

4-15-2008

Academic Interventions for Students with Attention-Deficit/Hyperactivity Disorder A Review of the Literature and Capstone Project

Lauma Pirvics
St. John Fisher College

[How has open access to Fisher Digital Publications benefited you?](#)

Follow this and additional works at: http://fisherpub.sjfc.edu/education_ETD_masters

 Part of the [Education Commons](#)

Recommended Citation

Pirvics, Lauma, "Academic Interventions for Students with Attention-Deficit/Hyperactivity Disorder A Review of the Literature and Capstone Project" (2008). *Education Masters*. Paper 79.

Please note that the Recommended Citation provides general citation information and may not be appropriate for your discipline. To receive help in creating a citation based on your discipline, please visit <http://libguides.sjfc.edu/citations>.

This document is posted at http://fisherpub.sjfc.edu/education_ETD_masters/79 and is brought to you for free and open access by Fisher Digital Publications at St. John Fisher College. For more information, please contact fisherpub@sjfc.edu.

Academic Interventions for Students with Attention-Deficit/ Hyperactivity Disorder A Review of the Literature and Capstone Project

Document Type

Thesis

Degree Name

MS in Special Education

Department

Education

Subject Categories

Education

Comments

As prevalence rates of children with Attention-Deficit/Hyperactivity Disorder increase, so does the need for effective academic interventions for these children. What is expected and required of children in school is completely at odds with what children with ADHD are capable of. With that said, it is pertinent to examine, analyze, and compare the efficacy of differentiated interventions that would increase and/or enhance academic performance of these students. This paper will analyze previous research studies in order to determine effective academic intervention strategies for students with ADHD. In addition, survey results from local Monroe County educators will demonstrate correlations between academic, behavioral, and medical interventions as they pertain to academic performance of students with ADHD.

4-15-2008

Academic Interventions for Students with Attention-Deficit/Hyperactivity Disorder A Review of the Literature and Capstone Project

Lauma Pirvics
St. John Fisher College

Follow this and additional works at: http://fisherpub.sjfc.edu/education_ETD_masters



Part of the [Education Commons](#)

Recommended Citation

Pirvics, Lauma, "Academic Interventions for Students with Attention-Deficit/Hyperactivity Disorder A Review of the Literature and Capstone Project" (2008). *Education Masters*. Paper 79.

This Thesis is brought to you for free and open access by the Ralph C. Wilson, Jr. School of Education at Fisher Digital Publications. It has been accepted for inclusion in Education Masters by an authorized administrator of Fisher Digital Publications.

Academic Interventions for Students with Attention-Deficit/ Hyperactivity Disorder A Review of the Literature and Capstone Project

Degree Type

Thesis

Degree Name

MS in Special Education

Department

Education

Subject Categories

Education

Comments

As prevalence rates of children with Attention-Deficit/Hyperactivity Disorder increase, so does the need for effective academic interventions for these children. What is expected and required of children in school is completely at odds with what children with ADHD are capable of. With that said, it is pertinent to examine, analyze, and compare the efficacy of differentiated interventions that would increase and/or enhance academic performance of these students. This paper will analyze previous research studies in order to determine effective academic intervention strategies for students with ADHD. In addition, survey results from local Monroe County educators will demonstrate correlations between academic, behavioral, and medical interventions as they pertain to academic performance of students with ADHD.

Analysis of Interventions Intended to Increase Academic Performance of Students with ADHD

Academic Interventions for Students with Attention-Deficit/Hyperactivity Disorder

A Review of the Literature and Capstone Project

Lauma Pirvics

GSED 595
Dr. Susan Schultz
April 15, 2008

Abstract

As prevalence rates of children with Attention-Deficit/Hyperactivity Disorder increase, so does the need for effective academic interventions for these children. What is expected and required of children in school is completely at odds with what children with ADHD are capable of. With that said, it is pertinent to examine, analyze, and compare the efficacy of differentiated interventions that would increase and/or enhance academic performance of these students.

This paper will analyze previous research studies in order to determine effective academic intervention strategies for students with ADHD. In addition, survey results from local Monroe County educators will demonstrate correlations between academic, behavioral, and medical interventions as they pertain to academic performance of students with ADHD.

Table of Contents

Review of Academic Interventions for Students with ADHD	4
Special Education Services	7
Review of Previously Identified Academic Interventions	10
Analysis of Previous Research Studies	11
Research Analysis Results	14
Discussion of Research Analysis	18
Capstone Project – <i>Methodology</i>	21
Discussion/Further Research	23
APPENDIX A	25
APPENDIX B	26
APPENDIX C	27
APPENDIX D	29
APPENDIX E	30
APPENDIX F	31
References	32

A Review of Academic Interventions for Students with Attention-Deficit/Hyperactivity Disorder

Attention Deficit/Hyperactivity Disorder (ADHD) is the most common disorder of childhood, with prevalence rates commonly reported between 3%-5% of the child population (American Psychological Association, 2008). Attention Deficit/Hyperactivity Disorder is marked by a consistent and chronic pattern of age-inappropriate hyperactivity, impulsivity and/or inattentiveness that results in impairment in multiple domains of functioning. Attention Deficit/Hyperactivity Disorder is often associated with multiple comorbidities including Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD)- collectively known as the Disruptive Behavior Disorders (DBDs). Attention Deficit/Hyperactivity Disorder and the other DBD's are often associated with negative outcomes including behavioral, social, and academic functioning (DuPaul & Stoner, 1994).

The core components of ADHD -inattention, hyperactivity and impulsivity- seem often to be at odds with what schools require of a child...paying attention to teachers, to classroom rules, or to details of lessons (Forness & Kavale, 2002, p. 24-1). Research has demonstrated that children with ADHD typically underachieve academically (Rapport, Scanlan, Denney, 1999). In regards to academic underachievement, research primarily focuses on impairment within the major academic domains of reading, written language and mathematics (Lyon & Cutting, 1998), rather than content or course material, with most research having been conducted on reading. Academic underachievement within the DBDs appear more exclusive to ADHD than to the other disruptive behavior disorders of childhood (Frick, Kamphaus, Lahey, Loeber, Christ, Hart & Tannenbaum; Hinshaw, 1992). Upwards of 30% of ADHD children underachieve academically, when using their age and/or IQ to predict academic status (Kamphaus & Frick, 1996: as cited in DeShazo, Lyman, & Klinger, 2002). Researchers posit that every classroom hosts at least one

ADHD child (DuPaul & Stoner, 1994), thus making the treatment and education of these children a pervasive concern among researchers and educators.

