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Running Head: IEP Goals and Services

Individual Education Plan Goals and Services for Adolescents with Autism: Impact of Age and Educational Setting

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Abstract

The purpose of this study is to describe the educational programs for adolescents with autism (ages 12-16 years) in inclusion and non-inclusion settings as reflected in their Individual Education Plan (IEP) goals, services, and curricular adaptations. Students who were included in general education math and language arts instruction had fewer overall IEP goals, but goals focused more on applied skill development, whereas students in non-inclusion had goals addressing primarily rote and procedural skills. For students in both groups, all IEP goals were derived from Kindergarten through fourth grade standards. Likewise, for students in both groups, most IEP goals addressed core symptoms of autism (e.g. communication skills) as opposed to academic skill development, along with fewer overall goals and more curricular adaptations as students entered adolescence. Implications for practitioners are discussed.

The incidence of students with autism in our middle schools has increased dramatically in recent years (National Center for Educational Statistics, 2005). Despite this increase in number of students with autism served in schools, autism research has continued to focus primarily on young children in early intervention settings, leaving elementary, middle, and high school teachers and parents with little guidance as to how to best serve these students (Iovnannone, Dunlap, Huber, & Kincaid, 2003; Wilczynski, Menousek, Hunter, & Mugdal, 2007).

Further compounding the difficulty of developing and providing effective services for youth with autism is the varied contexts of education settings. A significant factor in educational contexts is the provision of special education services to youth with autism in special education settings, general education settings, or a combination of both settings (Connor & Ferri, 2007; M. Fisher & Meyer, 2002; Lindsay, 2007; Simpson, de Boer-Ott, & Smith-Myles, 2003). As of 2006, 32.3% of students with autism in the United States spent 80% or more of their day instructed in general education settings, while approximately 38.7% spent less than 40% of their day in general education, and 9% of students with autism were educated at a separate school, indicating increases in the prevalence of inclusion in general education in just two years (*Individuals with Disabilities Education Act (IDEA) Data*, 2006).

Yet students with autism have complex educational needs that require comprehensive services, making it a significant challenge to provide them with an appropriate education regardless of setting (Simpson et al., 2003). An oft-cited challenge of inclusion is a lack of systematic or skilled support in these settings for students with autism (Volkmar, Lord, Bailey, Schultz, & Klin, 2004). Many teachers and paraeducators working with students with autism simply do not have adequate training in evidence-based methods for teaching and managing the behavior needs of these children (Bryson, Rogers, & Fombonne, 2003; Williams, Johnson, &

Sukhodolsky, 2005). Additionally, the idea of maintaining a continuum of service delivery options is considered standard in the educational landscape. While benefits of inclusion have been noted for students with significant disabilities (e.g. Causton-Theoharis & Malmgren, 2004; Cawley, Hayden, Cade, & Baker-Kroczynski, 2002; Dore, Dion, Wagner, & Brunet, 2002; M. Fisher & Meyer, 2002; Hedeen & Ayres, 2002; McCleskey, Henry, & Hodges, 1998; Meyer, 2001), many families and professionals prefer specialized placements for students with autism.

For all students receiving special education services, whether included in general education or instructed in special education settings, special education teams are required to develop student Individual Education Programs (IEPs) for all students receiving special education services. The IEP must contain several key components, including: (1) a description of what kind of special education program a student will receive, (2) what related services a school district will provide to the student with disabilities, and (3) measurable annual goals and objectives (Drasgow, Yell, & Robinson, 2001). A description of the educational program includes the setting in which education will be delivered, including the amount of time students will spend in general education and a rationale for that decision. Educational services, such as speech therapy or paraeducator support, are also described in terms of their frequency, duration, and educational purpose. Educational goals and objectives, as outlined by the Individuals with Disabilities Education Act (2004), have two purposes: (1) to enable the child to be involved in and progress in the general curriculum, and (2) to meet the child's other educational needs that result from his or her disability (Individuals with Disabilities Education Improvement Act, 2004). Lastly, IEP goals and objectives are intended to be written so students make reasonable progress on goals within the time frame allowed (Drasgow et al., 2001) while providing an educational benefit to the student with disabilities (Shinn, 2007).

