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## Post Hoc Analysis on the Effect of Early Intensive Behavioral Intervention Provided to Preschool Children on the Autism Spectrum

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*Running Head:* EFFECTS OF EARLY INTERVENTION FOR CHILDREN WITH ASD

Post Hoc Analysis of Data on the Effect of Early Intensive Behavioral Intervention (EIBI)

Provided to Preschool Children on the Autism Spectrum

Catherine Maxwell Dumont

Submitted in Partial Fulfillment of the Requirements for the Degree

Master of Science in Special Education: Autism Authorization

School of Education and Counseling Psychology

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**Signature Sheet**

This thesis, written under the direction of the candidate's thesis advisor and approved by the Chair of the Master's program, has been presented to and accepted by the Faculty of Education in partial fulfillment of the requirements for the degree of Master of Science. The content and research methodologies presented in this work represent the work of the candidate alone.

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**Table of Contents**

**TITLE PAGE ..... 1**

**SIGNATURE SHEET ..... 2**

**ACKNOWLEDGMENTS ..... 4**

**TABLE OF CONTENTS ..... 5**

**ABSTRACT ..... 7**

**CHAPTER 1 EFFECTS OF EARLY INTERVENTION FOR CHILDREN WITH ASD ..... 8**

**STATEMENT OF PROBLEM..... 9**

**PURPOSE STATEMENT ..... 9**

**RESEARCH QUESTION ..... 9**

**DEFINITION OF TERMS.....10**

**THEORETICAL RATIONALE .....12**

**ASSUMPTIONS .....13**

**BACKGROUND AND NEED.....15**

**SUMMARY .....16**

**CHAPTER 2 REVIEW OF THE LITERATURE.....18**

**INTRODUCTION .....18**

**HISTORICAL CONTEXT.....18**

**STATISTICAL INFORMATION .....20**

**REVIEW OF ACADEMIC RESEARCH .....22**

**LANGUAGE DEVELOPMENT .....22**

	6
<b>PEER INTERACTION .....</b>	<b>24</b>
<b>SOCIALLY APPROPRIATE BEHAVIOR .....</b>	<b>26</b>
<b>SUMMARY .....</b>	<b>28</b>
<b>CHAPTER 3 METHOD .....</b>	<b>29</b>
<b>RESEARCH APPROACH .....</b>	<b>29</b>
<b>ETHICAL STANDARDS .....</b>	<b>29</b>
<b>SAMPLE AND SITE .....</b>	<b>30</b>
<b>ACCESS AND PERMISSIONS .....</b>	<b>31</b>
<b>DATA GATHERING PROCEDURES .....</b>	<b>31</b>
<b>MEASUREMENT .....</b>	<b>31</b>
<b>DATA ANALYSIS APPROACH.....</b>	<b>33</b>
<b>CHAPTER 4 FINDINGS .....</b>	<b>35</b>
<b>RESULTS .....</b>	<b>35</b>
<b>COMPARISON OF FINDINGS TO THE LITERATURE .....</b>	<b>38</b>
<b>CHAPTER 5 DISCUSSION /ANALYSIS .....</b>	<b>40</b>
<b>SUMMARY OF MAJOR FINDINGS .....</b>	<b>40</b>
<b>IMPLICATIONS FOR FUTURE RESEARCH.....</b>	<b>41</b>
<b>LIMITATIONS/GAPS IN THE RESEARCH.....</b>	<b>41</b>
<b>OVERALL SIGNIFICANCE OF THE STUDY .....</b>	<b>41</b>
<b>ABOUT THE AUTHOR.....</b>	<b>42</b>
<b>REFERENCES .....</b>	<b>44</b>

### **Abstract**

Early Intensive Behavioral Intervention (EIBI) provides a framework for educators to assist children diagnosed with autism spectrum disorder (ASD) to increase independence and positive social skills in the classroom (Reichow, 2012). Preschoolers with ASD who do not have access to programs tend to display negative and socially inappropriate behavior, such as acts of aggression, withdrawal, and inability to attend to lessons. Studies on program effectiveness documented that preschool children who received EIBI scored higher on IQ, language comprehension, imitation, expressive language, nonverbal communication, play, stereotyped behaviors and adaptive functioning compared to preschool children who do not receive EIBI.

The literature revealed that children with ASD who received EIBI maintained successful relationships with peers through joint attention, displayed increased use of appropriate language, and demonstrated an interest in participating in group classroom activities (Barber, Saffo, Gilpin, Craft, & Goldsetin, 2015). The purpose of the study was to evaluate student development on language, behavior, and peer relationships by analyzing pre- and post- assessments gathered over a three-year period.

The study included data collected on a child in a general education non-profit preschool setting. The study was evaluative in nature and documented student progress toward behavior improvement as part of the agency's evaluation policy results indicated that EIBI contributed to increasing the child's socially appropriate behavior, language development, and peer interaction.

Keywords: Autism spectrum disorder (ASD), Early Intensive Behavioral Intervention (EIBI)

## **Chapter 1 Effects of Early Intervention for Children with ASD**

Autism spectrum disorder (ASD) is described by D'Elia, Valeri, Sonnino, Fontana, Mammone, and Vicari (2014) as a neurodevelopmental and biologically determined social disorder which is characterized by a triad of deficits including communication, joint social interaction, and restricted and repetitive behavior patterns, interests and activities. Autism is four times more likely to occur in boys than girls and has nonexistent boundaries when it comes to racial, ethnic, or social categories (Al-Shammari, Daniel, Faulkner, & Yawkey, 2010). While ASD was once believed to be untreatable, research shows that certain methods of intervention have increased children's development in language, behavior, and peer interaction.

After years of experience working with individuals with ASD, I, the researcher, noticed that children who participated in Early Intensive Behavioral Interventions (EIBI) demonstrated improvement in independence, an increase in socially appropriate behavior and maintained successful peer relationships. EIBI, as a framework for educators and their work with children with ASD, provides children with tools to navigate through social situations, which lowers their anxiety level during transitions, and equips them with communication options (D'Elia et al., 2014). Since brain development is rapid within the first three years of life and childhood experiences shape the mature adult, the researcher assumed that children diagnosed with ASD would benefit from EIBI during their preschool years (Prado & Dewey, 2014).

### **Statement of Problem**

Preschool children with ASD often demonstrate aggressive behavior, lack of engagement in-group classroom activities, and limited use of language to express their needs and feelings.