Further, ADHD is commonly associated with negative life outcomes that appear to be corollaries of academic underachievement, such as increased likelihood of poor grades (Klein & Mannuzza, 1989; Hopkins, Perlman, Hechtman, & Weiss, 1979) lower likelihood of completing school (Hopkins, et. al. 1979), poorer performance in occupations (Weiss & Hechtman, 1993), and lower occupational rank (Mannuzza, Klein, Bessler, Malloy, et. al., 1993).

Also unsettling is the evidence that once one is underachieving academically they are likely to persist in the level of academic underachievement. For instance, Shaywitz and Shaywitz (1994) documented that 75% of children with disabilities in reading who remained unidentified until the third grade had persistent reading difficulties throughout their high school education.

It appears that varied perspectives attempt to handle impairment associated with ADHD in different manners. For instance, within the educational domain, schools may appropriate special services and thereby handle the individual academic deficits and difficulties of students by placing them within special educational categories. Students demonstrating impairment and/or disability may be able to receive a multitude of special educational services to ensure that they may receive an appropriate free education (Individuals with Disabilities Education Act (1997)). Most typically, students with ADHD are placed within one of three categories: Learning Disabilities (LD), Serious Emotional Disturbance (SED), or Other Health Impaired (OHI), among ten other disability categories (SEEP, 2000), within the Individuals with Disabilities Education Act (Individuals with Disabilities Education Act (1997)), and placement within these categories qualifies one for special education services via an individualized education plan (IEP).

To be classified as LD one must demonstrate impairment in learning material despite equivalent IQ's to non-LD children. Those with LD typically do not process information in a manner that affords them the benefit of a regular classroom environment (Lyon & Cutting, 1998). To be classified as having an Emotional Behavior Disorder (EBD), one's educational achievement must be adversely influenced by some type of inappropriate behavior (Wehby, Lane & Falk, 2003). To be classified as OHI, a child's education performance is interfered with by an acute or chronic medical condition (Forness & Kavale, 2002).

When examining a longitudinal data set of diagnosed ADHD youth and adolescent, upwards of 30% of ADHD participants had received at least one year of part-time special education services, as compared to only 2.5% of those without ADHD, and 25% of ADHD participants had received at least one-year of full-time special education services, as compared to less than 1% of controls (Robb et. al, in preparation). DeShazo, Lyman & Klinger (2002) examined predictors of academic underachievement in both children with and without ADHD and found that children with ADHD were more likely to have been placed in a special education classroom and/or to have been diagnosed with a comorbid learning disorder than were children without ADHD.

When analyzing studies, it appears the proportion of children with ADHD within the various special education categories is varied with approximately 10%-25% of children with ADHD have a concomitant LD, approximately 43% of children with ADHD have a SED label, and 40% of children with ADHD are in the OHI category (Forness & Kavale, 2002).

Special Education Services

The purpose of special education services is to provide adequate resources for students to receive a successful educational experience (IDEA, 2004). However, special education resource allocations vary as a function of state and district, and the interventions provided may not always be evidence-based practices (e.g. preferential seating, more time on tests). Non-evidence based practices are not necessarily detrimental, however, they may not evince the same magnitude of change as may be evinced with evidenced-based practices.

Further, it may be that those with academic deficits are often not referred for treatment or special education services until they have failed behaviorally and/or academically. For example, the majority of children with reading disabilities are not identified for special education services until the late second or third grade year (Lyon & Cutting, 1998). It has been noted that, youth with reading disability *despite special education placement*, experienced growth in reading of only approximately .04 standard deviations per year across grade levels 3 through 6. That is, special education “tend[ed] to stabilize the relative deficit in reading skill rather than remediate it” (Torgensen, 1975).

Not only is special education potentially insufficient to remediate academic deficits, it is expensive. In a study on the cost of educating youth with ADHD, it was found that the costs associated primarily with disciplinary action and special education services yielded an incremental annual cost of \$4900 per student with ADHD (Roby, Pelham & Faraone, 2007), (in preparation), and upwards of \$200 billion dollars nationally.

Thus, it is clear that more potent interventions that can be appropriated in a more inexpensive manner are sorely needed to help children with ADHD. From a psychosocial perspective, as opposed to an educational perspective, there exists strong evidence for the efficacy of three modalities in treating the impairment associated with ADHD. The treatment

modalities for ADHD that have received the most evidentiary support are stimulant medication and contingency management interventions or the combination of the two (Pelham, Wheeler & Chronis, 1998). To note, these treatment options have only demonstrated short-term efficacy. These intervention strategies, stimulant medication and contingency management interventions, have been found to enhance rates of academic productivity and accuracy for most student participants (DuPaul & Eckert, 1997; Pelham, Wheeler, & Chronis, 1998), and thus may be necessary components of academically-aimed interventions.

However, despite the behavioral gains made when using either or both of these treatment modalities, the academic deficits often associated with the disorder are not sufficiently improved with these treatments (Ota & DuPaul, 2002). For example, Rapport, Denney, DuPaul, and Gardner (1994) found that when examining the benefit of methylphenidate (MPH), a commonly prescribed psychostimulant, 47% of children treated with MPH show either no change or decremented change in academic performance as compared to placebo groups. Further, effect sizes for stimulant medication effect on academic outcome measures typically are lower than for measures of behavioral outcomes (Forness, Kavale, Swcency, & Crenshaw, 1999). While stimulant medication has been studied in the treatment of academic difficulties of children with ADHD, the benefits of stimulants are associated more with improvement in behavioral symptoms (such decreases in off-task behavior), than is it associated with academic performance (Grimely, 1993, as cited in Coddling & Lewandowski, 2002). Further, long-term use of stimulant medication appears to elicit no change on long-term academic outcomes (Pelham, Wheeler, & Chronis, 1998)

Additionally, meta-analysis of school-based interventions for ADHD (DuPaul & Eckert, 1997) found that contingency-management and behavioral interventions (response-cost, contingency contracting, school-home notes, and token reinforcement) appear effective in

improving classroom behavior, however, but impact of these behavioral interventions yields small effects on academic outcomes.