Despite these legal mandates, teachers struggle with how to provide access to the general education curriculum for students with significant disabilities such as autism (Clayton, Burdge, Denham, Klienert, & Kearns, 2006). Many teachers believe that establishing connections to the general education curriculum is less important for students with significant disabilities, such as autism, than for students with more mild disabilities, such as Attention Deficit Disorder, resulting in instruction based on content outside of general education standards for students with significant disabilities (Lee, Amos, Gragoudas, Lee, Shogren, Theoharis, & Wehmeyer, 2006).

As for all students, the purpose of the IEP for students with autism is to obtain access to and participation in an appropriate educational program in the least restrictive environment. Students with autism have complex educational needs due to the nature of autism: students with autism have needs in communication, social skills, behavior and sensory regulation; students with autism also often have co-morbid conditions such as mental retardation; and finally students with autism have wide ranging skill development needs along with skill generalization requirements (Simpson, 2003). As such, the development of academic skills for students with autism is often overlooked, with IEP goals and services focused instead on the core symptoms of autism (Wilczynski et al., 2007).

An absence of academic goals can result in more restrictive placements with less access to the general education curriculum and diminished contact with typical peers and experiences (Boutot & Bryant, 2005; D. Fisher & Frey, 2001; Taylor, 2004). This limited access to the core general education curriculum may serve to further limit skill development and may be based on assumptions that students with autism cannot learn academic skills in a useful manner (Greenspan & Wieder, 2006). Despite the limited focus on academic skill development for students with autism, the growing increase in the number of students with autism in public

schools necessitates an increased understanding of the skills and needs of these students. Yet there is little recent information described in the literature related to IEP development and resulting skill development for students with autism, subjecting IEP teams to rely on judgment and experience rather than empirical evidence when developing goals, services, and programs for students with autism (Wilczynski et al., 2007).

While all IEP goals and services are by definition individualized and unique to the individual needs of students, variables including setting (inclusion and non-inclusion) and grade may influence IEP team decisions when developing IEP programs and goals for adolescents with autism. Thus, three questions are addressed in this study with the aim of providing additional information for the IEP teams of students with autism. First, what appear to be areas of focus in IEP goals for students with autism? Second, what seem to be trends in goals and objectives as students with autism enter adolescence? Finally, do IEP goals and objectives appear to vary by student placement in inclusion and non-inclusion settings?

Method

Participants

Five special education teachers and fifteen adolescents with autism participated in the study. Students and teachers were recruited for participation in the study via a letter sent to school administrators. Due to the difficulty of establishing contact with school administrators, three school districts were ultimately enrolled in the study, although six districts were contacted. The districts contacted represented diverse student populations and methods of educating students with autism in Northern California. Participants did not receive incentives for participation in the study, although of the three school districts in which contact was made with school administrators, a 100% response and participation rate was obtained for both students and teachers. Upon gaining permission from school administrators, the principals identified and invited teacher participants, who in turn identified possible student participants. Teachers contacted and invited parents and students to consent to participation in the study. Signed assent and consent forms were obtained from students, parents, and teachers.

Adolescents with Autism. Fifteen students with autism (12 males and 3 females) participated in this study. These students had independent diagnoses of autism; none of the students had a diagnosis of Asperger Syndrome. To determine the long-term impact of inclusion or non-inclusion in general education, the student participants were in middle school at the time of the study, or between sixth and ninth grade, when students typically enter adolescence and exit elementary and enter secondary school. Student participants met the following criteria: (1) The students in this study have diagnoses of autism, rather than Asperger Syndrome or other related conditions such as Pervasive Developmental Disorder (PDD). Youth with Asperger and PDD are over-represented in the literature on autism, and as such are excluded from this study;

(2) Students in the study do not have any co-morbid conditions, ensuring that any differences are due to autism and not other conditions such as Down syndrome; (3) The students are native English speakers so that there is no confounding effect between English language learning status and academic abilities; (4) The students have IEPs for the current school year, as well as IEPs dating to at least Kindergarten to ensure that they are presently and continuously have been enrolled in special education; and (5) The students have been continuously enrolled in either inclusion or non-inclusion educational settings since Kindergarten.

As shown in Table 1, seven students were enrolled in inclusion programs, spending 80% or more of their instructional day in general education. These students received math and language arts instruction in general education settings. Eight students were non-included, spending less than 50% of their instructional day in general education and received their math and language arts instruction in special education settings. The students were enrolled in four schools in three school districts in Northern California.

