills. Longitudinal research design would allow researches to uncover changes over time, although implementing such study design requires enormous amount of time and may be quite expensive. Because having positive peer relationships is developmentally important to *all* children, whether a confirmed diagnosis of ADHD exists or not, the time and expense associated with a longitudinal design should not dampen efforts to tease apart these relations.

In conducting future research, as suggested by Camarata and Gibson (1994), if clinically significant pragmatic deficits are detected, one could argue that interventions

for these deficits should be a priority. The development of interventions for ADHD as it relates to pragmatic language use and social skills should be reformulated to integrate children's participation in focused communicative interactions in multiple communicative contexts that clarify and expand on the appropriate use of pragmatic utterances and behaviors; specifically, topic initiation, topic maintenance, and the appropriate use and timing of pauses and intensity (Prutting & Kirchner, 1987; Bishop, 1998). In order for children with ADHD to change behavior and increase the appropriateness of their pragmatic language use and social skills, it is necessary that the intervention allow students to understand the purpose for the skills, the affect the inappropriate use of the skills may have on the perceptions others may garner toward them, and realize the benefits that the skill has on their social relationships, specifically those with their peers. Meaning must be attached to the strategy so that there is an understanding of the relation between behavior and the consequences (Westby & Cutler, 1994).

Notwithstanding, both parents and teachers also should be provided feedback and instruction as well as strategies to monitor the child's progress. Such feedback and instruction may lead to changes in the home and at school resulting in changes to parent and teacher perceptions and affective behavior towards the child. In light of the problematic social relationships children with ADHD experience, such interventional efforts may guide children to more positive and successful interactions with peers, family, and teachers, resulting in tenacious communicative abilities and social developmental outcomes in this population.

In closing, the current results highlight the complex interactive nature of ADHD symptomatology, social skills, and pragmatic language use. This issue has begun to be addressed in the reported work. Given that peer relations, both successful and unsuccessful, are complex and have many contributing factors, it is reasonable to assume that the treatment of disturbed relations requires an intensive, multimodal approach (Landau et al., 1998). This clearly should include pragmatic language assessment beyond the typically accessed receptive and expressive language abilities, and a more rigorous social skills assessment, which includes the quality and frequency of interactions with caregivers and peers. Expanded assessment procedures may provide a more fully

elaborated model regarding relations between the subtypes of ADHD, pragmatic language ability, and social development for children with different degrees of ADHD symptomatology.

**Appendix A: Recruitment Flyer**

# ATTENTION PARENTS!!!

## Is your child 9-, 10-, or 11-years-old?

If so, your child is being invited to take part in a research study about children's communication and behavior patterns.

What will my child be asked to do?
- Perform some school-type tasks, which should take approximately 60-90 minutes, with breaks.

What will I, the parent, be asked to do?
- Complete some behavior questionnaires about your child, which should take approximately 30-60 minutes.

All information that you and your child provide will be kept confidential.

Your family will be paid for taking part in the study.

The study will take place in Shelbyville, Kentucky over the next couple of months.

If you are interested in finding out more about the study and whether you and your child may be eligible, please contact Melinda Leonard, M.S. at _____ or at maleon2@uky.edu for more information.

An Equal Opportunity University

**Appendix B: Telephone Interview Script**

Thank you for calling.

My name is Melinda Leonard and I am a doctoral student attending the University of Kentucky. I am currently working on my dissertation research project. This research study is about the communication and behavior patterns in children between the ages of 9 and 11 years old.

First, I have a few questions that I need to ask to determine your family's eligibility to participate.

    1. Is your child 9, 10, or 11 years old?

*If NO:*
This research is specific to children ages 9, 10, and 11.
I am sorry, but you will not be able to participate. Thank you for calling.

*If YES:*               Okay.
    2. Is English your family's primary language spoken in the home?

*If NO:*
    3. Can you and your child read English well?

*If NO:* Because many of the tests we will be asking you and your child to complete are based on English, you will not be able to participate. Thank you for calling.

*If Yes to #2 or #3:*      Okay.
    4. Has your child ever been diagnosed with a speech or hearing impairment?

*If YES:*
    5. Is your child currently receiving any special services for this difficulty?

*If YES:* Because of the nature of the tests, I am sorry, but you will not be able to participate.

*If NO to #3 or #4:*      Okay.
    6. Does your child take any prescribed medications?

*If YES:*
    7. What medications is your child currently taking?

---

Okay. Based on your responses, your family is eligible to participate.

**Consent to Participate in a Research Study**

**Children's Communication and Behavior Patterns**

**Why is your child being invited to take part in this research?**
Your child is being invited to take part in this research study about children's
communication and behavior patterns.  Your child is being invited to participate because
he/she is between the ages of 9 and 11 years old and has never been referred for any
hearing or speech problems.  We anticipate that approximately 80 children between the
ages of 9 and 11 will participate in this study.

**Who is doing the study?**
The person in charge of this study is Melinda A. Leonard, M.S. a student of University of
Kentucky Department of Psychology. She is being guided in this research by Elizabeth
Lorch, PhD and Richard Milich, PhD.  There will be other people on the research team
assisting at different times during the study.

**What is the purpose of the study?**
The purpose of this study is to examine children's communication and behavior patterns
using a variety of different measures and procedures.  We are especially interested in
observing how children interact with an adult in a semi-structured task.

**Are there reasons why my child should not take part in this study?**
If your child has ever been referred for a hearing, speech, or language problem then
he/she cannot participate in this study.  If your child is taking medication for his/her
behavior, he/she will be allowed to participate but must be medication free on the day of
testing.

**Where is the study going to take place and how long will it last?**
The research procedures will be conducted at the principal investigator's home office.
You and your child will need to come to _____ in Shelbyville,
Kentucky one time during the study.  Your visit will take about 1-1/2 hours.  The total
amount of time you will be asked to volunteer for this study is about 1-1/2 hours over one
day.

**What will my child and I be asked to do?**
Your child will be asked to complete a task designed to measure communication patterns
and behaviors.  Your child will also be asked to perform some school-type tasks to give
us some idea of your child's overall academic and cognitive functioning.  We anticipate
that the procedures will take approximately 1-1/2 hours, with breaks.  There is enough
variety in the tasks so that we do not think your child will become too bored with the
procedures.  The testing session will be audio and video recorded.
While your child is completing these tasks, we will be asking you some questions about
your child's behavior and asking you to fill out some behavior questionnaires about your

child.  This will enable us to compare different child characteristics associated with different response patterns.

**What are the possible risks and discomforts?**
There are no known serious risks associated with participating in this study.  Your child may find some of the tasks boring or frustrating, especially because some of the tasks get more difficult as your child progresses on the task.  However, the discomforts associated with these tasks are similar to ones your child may experience in his/her everyday activities, such as doing schoolwork.

**Will my child or I benefit from taking part in this study?**
There is no guarantee that you or your child will get any benefit from taking part in this study.  Your willingness to have your child take part in this study may, in the future, help researchers better understand why some children are able to make careful, reflective decisions whereas others make impulsive, potentially problematic decisions.

**Does my child have to take part in this study?**
If you decide to have your child participate in this study, it should be because you really want to have him/her volunteer.  Further, you or your child can decide to stop participating at any time during the study.

**If you don't want your child to take part in this study, are there other choices?**
If you do not want your child to be in this study, there are no other choices except not to participate in the study.

**What will it cost to participate in the study?**
There are no costs to you for having your child participate in the study.

**Will you receive any rewards for taking part in this study?**
Each family will receive $15 for taking part in this study.

**Who will see the information that we give?**
Your information will be combined with information from other people taking part in the study.  When we write about the study to share it with other researchers, we will write about the combined information we have gathered.  Your child's teacher will be asked to provide information to the researchers about your child (the same questionnaires parent complete).  Neither you nor your child will be identified in these written materials.  If we publish the results of the study, we will keep your name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what the information is.  For example, your name and your child's name will be kept separate from the information you give, and these two things will be stored in different places under lock and key.  You should know that there are some circumstances in which we may have to show your information to other people, for example, if someone from the university needs to audit our study.

**Can your taking part in the study end early?**
If you decide to have your child participate in the study, you still have the right to decide at any time that you no longer want your child to continue. You will not be treated differently if you decide to stop your child's participation in the study early.

The individuals conducting the study may need to withdraw your child from the study. This may occur if your child is not able to follow the directions they give, or if they decide that your child's being in the study is more risk than benefit to him/her.

**What if you have any questions?**
Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the investigator, Melinda Leonard, at _____. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.


_____          _____
Signature of person agreeing to take part in the study                     Date


_____
Printed name of person agreeing to take part in the study


_____          _____
Name of [authorized] person obtaining informed consent                Date

**Appendix D: Child Assent Form**

**Consent to Participate in a Research Study**

**Children's Communication and Behavior Patterns**

You are invited to participate in a research study conducted by the University of Kentucky. The study looks at how children communicate with each other.

If you agree to be in this study, it will take approximately 1-½ hours, including breaks. You will be asked to play a game that requires that you talk with an adult.

You will also be asked to do some standard school-type tasks, such as telling the meanings of words or remembering numbers. However, you will not get a grade on any of these tasks. The testing session will be audio and video recorded.