Further, the denotation of SED and EBD as being behavioral in nature naturally leads one to assume behavioral intervention is the most appropriate treatment option for children with EBD and/or ADHD and academic underachievement. However, Wehby and colleagues (Wehby, Lane, & Falk, 2003) argue “the focus on inappropriate behaviors that affect achievement has led to an almost exclusive focus on behavior problems, with little attention given to the educational needs of this population” (p194). Thus, they further contend “the limited attention given to the academic needs of this population has contributed, in part, to the extremely poor outcomes for students (p. 194).”

(DuPaul, Volpe, Jitendran, Lutz, Lorah & Gruber, 2004) examined several variables, such as ADHD symptoms, academic skills, and achievement enabling behavior, among others, in the prediction of academic achievement. DuPaul et al. (2004) found ADHD children’s baseline math and reading skill levels were significant predictors of later academic achievement. While this makes intuitive sense, the finding underscores the need to target academic skills of children with ADHD, as opposed to solely targeting disruptive behaviors. Thus, interventions which focus on remedial instruction, tutoring, and training coupled with behavioral strategies that address the impairing aspects of ADHD and/or stimulant medication will most likely aid children in achieving their potential in the academic arena (DeShazo, et. al., 2002)

Review of Previously Identified Academic Interventions

With a significant proportion of ADHD students underachieving academically and/or receiving special education services, coupled with the knowledge that remedial special education services are not remediating deficits, it is necessary to look at specialized interventions that have been examined specifically with an ADHD sample.

Previous literature has identified academic interventions (DuPaul & Eckert, 1998) which have specific focus on antecedent-based modifications of academic assignments with outcome variables that examine an aspect of academic functioning or performance. These include instructional modifications (e.g., altering rate of teacher presentation of material), task modifications (e.g., allowing student choice of academic assignments), strategy training (e.g., instruction in self-management), peer-tutoring, and computer-assisted learning. To note, these strategies share some or all of the following characteristics presumed to be effective for modifying academic behavior, particularly for students with ADHD: (a) instructional pace is determined by the learner; (b) continuous prompting of academic responses; and (c) providing frequent, immediate feedback about quality of performance (Greenwood, Hart, Walker, & Risley, 1994; Pfiffner & Barkley, 1998; as cited in Ota & DuPaul, 2002).

Thus, this review shall focus on examining the literature on the previously-mentioned academic interventions that have utilized an identified ADHD, primary school-aged population. Several theses will be examined. The first hypothesis being that academic deficits associated w/ ADHD need academically-targeted interventions to evince the greatest change academically. This will be examined by noting indices of academic change documented in the literature, and by specifically delineating between changes in behavior and changes in academic achievement and/or competency. The second hypothesis is that academic interventions alone may be

insufficient to remediate classroom deficits. To evince greatest gain, academic interventions may need adjunctive behavioral and/or medical intervention. As such, interventions which combine behavioral and/or medical intervention, with academic interventions will be examined to see if they result in greater gain than academic intervention alone.

Analysis of Previous Research Studies

Inclusion Criteria

Studies were found by conducting keywords searches of the databases PsychINFO, and the Social Sciences Citation Index (SSCI) using the terms attention deficit disorder, attention deficit hyperactivity disorder, attention problems, behavior problems, academic intervention, peer-tutoring, peer-mediated instruction, computer-assisted instruction, and choice-making interventions, strategy training, task modification, and instructional modification.

Additionally, studies were found by conducting cited reference searches of prior reviews, and identified study's reference lists. Studies in preparation were included. Non-published studies and dissertations were excluded from the review. Additionally, studies were excluded if they did not include participants that were diagnosed as ADHD. Participants in studies that were described as learning disabled, mentally retarded, multiply handicapped, autistic etc. were excluded from this review. Further, outcome measures must have included indices of academic functioning or performance, and/or behavior.

Organization of Research Analysis

Study characteristics and outcome are reported for each identified study. Studies are presented categorically and chronologically.

Research Analysis Participant Characteristics

Participants in the presented studies were primarily Caucasian, elementary school aged boys. Most of the studies were conducted within the context of a regular education setting. Three studies utilized a sample of children in special education, or self-contained classrooms. One study utilized participants from an inpatient mental health center. Across all studies reviewed, 94 participants were diagnosed as having ADHD, and 13 children were undiagnosed, and served as controls in their respective studies.

Research Analysis Study Characteristics

Studies were largely uncontrolled single-subject designs. Two studies were within-subject designs that compared various treatments, utilizing the same sample of children. Four studies utilized a multiple-baseline design without a reversal condition. Fourteen studies employed ABA, ABAB or multiple-baseline with reversal designs.

Research Analysis Program Descriptions

- *Peer Tutoring, or peer-mediated instruction*, is an instructional procedure in which peers are paired into dyads, triads, or small groups, in order to engage students in active participation, and to provide individual, frequent, immediate feedback to their peer partner on relevant academic tasks.
- *CAI* generally consist of education objectives that are presented on a computer that often make use of fonts, colors, animations and other media to present and emphasis important material, and offers frequent feedback on performance, accuracy and completion (DuPaul & Eckert, 1998).
- *Choice-making* is a strategy that allows students to select assignments and/or work from a teacher-derived list of potential assignments. This strategy is generally associated with the development of quality of life, and decision-making strategies of the positive behavioral support movement