<Table 1 here>

Efforts were made to determine the relative equivalence of students in both groups, using cognitive, adaptive, and academic assessments (Ozonoff, Goodlin-Jones, & Solomon, 2005). As depicted in Table 2, the mean IQ of student participants, as measured by Wechsler Intelligence Scale for Children (WISC), were not significantly different as calculated using ANOVA techniques, indicating that intelligence scores do not differ by placement. In other words,

students with more significant autism were not more likely to be placed in non-inclusion settings. Likewise, the mean adaptive behavior score for these students, as measured by the Vineland Adaptive Behavior Scales, was not significantly different by placement in inclusion and non-inclusion settings, again indicating that skill level did not necessarily impact placement. The mean academic achievement of students placed in inclusion and non-inclusion settings was significantly different, however, demonstrating that those students in inclusion settings performed significantly better on the Woodcock-Johnson Tests of Academic Achievement than students who were not included. It is possible that placement in inclusion settings positively impacted academic skill development, or that those students with higher academic aptitude were more likely to be placed in inclusion settings.

<Table 2 here>

Special Education Teachers. The special education teachers included in this study are the primary special education teachers for the focal students with autism in the study. The primary teachers (also referred to as case managers) of the focal students with autism were selected for participation in this study because they best know the needs and development of the students and could assist in the records review. The teachers have case managed and taught the student participants during middle school, or for the past one to three years, depending on the student's grade level. Furthermore, these teachers provide daily instruction to the adolescents with autism in this study. The teachers are all fully credentialed by the state of California, and have a minimum of two years of experience teaching special education, the necessary amount for a full

(Clear) credential in the state of California. All special education teachers had a clear credential to teach students with severe disabilities (SH credential). Full credentialing was a criterion for this study so that teacher preparation and experience do not confound student instruction or IEP development.

Design

A quasi-experimental design was employed in this study, as random assignment of students to inclusion and non-inclusion settings was not possible. Instead, students in existing placements were evaluated. During the review of IEP records, placement decision discussions were sought to determine why teams decided to place students in inclusion and non-inclusion settings. Unfortunately, these decisions were rarely specified in student cumulative IEP records, making it impossible to know why some students were included in general education and others were not. However, teachers and principals described that two of the schools were not inclusive: one was a school only for students with autism (school D), and another school had segregated classes for students with disabilities on a general education campus (school B). The other two schools, which were in the same school district, had "full inclusion" philosophies (schools A and C), whereby all students with disabilities attended general education classes at their neighborhood school. It appears, then, that residence greatly impacted placement decisions, so that students who resided in non-inclusion districts were not included, while students residing in inclusion districts were included.

Procedure

The cumulative Individual Education Plan (IEP) records for the student participants were reviewed to determine the types and numbers of IEP goals, objectives, services, and curricular adaptations from kindergarten through middle school for each student participant. These records

were obtained with permission from the parents of the student participants, their teachers, and administrators overseeing the educational programs of the students. Each IEP record from kindergarten through middle school for an individual student was analyzed. There was at least one IEP record generated each school year as part of the student's annual IEP meeting. Often, however, IEP teams convened more than once a year to discuss changes in services, the needs or concerns of IEP team members, or to discuss assessment results. In such cases, this IEP addendum was also reviewed as part of this study.

The records were reviewed and coded on-site by the first author, at district or county offices, where such records were stored. A coding sheet was developed to allow for on-site data collection (see Appendix A). Basic student demographic for each record was collected, including student grade, setting (inclusion or non-inclusion and percent of time in general education), the date of the meeting, and any plans included in the IEP (namely behavior support plans or health care plans). Next, information on academic goals was collected. Academic goals were divided between reading, writing, and math skill areas, as determined by the teachers who wrote the goal. Any baseline information provided by teachers pertaining to these academic goals was recorded. For example, in a reading goal area, a teacher could record the baseline information that a student decodes all letter names and reads five high-frequency sight words.