If you agree to participate in this study, your family will receive $15.

If you agree to participate, nobody outside of our research group will see your answers or how well you are doing. We only use numbers to indicate your score sheets, not your name.

It is up to you to decide whether you want to participate in this study, and if you do decide to participate you can stop at any time if you do not want to finish.

Do you understand what I have told you?

Do you want to participate in our study?

**Appendix E:  Teacher Letter with Consent and Questionnaires**

U K
UNIVERSITY OF
KENTUCKY

College of Arts and Sciences
Department of Psychology
125 Kastle Hall
Lexington, KY  40506-0044
859 257-9640
*Fax* 859 223-1979
www.uky.edu

Date:

Dear Shelby County School Teacher.

You are being invited to take part in the University of Kentucky study IRB #0 8-0653-F4S exploring communication patterns and pragmatic language use among children between the ages of 9 and 11 recruited from local elementary schools. Your participation is strictly voluntary. Your willingness to take part in this study may, in the future, help researchers better understand why some children are able to make careful, reflective decisions whereas others make impulsive, potentially problematic decisions.

Because _____ is the first of your students to complete this study, I have enclosed a Teacher Consent Form along with three questionnaires. Please read the consent form and sign it if you agree to participate (even though there may be more than one of your students participating in this study, you will only be asked to complete the consent form this one time).  If you do choose to participate, please complete the questionnaires and place them along with the signed consent form in the self-addressed stamped envelope and return them to me.

Once these forms have been received, a check in the amount of $10.00 will be mailed to you at your respective school.  If you prefer to have the check mailed to your home address, please write the appropriate mailing address in the top left-hand corner of the first page of the Teacher Consent Form.

If you have any questions or concerns, please contact me by telephone at _____ or by email at maleon2@uky.edu, or you can contact the Office of Research Integrity at the University of Kentucky at 1-866 400-9428 if you have any questions about your rights as a volunteer in the research.

Sincerely,


Melinda A. Leonard, M.S.

**Appendix F:  Teacher Consent Form**

**Consent to Participate in a Research Study**

**Children's Communication and Behavior Patterns**

**Why are you being invited to take part in this research?**
You are being invited to take part in this research study about children's communication and behavior patterns.  Your student has been approved to participate because he/she is between the ages of 9 and 11 years old.  We anticipate that approximately 80 children between the ages of 9 and 11 will participate in this study.

**Who is doing the study?**
The person in charge of this study is Melinda A. Leonard, M.S., a student of University of Kentucky Department of Psychology.  She is being guided in this research by Elizabeth P. Lorch, PhD and Richard Milich, PhD.  There will be other people on the research team assisting at different times during the study.

**What is the purpose of the study?**
The purpose of this study is to examine children's communication and behavior patterns using a variety of different measures and procedures.  We are especially interested in observing how children interact with an adult in a semi-structured task.

**Are there reasons why you should not take part in this study?**
If your student has not participated in this study then you cannot participate in this study.

**Where is the study going to take place and how long will it last?**
The research procedures will be conducted at your school.  The total amount of time you will be asked to volunteer for this study will depend on the number of your students that have participated.  We anticipate the completion of data collection within twelve months.

**What will you be asked to do?**
You will be asked to fill out some behavior questionnaires about each of your students that have completed participation in this study.  This will enable us to compare different student characteristics associated with different response patterns. We anticipate that completion of these forms will take approximately ½ to 1 hour per student. All forms will be mailed directly to you at your respective school.  Once completed, please place the forms along with this signed Teacher Consent Form in the self-addressed stamped envelope and mail to the principal investigator.

**What are the possible risks and discomforts?**
There are no known serious risks associated with participating in this study.

**Will you benefit from taking part in this study?**
There is no guarantee that you will get any additional benefit from taking part in this study.  Your willingness to take part in this study may, in the future, help researchers better understand why some children are able to make careful, reflective decisions whereas others make impulsive, potentially problematic decisions.

**Do you have to take part in this study?**

If you decide to participate in this study, it should be because you really want to volunteer. Further, you can decide to stop participating at any time during the study.

**If you don't want to take part in this study, are there other choices?**
If you do not want to be in this study, there are no other choices except not to participate in the study.

**What will it cost you to participate in the study?**
There are no costs to you for your participation in the study.

**Will you receive any rewards for taking part in this study?**
You will receive $10 per each student that you provide information for.

**Who will see the information that you give?**
The information you provide about your student will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. Neither you nor your student will be identified in these written materials. If we publish the results of the study, we will keep your name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what the information is. For example, your name and your student's name will be kept separate from the information you give, and these two things will be stored in different places under lock and key. You should know that there are some circumstances in which we may have to show your information to other people, for example, if someone from the university needs to audit our study.

**Can your taking part in the study end early?**
If you decide to participate in the study, you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop participation in the study early.

**What if you have any questions?**
If you have questions about the study, you can contact the principal investigator, Melinda A. Leonard, M.S., at _____. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll free at 1-866-400-9428. You can make a copy of this signed consent form for your records or request a copy be mailed to you once we have received it.


_____        _____
Signature of person agreeing to take part in the study                Date


_____
Printed name of person agreeing to take part in the study


_____        _____
Name of [authorized] person obtaining informed consent                Date

**Appendix G: Teacher Letter with Questionnaires Only**

UK.
UNIVERSITY OF
KENTUCKY®

College of Arts and Sciences
Department of Psychology
125 Kastle Hall
Lexington, KY 40506-0044
859 257-9640
*Fax* 859 223-1979
Date:                                          www.uky.edu

Dear Shelby County School Teacher.

Thank you for choosing to volunteer for this study.

Your student _____ has
completed the University of Kentucky study IRB #0 8-0653-F4S exploring
communication patterns and pragmatic language use among children between the ages of
9 and 11 recruited from local elementary schools. Your voluntary participation in this study
may, in the future, help researchers better understand why some children are able to make careful,
reflective decisions whereas others make impulsive, potentially problematic decisions.

As before when you signed the consent form, please read and complete the enclosed
questionnaires about your student. Upon completion, please place the completed
questionnaires in the self-addressed stamped envelope and return to me.

Once these forms have been received, monetary compensation will be mailed to you at
either your respective school or home address as indicated on your signed Teacher
Consent Form.

If you have any questions or concerns, please contact me by telephone at
_____ or by email at maleon2@uky.edu, or you can contact the Office of
Research Integrity at the University of Kentucky at 1-866 400-9428 if you have any
questions about your rights as a volunteer in the research.

Sincerely,


Melinda A. Leonard, M.S.

**Appendix H: Intercorrelations among the CCC-2: SIDI~ and ADHD Symptomatology, Pragmatic Language Use, and Social Skills**

*Intercorrelations among the CCC-2: SIDI~ and ADHD Symptomatology, Pragmatic Language Use, and Social Skills*

| Subscale | SIDI | ADHD Symptomatology | Pragmatic Language Use | Social Skills |
|---|---|---|---|---|
| *CCC-2:* SIDI~ | --- | -.320* | .319* | .242 |
| *CPRS-R:S* ADHD Index | -.320* | --- | -.467** | -.649** |
| *CCC-2:* GCC | .319* | -.467** | --- | .590** |
| *SSRS*: CARS | .242 | -.649** | .590** | --- |

*Note. CCC-2 =Children's Communication Checklist, 2<sup>nd</sup> ed.;* SIDI = Social Interaction Deviance Index; ~ = original scores were converted to absolute values*; ADHD = Attention deficit hyperactivity disorder; CPRS-R:S – Conners' Parent Rating System Revised: Short Version* (ADHD Index as a measure of ADHD Symptomatology)*; GCC = General Communication Composite (measure of Pragmatic Language Use); SSRS = Social Skills Rating System;* CARS = Social Skills Standard Score (measure of Social Skills).

***p < .01 two-tailed.*

**Appendix I: Intercorrelations among the SSRS: EIH and ADHD Symptomatology, Pragmatic Language Use, and Social Skills**

*Intercorrelations among the SSRS: EIH and ADHD Symptomatology, Pragmatic Language Use, and Social Skills*

| Subscale | EIH | ADHD Symptomatology | Pragmatic Language Use | Social Skills |
|---|---|---|---|---|
| *SSRS: EIH* | --- | .847** | -.562** | -.672** |
| *CPRS-R:S* ADHD Index | .847** | --- | -.467** | -.649** |
| *CCC-2:* GCC | -.562** | -.467** | --- | .590** |
| *SSRS*: CARS | -.672** | -.649** | .590** | --- |

*Note. SSRS = Social Skills Rating System;* EIH = Problem Behavior Standard Score; ADHD = Attention deficit hyperactivity disorder; *CPRS-R:S – Conners' Parent Rating System Revised: Short Version* (ADHD Index as measure of ADHD Symptomatology)*; CCC-2 =Children's Communication Checklist, 2nd ed.;* GCC – General Communication Composite (measure of Pragmatic Language Use); CARS = Social Skills Standard Score (measure of Social Skills).