Research Analysis Results

Study (Year)	Participant Characteristics	Study Design	Academic Intervention	Behavioral Component	Medication Component	Academic Outcome	Behavioral Outcome
DuPaul & Henningson (1993)	n=1 child with ADHD: in regular education classroom	ABAB reversal design	Peer Tutoring			Increased work accuracy	Decreased off-task behavior
DuPaul, Ervin, Hook & McGoey (1998)	n=18 children with ADHD, n=10 children without ADHD; in regular education classroom	ABAB reversal design	Peer Tutoring			Assessed math and spelling curriculum pre- and post-; no systematic change was seen.	Increased on-task behavior, decreased off-task behavior for ADHD and controls
Locke & Fuchs (1995)	n=3 children labeled with attention-deficit problems (not formally diagnosed with ADHD); in regular education classroom	ABAB reversal design	Peer Tutoring				Increased on-task behavior; increased positive social interactions
Falk & Wehby (2001)	n= 2 children with ADHD: in special education (SED) classroom	Multiple baseline experimental design	Peer Tutoring using Peer Assisted Learning Strategies (PALS)			Increased sound play and decoding for one participant. Highly variable inconsistent results for other participant	
Klieman Humphrey, & Lindsay (1981)	n= 18, children with attention-deficit disorder (ADD: DSM-III-R), and/or as having hyperactiveness; in regular education classroom	Within-subjects design comparing CAI to traditional paper-and-pencil assignments	Computer Assisted Instruction				Increased number of completed problems and time spent on problems.
Ford, Poe & Cox (1993)	n= 21 children with ADHD: in regular education classroom	Within-subjects design comparing game version to non-game version of CAI	Computer Assisted Instruction				Decrease in off-task behaviors

Study (Year)	Participant Characteristics	Study Design	Academic Intervention	Behavioral Component	Medication Component	Academic Outcome	Behavioral Outcome
Ota & DuPaul (2002)	n= 3 children with ADHD; in regular education classroom	Multiple-baseline, within-subjects design comparing CAI to traditional paper-and-pencil assignments	Computer Assisted Instruction			improvement in academic performance	Decrease in off-task behavior and increase in on-task behavior
Dunlap, et al (1994)	n=1 child with ADHD; in self-contained SED classroom.	Reversal design	Choice-making	Existing contingency management program aimed at targeting and decreasing negative behavior was in place during the course of the study.	Medicated with 75 mg per day of desipramine		Decrease in off-task behavior and noncompliance and increase in task-engagement
Powell & Nelson (1997)	n=1 child with ADHD; in regular education classroom	ABAB reversal design	Choice-making		15mg of methylphenidate daily		Decrease in undesirable behavior (noncompliance, off-task behavior, interruption behaviors were collapsed into one outcome behavior) during choice condition.

Study (Year)	Participant Characteristics	Study Design	Academic Intervention	Behavioral Component	Medication Component	Academic Outcome	Behavioral Outcome
Cole, Davenport, Barbara & Ager (1997)	n=1 child ADHD; in university lab school for students with Emotional and Behavioral Disorders (EBD)	An uncontrolled experimental design: a preferred task (as assessed prior to experimentation), a non-preferred task, or choice between tasks	Choice-making				Increase in on-task behavior and work productivity during choice assignments that during the non-preferred assignments; however, the participant's on-task behavior was variable across conditions. No change in disruptive behavior.
Kern et. al (2001)	n=1 child with ADHD; in inpatient unit	ABAB reversal design	Choice-making				Decrease in problem behavior and increase in on-task behavior during choice conditions.
Hoffman and DuPaul (as cited in Hoffman & DuPaul, 2000)	n=4 children with ADHD; in a general education classroom		Choice-making				
Romaniuk et. al (2002)	n=1 child with ADHD; in regular education classroom	Reversal design ABABAB	Choice-making		20 mg MPH bid		No change in disruptive behavior
Barry & Messer (2003)	N=5 children diagnosed with ADHD; in regular education classroom	Multiple baseline	Self-management, strategy training		Continual dose-20 mg Adderall, 15 mg MPH bid; 20 mg Adderall TR, 5 mg Dex-drine bid, 10 mg Dexedrin TR, 10 MPH bid	Increase in academic performance (as measured by work completion and accuracy)	Decrease in disruptive behavior and increase in on-task behavior.

Study (Year)	Participant Characteristics	Study Design	Academic Intervention	Behavioral Component	Medication Component	Academic Outcome	Behavioral Outcome
Mathes & Bender (1997)	N=3 children diagnosed with ADHD in special education classroom	Multiple baseline	Self-monitoring.		10 mg bi.d; 20 mg extended release and 10 mg noon dosing; 37.5 mg pemoline daily.		Increase in on-task behavior
Ajibola & Clement (1995)	N=4 diagnosed with ADHD in a resource room		Self-management strategy training			Increase in academic productivity	
Edwards, Salant, Howard, Brouger & McLaughlin (1995)	N = 4 diagnosed ADHD in a regular education setting	ABABC	Self-management training	Point gain or loss for on-task behavior		Increase in reading comprehension scores	Increase in on-task behavior
Chase & Clement (1985)	N= 6 diagnosed with ADD+H (DSM III) in laboratory classroom	CACABAB (A= MPH only; B= Self management (SM); C= combination MPH and SM	Self-management training	Contingency management for disruptive behavior	5-20 mg MPH	Increase in reading accuracy. Greatest effect with combination condition, followed by SM condition. MPH condition yielded negative effect size.	

Discussion of Research Analysis

The aim of this study was to examine the literature available on academic interventions studied using an ADHD population, and determine based upon available literature, if children with ADHD need academically-based interventions and/or multimodal treatment to evince the greatest academic change.

The major findings of this review are limited and lead to more questions than answers. The number of studies collectively, as well as within each intervention category is limited and thus the conclusions drawn are tenuous in nature. Notably, not one randomized experimental design was utilized and sample sizes were exceedingly small. Antecedent-based interventions appear to universally increase on-task behavior and decrease disruptive and/or off-task behavior. Further, it appears that when measured, antecedent-based interventions elicited positive change in academic outcomes (e.g. increased work-productivity and accuracy; however, academic outcomes were only assessed in eight of the reviewed studies.

It is well-documented in the research literature that there does exist a relationship between ADHD and academic underachievement (CITE). The directionality of the relationship is likely complex (Hinshaw, 1992b) in that mediating variables such as general intelligence, sub-type of ADHD, degree of symptomology and subsequent impairment, cognitive variables and executive functioning all account for variance within the construct of academic underachievement. Because of these many potential contributing factors it is not surprising that multiple intervention modalities have been empirically evaluated, nor is it still unreasonable to speculate that a multimodal approach is needed to evince the greatest change in achievement-particularly in light of the dearth of actual research which has examined the contribution of different treatment modalities on achievement and academic outcomes.