Next, the method of determining this baseline information was recorded. That is, did teachers report assessment results or anecdotal information? The IEP objectives in each content area (math, reading, and writing) were recorded verbatim next. The progress monitoring strategy incorporated into each objective was also recorded, including the persons responsible for measuring the student's goal progress. Next, the California content standard the goal was based on was also described. In such cases when no standard was cited, the appropriate standard was

found by examining the California Content Standards to determine and cite the appropriate standard (Ong, 1998, 1999). In cases when goals were not based on California standards, a non-standard (functional or compensatory) category was created and cited (Browder et al., 2003). Goals were deemed non-standard when both authors agreed that the goal was not tied to any derivation of a California state standard. Finally, a notation was made if the teacher reported the goal was met or unmet.

Number and Types of Goals. To determine the role of non-academic goals and objectives in student IEPs, the number of communication, social, motor/sensory, self-help, and behavior goals were also recorded. Goals were coded by the first author and subsequently checked for errors. The goals coded were included in one of these groups based the following criteria: Communication goals are those goals addressing all communication areas, including developing non-verbal communication through means such as the Picture Exchange Communication System (PECS), improving articulation, and improving pragmatics. Motor and sensory goals address fine and gross motor skill development as well as sensory regulation, such as the use of tactile brushes to soothe students. Self-help goals address independence and self-care skills. Finally, behavior goals targeting improving on-task, appropriate behaviors as well as goals to reduce inappropriate behaviors were also noted.

Curricular Standards for Goals. Upon completion of IEP goal data collection, it became apparent that another layer of analysis was needed. A second data collection form, found in Appendix B, was used to note the content standard of the goal, its associated grade level, an example of a goal, and then the students who had the goal and in which grade they had the goal. This allowed an analysis of goal repetition, out-of-grade level goal documentation, and an understanding of which goals were common to students in terms of type of goals, standard area,

and grade level of the standard. For example, it was found that a 7th grade student had a goal based on a first grade reading comprehension standard in his 3rd, 4th, 5th, 6th, and 7th grades.

Adaptations and Services. In addition to describing goals and objectives, the curricular adaptations and services developed to support student learning as part of the IEP were also recorded. Again, while curricular adaptations and services are unique to individual student needs, the types and amounts of accommodations and services provided in IEPs were reported to determine if student age and placement impacted IEP team decision making regarding types and amounts of adaptations and services. Curricular adaptations in the IEP serve to provide students the supports and resources needed to access curriculum, such as providing students with calculators to complete math problems or word-processors to participate in written expression. Services were reported in terms of the type of service and the frequency and duration of that service. Services included speech therapy, occupational therapy, paraeducator support, and behavioral support services.

Data Analysis. Data analysis of the records review began by describing the number and types of goals and services for each student. Descriptive statistics and frequency counts were used to describe basic information about goals and services, including goals met, how progress was monitored, and what standards goals were based on. To describe mean differences in goals between adolescents who were and were not included in general education, a multivariate analysis was computed to describe the impact of setting (inclusion versus non-inclusion) on the dependent variables (types of goals). Statistical significance and effect sizes were calculated and reported for each set of dependent variables. To control for power in this small sample size, the alpha level was adjusted to a 0.15 level (Stevens, 1996).

Results

IEP Goals

A review of the cumulative IEP files reveals that students have on average 19 IEP goals each year. As shown in Figure 1, the average number of goals varies by age, with students having more goals in elementary school (grades Kindergarten through 5) and fewer average goals in middle school (grades 6 through 9). The number of goals rises between second and sixth grades, and then begins to decline, so that at the transition from elementary to middle school (grades 6-9), the number of IEP goals decreases for the students in this sample. Instructional setting is also associated with number of IEP goals for students with autism: students who are included have fewer average goals (average 12.4 goals each year between Kindergarten and 9th grade) than students who are not included (average 18.5 goals each year between Kindergarten and 9th grade).

<Figure 1 here>

Domains of IEP Goals. An analysis of student IEP goals reveals that goals fall within six primary domains: communication, self-help, motor/sensory, social, academic, and behavior. For all students with autism in this sample, communication goals constituted the largest percentage of IEP goals, at approximately 40.7% of all goals for those students who are included and 37.3% for students who are not included, as seen in Table 3. Self-help goals were the second most frequent goals for both groups, followed by social goals for students who were included and motor/sensory goals for students who were not included. For all students, academic goals constituted a small percent of the total goals; 11.1% of all goals for students who are included

and 8.3% of all goals for students who are non-included. There were no significant between group differences in terms of mean number of IEP goals in each domain. These results indicate that most goals target core deficits in autism (communication) as opposed to academic development (academic goals) for both groups of students.