Lack of intervention when children are as young as three, may lead to stress, anxiety, frustration and misunderstanding for the child diagnosed with ASD, their parents, teachers, and peers (Hill, Zuckerman, Hagan, Kriz, Duvall, Van Santen, & Fombonne, 2014).

### **Purpose Statement**

The purpose of this study is to analyze data on the effect of EIBI on one preschool child's behavior, language development and social skills. The intent of this evaluation research study is to offer parents, teachers, and caregivers information to improve their knowledge of effective intervention strategies for young children diagnosed with ASD.

### **Research Question**

What is the effect of EIBI in increasing social interaction, language production, and socially appropriate behavior in a preschool child diagnosed with ASD? The intent of the study is to add to the literature and for behavioral therapists, teachers in an educational setting as well as parents in the home setting. For the purpose of this study, the following terms are defined as follows:

## **Definition of Terms**

**Autism Spectrum Disorder (ASD)**—The autism spectrum, as defined by the DSM-V, includes Autistic Disorder, Child Integrative Disorder, Rett’s Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). Autism spectrum disorder (ASD) is a neurodevelopmental disorder based upon three symptomatic areas that are categorized in the Diagnostic and Statistical Manual, Fifth Edition (DSM-V) as impaired social interaction, limited functional and social communication, and repetitive or restricted behaviors (Young & Rodi, 2014). ASD acts as an umbrella to Autistic Disorder, Childhood Disintegrative Disorder, Rett’s Disorder, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) and has recently become separated from Asperger’s Syndrome (Barton, Robins, Jashar, Brennan, Fein, 2013). The extremely common disorder affects 1 in 68 children in the United States according to the Centers for Disease Control and Prevention and is defined as a spectrum because, just like neurologically typical individuals, every single child is completely different (U.S. Department of Health and Human Services, 2015).

**Early Intensive Behavioral Intervention (EIBI)**—A method in which behavioral therapists, caregivers, and teachers encourage, shape, display, modify, and teach specific behaviors to children with ASD. EIBI is a therapy which increases behavior such as imitation, receptive and expressive language, gross and fine motor skills, play, and joint attention while decreasing behaviors such as tantrums, aggression, self-inflicted injury, and stereotypical ASD behavior (Grandin, 2011). EIBI has multiple methods that are molded to each child’s individual needs but is predominantly based upon Applied Behavioral Analysis (ABA). Other popular methods of

intervention include Picture Exchange Communication System (PECS), naturalistic teaching strategies, floortime, comic strip conversations, and tablet applications (Sicile-Kira, 2004).

**Applied Behavioral Analysis (ABA)**—A widely used method of behavioral therapy, which was created by O. Ivar Lovaas. ABA is a systematic, repetitive approach that focuses on cognitive, language, and motor development and is typically sculpted to each child’s individual needs (Sicile-Kira, 2004).

**Autism Diagnostic Observation Schedule (ADOS)**—A widely used diagnostic assessment for children with ASD. The ADOS-2 is semi structured and measures communication, repetitive behaviors and play by using a 3-point rating scale to evaluate the child’s performance (MacDonald, Parry-Cruwys, Dupere, Ahearn, 2014).

**Diagnostic and Statistical Manual Fifth Edition (DSM-V)**—A manual published by the American Psychological Association (APA) that is intended to be a resource which classifies criteria of mental disorders (Tsai & Ghazludden, 2014).

**Joint attention**—The ability to display and maintain attention with another individual through gestures, eye contact, or verbal cues (Sicile-Kira, 2004).

**Preschool children**—Children who range in the ages of 3 to 5 years old.

**Echolalia**—Immediate or delayed repetitive speech patterns that are stereotypical of children on the autism spectrum (Cable & Weimer, 2015).

## **Theoretical Rationale**

In the 1940s, individuals with ASD were considered mentally ill. Currently, ASD is categorized as a developmental disability. Early researchers claimed that the cause of autism was due to “refrigerator mothers: cold, unfeeling parents who pushed their children into mental isolation (Sicile-Kira, 2004, p. 8).” In the late 1960s, O. Ivar Lovaas, “the pioneer of Applied Behavioral Analysis” devoted nearly half a century to studying, researching, and developing therapeutic intervention strategies for children with autism who were initially thought to be untreatable (Smith & Eikeseth, 2011, p. 374).

Lovaas conducted research on the efficacy of ABA in order to document that an autism diagnosis did not equate to a referral to a hospital or institution for life. Lovaas conducted studies that documented effects of positive reinforcement and occasional low doses of electric shock to reduce life-threatening self-injury or aggression. “The rapid reduction of even the most horrifying behavior—children punching themselves hard in the face thousands of times every hour, chewing off their fingertips, smashing their heads against the sharpest object available, or poking their eyes—helped prove that children with autism were sensitive to consequences” contrary to the hypothesis that ASD was untreatable (Smith & Eikeseth, 2011, p. 376).

During follow-up studies of the children who received ABA intervention, Lovaas was devastated to learn that children had regressed to their pre-intervention state. At this point, Lovaas advocated that children diagnosed with ASD should receive EIBI during the preschool years. In 1987, after nearly 30 years of research, Lovaas published the study for which he is now

best known: the report entitled *Behavioral Treatment and Normal Educational and Intellectual Functioning in Young Autistic Children*. This report indicated that:

children with autism who received early intensive ABA achieved vastly better outcomes than similar children who received little or no ABA. Provocatively, Lovaas described 9 of the 19 intensively treated children as “normal-functioning” and possible even recovered. In so doing, he challenged the prevailing belief that, although children with autism might be able to learn isolated skills, they would always be delayed and socially isolated (Smith & Eikeseth, 2011, p. 3770).

Lovaas is recognized as an advocate for EIBI in the autism community. The literature revealed that Lovaas was not simply a researcher of ASD. He is credited for improving the lives of countless children and families, and ensuring that EIBI is offered to children with ASD was his lifetime goal. Lovaas’ theory provided an explanation and created a context for the researcher to view observations as related (Patten, 2009). Lovaas’ research indicated that behavioral therapy is key to transforming the lives of children and families who are affected by ASD. The creation of ABA was key to the development of the present study.

### **Assumptions**

The researcher assumes that children who receive early intervention demonstrate increased social skills, language production and attention in-group activities. The researcher also assumed that children diagnosed with ASD were diagnosed on a broad based spectrum. Children with ASD who have increased social skills have an increased chance of maintaining friendships

with peers and demonstrating increased language production. The focus on increased language production also has the benefit of increasing children's success rate at getting their needs met. Increased social skills, as well as increased language production, have the potential of encouraging children with ASD to participate in-group activities in the classroom. Children who have received early intervention will most likely behave in a way that reduces stress on their families. It is also the assumption of the researcher that children who have received early intervention appear happier and more successful in the classroom, compared to children who do not receive early intervention.