Thus it is imperative that the research literature examine the contribution of individual and combined treatment modalities on academic success. In the present review, when academic outcomes were assessed they were exclusively limited to work completion and accuracy during a very short time frame. It is likely that multiple variables contribute to long-term academic outcome. While the assessment of change is important during the acute treatment phase, long-term change sorely needs to be assessed. Notably, does the magnitude of change evinced maintain over a longer time period? Can behavioral and/or academic interventions be faded, and will changes maintain? Are short-term changes in work-completion and accuracy prognostic of long-term change in academic achievement and outcome? Do treatments differentially influence type of academic outcome variable (e.g. teacher-perception of change in academic success, change on achievement testing).

Pressing questions exist, including though not limited to, the relative contribution of academic interventions, behavioral intervention, and medical/pharmacological intervention, as well as efficacy of these interventions in combination and the comparison of these combinations.

That children with ADHD underachieve academically has been documented for decades, however, the treatment and intervention for academic underachievement has been inconsistently defined, inconsistently measured and the academic underachievement clinically undertreated (Hinshaw, 1992).

In addition to the future research questions posed, several questions which implicate clinical treatment are in need of answer. In particular, we need to begin to understand what predicts success academically. Many children with ADHD underachieve, however, it would be remiss to not examine those children with ADHD who *do not* underachieve academically. Is academic success a function of long-term intervention and support that hasn't been documented

empirically, or is a function of other genetic or environmental contributions. Examining the efficacy of academic interventions is useful only to the extent that it influences our understanding of why children succeed or fail academically, and to our understanding of *what to do* to help remediate and thereby *vis a vi* promote academic success. Further understanding of how to treat children with academic deficits will aid in understanding how to promote long-term academic resiliency.

Capstone Project -*Methodology*

Introduction

In attempt to further research the effects of academic interventions for students with ADHD in Monroe County, the following project was performed:

Method

Surveys were distributed in attempt to gather data that would indicate effective academic intervention approaches for Monroe County students, grades 1-6, diagnosed with ADHD. Emails were sent to principals of 18 Monroe County schools. Schools included, but were not limited to, urban, suburban, and parochial schools. Emails contained the following information:

- Principal Letter (APPENDIX A)
- Teacher Letter (APPENDIX B)
- Consent Forms (APPENDIX C)
- Survey (APPENDIX D)

Sample Population Number One

Out of the 18 schools, two schools agreed to participate, four required central office approval, and 12 did not respond. Of the four that required central office approval, two denied participation due to previous commitments with other organizations, and two did not respond.

Results

In total, 20 surveys were distributed among the two participating schools. Teachers in grades 1-6 received the following:

- Revised Teacher Letter (APPENDIX E)
- Survey (APPENDIX D)

A pick-up date was determined and included in the teacher letter. None of the surveys were completed and/or returned by the indicated due date. As a result, school principals were contacted and pick up dates were extended one additional week. Regardless of the extension, results remained the same. Zero surveys were returned.

In order to gather data, the same surveys (APPENDIX D) and revised teacher letters (APPENDIX E) were distributed directly to teachers in Monroe County. Out of the 18 surveys distributed, 13 were completed and returned. Ten out of the 13 reported having students with ADHD in their classrooms. This now became *sample population number two*. Sample population number two was comprised of two male and eight female educators, employed in Monroe County.

Survey Results

See APPENDIX F to view survey results.

Eight out of the 11 cases reported medical interventions to be most effective for academic performance. Of the eight students receiving medical interventions, seven of those students also received academic interventions. Lastly, out of those seven students, six received a combination of behavioral, academic, and medical interventions.

Based on teacher responses, it was reported that both behavioral and medical interventions increased student time on task, but did not necessarily increase academic skills. The majority of teachers also reported that behavior management was a pressing issue and pertinent to address prior to academic interventions.

Overall, the survey results demonstrate the increased effectiveness of intervention approaches when fully combined (i.e. behavioral, academic, and medical). However, there is not enough evidence to support each approaches efficacy on an individual basis.

The aim of this capstone project was to gather data that would indicate whether academic interventions for students with ADHD increased academic skills and performance. The results of this project, based on the distributed survey, are limited and again, lead to more questions than answers. Due to various limitations such as:

- Small sample size
- Format in which questions were posed.
- Data revealed correlations rather than direct relationships
- Survey focused on students with a diagnosis of ADHD. What about students who may have have ADHD but are not diagnosed? How do these interventions effect them?
- Teachers were not provided with lists of the different program and intervention discriptions.

The survey results provided a framework/baseline for further research. That is, the data obtained was rather broad and consequently creates ambiguity as to which specific interventions provided which specific outcomes. It is pertinent to establish a direct relationship rather than a mere

correlation. The survey results (APPENDIX E) support previous research addressing the fact that medical and contingency-management interventions may enhance academic productivity (DuPaul & Eckert, 1997; PWC, 1998), however do these interventions have a lasting impact, in that, do they have a long-term effect? Is productivity reflective of the behavioral expectations rather than academic? Productivity could merely refer to time on task rather than academic skills and ability.

Further research could potentially focus on the individual outcomes of particular interventions. Studies could narrow their focus and research how different intervention techniques effect academic performance when paired differently.

APPENDIX A (Principal Letter)

November, 2007

Dear School Principals of Monroe County,

My name is Lauma Pirvics and I am currently a graduate student at St. John Fisher College. I am enrolled in the childhood special education masters program. As I approach the end of my masters program, I am required to complete my master's thesis. For my thesis, I have chosen to focus on academic interventions for students with Attention Deficit Hyperactivity Disorder (ADHD).

I am writing this letter in hopes that you would be willing to allow me to hand out surveys to your grades 1-6 teachers. As I previously mentioned, this research project focuses on academic interventions for students with ADHD. I am interested in collecting data on interventions for students with ADHD and how/if those interventions affect student academic performance.

I have attached a copy of the following:

1. Letter to teachers. This letter describes the purpose of the research project.
2. Consent forms
3. Surveys

My intention is to complete this process in an expedited fashion. If possible, letters, consent forms, surveys and envelopes would be placed in teachers' mailboxes. A drop box would then be labeled and placed in a convenient location (i.e. office.) Once forms are completed, teachers could return completed forms to the office (or designated location) in the drop box.