<Table 3 here>

Within academic goals, students in both inclusion and non-inclusion groups have approximately an equal proportion of reading, writing and math goals, with each goal area constituting about 1/3 of the total academic goals.

<Table 4 here>

All academic goals in the sample were derived from Kindergarten through fourth grade California content standards. For example, although a student is in 7th grade, he has goals derived from a second grade content standard. Some goals were not based on California content standards, and are referred to as non-standard goals. Although these goals are not California state standards verbatim, the mode of the standard has been changed to address a learning need for the student in the sample. For example, a non-standard reading goal in this sample was to read a picture schedule. Reading picture schedules is not explicitly part of the core curriculum in California, but addresses a learning need for a particular student and addresses reading for

meaning in an alternate mode. As shown in Figure 2, most of the goals for both students who are included and non-included came from Kindergarten through second grade standards (65% and 70% respectively). The remaining goals came from third and fourth grade standards for the students who are included and non-included (27% and 11% respectively). Approximately 9% of the goals were non-standards based for the students who are included in general education, whereas 19% of goals were non-standards based for students who were not included.

<Figure 2 here>

Although all students had an approximately equal number of total academic goals, differences were found in the types of goals within each academic domain when IEP goals were analyzed by *English-Language Arts Content Standards for California* (ELA Standards) (Ong, 1998). The ELA Standards identify three areas for reading in the Kindergarten through fourth grade standards: (1) Word Analysis, Fluency and Vocabulary which addresses decoding words fluently and accurately using phonics and sight reading strategies; (2) Reading Comprehension, addressing reading for meaning; and (3) Literary Response and Analysis, which addresses character analysis, figurative language, and other elements of text analysis. A fourth goal area, non-standards based goals, was added during this analysis as some goals did not correspond exactly with California standards.

IEP Goals by Setting. Between group differences were found in this analysis as depicted in Table 5. Students in inclusion settings have more reading goals addressing reading

comprehension than any other area (48.8%), suggesting that priority needs for this group of students involves reading for meaning and understanding. For students with autism who were not included, the primary goal area was non-standards based reading skills (37.1%). A multivariate analysis of variance was conducted to explore the impact of setting (inclusion versus non-inclusion) on the four dependent variables (type of reading goal). To control for power in this small sample size, the alpha level was adjusted to a .15 level (Stevens, 1996). Statistically significant between group differences were detected in that students who are included have more Reading Comprehension goals: F (1, 13) = 2.789, p = .119 with a large effect size, calculated using eta squared, at .177. Statistically significant differences were also found in Literary Response and Analysis goals: F (1, 13) = 5.648, p = .034; however, the students who are not included had no Literary Response and Analysis goals in this sample. Finally, a significant difference was found in non-standards based goals, with the students who are not included having more non-standards based goals: F (1, 13) = 3.528, p = 0.83 and a large effect size of .213.

<Table 5 here>

Similar between-group differences were found in writing goals. The California ELA standards identify four writing areas in Kindergarten through fourth grade standards: Writing Strategies, Writing Conventions, Listening and Speaking Strategies, and Speaking Applications. Writing strategies goals include expressive writing via sentences and paragraphs, while Writing Conventions addresses writing neatly with proper punctuation and capitalization. Listening and

Speaking Applications and Strategies address speaking in complete sentences and understanding oral directions.

As shown in Table 5, students with autism who were included in general education had writing goals addressing writing passages (Writing Strategies) in approximately 50% of their writing IEP goals, while the students who were not included had goals largely addressing writing conventions such as writing neatly and using proper punctuation (approximately 50% of their writing goals). The students with autism who were included had statistically significantly more goals addressing writing strategies than their non-included peers: F (1, 13) = 3.128, p = .100 with a large effect size of .194 calculated using eta squared. While not statistically significant at p < .15, the students who were not included had more non-standards based writing goals than students who were included as shown with an effect size of .148, indicating that again, the students who were not included were more likely to have writing goals not based on state standards. Examples of non-standards based writing goals in this sample included stamping one's first name on a paper and composing a sentence using pictures.