## **Background and Need**

Literature from Cohen, Dickerson, and Forbes (2014) explained that ASD affects 1 in 68 children in the United States alone and is projected to increase by 625 percent by the year 2030. An emerging trend for those who work with children on the autism spectrum is an increase in EIBI as a teaching practice. Macdonald, et al., (2014) described research on EIBI for young children with ASD as sparse and have noted that examining the efficacy of EIBI among young children on the spectrum is an important area that requires continued research.

Research on the effects of EIBI for young children diagnosed on the autism spectrum is a necessity to provide caregivers with successful treatment options, once the ASD diagnosis is confirmed. Literature from Cohen, et al. (2014) shows that providing EIBI to children on the spectrum is widely beneficial to our society as whole:

ASDs impose enormous financial and personal burdens not only on the families of an ASD individual, but also on society as a whole. The financial costs to families and service agencies for providing the appropriate multi-faceted treatments, interventions, and services are significant, and because of the pervasive nature of the disorder, these costs are often required in some form during the ASD individual's lifetime. Yet, the costs to society for not providing treatments are even greater (Cohen, et al., 2014, p. 389).

MacDonald et al. (2014) conducted research on 83 children diagnosed with autism who were receiving EIBI in a home setting, and compared their performance to 58 typically

developing children who were enrolled in a preschool program. Assessments were conducted upon entry into the EIBI program and follow-up assessments were conducted after 7-15 months of treatment. Research showed that the children with ASD demonstrated increased social skills, language development as well as attention after receiving EIBI.

The post-test results for the 18-23 month-olds indicated that scores on all measured areas improved significantly except in stereotypic ASD behavior such as repetitive speech patterns. The children in the 24-29 month-old age range improved on all measures except play and stereotypical behavior and the 30-48 month-olds scored higher on joint attention, eye contact, and cognitive performance. The data results reflected that the younger the child receives therapy, the higher the improvement score after receiving EIBI.

Another study conducted by Eldevik, Hastings, Jahr, and Hughes (2012) showed significant improvement among children with ASD after receiving EIBI. Eldevik et al. (2012) noted a study that included 332 children with autism between 2 and 7 years old. After receiving EIBI in a home setting as well as in a school setting, children made statistically significant improvements in adaptive functioning, intellectual functioning and general autism symptoms.

## **Summary**

The efficacy of and requirement for implementing EIBI needs continual research. In considering the historical context of treatment options for children with ASD, EIBI emerges as a strong therapy option that suggests important improvements for children in language, behavior, and social skills. An approach to instruction, emerging from the research as successful for a unique population of children, has the potential for increasing children's positive growth. This

can be accomplished if EIBI can be implemented immediately following a child's diagnosis of ASD in order to promote growth in language, social skills and independence. Research showed that preschool-aged children who received EIBI in a school or home setting improved in language development, peer interaction, and appropriate behavior. Providing children with EIBI such as ABA has allowed children the option to reside within their own community compared to the historical practice of institutionalizing them. The research literature indicated that children with ASD have the potential to improve behavior, language and social interaction skills, contrary to early research studies in the mid- to late 1900s.

The literature indicated that EIBI is an approach that is effective in improving the behavior, language and peer relationships of children with ASD. Literature revealed that EIBI has led children to increased independence, lowering stress levels among children and their families, and decreased stereotypical, socially inappropriate ASD symptoms. The following chapter is a review of the literature on the importance of EIBI and illustrates the success of early intervention among young children diagnosed on the autism spectrum.

## **Chapter 2 Review of the Literature**

### **Introduction**

This section is an examination of the research literature on EIBI. Information was gathered from academic library searches using online resources, peer reviewed articles, as well as textbooks used in autism specific graduate level courses. Research information is organized in the following categories: Historical Context, Review of the Academic Research, and Statistical Information. Historical Context documents the discovery of ASD, the development of intervention, and diagnostic criteria. Review of the Academic Research includes information from a number of studies that create a context for this research study. The review also describes how peers interaction, language development and social skills are positively affected by EIBI. Statistical Information from past research is illustrated through graphs and tables.

### **Historical Context**

Literature revealed that the first documentation of autism was reported in the early 1900s when the Latin word autismus was used to define schizophrenic symptoms (Ataman, Bicer, & Vatanoglu-Lutz, 2014). The researchers disclosed that autism syndrome was first described as schizophrenic psychosis and throughout a century of research, is now considered a biologically based pervasive neurodevelopmental disorder which is in effect from birth throughout a lifetime. Kanner (1896 – 1981), an Austrian psychiatrist who was well known for his autism related

research, published a paper entitled, “Autistic Disturbances of Affective Contact” in which he described one of his child patients who demonstrated autistic symptoms:

Donald T. was not like other 5-year-old boys. [He was] “happiest when he was alone...drawing into a shell and living within himself...oblivious to everything around him.” Donald had a mania for spinning toys, liked to shake his head from side to side and spin himself around in circles, and he had temper tantrums when his routine was disrupted...Donald referred to himself in the third person, repeated words and phrases spoken to him, and communicated his own desires by attributing them to others (Ataman, et al., 2014, p. 427).

Kanner became the editor for a journal, which published studies about childhood schizophrenia and autism. According to Ataman, et al. (2014), childhood schizophrenia and autism were described as an inward, self-absorbed aspect of schizophrenia in adults. Kanner did not recognize his patients as schizophrenic, because unlike schizophrenia, Kanner’s patients displayed autistic symptoms from birth. In the late 1960’s, “autism was established as a separate syndrome by demonstrating that it is lifelong, distinguishing it from intellectual disability and schizophrenia and from other developmental disorders” (Ataman, et al., 2014, p. 30).

ASD was thought to be an untreatable mental disorder until the mid 1970s when studies conducted by Lovaas displayed that the children with the disorder responded positively to treatment. Lovaas developed ABA as a therapy for individuals with ASD after conducting his own personal research throughout the 1970s and 1980s. Lovaas published his first data on the

effects of his treatment in 1987. Results were described by Reichow (2012) as empirical and encouraging to researchers studying ASD and families affected by the disorder.