Your time and consideration is greatly appreciated.

Sincerely,

Lauma Pirvics

APPENDIX B (Teacher Letter)

November, 2007

Dear Teachers of Monroe County,

My name is Lauma Pirvics and I am currently a graduate student at St. John Fisher College. I am enrolled in the childhood special education masters program. For my thesis project, I have chosen to focus on academic interventions for students with Attention Deficit Hyperactivity Disorder (ADHD).

An abundant amount of research has been conducted evaluating the effectiveness of behavioral interventions for children with ADHD. However, I have chosen to focus on academic interventions for children with ADHD and how they affect academic performance.

I am writing this letter to see if you would be willing to assist me in gathering information and data on the topic at hand. Attached is a survey which will better allow me to research effective support and/or intervention techniques that enhance academic performance of students with ADHD.

All information will remain confidential as teacher, student, school, and/or principal names are not required, nor will they be used. Envelopes are provided. Once completed, surveys can be sealed to ensure confidentiality. There are no known risks to participating in this project. However, certain benefits do exist. If collected data indicates and or finds that certain support/intervention techniques seem to have been effective, this information can be passed on to further researchers. As a result, this could help advocate for students with ADHD to receive appropriate support/intervention systems/techniques to encourage an increase in academic performance.

I would greatly appreciate your time and participation.

Sincerely,

Lauma Pirvics

APPENDIX C (Informed Consent)

Title of study: Academic Interventions for Children with Attention Deficit Hyperactivity Disorder

Name(s) of researcher(s): Lauma Pirvics **Faculty Supervisor:** Dr. Susan Schultz

Phone for further information: 585-317-1075

Purpose of study: The purpose of this study is to evaluate the effectiveness of additional support services and interventions provided for children with ADHD. This study will look at which interventions increase academic performance among these students.

Approval of study: This study has been reviewed and approved by the St. John Fisher College Institutional Review Board (IRB).

Place of study: Five – Ten schools in Monroe County.

Length of participation: 10/07 – 10/08

Risks and benefits: The expected risks and benefits of participation in this study are explained below:

The author does not see any risks in participating in the following study as all information will remain confidential. Surveys will not include names of districts, teachers, students, and/or schools. However, possible benefits *do* exist. If data indicates that certain interventions seem to be more effective in increasing academic performance of ADHD students, that information could be used in further research to help advocate for students with ADHD. As a result, students with ADHD could potentially receive the most appropriate and effective services/interventions to increase their academic performance.

Method for protecting confidentiality/privacy: Surveys will be left with principals of 5-10 schools in Monroe County. The researcher will ask the principal to pass the surveys out to teachers of grades 1-6. Each survey will be accompanied by an envelope so that information can be immediately sealed to ensure confidentiality. Names of teachers, students, and/or schools will not be included on surveys. All information provided will be completely confidential and results will only be used to interpret effectiveness of certain intervention techniques used for students with ADHD. The data will be represented in a capstone project which will evaluate effectiveness of different support/intervention techniques. The author will remain blind to who filled out surveys. Names will not be included on surveys, nor will the name of the district. Teachers do not have to fill out grade level if they feel that will disclose any information that they feel would remain confidential by keeping that question unanswered.

Your rights: As a research participant, you have the right to:

1. Have the purpose of the study, and the expected risks and benefits fully explained to you before you choose to participate.
2. Withdraw from participation at any time without penalty.
3. Refuse to answer a particular question without penalty.
4. Be informed of appropriate alternative procedures or courses of treatment, if any, that might be advantageous to you.
5. Be informed of the results of the study.

I have read the above, received a copy of this form, and I agree to participate in the above-named study.

Print name (Participant)

Signature

Date

Print name (Investigator)

Signature

Date

If you have any further questions regarding this study, please contact the researcher listed above. If you experience emotional or physical discomfort due to participation in this study, please contact the Office of Academic Affairs at 385-8034 or the Wellness Center at 385-8280 for appropriate referrals.

APPENDIX D (Survey)

1. Grade: _____

2. What type of classroom? Please circle one.

- General Education
- Special Education
- Inclusion
- ESL
- Other (_____) please specify

3. Do you currently have any students in your classroom that are diagnosed with Attention Deficit Hyperactivity Disorder? (Please circle one)

Y or N

4. If so, how many, and of what gender? _____

5. Do they receive any kind of additional support as a result of their ADHD? Y or N

6. If so, please circle what kind of support these students receive. If possible, please describe type of support/interventions (i.e. token system, seating arrangements, etc.) and how long these supports/interventions have been implemented for.

- Behavioral - _____
- Academic - _____
- Medical - _____
- Combination - _____
- Other (_____)

7. Have test scores improved for these children that receive additional support/interventions? Y or N

8. Have reading abilities and skills improved? Y or N

9. Have math skills improved for these students? Y or N

10. In your opinion which supports/interventions have been most effective in improving academic skills and academic performance for these students with ADHD?

APPENDIX E (Revised Teacher Letter)

January 2008

Dear Teachers of Monroe County,

My name is Lauma Pirvics and I am currently a graduate student at St. John Fisher College. I am enrolled in the childhood special education masters program. For my thesis project, I have chosen to focus on academic interventions for students with Attention Deficit Hyperactivity Disorder (ADHD).

An abundant amount of research has been conducted evaluating the effectiveness of behavioral interventions for children with ADHD. However, I have chosen to focus on academic interventions for children with ADHD and how they affect academic performance.

I am writing this letter to see if you would be willing to assist me in gathering information and data on the topic at hand. Attached is a survey which will better allow me to research effective support and/or intervention techniques that enhance academic performance of students with ADHD.

All information will remain confidential as teacher, student, school, and/or principal names are not required, nor will they be used. Envelopes are provided. Once completed, surveys can be sealed to ensure confidentiality. There are no known risks to participating in this project. However, certain benefits do exist. If collected data indicates and/or finds that certain support/intervention techniques seem to have been effective, this information can be passed on to further researchers. As a result, this could help advocate for students with ADHD to receive appropriate support/intervention systems/techniques to encourage an increase in academic performance.