**p* < .01 two-tailed.

**Appendix J:  Pragmatic Language Use Training Manual**
**TV Talk Show Task**

**Appendix J:  Pragmatic Language Use Training Manual**
**Section 1 - Instructions for Transcribing Audiotaped Dyadic Interactions**

**TV Talk Show Task**
**Host and Guest Roles**

1.  The audiotaped interaction between the study participant and experimenter within each role should be transcribed verbatim and verified by a second transcriber for content.
2.  The videotapes should only be used if the audiotaped interaction is inaudible.
3.  Transcriber should type the following information at the top of each transcript:
    a.  Subject: The subject ID number will be noted at the beginning of each session on the audiotape.
    b.  Task: TV Talk Show
    c.  Subject Role: Type the child's role (H/G) and gender (F/M) -  (HF or GM)
    d.  Observation Date: The date the interaction was originally taped (located on the side of the audiotape)
    e.  Transcriber: The first and last name initials of the person completing the transcription
    f.  Transcription Completion Date: The date the transcription was completed
4.  The children's utterances should be broken down into speech turns, which are delineated by a change in speaker or by a pause of at least 2 seconds between two consecutive utterances by the same speaker.  The following coding scheme should be used to identify speaker.
    a.  HM = Host (male)
        HF = Host (female)
    b.  GM = Guest (male)
        GF = Guest (female)
5.  If an overlap in utterances occurs, note by using a double slash (//) before and after the respective speaker utterance (See the following transcription example).
6.  All pauses longer than two (2) seconds should be noted by typing: (pause 3 secs) where the pause occurred.
7.  When the timer rings, type (buzzer) at the end of the transcription.
8.  Once transcription has been completed, the file should be saved using the following format:  Subject000-H or Subject000-G depending on child's role.
9.  One copy of both transcribed dyadic interactions should be printed and placed in the subject's file.
10. After printing the transcription from each role, a total number of utterances should be calculated for both child and examiner using the MS Word "word count" option.
    a.  Each transcription should first be saved as a separate file noted as follows: Subject000-H Ch Count or Subject000-H Ex Count.
    b.  Eliminate all speaker codes (e.g., HM or GM) and any pause indicators.
    c.  Once the word count as been calculated, type and highlight in red, Child Utterances: # or Examiner Utterances: # under the top heading (before interaction starts).
    d.  Once the file has been saved, print a copy and place in the subject's file.

**TV Talk Show Task**
**Host Role**

Subject:  000                                                     Observation Date:  01/01/09
Task: TV Talk Show Task                               Transcriber: ML
Subject Role:    HF                                          Completed:  02/02/09

HF:  Hello, (guest's name).  Welcome to the (host's name) Show.

GF:  Hello.

HF:  Audience, thi-, what we do is I question her about movies and cartoons.  (Guest's name),

GF:  Yes.

HF:  What is your favorite cartoon?

GF:  Bugs Bunny.

HF:  That's funnyyyy.

GF:  It is funny a funny show.  I like it.

HF:  What's it about?  Could you tell us?

GF:  Sure.  Bugs Bunny is about this long eared rabbit, and he just talks and eats carrots and he's always gettin into some silly stuff and Elmer Fudd tries to capture him.

HF:  (pause – 3 secs)  Um, any other shows that you like?

GF:  Tom and Jerry.

HF:  Could you tell us what that's about?

GF:  Well, Tom is a cat and Jerry is a mouse and Tom is always trying to catch Jerry and Jerry is always trying to get him kicked out of the house

HF:  (pause – 4 secs) How about movies?  Do you like any movies?

GF:  Yes, I do.  My favorite movie is Harry Potter and the Goblet of Fire.

HF:  Could you explain what that's about to us too?

GF:   Sure.  Harry Potter and his friends, um, they are at a school for witches and wizards and that show is about a contest that they have to get, to be champion.

HF:   Do you like any other movies?

GF:  Oh, I do.  I like, um, the Indiana Jones movies.

HF:   Could you explain what some of those are about?

GF:  Well, it's very action oriented.  Lots of action and, and, a, Indiana Jones is an archaeologist so he's always searching for something.

HF:  Um, how bout TV shows?  Do you like any particular TV shows?

GF:  My favorite TV show is Dirty Jobs.

HF:  Could you explain what that's about?

GF:  Well, it's about this guy that goes around the country and just shows what kind of jobs are out there.  Most of 'em are real dirty and nasty.

HF:  Oh, well good.  Thank you.  Um, (pause 4-secs) How about TV sayings from your favorite cartoons?  Do you have any favorite TV sayings?

GF:  Uhhh, I guess I like the one that Bugs Bunny says, "What's up Doc?" (laughs)

HF:  That has always been cute.

GF:  It is cute.  You're right.

HF:  How booooout (pause – 12 secs ) your favorite movie that you have at your house?

GF:  Well, (pause – 4 secs) I would have to saaaaay probably Harry Potter and the Goblet of Fire (laughing).  I have that one on DVD.

HF:  Oh (pause – 7 secs)  How bout favorite (pause – 14 secs)  favorite (pause – 7 secs)  //I can't//

GF:  //I like// the Discovery Channel.

HF:  Favorite channel?

GF:  Uh huh.

HF:  Oh, could you explain why that, what the Discovery Channel is about?  (buzzer)

**Appendix J: Pragmatic Language Use Training Manual**
**Section 3 - Rules of Conversation Rating Instructions**

**TV Talk Show Task**
**Host and Guest Roles**

*Note: This coding should take place <u>before</u> conducting the global rating of the Cooperative Principles while viewing the videotapes. Make one copy of the subject's transcription from each role for use in rating (found in subject's file).*

The ratings described in this manual are divided into two categories: (1) frequency count and (2) global rating. The frequency count is the total number of occurrences, while the global rating reflects the observer's general impression of the child's ability to conform to the specified rules of conversation listed below during the entire 4-minute dyadic interaction, separate for each role.

1.  At least two trained observers blind to the experimental design should independently tally and rate the interactions while watching the videotape.

2.  The independent observer should write the following information in the upper right hand corner on the transcription copy prior to viewing the videotape:
    a.  Rater: The first and last name initials of the person completing the rating
    b.  Rating Completion Date: The date the rating was completed

3.  A total frequency count of the subject's conformity [positive (+) and/or negative (-)] to the following categories during the entire dyadic interaction should be tallied and written in the top left-hand corner on the transcription copy:
    a.  Verbal Utterances: Turn-Taking - Should be noted on the transcription copy based on the child's role as either HM, HF, GM, or GF
    b.  Verbal Utterances: Topic Initiations - Code as TI or –TI
    c.  Verbal Utterances: Repairs - Code as R
    d.  Verbal Utterances: Interruptions - Should be noted on the transcription copy as a double slash (//) before and after the respective speaker utterance
    e.  Nonverbal Behaviors: Gestures - Code as G
    f.  Nonverbal Behaviors: Back-Channels - Code as BC

4.  The global rating should encompass the entire 4-minute dyadic interaction, separate for each role, and is based on a Likert scale of 1 = Poor (4 or more negative utterances or behaviors), 2 = Low (2 or 3 negative utterances or behaviors), and 3 = Good (One or no negative utterances or behaviors) of the child's conformity to each of the following categories:
    a.  Verbal Utterances: Topic Maintenance
    b.  Verbal Utterances: Use of Context – Rating based on negative topic initiations.
    c.  Paralinguistic Utterances: Intensity
    d.  Paralinguistic Utterances: Intelligibility
    e.  Nonverbal Behaviors: Eye Gaze

f.  Nonverbal Behaviors: <u>Facial Expression</u>
g.  Nonverbal Behaviors: <u>Physical Proximity</u>
h.  Nonverbal Behaviors: <u>Body Posture</u>

5.  Interrater reliability of at least .80 between the two independent coders should be assessed for 20% of the total number of dyadic interactions.

6.  Once both roles have been rated, information should be written on the *Rules of Conversation Observation Form.*

## Appendix J:  Pragmatic Language Use Training Manual
## Section 4 - Rules of Conversation Observation Form

**RULES OF CONVERSATION OBSERVATION FORM**

Subject #: _____

Rating Completion Date:

Host = H    Guest = G

| Category | No. | Group | Measure |
|----------|-----|-------|---------|
| Turn Taking | I. | Verbal Utterances | Count |
| Topic Initiation | II. | Verbal Utterances | + Count / - Count |
| Topic Maintenance | III. | Verbal Utterances | + Global / - Count |
| Repairs | IV. | Verbal Utterances | Count |
| Use of Context | V. | Verbal Utterances | Global |
| Interruptions | VI. | Verbal Utterances | Count |
| Intensity | VII. | Paralinguistic Utterances | Global |
| Intelligibility | VIII. | Paralinguistic Utterances | Global |
| Eye Gaze | IX. | Non-Verbal Behaviors | Global |
| Facial Expression | X. | Non-Verbal Behaviors | 1 |
| Physical Proximity | XI. | Non-Verbal Behaviors | Global |
| Body Posture | XII. | Non-Verbal Behaviors | Global |
| Gestures | XIII. | Non-Verbal Behaviors | Count |
| Back-Channelling | XIV. | Non-Verbal Behaviors | Count |
| Rater | | | |

(Data columns repeated as paired G / H columns for each rating interval.)