Math goals were also analyzed using the *Mathematics Content Standards for California Public Schools Kindergarten Through Grade Twelve* (Ong, 1999). The California Math Standards fall into five domains in the Kindergarten through fourth grade standards: Algebra & Functions, Number Sense, Mathematical Reasoning, Measurement & Geometry, and Statistics, Data Analysis, & Probability. Algebra and Functions address sorting and classifying objects by attribute. Number Sense includes counting and calculation. Mathematical Reasoning primarily is concerned with determining the approach and materials needed to solve mathematics problems, such as word problems. Measurement and Geometry addresses using tools, such as clocks and rulers, to measure as well as understanding shapes and spatial relationships. Statistics

and Probability is concerned with patterns at the Kindergarten through fourth grade level. Finally, a sixth goal area, non-standards based goals, was included for those goals that were not related to the above mentioned California Math Standards.

As in reading and writing goal areas, significant between-group differences were found in the math content standards for those students with autism who are included in general education and those who are not. As depicted in Table 5, both students who were included and non-included had math goals primarily drawn from the Number Sense goal area. That is, approximately 70% of all math goals for both groups address counting and calculation. Closer inspection reveals some group differences, however. Namely, while most goals for the students who are included address the domain Number Sense, approximately 21% of their IEP goals address mathematical reasoning, or the ability to set up and solve applied problems, while only about 8% of the students who were not included had goals in this area. This finding is statistically significant at F (1, 13) = 4.356, p = .057 and a large effect size of .251. The students who were included had significantly more non-standards based math goals, although these goals only account for 2.4% of all goals; none of the students who were not included had non-standards based math goals. Finally, the students who were not included had statistically significantly more Algebra and Functions goals. Again, however, this goal area only accounted for 2.7% of their entire math goals; the students who were included had no Algebra and Functions goals in this sample.

Progress in Meeting IEP Goals

The students with autism in this sample had goals derived from Kindergarten through fourth grade content standards in addition to non-standards based goal areas. Despite having goals based on early academic content areas, students were largely unsuccessful in attaining their

IEP goals in reading, writing, and math. As shown in Figure 3, students met on average fewer than 70% of their IEP goals each year. Between-group differences in goal attainment are evident. Those students who are included in general education met on average 55.3% of the IEP goals between Kindergarten and eighth grade; those students who were not included met on average 34.3% of their IEP goals between Kindergarten and eighth grade. Ninth grade progress reports are not available for either group as students were currently in ninth grade at the time of the study, and therefore their final goal progress for ninth grade was not yet available.

<Figure 3 here>

While students did not meet many of their goals, the teachers of these students did not report goal progress a significant percentage of the time, with a substantial downward trend over time as illustrated in Figure 4. In Kindergarten, special education teachers reported progress in the cumulative file on average 75% of the time for the students who were included and 71% of the time for the students who were not included. By eighth grade, progress was reported on average only 50% of the time in the cumulative records for students who were included and 32% of the time for students who were not included. Inspection of Figure 4 reveals that the teachers of students in inclusion programs reported goal progress more frequently than teachers in non-inclusion programs in five of the nine reporting periods. Overall, however, teachers in both inclusion and non-inclusion programs did not report progress on IEP goals a substantial percentage of the time. While it is possible that progress on IEP goals was reported to families

in some other form, no permanent record of this reporting could be found in the cumulative IEP records. These findings are consistent with others who note that while monitoring student progress on IEP goals is required under IDEA, there is less compliance with this component than any other (Etscheidt, 2006).

<Figure 4 here>

As there was insufficient data to determine which academic goals were more or less likely to be met by students with autism, the number of times a specific goal was repeated at each IEP cycle was determined. It is assumed that when a goal is repeated, the student did not adequately attain that goal and it was therefore repeated in the next IEP in hopes the student would meet the goal with additional practice and instruction in the upcoming IEP year. For example, a student had a math goal to state the name and value of four coins. This goal first appeared in second grade, but was repeated without any change in third and fourth grade. In such a case, the same goal appeared three times in the student records, suggesting to the researchers that a plausible explantion is that the student was likely not successful in identifying the coins in previous IEPs. However, it is important to note that IEP goals may have been continued or discontinued for a variety of reasons, including the applicabilty and meaningfulness of the IEP goal over time which is an area that requires further investigation in future studies.