Previous to Lovaas' publications, large populations of individuals on the spectrum were forced to live an institutionalized life and the cause of ASD was frequently described as the emotionally cold and socially detached mothers (Thompson, 2013). Until the 1970s, there was limited research defining the role of genetics in autism. Today, autism is considered one of the most genetically transmissible psychiatric conditions, however, Ataman et al. (2014) suggests environmental factors, such as heavy metals, vaccines, prenatal stress, pesticides, and certain foods are in the process of being examined as factors contributing to or intensifying ASD.

### **Statistical Information**

Reichow (2012) analyzed the results of five meta-analysis studies that illustrated the findings of EIBI efficacy and described the necessity of EIBI research as a priority. Out of the five analyses, four studies concluded that the EIBI is an effective intervention strategy for some, but not all, children with ASDs. While many studies provide statistical data showing EIBI is effective, there is yet to be research that identifies a particular intervention as successful for all children with ASD. As previously stated, all children with ASD are different, therefore, they require individualized treatments and interventions.

While one particular method of intervention is unable to benefit *all* children on the spectrum, research showed that any type of behavioral intervention is successful when provided at the youngest age possible. Ben-Itzhak and Zachor's (2011) research documented how and why EIBI is beneficial to children with ASD, specifically young children in their study between

the ages of 15-35 months. The age of a child was a significant predictor of cognitive gains in response to intervention. Data suggested that the younger the age of child at the start of EIBI, the better the child's responded cognitively to treatment. This finding is in accordance with previous studies that found that it is important to initiate intervention at a young age, a critical time in brain development, with increased intellectual plasticity that enables changes in central nervous system circuits.

Eikeseth, Klintwall, Jahr, and Karlsson (2012) also provided a summary of research on the efficacy of EIBI for young children with ASD who displayed an increased intellectual and adaptive functioning ability after receiving EIBI. A retrospective study conducted by Sheinkopf and Siegel (1998) was examined by Eikeseth et al. (2012) and depicted one of the largest effectiveness studies to date. Eleven children ranging from 4-47 months of age received one-to-one ABA treatment about 19 hours per week for approximately 15 months; these children gained an average of 26.9 IQ points using a pre-post assessment.

Eldevik, Hastings, Jahr, and Hughs (2012) evaluated outcomes of 31 preschool children with ASD receiving EIBI at a therapy center compared to 12 children with ASD who received early intervention in a mainstream preschool setting in Norway. Preschool staff members were trained for EIBI over a three-day workshop. Team meetings were held for the child, staff, supervisor and caregiver(s) to be on the same page; parent participation was strongly encouraged in order to provide the child with multiple learning experiences in the community, at home, and in school. The intervention was geared toward peer interaction, language development, and communication with an average of 13.1 hours per day of intervention, although, immeasurable, casual 1:1 intervention strategies were conducted throughout each day by teachers and

caregivers. Eldevik, et al. (2012) found that the group of children who received EIBI made significantly larger gains on intelligence, adaptive behavior, communication and socialization. There was a 95% confidence interval when assessing IQ scores for the group studied.

Klintwall, Eldevik, and Eikeseth (2015) described EIBI as an intervention method that consists of a fair amount of diversity in the manner it is delivered and described, but shares common core elements or goals. While research shows that several studies have been conducted on the efficacy of EIBI, there is an individual variation. That is, studies show some children on the spectrum who have made significantly large gains through participating in EIBI while others have only shown modest or no gains at all (Klintwall, et al., 2015). Klintwall et al. (2015) analyzed a previous study, which analyzed 453 children, ages 4-6 years old, with autism by comparing children receiving EIBI to those of a control group. The analysis showed that children who received EIBI, “exhibited significantly faster learn rates, both in IQ (75% faster) and in adaptive behaviors (38% faster), compared to children in a control group” (Klintwall et al., 2015, p. 59). The developmental trajectories for the children who received EIBI displayed a significantly higher progress rate compared to the children who did not receive intense therapy.

## **Review of Academic Research**

### **Language Development**

“In addition to social impairments and restricted and repetitive behaviors, many children with autism also experience language deficits, behavior problems, and difficulties with functioning in their environment” (Park, Gray, Taffe, & Yelland, 2012, p. 2761). Park, et al. (2012) associated language deficits to poor behavior as problematic behavior is considered a

communicative method for undesirable activities or to gain attention of an individual or a desired object for neurotypical and children with ASD alike. A study was conducted to analyze the discrepancy between language skills, behavior problems and adaptive behavior with a hypothesis that an increase in language skills would create lower levels of problematic behavior while better structural language skills would increase adaptive functioning (Park, et al., 2012, p. 2762). This particular study analyzed children with ASD, children with developmental delays and typically developing children who were between the ages of 3.5 and 6 years of age and found, “for the group with autism, receptive communication skills were significantly positively associated with daily living and social skills, and significantly negatively associated with self-absorbed behaviors, and social relating problems” (Park, et al., 2012, p. 2764). The literature revealed that having the ability to effectively communicate within social settings creates higher levels of peer interaction and relationships as well as notably lower levels of problematic behavior.

A research study conducted by Magiati, Charman, Howlin and Moss (2011) showed the important effects of EIBI within the critical preschool years for children with ASD—specifically language development. Their study was conducted in order to magnify the lack of long-term data on the progress of children with ASD who received EIBI during their preschool years. Magiati, et al. (2011) investigated the outcomes in middle and later childhood of 36 children with ASD who had received EIBI in autism specific programs for at least two years with an average of 30.7 hours per week of intense intervention. Three follow-up assessments were conducted and among them, Magiati, et al. (2011) described some of the most encouraging findings were the gains made in the children’s language between the first two assessments. During the first assessment, “most children were severely delayed in their language development, with only 8% having any

functional phrase speech. By [the third assessment], many more children (50%) had acquired functional phrase speech” (Magiati, et al., 2011, p. 1024).

### **Peer Interaction**

The Individuals with Disabilities Educational Act (IDEA) of 2004 and the No Child Left Behind Act (NCBL) of 2001 requires public schools to provide free and appropriate education for children with ASD in the least restrictive environment that is most suitable for their personal needs (Individuals with Disabilities Act, 20 U.S.C. § 1412). Nahmias, Kase, and Mandell (2014) evaluated research literature and noted that there were limited studies on children with ASD receiving intervention in a general education preschool setting, compared to receiving instruction in a learning environment solely populated with children on the autism spectrum. Research showed that providing children with ASD consistent opportunities to interact with neurotypical peers is often a recommended method of intervention but is rarely applied as part of EIBI (Nahmias, et al., 2014). The study conducted by Nahmias, et al. (2014) showed that children who attended inclusive preschools had significantly higher scores than those who did not. Cognitive, social-emotional, adaptive behavior and communication scores were all higher for children who received EIBI among the same setting as their typically developing peers (Nahmias, et al., 2014, p. 316).