72

**Appendix J:  Pragmatic Language Use Training Manual**
**Section 5 - Rules of Conversation Rating Dimensions and Descriptions**

**TV Talk Show Task**
**Host and Guest Roles**

The rating dimensions and their descriptions presented in this manual have been modified from the standards developed by Prutting and Kirchner (1987), and Bishop (1998).  The Rules of Conversation Observation Form includes a checklist of behaviors that should be judged appropriate in the conversational interactions of children above the age of five. This behavioral framework can be directly compared to the behavioral characteristics of the *DSM-IV* (American Psychiatric Association, 1994).  Ratings are established in the following areas as they relate to conversational competence: verbal utterances, paralinguistic utterances, and nonverbal behaviors.

**VERBAL UTTERANCES:**  The actual linguistic utterance
I.    Turn-taking – all the utterances produced by the one speaker bounded on both sides by utterances produced by the other
　　　　a. (-) Talking too much
　　　　　　　Dominating the conversation as Host
　　　　b. (-) Not responding consistently to a conversational partner
　　　　　　　Pauses longer than two (2) seconds

II.   Topic initiation – questions, requests, or comments which start a new topic
　　　　a.   (-) Changes topic inappropriately – Topics are not based on television programs, cartoons, or movies
　　　　　　　HM:  So, so we just did a bunch of questions, so, what made you um, want to come on to the show?
　　　　　　　GF:  Um, I just like the show.  It's interesting.
　　　　　　　HM:  Um hmm, so, do you have a basement because I am not familiar with your home?
　　　　　　　GF:  No, I don't.
　　　　b. (-) Asks questions although he knows the answers
　　　　　　　HM:  But I did see you have a fence back there.  Do you have a backyard?
　　　　　　　GF:  Yes, we do.

III.  Topic maintenance – turn-taking which continues on the same topic for more than two turns
　　　　a. (+) Talks about one topic for several turns
　　　　　　　HF:  Today we are going to talk about your favorite TV program.
　　　　　　　GF:  Oh boy!  I love television.
　　　　　　　HF:  What is your favorite program?
　　　　　　　GF:  Well, I have so many that I like.
　　　　　　　HF:  That's okay. Just pick one of your favorites.
　　　　　　　GF:  I really like Sponge Bob.  It's about this sponge that lives in the sea. He works at the Crusty Crab.
　　　　b. (-) Failure to track and respond to topic shifts

GM: The movie Godzilla is really cool.
HF: Now let's talk about your favorite cartoon character.
GM: Well, Godzilla eats this man and smashes a bunch of cars.

IV. Repairs - repairing misunderstandings or breakdowns in comprehension
     a. (+) Corrects own misspoken utterance
        HM: Have you seen the, have you heard of the a, a Seventeen Again?
        GF: I have heard about that movie.
        HM: Yeah I know. It came out tomorrow, a yesterday.

V. Use of conversational context – ability to maintain the entire interaction following the specified TV Talk Show guidelines: dialogue based on television programs, cartoons, and movies
     a. (+) Questions and responds based on role
        HM: So, what TV shows do you like?
        GF: Uh, I like, Dirty Jobs.
     b. (-) May say things that are tactless or socially inappropriate based on role
        HM: Do you have a hobby?
        GF: I like to garden.

VI. Interruptions – when one speaker overlaps the other in an attempt to seize the floor

**PARALINGUISTIC UTTERANCES:** The mechanics of speaking
Note that this domain refers to the conversational impact of these characteristics. For example, all speakers display dysfluencies when talking. This domain would be coded as inappropriate only if the extent of the dysfluencies reaches a level that disrupted the conversation.

VII. Intensity
     (+) Uses a calm, friendly tone
     (-) Talks too loud or too soft
     (-) Talks in a sarcastic manner

VIII. Intelligibility
     (+) Speaks in a manner that can be understood
     (-) Talks too fast
     (-) Uses words that are incomprehensible or inappropriate for age (i.e., baby talk, self-talk)

**NONVERBAL BEHAVIORS:**
IX. Eye gaze
     (+) Maintains appropriate eye contact to speaker throughout the conversation
     (-) While speaking, shifts eye gaze away from listener (i.e., looking down, around, or away from listener)
X. Facial expression
     (+) Looks interested in the conversation
     (-) Displays bizarre facial expressions while conversing

74

(-) Bites lip in a nervous manner

XI.   Physical proximity
     (+) Maintains or shifts forward toward conversational partner
     (-) Leans back in chair

XII.   Body posture
     (+) Maintains appropriate body posture indicating interest in conversation
     (-) Turns head or body away from conversational partner
     (-) Fidgets with arms, hands, legs, face, or hair
     (-) Shifts side to side in chair
     (-) Folds arms tightly against chest

XIII.   Gestures
     (+) Shakes head or shrugs shoulders "yes" or "no" in response to a comment
          made by conversational partner
     (+) Raises hands above table in an effort to add to comment
     (-) Uses self-stimulating hand movements

XIV.   Back-channel – the listener is unwilling to take a turn as speaker. Note:  Do not
          count as a turn.  This technique also provides an opportunity for the
          listener to be an active participant in the conversation and implies that the
          listener understands and is attentive to the speaker.
     (+) Gives feedback to the other person (noninterrupting response from the
          listener)
               "mm-hmm"
               head nodding (not responding to a question)
               laugh or giggle in response to a comment made by conversational
                  partner

**Appendix J: Pragmatic Language Use Training Manual**
**Section 6 - Global Cooperative Principles Rating Instructions**

**TV Talk Show Task**
**Host and Guest Roles**

*Note: This coding should take place <u>after</u> rating the Rules of Conversation while viewing the videotape. Make one copy of the subject's transcription from each role for use in rating (found in subject's file).*

The ratings described in this manual reflect the observer's general impression of the child's ability to conform to each of the conversational maxims listed below during the overall dyadic interaction within each role.

1. At least two trained observers blind to the experimental design should independently rate the interactions while watching the videotape.
2. Using one *Global Cooperative Principles Rating Instrument*, the independent observer should enter the following information prior to rating:
    a. Subject: The subject ID number will be noted at the beginning of each session on the videotape and can be found in the upper left-hand corner on the transcription.
    b. Task: TV Talk Show
    c. Role: Enter the child's role (Host or Guest)
    d. Rater: The first and last name initials of the person completing the global rating.
    e. Rating Completion Date: The date the global rating was completed.
3. Negative utterances and behaviors occurring within the Rules of Conversation should be used to determine the global rating according to the following guidelines:
    a. Maxim of Quantity
        1. Verbal Utterances: Turn-taking
        2. Verbal Utterances: Topic Initiation
        3. Verbal Utterances: Topic Maintenance
        4. Verbal Utterances: Pauses (longer than two seconds)
    b. Maxim of Quality
        1. Verbal Utterances: Repairs
        2. Verbal Utterances: Use of Context
        3. Verbal Utterances: Pauses (longer than two seconds)
        4. Paralinguistic Utterances: Intensity
        5. Paralinguistic Utterances: Intelligibility
        6. Nonverbal Behaviors: Eye Gaze
        7. Nonverbal Behaviors: Facial Expression
        8. Nonverbal Behaviors: Body Posture
    c. Maxim of Relation
        1. Verbal Utterances: Topic Initiation
        2. Verbal Utterances: Topic Maintenance

       d. Maxim of Manner
         1. Verbal Utterances:  Turn-taking
         2. Verbal Utterances: Topic Initiation
         3. Verbal Utterances: Pauses (longer than two seconds)
         4. Paralinguistic Utterances: Intensity
         5. Nonverbal Behaviors: Eye Gaze
         6. Nonverbal Behaviors: Facial Expression
         7. Nonverbal Behaviors: Body Posture
       e. Maxim of Politeness
         1. Verbal Utterances: Interruptions
         2. Paralinguistic Utterances: Intensity
         3. Nonverbal Behaviors: Eye Gaze
         4. Nonverbal Behaviors: Facial Expressions

4. The global rating should encompass the entire 4-minute dyadic interaction, separate for each role, and is based on a Likert scale of 1 to 6 (lowest to highest) of the child's conformity to each of the above listed five groups (Maxims).
    a. 1 = Lowest
    Very poor conformity with multiple errors within multiple groups
    b. 2 = Low
    Poor conformity with one or two errors within multiple groups
    c. 3 = Average
    Average conformity with two errors in no more than two groups or more than two
    errors in only one group
    d. 4 = High
    Above average conformity with one error in no more than one group
    e. 5 = Highest
    Much above average conformity with no errors within any group

5. Interrater reliability of at least .80 between the two independent observers should be assessed for 20% of the total number of interactions.