Filling out the attached survey will provide consent to participating in this project. Again, all information will remain anonymous and completely confidential. A box for completed surveys is located in the main office. Completed surveys will be picked up on January 18, 2008.

Your time and consideration to this matter are greatly appreciated.

Sincerely,

Lauma Pirvics

Academic Interventions 31

Grade	Class Type	ADHD Diagnosis	#/Gender	Support	Behavioral	Academic	Medical	Combo	Other	Inc Test Scores?	Inc reading?	Inc. math?	Most effective?
1	Gen Ed.	Y	1-Male	Y	Token system	Seating Color visuals	Y	All 3	N	N	Y	Y	Medical
1	12:1:1 Special Ed	Y	1-male	Y	Token System Self reflection	12:1:1 placement	Y	B, A, M	N	N	N	Y	Medical and self reflection
1	12:1:1	Pending	1-male	Not official	Token System	N	N	N	N	N	N	N	Nothing at this point
2	Gen Ed	Y	1-male	Y	Star Chart	Frequent Time Checks Inc. Test time	Y	B, A, M	Frequent reminders	Y	Y	Y	Combination of all interventions
3	Gen Ed	Y	1-male 1-female	Y Y	Token Syst. No	Shorter Assignments	Y Y	B, A, M A, M	N N	N N	Y Y	Y Y	Medical
3	Gen Ed	Y	1-male	Y	Star Chart	Check points Inc. test time	Y	B, A, M	N	Y	Y	Y	Combination
3	12:1:1 Special Ed	Y	2-male	Y	Y Token System	1:1 aides	Y	B, A, M	N	N	Y	Y	Academic (1:1) aides that provide more attention and break down tasks
4	Gen Ed	Y	1-male	Y	Schedule Review of expectation s	Peer tutoring in reading	N	B, A	N	N	Y	N	Visuals of schedule and peer tutoring
4	Gen Ed	Y	1-male	N	Green Yellow red card system	N	Y	B, A	N	N	N	N	Medical, but inconsistent
5	Gen Ed	Y	1 female	Y	N	Modified Assignments Inc Test time	Y	A, M	N	N	Y in the sense of time on task.	N	Medical

References

- Ajibola, O., & Clement, P. W. (1995). Differential effects of methylphenidate and self-reinforcement on attention-deficit hyperactivity disorder. *Behavior Modification, 19*, 211-233.
- Attention deficit hyperactivity disorder. (n.d.). *American psychological association*. Retrieved April 20, 2008, from <http://www.apa.org/>
- Barkley, Copeland, & Sivage. (1980). A self-control classroom for hyperactive children. *Journal of Autism and Developmental Disorders, 10*(1), 75-89.
- Bowers, D. S., Clement, P. W., Fantuzzo, J. W., & Sorensen, D. A. (1985). Effects of teacher-administered and self-administered reinforcers on learning disabled children. *Behavior Therapy, 16*(4), 357-369.
- Chase, S. N., & Clement, P. W. (1985). Effects of self-reinforcement and stimulants on academic performance in children with attention deficit disorder. *Journal of Clinical Child Psychology, 14*, 323-333.
- Christie, D. J., Hiss, M., & Lozanoff, B. (1984). Modification of inattentive classroom behavior: Hyperactive children's use of self-recording with teacher guidance. *Behavior Modification, 8*(3), 391-406.
- Clarfield, J., & Stoner, G. (2005). Research brief: The effects of computerized reading instruction on the academic performance of students identified with ADHD. *School Psychology Review, 34*(2), 246-254.
- Cole, C. L., Davenport, T. A., Bambara, L. M., & Ager, C. L. (1997). Effects of choice and task preference on the work performance of students with behavior problems. *Behavior Disorders, 22*(2), 65-74.

- Davies, S., & Witte, R. (2000). Self-management and peer-monitoring within a group contingency to decrease uncontrolled verbalizations of children with attention-deficit/hyperactivity disorder. *Psychology in the Schools, 37*(2), 135-147.
- DeShazo, B., Lyman, T., Klinger, R., & Grofer, L. (2002). Academic underachievement and attention-deficit/hyperactivity disorder: The negative impact of symptom severity on school performance. *Journal of School Psychology, 40*(3), 259-283.
- DuPaul, G. J., DePerzel, M., Clarke, S., Wilson, D., Wright, S., White, R., et al. (1994). Choice making to promote adaptive behavior for students with emotional and behavioral challenges. *Journal of Applied Behavior Analysis, 27*, 505-518.
- DuPaul, G. J., & Eckert, T. L. (1997). The effects of school-based interventions for attention deficit hyperactivity disorder: A meta-analysis. *School Psychology Review, 26*, 5-27.
- DuPaul, G. J., & Eckert, T. L. (1998). Academic interventions for students with attention-deficit/hyperactivity disorder: A review of the literature. *Reading and Writing Quarterly, 14*, 59-82.
- DuPaul, G. J., Ervin, R. A., Hook, C. L., & McGoey, K. E. (1998). Peer tutoring for children with attention deficit hyperactivity disorder: Effects on classroom behavior and. *Journal of Applied Behavior Analysis, 31*, 579-592.
- DuPaul, G. J., & Henningson. (1993). Peer tutoring effects on the classroom performance of children with Attention Deficit Hyperactivity Disorder. *School Psychology Review, 22*(1), 134-143.