Camargo, Davis, Ganz, Hong, Mason, and Rispoli (2014) also studied the significance of peer interaction for children with ASD and the benefits for these children of participating in a general education setting. “Advocates of inclusion suggest that placement of children with ASD in general education settings can lead to academic and social benefits due to reduced isolation and stigma, increased teacher expectations, access to a more stimulating environment, and

behavioral models from typical peers” (Camargo, et al., 2014, p. 2097). While Camargo, et al. (2014) suggested that general education placement for children with ASD is desirable, they also explained the difficulty that children on the spectrum might face in an inclusive setting such as difficulty initiating and responding to social interactions with peers, sharing objects and activities, and responding appropriately to others’ feelings. Deficits in social functioning for children with ASD can be detrimental in a long-term manner but are able to be treated through EIBI. Camargo, et al. (2014) explains that:

...deficits in social functioning interfere with social, emotional and cognitive development, thereby impeding the establishment of meaningful relationships and contributing to detrimental outcomes such as poor academic performance, peer rejection, social isolation, and social anxiety. Lack of social skills may lead to behavioral difficulties that compromise the long term success of children with ASD in inclusive settings and may result in their placement in more segregated environments. To ensure that children with ASD remain in inclusive settings and satisfactorily benefit from their education with typical peers, it is necessary to provide these children with interventions that attenuate their social impairments and facilitate peer interactions (Camargo, et al., 2014).

Research illustrated that providing components of EIBI to children on the spectrum who suffer from behavioral challenges is effective. Much of the research investigated the efficacy of intervention in settings other than inclusive educational environments such as clinical settings, special education classrooms or in the child’s home, because stimulus overload has proven to be

problematic. Camargo, et al. (2014) analyzed a variety of studies in which social skill interventions, including ABA strategies, were used to facilitate social interaction among children with ASD. Data collected showed fourteen studies (74%) reported positive results and 4 studies (21%) reported mixed results while only one study (5%) presented negative results because no effects were observed after the participants received EIBI. After analyzing the 19 studies at hand, Camargo, et al. (2014) determined that behaviorally based interventions qualify as evidence-based practices to improve social interaction skills of children with ASD.

### **Socially Appropriate Behavior**

Al-Shammari et al. (2010) analyzed the efficacy of behavioral interventions for children with ASD to determine whether or not they improved in their peer relationships. Similar to Camargo et al. (2014), Magiati et al. (2011) and Nahmias et al. (2014), the necessity to conduct more studies on control groups who have received EIBI is said to be imperative. The population of the study conducted by Al-Shammari et al. (2010) consisted of one student with ASD who was 21 years of age and was observed before, during and after participating in an intervention called LISTEN (an acronym) which included modeling, instruction, and mimicking behavior. The inappropriate behavior, which was targeted, was the manner in which the student would react to visitors entering the classroom. Rewards were used when appropriate behavior was demonstrated by the observed student and after utilizing the LISTEN intervention method, the student independently applied the strategy 75% of the time and was able to react to guests in a socially appropriate manner.

As mentioned in Lang, Machalicek, Rispoli, O'Reilly, Sigafos, Lancioni, Peters-Scheffer, and Didden (2014), play is widely acknowledged as an imperative method of social,

physical, emotional and intellectual development. Research shows that children affected by ASD find it difficult to participate in socially appropriate play due to their lack of social skills, disinterest in socialization, and interest in subject-areas that do not match their age group but providing EIBI has exposed a positive change in stereotypical ASD behaviors allowing children on the spectrum to participate in appropriate peer relationships (Lang, et al., 2014). While Lang, et al. (2014) describes the importance of providing EIBI to children with ASD in order for them to demonstrate appropriate behaviors with peers, Grandin (2011) reminds us to take a step back and rethink what “bad” and “good” behavior really is—specifically to those on the autism spectrum.

Behavior is one of the most widely discussed topics of all times by parents and professionals within the autism community. Parents want to know how to deal with their child’s behaviors at home and in the community. Educators in the classroom find it difficult to manage the behavior outbursts that can accompany autism, and often resort to punitive tactics, which have little or no effect on an autistic child who is having a tantrum due to sensory overload or social misunderstandings (Grandin, 2011, p. 139).

While examining the problematic behavior that teachers, peers, caregivers and siblings undergo during socialization with children with ASD, Grandin (2011) says knowledge of the difference between troublesome behavior caused by lack of sensory integration and plain bad behavior is imperative. “To bring about positive change in the behavior of the child with ASD, adults need

to first adjust their own behaviors,” expectations, consequences, and limitations (Grandin, 2011, p. 143).

### **Summary**

There is little research documenting effective practices of EIBI. As the number of children diagnosed with ASD continues to increase, educational specialists who work with this population need continual documentation of EIBI as an effective set of strategies to assist children with ASD in becoming successful and independent. Camargo, et al. (2014) describes the importance of children on the spectrum learning and receiving EIBI in a general education classroom setting, therefore, this research is important to the autism community, educators and the general population as a whole. It shows the importance of providing EIBI to preschoolers with ASD to enhance quality of life, engage in appropriate social play with their typically developing peers, teachers and family members. The researcher examine data similar to Nahmias et al. (2014) where children on the spectrum received EIBI in a general education classroom, acquired and established language, behavioral, and social skills to increase peer interaction, and demonstrate successful participation in group classroom activities and effectively communicate their personal needs.

## **Chapter 3 Method**

### **Research Approach**

This program evaluation study used formative data, which was collected from assessing a student diagnosed on the autism spectrum at just less than three years of age. The child at the time of the data collection was five years old. The purpose of this study was to document outcome of methods of instruction that are effective in addressing social and behavioral needs for children on the autism spectrum (Patten, 2009). The study is qualitative and descriptive in nature.

### **Ethical Standards**

This paper adheres to the ethical standards for protection of human subjects of the American Psychological Association (2010). The research study was evaluative in nature, using data collected at a preschool site, as part of the overall educational plan for an independent non-profit childcare center that serves neurotypical preschool children as well as children diagnosed with developmental delays. The researcher, a teacher who has experience working with children ages 12 months through 13 years at this non-profit site, has received graduate level, specialized certification which included 360 hours of autism training, and has completed a special education graduate program of study with a focus on autism. This proposal was reviewed by the faculty advisor on the thesis and approved.