## Appendix J: Pragmatic Language Use Training Manual
## Section 7 - Global Cooperative Principles Rating Instrument

| GLOBAL COOPERATIVE PRINCIPLES RATING INSTRUMENT | | | | | |
|---|---|---|---|---|---|
| (Note: This coding should take place after rating the Rules of Conversation.) | | | | | |

SUBJECT: _____   RATER: _____

TASK: _____   RATING COMPLETION DATE: _____

ROLE: _____

**The global rating should encompass the entire 4-minute dyadic interaction and should reflect your overall general impression of the child's ability to conform to the conversational maxims listed below.**
**Follow the specific instructions listed in the Pragmatic Language Manual - Section 3.**

| *Maxim of Quantity* | | | | | |
|---|---|---|---|---|---|
| Make your contribution as informative as required. | | | | | |
| Do not make your contribution more informative than | 1. Lowest | 2. Low | 3. Average | 4. High | 5. Highest |
| is required. | Level of Conformity | | | | |
| *Maxim of Quality* | | | | | |
| Do not say what you believe to be false. | | | | | |
| Do not say that for which you lack adequate evidence. | 1. Lowest | 2. Low | 3. Average | 4. High | 5. Highest |
| | Level of Conformity | | | | |
| *Maxim of Relation* | | | | | |
| Be relevant. | | | | | |
| | 1. Lowest | 2. Low | 3. Average | 4. High | 5. Highest |
| | Level of Conformity | | | | |
| *Maxim of Manner* | | | | | |
| Avoid obscurity of expression. Be orderly. | | | | | |
| Avoid ambiguity. Be brief (avoid unnecessary prolixity). | 1. Lowest | 2. Low | 3. Average | 4. High | 5. Highest |
| | Level of Conformity | | | | |
| *Maxim of Politeness* | | | | | |
| Be polite. | | | | | |
| | 1. Lowest | 2. Low | 3. Average | 4. High | 5. Highest |
| | Level of Conformity | | | | |

**Appendix J:  Pragmatic Language Use Training Manual**
**Section 8 - Global Cooperative Principles Rating Dimensions and Descriptions**

**TV Talk Show Task**
**Host and Guest Roles**

The global rating dimensions and their descriptions presented in this manual are based on the standards developed by Grice (1975). Grice proposed that speakers in conversation implicitly follow a Cooperative Principle. They cooperate towards an accepted purpose. To do that they conform to ten conversational maxims that are divided into five groups: Quantity, Quality, Relation, Manner, and Politeness.

These maxims allow the following: (1) to be more brief in communicating, since we do not need to say everything we would need to if we were being perfectly logical, (2) to say things indirectly to avoid some of the discomfort which comes from saying unpleasant things directly, (3) to insult/deride people indirectly without as much danger of confrontation, and (4) to imply dissatisfaction/anger without putting us in a position where we will have to directly defend our views.

> ***Maxims of Quantity:***
> 1.  Make your contribution as informative as is required.
>       a.  Don't say too little.
> 2.  Do not make your contribution more information than is required.
>       a.  Don't say too much.
> ***Maxims of Quality:***
> 1.  Do not say what you believe to be false.
>       a.  Don't lie.
> 2.  Do not say that for which you lack adequate evidence.
>       a.  Don't say things that you can't back up.
> ***Maxim of Relation:***
> 1.  Be relevant.
>       a. This maxim is responsible for preventing random, incoherent conversation lacking any continuity.
> ***Maxims of Manner:***
> 1.  Avoid obscurity of expression.
> 2.  Avoid ambiguity.
> 3.  Be brief (avoid unnecessary prolixity).
> 4.  Be orderly.
>       a.  These maxims relate to the form of speech you use.
>       b.  Don't use words you know your listener won't understand.
>       c.  Don't say things you know can be taken multiple ways.
>       d.  Don't state something in a long drawn out way if you could say it in a much simpler manner.
> ***Maxim of Politeness:***
> 1.  Be polite.

**Appendix K:  Multiple Regression Analyses Predicting Social Skills from CPRS-R:S Subscales and Pragmatic Language Use**

*Multiple Regression Analyses Predicting Social Skills from CPRS-R:S Subscales and Pragmatic Language Use*

| | Zero-Order $r$ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Opposition | Inattention | Hyper. | PLU | SS | $\beta$ | $sr^2$ | $B$ | $R^2$ |
| PLU | -.501** | -.426** | -.411** | --- | .590** | | | | |
| Opp. | --- | .636** | .511** | -.501** | -.661** | -.488** | .179 | -.739 | .526 |
| Inatt. | .636** | --- | .370** | -.426** | -.654** | -.492** | .199 | -.859 | .546 |
| Hyper. | .511** | .370** | --- | -.411** | -.462** | -.264* | .058 | -.449 | .406 |
| Mean | 51.17 | 51.48 | 54.30 | 120.89 | 108.81 | | | | |
| SD | 11.37 | 9.87 | 10.11 | 14.86 | 17.20 | | | | |

*Note. CPRS-R:S – Conners Parent Rating System Revised: Short Version;* PLU = Pragmatic Language Use as measured by the *CCC-2* – GCC (*Children's Communication Checklist, 2nd edition* – General Communication Composite); SS = Social Skills as measured by the *SSRS* – CARS (*Social Skills Rating System* - Social Skills Standard Score); Opposition, Inattention, Hyperactivity, and PLU were centered at their means for the mediational analyses.

\*\**p* < .01, one-tailed.

# References

Adams, C., Baxendale, J., Lloyd, J., & Aldredge, C. (2005). Pragmatic language impairment: Case studies of social and pragmatic language therapy. *Child Language Teaching & Therapy, 21*(3), 227–250.

Adams, C. (2002). Practitioner review: The assessment of language pragmatics. *Journal of Child Psychology and Psychiatry, 43(8),* 973-987.

Adams, C., Green, J., Gilchrist, A., & Cox, A. (2002). Conversational behaviour of children with Asperger syndrome and conduct disorder. *Journal of Child Psychology and Psychiatry, 43*, 679-690.

American Psychiatric Association, (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4ᵗʰ ed.), Washington, DC: Author.

Andersen-Wood, L., & Smith, B. R. (1997). *Working with pragmatics.* London: Winslow Press. Baird, J., Stevenson, J. C., & Williams, D. C. (2000). The evolution of ADHD: A disorder of communication? *Quarterly Review of Biology, 75*(1), 17-35.

Baker, L., & Cantwell, D. P. (1992). Attention deficit disorder and speech/language disorders. *Comprehensive Mental Health Care, 2(1)*, 3-16.

Barkley, R. A. (1990). *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment.* New York: Guilford Press.

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin, 121*, 65-94.

Barkley, R. A. (1999). Response inhibition in attention-deficit hyperactivity disorder. *Mental Retardation and Developmental Disabilities Research Review, 5,* 177-184.

Barkley, R. A., DuPaul, G. J., & McMurray, M. B. (1990). A comprehensive evaluation of attention deficit disorder with and without hyperactivity. *Journal of Consulting and Clinical Psychology, 58*, 775-789.

Bates, E., Benigni, T., Bretherton, I., Camaioni, D., & Volterra, V. (1979). *The emergence of symbols: Cognition and communication in infancy.* New York: Academic Press.

Bates, J. E., Bayles, K., Bennett, D. S., Ridge, B., & Brown, M. M. (1991). Origins of externalizing behavior problems at eight years of age. In D. J. Pepler & K. H. Rubin (Eds.), *The Development and Treatment of Childhood Aggression*, Hillsdale, NJ: Erlbaum.

Bierman, K. L. (2004). *Peer Rejection: Developmental processes and intervention strategies.* In C. B. Kopp & S. R. Asher (Eds.). New York: The Guilford Press.

Bignell, S. & Cain, K. (2007). Pragmatic aspects of communication and language comprehension in groups of children differentiated by teacher ratings of inattention and hyperactivity. *British Journal of Developmental Psychology, 25,* 499-512.

Bishop, D. V. M. (1998). Development of the Children's Communication Checklist (CCC): A method of assessing qualitative aspects of communicative impairment in children. *Journal of Child Psychology and Psychiatry, 39(6),* 879-891.

Bishop, D. V. M. (2003). *Children's Communication Checklist-Revised (CCC-2)* (2ⁿᵈ ed.). London: The Psychological Corporation.

Bishop, D. V. M., & Baird, G. (2001). Parent and teacher report of pragmatic aspects of communication: Use of the Children's Communication Checklist in a clinical setting. *Developmental Medicine and Child Neurology, 43,* 809-818.

Bishop, D. V. M., Chan, J., Adams, C., Hartley, J. & Weir, F. (2000). Conversational responsiveness in specific language impairment: Evidence of disproportionate pragmatic difficulties in a subset of children. *Development and Psychopathology, 12,* 177-199.

Bruce, B., Thernlund, G., & Nettlebladt, U. (2006). ADHD and language impairment: A study of the parent questionnaire FTF (Five to Fifteen). *European Child Adolescent Psychiatry, 15*, 52-60.

Bryan, T., Donahue, M., Pearl, R., & Sturm, C. (1981). Learning disabled children's conversational skills: The "TV Talk Show", *Learning Disability Quarterly, 4*, 250-259.

Camarata, S. M. & Gibson, T. (1999). Pragmatic language deficits in attention-deficit hyperactivity disorder (ADHD). *Mental Retardation and Developmental Disabilities Research Reviews, 5,* 207-214.

Cantwell, D. P., & Baker, L. (1991). Association between attention deficit-hyperactivity disorder and learning disorder. *Journal of Learning Disabilities, 24*, 88-95.

Carrow-Woolfolk, E. (1995). *Oral and Written Language Scales Manual.* Circle Pines, MN: American Guidance Service, Inc.