- DuPaul, G. J., & Hoff, K. E. (1998). Attention/concentration problems: Issues in clinical child psychology. In *Handbook of child behavior therapy* (pp. 99-126). New York, NY: Plenum Press.
- DuPaul, G. J., & Stoner, G. (1994). Assessment and intervention strategies. In *ADHD in schools*. New York, NY: Guildford Press.
- DuPaul, G. J., Volpe, R. J., Jitendra, A. K., Lutz, J. G., Lorah, K. S., & Gruber, R. (2004). Elementary school students with AD/HD: Predictors of academic achievement. *Journal of School Psychology, 42*(2), 285-301.
- Falk, J. L., & Wehby, J. H. (2001). The effects of peer-assisted learning strategies on the beginning reading skills of young children with emotional or behavioral disorders. *Behavioral Disorders, 26*(4), 344-359.
- Ford, M. J., Poe, V., & Cox, J. (1993). Attending behaviors of ADHD children in math and reading using various types of software. *Journal of Computing in Childhood Education, 4*, 183-196.
- Forness, S. R., & Kavale, K. A. (2002). Impact of ADHD on school systems. In *Attention deficit hyperactivity disorder: State of the science-best practices* (pp. 24.1-24.20). Kingston, NJ: Civic Research Institute.
- Frick, P. J., Kamphaus, R. W., Lahey, B. B., Loeber, R., Christ, M. G., Hart, E. L., et al. (1991). Academic underachievement and the disruptive behavior disorders. *Journal of Consulting and Clinical Psychology, 59*(2), 289-294.
- Greenwood, C. R., Hart, B., Walker, D., & Risely, T. (1994). Behavior analysis in education: Focus on measurably superior instruction. In *The opportunity to respond and academic performance revisited: A behavioral theory of*

developmental retardation and its prevention (pp. 213-223). Belmont, CA: Thomson Brooks/Cole Publishing Co.

Harris, K. R., Frielander, B. D., Saddler, B., Frizzelle, R., & Graham, S. (2005). Self-monitoring of attention versus self-monitoring of academic performance: Effects among students with ADHD in the general education classroom. *The Journal of Special Education, 39*(3), 145-156.

Hinshaw, S. P. (1992a). Externalizing behavior problems and academic underachievement in childhood and adolescence: Causal relationships and underlying mechanisms. *Psychological Bulletin, 111*, 127-155.

Hinshaw, S. P. (1992b). Academic underachievement, attention deficits, and aggression: Comorbidity and implications for intervention. *Journal of Consulting and Clinical Psychology, 60*, 893-903.

Hoffman, J. B., & DuPaul, G. J. (2000). Psychoeducational interventions for children and adolescents with attention-deficit/hyperactivity disorder. *Child and Adolescent Psychiatric Clinics of North America, 9*(3), 647-661.

Hopkins, J., Perlman, T., Hechtman, L., & Weiss, G. (1979). Cognitive style in adults originally diagnosed as hyperactiveness. *Journal of Child Psychology and Psychiatry, 20*(3), 209-216.

Horn, W. F., Chatoor, I., & Conners, C. K. (1983). Additive effects of Dexedrine and self-control training: A multiple assessment. *Behavior Modification, 7*(3), 383-402.

Individuals with Disabilities Education Act (n.d.) IDEA. Retrieved April 21, 2008 from <http://www.nichcy.org/idealaw.htm>

- Kamphaus, R. W., & Frick, P. J. (1996). *Clinical assessment of child and adolescent personality and behavior*. Needham Heights, MA: Allyn and Bacon.
- Kern, L., Mantegna, M. E., Vorndran, C. M., Bailin, D., & Hilt, A. (2001). Choice of task sequence to reduce problem behaviors. *Journal of Positive Behavior Interventions*, 3(1), 3-10.
- Kleiman, G., Humphrey, M., & Lindsay, P. H. (1981). Microcomputers and hyperactive children. *Creative Computing*, 7, 93-94.
- Lyon, R. G., & Cutting, L. (1998). Learning disabilities. In *Treatment of childhood disorders* (2nd ed., pp. 468-498). New York, NY: Guilford Press.
- Mannuzza, S., Klein, R. G., Bessler, A., Malloy, P., & et. al. (1993). Adult outcome of hyperactive boys: Educational achievement, occupational rank, and psychiatric status. *Archives of General Psychiatry*, 50(7), 565-576.
- Mathes, M. Y., & Bender, W. N. (1997). The effects of self-monitoring on children with attention deficit/hyperactivity disorder who are receiving pharmacological interventions. *Remedial and Special Education*, 18(2), 121-128.
- Ota, K. R., & DuPaul, G. J. (2002). Task engagement and mathematics performance in children with attention deficit hyperactivity disorder: Effects of supplemental computer instruction. *School Psychology Quarterly*, 17, 242-257.
- Pelham, W. E., Wheeler, T., & Chronis, A. (1998). Empirically supported psychosocial treatments for attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology*, 27, 190-205.

- Powell, S., & Nelson, B. (1997). Effects of choosing academic assignments on a student with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis, 30*, 181-183.
- Rapport, M. D., Denney, C. B., & DuPaul, G. J. (1994). Attention deficit disorder and methylphenidate: Normalization rates, clinical effectiveness, and response prediction in 76 children. *Journal of the American Academy of Child and Adolescent Psychiatry, 33*, 882-893.
- Rapport, M. D., Scanlan, S. W., & Denney, C. B. (1999). Attention-deficit/hyperactivity disorder and scholastic achievement: A model of dual developmental pathways. *Journal of Child Psychology and Psychiatry, 40*(8), 1169-1183.
- Robb, J.A., Perham, W.E. & Foster, E.M. (in preparation). The impact of attention deficit/hyperactivity disorder in children and adolescents: Analysis of educational costs and outcomes.
- Romaniuk, C., Miltenberger, R., Conyers, C., Jenner, N., Jurgens, M., & Ringenberg, C. (2002). The influence of activity choice on problem behaviors maintained by escape versus attention. *Journal of Applied Behavior Analysis, 35*(4), 349-362.
- Shaywitz, B. A., & Shaywitz, S. E. (1994). Measuring and analyzing change. In *Frames of reference for the assessment of learning disabilities: New views on measurement issues* (pp. 59-68). Baltimore, MD: Paul H Brookes Publishing.
- Shimabukuro, S. M., Prater, M., Jenkins, A., & Edelen-Smith, P. (1999). The effects of self-monitoring of academic performance on students with learning disabilities and ADD/ADHD. *Education and Treatment of Children, 22*(4), 397-414.

- Torgensen, J. (1975). Problems and prospects in the study of learning disabilities. In *Review of child development research* (pp. 61-62). Oxford, England: U Chicago Press.
- Wehby, J. H., Lane, K. L., & Falk, K. B. (2003). Academic instruction for students with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders, 11*(4), 194-197.
- Weiss, G., & Hechtman, L. T. (1993). *Hyperactive children grown up: ADHD in children, adolescents, and adults* (2nd ed.). New York, NY: Guilford Press.