## **Sample and Site**

Dayton Regional Center (DRC), a pseudonym, is a non-profit childcare agency, which serves students twelve months through 8<sup>th</sup> grade year round. Neurotypical children as well as children with special needs are served at this site; 1:1 aides are provided to those with Individualized Education Plans (IEP) from outside agencies. The DRC adheres to licensure practices upheld by the California Department of Education (CDE). The values that the DRC strives to demonstrate include collaboration and teamwork, cultural competence, excellence in childcare, integrity, and continuous improvement.

The preschool room where the observed child, Nicholas (a pseudonym), was assessed serves children 3 to 5 years of age and uses creative, theme-driven curriculum that aligns with California Preschool and Early Education Standards. The preschool program focuses on language development, social skills, math, music and movement, science and nature, cultural studies, gross and fine motor skills, nutrition, art, and dramatic play. Guest visitors and local field trips are heavily encouraged for this age group and family engagement is a priority. The preschool room has a staff/child ratio of 1 to 8 and consists of five main areas: literacy, dramatic play, manipulatives, blocks, and discovery. Adjacent to the classroom is a large, age-appropriate playground for outdoor play. The children are expected to participate in both self- and teacher-directed activities in a safe, nurturing environment in which the teachers strive to provide a variety of opportunities for children to experiment, explore, and succeed.

The assessed child, Nicholas, is a 5-year-old Chinese-American boy who lives at home, with his parents, in an affluent community in Northern California. His older sister who is in

middle school also lives at home with the family. Nicholas was born premature at 3.5 weeks early with a low birth weight of 4lbs. 14 ounces and was diagnosed with mild jaundice and failure to thrive. In March 2013 at 28 months old, the DRC suggested Nicholas be assessed due to lack of social interaction, not following simple tasks, self-injurious behavior such as repetitively hitting his own head on the floor and frequent tantrum behavior. Nicholas has attended DRC since he was six months of age.

### **Access and Permissions**

The researcher was an assigned teacher at DRC and Nicholas was her responsibility prior to conducting research. The researcher also has a personal relationship with the student and his family outside of DRC and has provided in-home childcare to Nicholas.

### **Data Gathering Procedures**

Their teacher using the Desired Results Developmental System (DRDP) biannually assesses every student who attends DRC. As a teacher at DRC, the researcher has approved access of Nicholas' DRDP assessments including fall 2012, fall 2013, fall 2014, spring 2015 and fall 2015.

### **Measurement**

The Desired Results Developmental Profile System (DRDP) measures the strategies used to evaluate progress. The DRDP measures five domains including Self and Social Development (SSD), Language and Literacy Development (LLD), Cognitive Development (COG), Motor and

Perceptual Development (MPD), Mathematics and Health (HLTH). The DRDP—Infant/Toddler (2010) assessment was used to assess Nicholas in fall 2012 and fall 2013 and has 35 measures with a five-category rating-scale including Responding with Reflexes, Expanding Responses, Acting with Purpose, Discovering Ideas, and Developing Ideas. Nicholas was assessed using the DRDP—Preschool without English Language Development (2014) for fall 2014, spring 2015 and fall 2015 with the same domains measured.

The Desired Results (DR) system is designed to improve the quality of programs and services provided to all children, birth through 12 years of age who are enrolled in early care and education programs or before- and after-school programs, and their families... Desired Results are defined as conditions of well-being for children and their families. Each DR defines an overall outcome. The DR system was developed based on the following six Desired Results: Children are personally and socially competent, Children are effective learners, Children show physical and motor competence, and Children are safe and healthy. The DRDP is an assessment that documents the level of development on a continuum separately for each individual child... a teacher can use the foundations as a guideline to understand the overall direction of all children's learning in the program (DRDP-IT, p. iii, 2010).

Extensive studies of the DRDP assessment have been conducted by the California Department of Education to establish the reliability and validity of the instrument. An assessment instrument is considered valid if there is evidence that it actually measures what it is designed to measure. For the DRDP instruments, this evidence begins with the researchers whose

contributions ensured that the wording of the descriptors and of the examples is based on the science of early development. The input of practitioners helped to ground the wording based on their years of knowledge and experience with children at these age levels. The evidence of validity also comes from the contributions of the teachers using the DRDP instruments in research studies. Teachers shared their understandings to help make the wording clearer and to better reflect what children actually do in early care and education programs. Additional evidence of validity comes from the data analyses conducted by the assessment experts. The analyses demonstrate the DRDP measures work together consistently, according to the intended assessment design, and that DRDP results are consistent with the results obtained from other assessment instruments that measure the same aspects. The reliability of an assessment instrument constitutes further evidence of validity. An assessment instrument is considered reliable if different observers rate the same child at the same developmental level for each item or measure and arrives at the same results. For actual use in any real-world situation, a high-level of agreement between observers, however, is not required. In the DRDP studies, the level of agreement between observers documented for the DRDP measures consistently met and exceeded accepted standards for reliability (DRDP-IT, 2010, p. ii).

### **Data Analysis Approach**

Once data were compiled, the researcher created graphs and charts to provide a visual understanding of Nicholas' growth over time in the interest areas of research including Self and Social Development, Language and Literacy Development, Cognitive Development, Motor and Perceptual Development and Health. Nicholas was rated on a five point rating scale using the

DRDP Infant/Toddler assessment tool which included responding with reflexes, expanding responses, acting with purpose, discovering ideas and developing ideas. The teacher who assessed the child also had the option to choose 'unable to rate this measure'. On the DRDP Preschool assessment, Nicholas was rated on a four point rating scale which included exploring, developing, building or integrating.