Clark, T., Teehan, C., Tinline, C., & Vostanis, P. (1999). Autistic symptoms in children with attention deficit hyperactivity disorder. *European Child and Adolescent Psychiatry, 8*, 50-55.

Cohen, N. J., Davine, M., Horodezky, N. B., Lipsett, L., & Isaacson, L. (1993). Unsuspected language impairments in psychiatrically disturbed children: Prevalence and behavioural characteristics. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 595, 603.

Cohen, N. J., Menna, R., Vallance, D. D., Barwick, M. A., Im, N., & Horodezky, N. B. (1998). Language, social cognitive processing, and behavioral characteristics of psychiatrically disturbed children with previously identified and unsuspected language impairments. *Journal of Child Psychology and Psychiatry, 39*, 853-864.

Cohen, N. J., Valance, D. D., Barwick, M., Im, N., Menna, R., Horodezky, N. B., & Isaacson, L. (2000). The interface between ADHD and language impairment: An examination of language, achievement, and cognitive processing. *Journal of Child Psychology and Psychiatry, 41*(3), 353-362.

Conners, C. K. (2001). Conners' Rating-Scales Revised Technical Manual. North Tonawanda, NY: Multi-Health Systems.

Conoley, J. C., Impala, J. C., Murphy, L. L., (Eds.) (1995). *The Twelfth Mental Measurements Yearbook.* Lincoln, NE, US: Buros Institute of Mental Measurements.

Cowen, E. L., Pederson, A., Babigian, H., Izzo, L. D., & Trost, M. A. (1973). Long-term follow-up of early detected vulnerable children. *Journal of Consulting and Clinical Psychology,41*(3), 438-446.

Craig, H. K. (1993). Social skills of children with specific language impairment: Peer relationships. *Language, Speech, and Hearing Services in Schools, 24*, 206-215.

Deater-Deckard, K. (2001). Annotation: Recent research examining the role of peer

Relationships  in the development of psychopathology. *Journal of Child Psychology and Psychiatry, 42*(5), 565-579.

Dore, J. (1974). A pragmatic description of early language development. *Journal of Psycholinguistic Research, 4*, 343-350.

Dore, J. (1975). Holophrases, speech acts and language universals. *Journal of Child Language, 2,* 33.

Dunn, K., & Kendrick, C. (1982). The speech of two and three year olds to infant siblings: Baby talk and the context of communication. *Journal of Child Language, 9*, 579-595.

Einsberg, N., Fabes, R. A., Nyman, M., Bernzweig, J., & Pinuelas, A. (1994). The relations of emotionality and regulation to children's anger-related reactions. *Child Development, 65*, 109-128.

Erhardt, D. & Hinshaw, S. P. (1994). Initial sociometric impressions of attention-deficit hyperactivity disorder and comparison boys: Predictions from social behaviours and from nonbehavioural variables. *Journal of Consulting and Clinical Psychology, 62,* 833-842.

Ervin-Tripp, S. (1979). Children's verbal turn-taking. In E. Ochs & B. Schiefflin (Eds.), *Developmental Pragmatics.* New York: Academic Press.

Faul, F., Erdfelder, E., Lange, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191.

Flory, K., Milich, R., Lorch, E. P., Hayden, A. N., Strange, C., & Welsh, R. (2006). Online story comprehension among children with ADHD: Which core deficits are involved? *Journal of Abnormal Child Psychology, 34*, 853-865.

Frederick, B. & Olmi, D. (1994). Children with attention deficit/hyperactivity disorder: A review of the literature on social skills deficits. *Psychology in the Schools, 31(4),* 288-296.

Freitag, C. M., Hänig, S., Palmason, H., Meyer, J., Wüst, S., Seitz, C. (2009). Cortisol awakening response in healthy children and children with ADHD: Impact of comorbid disorders and psychosocial risk factors. *Psychoneuroendocrinology, 34*(7), 1019-1028.

Furrow, D. (1984). Social and private speech at 2 years. *Child Development, 55,* 355-362

Geurts, H. M., Verte, S., Oosterlaan, J., Roeyers, H., Hartman, C. A., et al. (2004). Can the *Children's Communication Checklist* differentiate between children with autism, children with ADHD, and normal controls? *Journal of Child Psychology and Psychiatry, 45(8),* 1437-1453.

Gottman, J. M. (1983). How children become friends. *Monographs of the Society for Research in Child Development, 48*(2, Serial No. 201).

Greene, R. W., Biederman, J., Faraone, S. V., Ouellette, C. A., Penn, C., & Griffin, S. M. (1996). Toward a new psychometric definition of social disability in children with attention deficit hyperactivity disorder. *Journal of American Academy Child Adolescent Psychiatry, 35(5),* 571-578.

Gresham, F. M., & Elliott, S. N. (1990). *Social Sills Rating System Manual.* Circle Pines, MN: American Guidance Services.

Grice, H. P. (1975). Logic and conversation. In P. Cole and J. L. Morgan (Eds.), *Speech Acts: Syntax and Semantics, Volume 3.* New York: Academic Press.

Hadley, P. A., & Rice, M. L. (1991). Conversational responsiveness of speech- and language- impaired preschoolers. *Journal of Speech and Hearing Research, 34*, 1308-1317.

Halliday, M. A. K. (1973). *Explorations in the functions of language.* London: Edward Arnold Publishers Ltd.

Halliday, M. A. K. (1975). *Learning how to mean: Explorations in the development of language.* London: Edward Arnold.

Halliday, M. A. K. (1977). *Explorations in the Functions of Language.* New York: Elsevier North-Holland.

Hemphill, L., & Siperstein, G. N. (1990). Conversational competence and peer response to mildly retarded children. *Journal of Educational Psychology, 82,* 1-7.

Henker, B. & Whalen, C. K. (1999). The child with attention-deficit/hyperactivity disorder in school and peer settings. In H. C. Quay & A. E. Hogan (Eds.), *Handbook of Disruptive Behavior Disorders.* New York: Kluwer Academic/Plenum Press.

Hinshaw, S. P. (2002). Preadolescent girls with attention-deficit/hyperactivity disorder: I. Background characteristics, comorbidity, cognitive and social functioning, and parenting practices. *Journal of Consulting and Clinical Psychology, 70*(5), 1086-1098.

Hinshaw, S. P., & Melnick, S. M. (1995). Peer relationships in boys with attention-deficit hyperactivity disorder with and without comorbid aggression. *Development and Psychopathology, 7*(4), 627-647.

Hoza, B. (2007). Peer functioning in children with ADHD. *Journal of Pediatric Psychology, 32*(6), 655-663.

Hoza, B., Mrug, S., Gerdes, A. C., et al. (2005). What aspects of peer relationships are impaired in children with attention-deficit/hyperactivity disorder? *Journal of Consulting and Clinical Psychology, 73*(3), 411-423.

Hoza, B., Waschbsch, D. A., Pelham, W. E., Molina, B. S. G., & Milich, R. (2000). Attention- deficit/hyperactivity disordered and control boys' responses to social success and failure. *Child Development, 71,* 432-446.

Huang-Pollock, C. L., Mikami, A. Y., Pfiffner, L., & McBurnett, K. (2009). Can executive functions explain the relationship between attention deficit hyperactivity disorder and social adjustment? *Journal of Abnormal Child Psychology, 37*, 679-691.

Humphries, T., Koltun, H., Malone, M., & Roberts, W. (1994). Teacher-identified oral language difficulties among boys with attention problems. *Developmental and Behavioral Pediatrics, 15*, 92-98.

Hyter, Y. D. (2007). Pragmatic language assessment: A pragmatics-as-social practice model. *Topics in Language Disorders, 27*(2), 128-145.

Kaufman, A. S., & Kaufman, N. L. (2004). Kaufman Brief Intelligence Test, Second Edition, Manual. Minneapolis, MN: NCS Pearson, Inc.

Kim, O. H., & Kaiser, A. P. (2000). Language characteristics of children with ADHD. *Communication Disorders Quarterly, 21(3),* 154-166.

Klecan-Aker, J. S., & Swank, P. (1988). The use of a pragmatic protocol with normal pre-school children. *Journal of Communication Disorders, 21,* 85-102.

Landau, S., & Milich, R. (1988). Social communication patterns of attention-deficit-

disordered boys. *Journal of Abnormal Child Psychology, 16(1),* 69-81.

Landau, S., Milich, R., & Diener, M. B. (1998). Peer relations of children with attention-deficit hyperactivity disorder. *Reading and Writing Quarterly: Overcoming Learning Difficulties, 14,* 83-105.

Langdell, T. (1981). Face perception: An approach to the study of autism. Unpublished doctoral dissertation, University of London.

Lapadat, J. C. (2001). Pragmatic language skills of students with language and/or Learning disabilities: A quantitative synthesis. *Journal of Learning Disabilities, 24*(3), 147-158.

Leonard, M. A. (2005). Parent-child storytelling during joint picture-book reading and relation to language scores of children with ADHD. Unpublished master's thesis.

Mackinnon, D. P., Krull, J. L., Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science, 1*(4), 173-181.

Martin, I., & McDonald, S. (2003).Weak coherence, no theory of mind, or executive dysfunction: Solving the puzzle of pragmatic language disorders. *Brain and Language, 85*, 451–466.

Mathers, M. E. (2006). Aspects of language in children with ADHD. *Journal of Attention Disorders, 9(3)*, 523-533.

McLaughlin, S. (1998). *Introduction to Language Development.* San Diego: Singular Publishing Group, Inc.

McTear, M., & Conti-Ramsden, G. (1992). *Pragmatic disability in children.* London: Whurr.

Melnick, S. M. & Hinshaw, S. P. (1996). What they want and what they get: The social goals of boys with ADHD and comparison boys. *Journal of Abnormal Child Psychology, 24,* 169-185.

Milich, R., Balentine, A. C., & Lynam, D. R. (2001). ADHD combined type and ADHD predominately inattentive type are distinct and unrelated disorders. *Clinical Psychology: Science and Practice, 8*(4), 463-488.

Mueller, E., Bleier, M., Krakow, J., Hegedus, K., & Cournoyer, P. (1977). The development of peer verbal interaction among 2 year old boys. *Child Development, 48,* 284-287.

Ohta, M. (1987). Cognitive disorders of infantile autism: A study employing the WISC, spatial relationship conceptualization, and gesture limitations. *Journal of Autism and Developmental Disorders, 17,* 45-62.

O'Neill, M. E. & Douglas, V. I. (1991). Study strategies and story recall in attention deficit hyperactivity disorder and reading disability. *Journal of Abnormal Child Psychology, 19*, 671-692.

Owens, R. E., Jr. (2001). *Language Development: An Introduction* (5th ed.). Needham Heights, MA: Allyn & Bacon.

Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: Are low- accepted children at risk? *Psychological Bulletin, 102,* 357-389.

Parker, J. G., Rubin, K. H., Price, J. M., & DeRosier, M. E. (1995). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental Psychopathology: Risk, Disorder, and Adaptation, Volume 2.* New York: John Wiley & Sons, Inc.

Pelham, W. E. & Bender, M. E. (1982). Peer relationships in hyperactive children: Description and treatment. In K. D. Gadow & I. Bialer (Eds.), *Advances in Learning and Behavioral Disabilities, Volume 1.* Greenwich, CT: JAI Press.

Pennington, B. F., & Ozonoff, S. (1996). Executive functions and developmental psychopathology. *Journal of Child Psychology and Psychiatry, 37*, 51-87.

Perkins, L., Crisp, J., & Walshaw, D. (1999). Exploring conversation analysis as an assessment tool in aphasia: The issue of reliability. *Aphasiology, 13,* 259-281.

Phelps-Terasaki, D., & Phelps-Gunn, T. (1992). Test of pragmatic language. Austin, TX: PRO-ED.

Prutting, C., & Kirchner, D. (1987). A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders, 52*, 105-117.

Purvis, K. L. & Tannock, R. (1997). Language abilities in children with attention deficit hyperactivity disorder, reading disabilities, and normal controls. *Journal of Abnormal Child Psychology, 25,* 133-144.

Redmond, S. M., & Rice, M. L. (2008). The socio-emotional behaviors of children with SLI: Social adaptation or social deviance. *Journal of Speech, Language, and Hearing Research, 41*, 688-700.

Roeyers, H. Keymeulen, H., & Buysse, A. (1998). Differentiating attention deficit/hyperactivity disorder from pervasive developmental disorder not otherwise specified. *Journal of Learning Disabilities, 31*, 565-571.

Rubin, K. H., Bukowski, W., & Parker, J. G. (1998). Peer interactions, relationships, and groups. In: N. Eisenberg (Ed.), *Handbook of Child Psychology, Vol. 3, Social, Emotional, and Personality Development* (pp. 619-700). New York: Wiley.

Russell, R. L., Grizzle, K. L. (2008). Assessing child and adolescent pragmatic language competencies: Toward evidence-based assessments. *Clinical Child and Family Psychology Review, 11*(1-2), 59-73.

Schley, S. & Snow, C. (1992). The conversational skills of school-aged children. *Social Development1(1)*, 18-35.

Searle, J. R. (1969). *Speech Acts: An Essay in the Philosophy of Language.* Cambridge: University Press.

Searle, J. R. (1975). Indirect speech acts. In P. Cole and J. L. Morgan (Eds.), 59-82.

Searle, J. R. (1979). *Expression and meaning: Studies in the theory of speech acts*. Cambridge: University Press.

SPSS for Windows, Rel. 10.0.5. 1999. Chicago: SPSS, Inc.

Stevens, L. J. (1992, November). *The Resolution of Conflicts by Language-Impaired Preschoolers.* Paper presented at the meeting of the American Speech-Language-Hearing Association, San Antonio, TX.

Tannock, R., & Schachar, R. (1996). Executive dysfunction as an underlying mechanism of behavior and language problems in attention deficit hyperactivity disorders. In J. H. Beitchman, N. J. Cohen, M. M. Konstatareas, & R. Tannock (Eds.), *Language learning and behavior disorders: Developmental, biological, and clinical perspective* (pp. 128- 155). New York: Cambridge University Press.

Tannock, R., Purvis, K. L., & Schachar, R. J. (1993). Narrative abilities in children with attention deficit hyperactivity disorder and normal peers. *Journal of Abnormal Child Psychology, 21-1*, 103-118.

Tirosh, E., & Cohen, A. (1998). Language deficit with attention-deficit disorder: A

prevalent comorbidity. *Journal of Child Neurology, 13*, 493-497.

Vygotsky, L. S. (1962). *Thoughts and Language*. New York, NY: Wiley.

Wadman, R., Durkin, K., Conti-Ramsden, G. (2008). Self-esteem, shyness, and sociability in adolescents with Specific Language Impairment (SLI). *Journal of Speech, Language, and Hearing Research, 51*, 938-952.

Wellman, H., & Lempers, J. D. (1977). The naturalistic communicative abilities of 2 year olds. *Child Development, 48,* 1052-1057.

Westby, C. E., & Cutler, S. K. (1994). Language and ADHD: Understanding the bases and treatment of self-regulatory deficits. *Topics in Language Disorders, 14(4)*, 58-76.

Wetherby, A. M., & Prutting, C. A. (1984). Profiles of communicative and cognitive-social abilities in autistic children. *Journal of Speech and Hearing Research, 27,* 364-377.

Whalen, C. K., & Henker, B. (1985). The social worlds of hyperactive children. *Clinical Psychology Review, 5,* 1-32.

Whalen, C. K., & Henker, B. (1992). The social profile of Attention-Deficit Hyperactivity Disorder: Five fundamental facets. *Child and Adolescent Psychiatric Clinics of North America,1*, 395-410.

Whalen, C. K., Henker, B., Collins, B. E., McAuliffe, S., & Vaux, A. (1979). Peer Interaction in a structured communication task: Comparisons of normal and hyperactive boys and of methylphenidate (Ritalin) and placebo effects. *Child Development, 50,* 388-401.

Zentall, S. S. (1988). Production deficiencies in elicited language but not in the spontaneous verbalizations of hyperactive children. *Journal of Abnormal Child Psychology, 16-6*, 657-673.

Zentall, S. S., Gohs, D. E., & Culatta, B. (1983). Language and activity of hyperactive and comparison children during listening tasks. *Exceptional Children, 50(3)*, 255-266.

<div align="center">**Vita**</div>

<div align="center">**Melinda A. Leonard, Ph. D.**</div>

## ACADEMIC AND PROFESSIONAL EXPERIENCE

### PROFESSIONAL AFFILIATIONS
- **Assistant Professor,** Department of Psychological and Brain Sciences, University of Louisville, July 2008 – present
- **Visiting Assistant Professor,** Division of Behavioral and Social Sciences, Kentucky State University, Frankfort, Kentucky, July 2007 – 2008
- **Instructor,** Department of Psychology, Hanover College, Hanover, Indiana, August 2006 – 2007
- **Instructor,** Department of Psychology, University of Kentucky, Lexington, Kentucky, May 2006

### EDUCATION
- **Doctor of Philosophy in Experimental Psychology - Cognitive & Developmental Studies,** University of Kentucky Graduate School, Lexington, KY, *Expected 12/2009*; completed Qualifying Examination 03/2008, Dissertation defended 10/2009 *The Role of Pragmatic Language Use in Mediating the Relation between ADHD Symptomatology and Social Skills*
  Co-Advisor: Elizabeth P. Lorch        Co-Advisor: Richard Milich
- **Graduate Certificate in College Teaching & Learning,** University of Kentucky Graduate School, Lexington, KY, 2006
- **Master of Science in Experimental Psychology – Cognitive & Developmental Studies,** University of Kentucky Graduate School, Lexington, KY, 2009; Degree and Thesis completed 2005 - *Parent/Child Storytelling during Joint Picture-Book Reading and Relation to Child Language Scores*
  Co-Advisor: Elizabeth P. Lorch        Co-Advisor: Richard Milich
- **Bachelor of Science in Psychology,** University of Tennessee, Chattanooga, TN, 2003, Magna Cum Laude; minor in Sociology
- **Associate of Science in Business Administration,** Nebraska College of Business, Omaha, NE, 1983, Magna Cum Laude