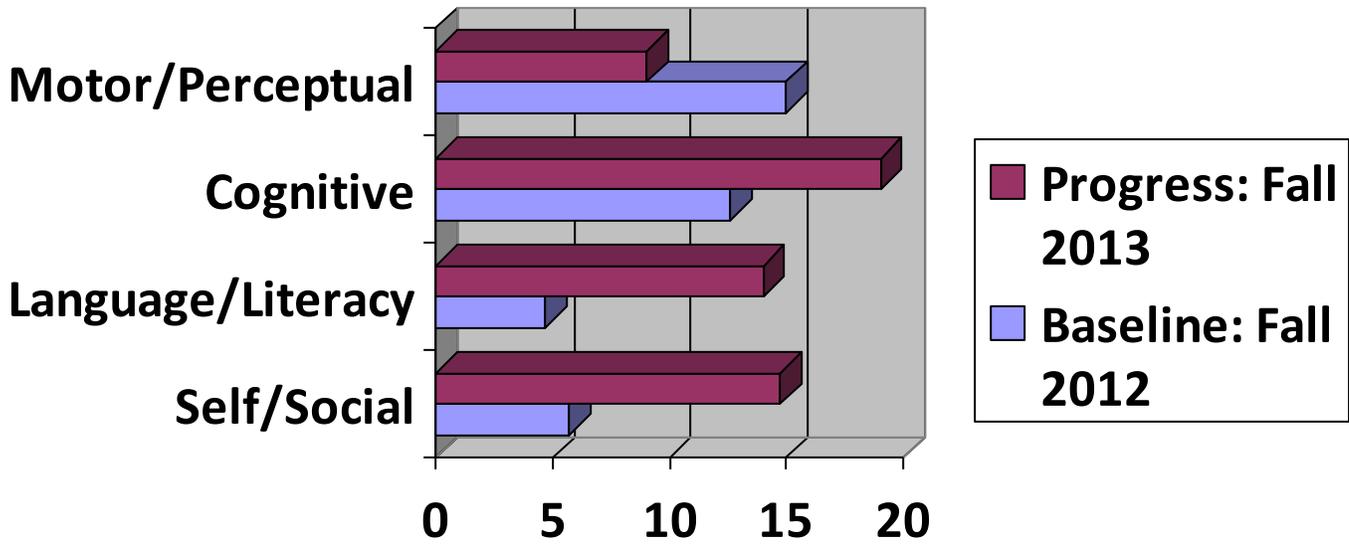
The specific social developmental subdomains that were included in Nicholas' assessment included identity of self, recognition of own skills and accomplishments, expressions of sympathy, impulse control, taking turns, relationships with adults, socio-dramatic play, friendships with peers, conflict negotiation and shared use of space and materials. For language and literacy development, Nicholas was assessed in the following developmental areas: comprehension of meaning, expression of self through language, interest in literacy, concepts about print, phonological awareness, letter and word knowledge and emergent writing. The assessment of cognitive and mathematical development included: cause and effect, problem solving, memory and knowledge, curiosity and initiative, number and sense of quantity and counting, classification, measurement, shapes and patterning. Subdomains for physical development and health included gross motor movement, balance, fine motor skills, personal care routines, healthy lifestyle and personal safety.

Nicholas' DRDP assessments were used to create graphs and charts, which displayed the baseline in fall 2012 and showed progress over a three year time period ending in fall 2015. Nicholas was assessed on each developmental domain measured by the DRDP assessment tool and the results were used to create the following graphs.

## **Chapter 4 Findings**

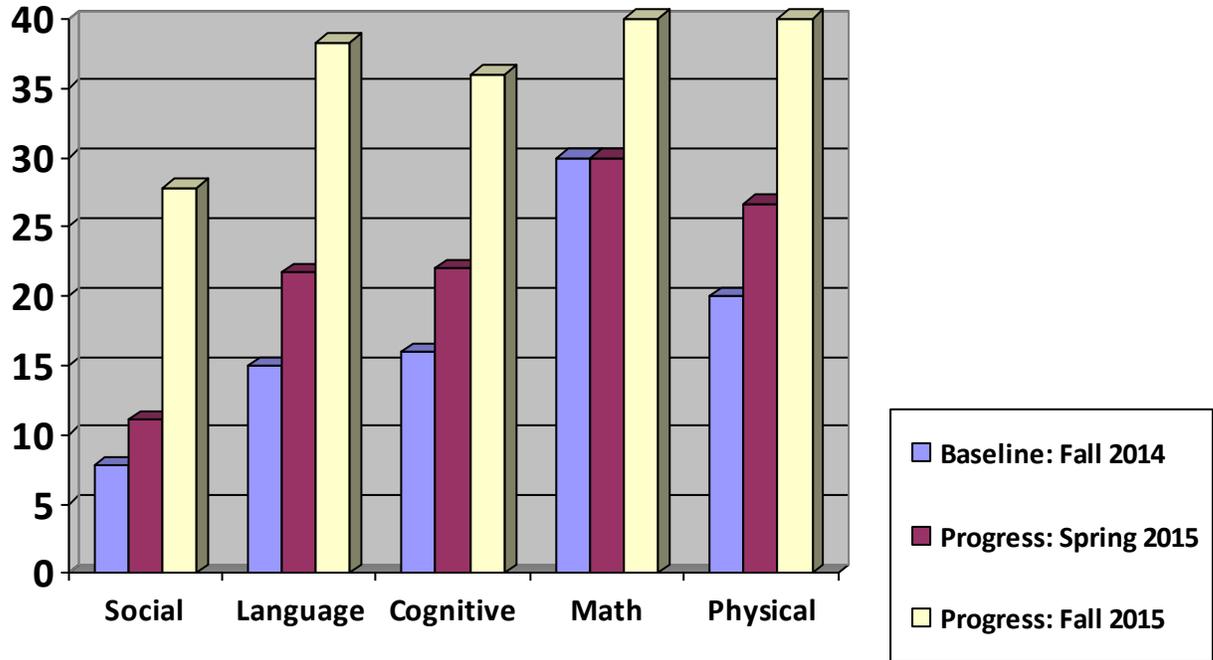
### **Results**

The researcher examined data that illustrates Nicholas' increase in development in the measured domains over the four-year period of data collected before and during the time Nicholas participated in EIBI. Nicholas increased developmental skills with an ascending trajectory in all areas except for Motor and Perceptual Development between fall 2012 and fall 2013. Between fall 2014 and fall 2015, Nicholas steadily increased his assessed developmental skills with a dramatic increase between spring 2015 and fall 2015 while receiving EIBI with a consistent therapist. The analysis of the DRDP assessment clearly illustrates that Nicholas has discovered, expanded and acted upon several developmental domains after participating in EIBI. The following graphs illustrate Nicholas' progress.



**Table 1**

The above chart illustrates the increase in development between fall 2012 and fall 2013 measured by cognitive, language, and social development. The only area where Nicholas had a decrease in score was in motor development.



**Table 2**

The above chart shows a steady increase in social, language, cognitive, mathematical and physical development over a 1.5 year time period with three assessments performed by the same teacher researcher.

### **Comparison of Findings to the Literature**

The research was based upon analyzed articles, which illustrated the ascending progress of preschool children with ASD after participating in EIBI. This particular study is similar in nature to the research study conducted by Nahmias, et al. (2014) that showed that children who attended inclusive preschools had significantly higher scores than those who did not. Cognitive, social-emotional, adaptive behavior and communication scores improved for children who received EIBI in the same setting as their typically developing peers (Nahmias, et al., 2014, p. 316). Nicholas received EIBI at an autism specific preschool each morning, at DRC from a 1:1 aide each afternoon and at his home sporadically. He showed tremendous progress over the critical three year time period in which data were collected.

Similar to Camargo, et al. (2014) after analyzing the 19 studies, it was determined that behaviorally-based interventions qualify as evidence-based practices to improve social interaction skills of children with ASD. While all measured domains are equally as important, social interaction is a paramount goal for educators, therapists, and caregivers when it comes to children with ASD because typically, it is the most difficult domain to improve upon. While Camargo et al. (2014) suggest that general education placement for children with ASD is desirable, they also explain the difficulty that children on the spectrum might face in an inclusive setting such as difficulty initiating and responding to social interactions with peers, sharing objects and activities, and responding appropriately to other's feelings. After Nicholas received EIBI, his social development rating increased from 7.8% in fall 2014 to 27.8% in fall 2015.

## **Summary**

Preschool children with ASD often demonstrate aggressive behavior, lack of engagement in group classroom activities, and limited use of language to express their needs and feelings. Research shows that lack of intervention during this critical time period can be detrimental to the development of the child and creates stress, anxiety, frustration and misunderstanding for the individual with ASD, their parents, teachers, and peers (Hill, et al., 2014). Literature revealed that children with ASD who received EIBI during their preschool years maintained successful relationships with peers through joint attention, displayed increased use of appropriate language, as well as demonstrated an interest in participating in group classroom activities (Barber, et al. 2015). The purpose of the study was to conduct a program evaluation by analyzing student performance pre- and post- assessments by gathering data from a three year time period to report on the effectiveness of EIBI.

The research data supports the use of EIBI as a framework to improve development of children with ASD. Factors which influenced this particular study include the intense level of intervention that Nicholas' received, the consistency of his 1:1 aide and the mixture of education in an autism specific preschool and a general education preschool, and the reliability/validity of the DRDP assessment tool. Nicholas' has been provided the intense therapy that he requires to maximize his independence, to maintain peer relationships and display socially appropriate behavior inside and out of the classroom. This study contributes to the literature that shows EIBI is an effective set of strategies that should be provided to children with ASD during their preschool years.

## **Chapter 5 Discussion /Analysis**

### **Summary of Major Findings**

From spring 2015 to fall 2015, Nicholas displayed a strong increase in development with a 16.6% improvement in language development, 14% in cognitive development, 10% in mathematics, and 13.3% in physical development. Between spring 2015 and fall 2014, Nicholas was participating in the most intense behavior therapy to date with a consistent 1:1 aide at least 30 hours per week in a general education preschool setting and 20 hours per week in an autism specific preschool.

Nicholas' teachers who rated him using the DRDP assessment tool measured the domains. Each assessed developmental domain is measured as: student is responding with reflexes, expanding responses, acting with purpose, discovering ideas, developing ideas, or emerging. The teacher also has the choice to select 'unable to rate.' The specific measures where Nicholas showed a positive increase in behavior, social, and language skills include recognition of own accomplishments, impulse control, cooperative play with peers, friendships with peers, shared use of space and materials, language in conversation, engagement and persistence, and gross motor development. Nicholas displayed a complete lack of interest with peers and group activities on the fall 2012 DRDP assessment and began socializing with peers through taking turns with toys and using verbal cues to initiate play on the fall 2015 DRDP assessment. Nicholas displayed a decrease in motor and perceptual development from fall 2012 to fall 2013 which theoretically could be due to the change in his outdoor playground environment after

transitioning from the toddler playground to preschool playground. The assessed domain that remained stagnant throughout data collection was socio-dramatic play, which is typically an area where children with ASD lack interest, participation or understanding.

### **Implications for Future Research**

Future research on the efficacy of EIBI for preschool aged children with ASD should be conducted in control groups to allow attainment of pre- and post-assessments five, ten, fifteen, twenty years after EIBI to inquire whether or not the skills remain intact years down the line. Further future research, suggested by Bradshaw, Mossman Steiner, Gengoux, and Koegel (2015) consists of assessing the efficacy of EIBI at an even younger age than preschool due to brain malleability while less than 24 months. More research must be conducted to contribute to the literature on the efficacy of EIBI—specifically longitudinal studies so that caregivers and educators can provide therapy that will create life-long lasting skills.

### **Limitations/Gaps in the Research**

The data displayed a consistent increase in language, behavioral and social development for Nicholas. The researcher intended to assess multiple children on the spectrum before, during, and after receiving EIBI throughout their preschool years. Results of this study are limited because only one child was assessed. Reliability of the DRDP tool is limited as well.

### **Overall Significance of the Study**

This research contributes to the literature about the importance of EIBI for children with ASD. The rising trajectory of the assessed student shows that EIBI affected him in a positive way. He acquired and demonstrated appropriate social skills, language, and behavior to function successfully in a general education preschool setting. The researcher's hypothesis that EIBI would positively affect Nicholas' social skills was correct and his assessments showed that during the time period when he was receiving EIBI for an average of 30 hours per week from a consistent therapist, his scores increased dramatically. A significant factor in this particular research is the consistency of the 1:1 aide from spring to fall 2015 when Nicholas displayed the highest ascending trajectory of development.

The significance of contributing research to the efficacy of EIBI is important now more than ever since the rate of ASD has skyrocketed from 1 in 150 in the year 2000 to 1 in 68 today in the United States (U.S. Department of Health and Human Services, 2015). Autism services cost U.S. citizens \$236-262 billion annually but research shows that providing EIBI to young children with ASD can reduce the lifelong cost of care by 2/3 (Ostrow, 2014). Nicholas' progress in language development, mathematics, social skills, peer interaction, and cognitive development are hypothesized by the researcher to be a direct result of consistent, effective EIBI.

### **About the Author**

Catherine Maxwell Dumont is a Graduate Student at Dominican University of California obtaining a Master's Degree in Special Education with an Autism Spectrum Disorder Authorization. After earning a Bachelor's Degree at Sonoma State University in Human Development, she became fascinated with ASD and soon after fell in love with working with

children in need of individualized education. She also earned a certificate of completion from Sonoma State University for completing 360 hours of autism training from the Collaborative Autism Training and Support Program (CATS). As a toddler and preschool teacher, she is well-known as someone who loves to touch the lives of children in a positive way. Along with her husband Beau, Catherine is ecstatic to have welcomed her own bundle of joy, Maddison Kay, into the world in March 2015.

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