## TEACHING EXPERIENCE

### TEACHING INTERESTS
- Life Span Development
- Cognition
- Learning
- Experimental Psychology
- Research Methods
- Conflict and Peace Psychology
- Introduction to Psychology

### UNIVERSITY OF LOUISVILLE, LOUISVILLE, KENTUCKY

PSY201: Honors - Introductory Psychology: Fall 2008 – present

PSY302: Experimental Psychology: Spring 2009, 2010

PSY322: Cognitive Psychology: Fall 2008

PSY363: Life Span Developmental Psychology: Fall 2008 - present

PSY363: Honors – Life Span Developmental Psychology: Fall 2009 and Spring 2009

PSY401: Research Psychology: Fall 2009 – present

### KENTUCKY STATE UNIVERSITY - FRANKFORT, KENTUCKY

PSY200: General Psychology: Spring 2008 and Fall 2007

PSY303: Theory & Research Methods of Developmental Psychology – Classroom
Section: Spring 2008 and On-Line (*Blackboard)* Section: Fall 2007

PSY490: Psychology Practicum: Spring 2008

PSY499: Advanced Research (Senior Seminar): Fall 2007

### HANOVER COLLEGE - HANOVER, INDIANA

PSY111: Basic Principles of Psychology: Winter 2007 and Fall 2006

PSY 260: Psychology of Intergroup Contact & Conflict Resolution; Spring 2007

PSY309: Research Practicum: Winter 2007 and Fall 2006

PSY337: Learning / Laboratory & Research Project: Fall 2006

PSY401: Senior Research: Fall 2006

PSY462: Research Seminar: Winter 2007

### UNIVERSITY OF KENTUCKY - LEXINGTON, KENTUCKY

PSY223: Developmental Psychology: Summer 2006

Lab Instructor / Teaching Assistant: PSY215: Experimental Psychology: Spring 2006 and
    Fall 2003

Lab Instructor / Teaching Assistant: PSY450: Learning: Fall 2005

Mentor:  Mentored a KYSS Research Program Participant: Spring 2004 through Spring
    2005

Mentor:  Mentored a UVA undergraduate intern: Summer 2004


## UNIVERSITY OF TENNESSEE – CHATTANOOGA, TENNESSEE

Teaching Assistant: PSY221: Child Development: Fall 2002 and Spring 2003

Literacy Lab Coordinator: GEAR UP (Literacy program for High School students):
    Spring 2002


## RESEARCH EXPERIENCE

### RESEARCH INTERESTS
- Attention Deficit Hyperactivity Disorder (ADHD) and its development over the
  lifespan
- Cognitive abilities (e.g., attention, language, intelligence, and impulsivity) in children
  as they relate to peer relations and academic performance
- Attitudes and perceptions of teens and adults as they relate to the "Conflict" in
  Northern Ireland

**Principal Investigator:**          University of Kentucky, Lexington
Fall, 2008 – Fall, 2009          The Role of Pragmatic Language Use in Mediating the
                                 Relation Between ADHD Symptomology and Social Skills

**Principal Investigator:**          University of Kentucky, Lexington
Fall, 2005 – Current              (In collaboration with Oxford University, Oxford England
                                 and University of Ulster, Coleraine, Northern Ireland)
                                 Ulster Project International Impact Evaluation

**Graduate**                     University of Kentucky, Lexington
  **Research Assistant:**        ADHD & Story Comprehension
Summer, 2003 – 2006              PI: E. P. Lorch, Ph.D.     Co-PI: R. Milich, Ph.D.

**Undergraduate**                University of Tennessee, Chattanooga
  **Research Assistant:**        Chattanooga Endeavors, Inc.
2002 – 2003                      PI: S. Van Ness, Ph.D.

| | |
|---|---|
| **Undergraduate** | University of Tennessee, Chattanooga |
| **Research Assistant:** | Early SUCCESS |
| 2002 – 2003 | *PI:* S. Sandefur, Ph.D. |
| | *Co-PIs:* A. Gamble, Ph.D. & A. R. Warren, Ph.D. |

## SCHOLARLY ACTIVITY

*PUBLICATIONS:*

**Leonard, M. A.,** Lorch, E. P., Milich, R., & Hagans, N. (2009). Parent-child joint picture-book reading among children with ADHD. *Journal of Attention Disorders, 12(4)*, 361-371.

**Leonard, M.A.**, Mayne, J., Cairns, E., & Wesseler, J., & Hewstone, M. (manuscript in progress). The contact hypothesis revisited: Ulster Project International Impact Evaluation*.*

**Leonard, M. A.** (2004). Predicting completion vs. defection in a community-based reintegration program. *Journal of Offender Rehabilitation, 40 (1/2)*, 133-146.

*PRESENTATIONS:*

**Leonard, M. A.** (2009). Ulster Project International Impact Evaluation. *Invited Presenter* – Ulster Project International Conference, Youngstown, Ohio.

**Leonard, M. A.** (2007). Ulster Project International Impact Evaluation. *Invited Presenter* – Ulster Project International Conference, St. Louis, Missouri.

**Leonard, M. A.** (2005). Ulster Project International Impact Evaluation. *Invited Presenter* – Ulster Project International Conference, Derry/Londonderry, Northern Ireland.

**Leonard, M. A.,** Lorch, E. P., Milich, R., & Hagans, N. A. (2005). Parent and child language influences during joint picture-book reading. Poster presented at the American Psychological Association 113th Annual Convention, Washington, DC.

**Leonard, M. A.,** Hagans, N. A., Milich, R., Lorch, E. P. (2004). ADHD and parent-child storytelling. Poster presented at the16[th] Annual International Conference on Attention-Deficit/Hyperactivity Disorder, Nashville, Tennessee.

**Leonard, M. A.,** & Van Ness, S. (2003). A Reintegration Program Evaluation: Comparison of Completers and Non-Completers. Oral presentation at the Emory University Sociology Symposium, Atlanta, Georgia.

**Leonard, M. A.,** & Van Ness, S. (2002). Outcomes of a reintegration program: Comparison of completers and dropouts. Oral presentation at the American Society of Criminology, Chicago, Illinois.

*EDITORIAL RESPONSIBILITIES:*
**Invited Reviewer:** *Myers, D. G. (2009),* Motivation. *Exploring Psychology, (8<sup>th</sup> edition),* New York, NY: Worth Publishers

**Editorial Review Board:** *Modern Psychological Studies,* University of Tennessee, Chattanooga - 2002-2003

## GRANTS AND FELLOWSHIPS

**Graduate School Award** – University of Kentucky: $400 Research & Travel Award to present at The Ulster Project International Conference, Youngstown, Ohio, USA - October 2009

**University of Kentucky Woman's Club 2008 Endowed Fellowship** - $2,000, - December, 2008

**Research Challenge Trust Fund Award** – University of Kentucky: $500 to conduct research - The Role of Pragmatic Language Use in Mediating the Relation between ADHD Symptomatology and Social Skills - October 2008

**Research Challenge Trust Fund Award** – University of Kentucky: $500 to conduct research - Ulster Project International Impact Evaluation - November 2007

**Graduate School Award** – University of Kentucky: $400 Research & Travel Award to present at The Ulster Project International Conference, St. Louis, Missouri, USA - November 2007

**Faculty Development Award** – Hanover College: $1,700 to conduct research – Ulster Project International Impact Evaluation - October 2006/January 2007

**Research Challenge Trust Fund Award** – University of Kentucky: $550 to conduct research - Ulster Project International Impact Evaluation - January 2006

**Graduate School Award** – University of Kentucky: $800 International Research & Travel Award to present at the Ulster Project International Conference, Londonderry, Northern Ireland - October 2005

**Research Challenge Trust Fund Award** – University of Kentucky: $800 International

Research & Travel Award to present at the Ulster Project International Conference Londonderry, Northern Ireland - October 2005

**Graduate School Award** – University of Kentucky: $400 Research & Travel Award to present at the 113th Annual American Psychological Association Convention, Washington, DC - August 2005

**Graduate School Award** – University of Kentucky: $400 Research & Travel Award to attend the 16th Annual International Conference on Attention-Deficit/ Hyperactivity Disorder, Nashville, TN - October 2004

## ACADEMIC SERVICE

**Faculty Director: International Service Learning and Research Program:**
University of Louisville – 2009 - present

**Psi Chi Faculty Advisor:** University of Louisville – 2008-present
Model Chapter Award – 2008-2009

**Undergraduate Committee Member:** University of Louisville – 2008-present

**Instructor:** University of Kentucky - Spring 2006 and Fall 2005
Invited to teach the new University of Kentucky Teaching Assistants during the Spring and Fall semester orientations

## PROFESSIONAL MEMBERSHIPS

- American Psychological Association
  - Division 7: Developmental Psychology
  - Division 48: Society for the Study of Peace, Conflict and Violence: Peace Psychology
- Southeastern Psychological Association
- Psi Chi – The International Honor Society in Psychology
- Golden Key International Honor Society
- The Alpha Scholastic Honor Society

## PERSONAL INFORMATION

Place of Birth: Great Bend, KS         Date of Birth: 06/12/1959

*Updated 10.20.2009*