In analyzing the IEP goals, it was determined that IEP goals appeared only one time about 50% of the time. That is, in half of all goals the goal was discontinued after one year; it is therefore assumed that half of the goals were met during the first year a student had the goal.

However, this indicates that half of the goals were *not* met during the initial year of instruction, and were therefore repeated. As depicted in Table 6, the average number of times a reading goal was repeated was 2.67 times for students who were included and 2.52 times for students who were not included, indicating that the same reading goal appeared in a student's IEP records for on average 2 and a half years. Reading goals were the most likely goals to be repeated in both groups, with the number of times a goal is repeated ranging from one to nine, indicating that some students had the same reading goal for all 9 years of their education. Math goals were the least likely to be repeated for both groups, with the number of times math goals being repeated ranging from one to eight and 2.09 mean repeats for students who were included and 1.67 mean repeats for students who were not included. Writing goals were repeated on average 2.32 times for students who were included and 1.67 times on average for students who were not included with a range of one to eight repeated goals.

<Table 6 here>

While there are no significant differences in the type of goals repeated for students who are included and not-included in the three broad curricular areas, an inspection of the types of goals reveals some statistically significant differences, as depicted in Table 7. For example, students who were included were more likely to have repeated reading comprehension goals (on average the same goal for 3.92 IEPs) while the students who were not included had more Word Analysis goals repeated (on average the same IEP goal for 2.61 IEPs). Within the broad area of

reading, non-standards based goals were the least likely to be repeated (and presumably the most likely goals to be met) while Reading Comprehension was overall the most likely to be repeated (and presumably the least likely goal type to be met).

Among writing goals, writing strategies (writing sentences or paragraphs) was the most likely goal to be repeated for both students in inclusion and non-inclusion programs. These goals were repeated on average for 2.39 years for both groups, indicating students in both groups had more success in meeting non-compositional writing goals, such as spelling, using correct punctuation, and non-standards based writing skills. Students in both groups were overall most successful in attaining their math goals in that these goals have the lowest mean number of repeated goals, ranging from .25 to 1.99 mean repeated goals. Although only repeated approximately twice, number sense, mathematical reasoning, and measurement and geometry content areas were the most likely math goals to be repeated. Mathematical reasoning had the highest mean number of repeated goals (2.5 for students who were included), indicating that students were least successful in attaining their goals in this content area.

<Table 7 here>

Service and Adaptations

The number and types of IEP services and adaptations were collected from the student's cumulative IEP records to determine if age and setting influence services and adaptations written into IEP documents. Adaptations are changes in the environment, instruction, or materials that

assist students in participating in an instructional activity (Westling & Fox, 2000). As illustrated in Figure 5, the students in this study were provided with a number of adaptations within their IEPs. Adaptations included adjustments to how students would be taught ("input"), such as access to modified or alternative curriculum as well as adjustments to how students would demonstrate their knowledge ("output"), such as allowing students to take alternative tests. Other adaptations present included personnel adaptations such as consultation between professionals serving the student, along with adaptations to support student learning style such as extended time and the use of positive behavioral supports.

As seen in Figure 5, the number of adaptations present in student IEP varies by placement and grade, although individual student needs must drive the development of adaptations and services. Students in early elementary grades (Kindergarten through grade four) have fewer adaptations than students in middle grades (grades five through nine). Likewise, students in inclusion programs have more adaptations present in their IEPs than students who are not included. Early elementary students in inclusion settings have on average 14.6 adaptations, whereas students who were included in middle grades have on average 19.2 adaptations. This suggests that as students enter higher grades with increasingly abstract curriculum (Mastropieri & Scruggs, 2001), more adaptations are provided to students to enable access to and participation in the curriculum. Furthermore, students who were not included have far fewer adaptations within their IEPs across grade levels, suggesting that curricular changes that occur in general education settings have a lesser impact on these students in that a personalized curriculum is already being provided without the need for extensive adaptations, or that students who are not included simply have less access to the core curriculum and thus less need for adapted materials.

<Figure 5 here>

The number of support services provided in student IEPs also varied by age and educational setting. As shown in Table 8, four services appeared in student IEPs: speech and language therapy (speech), occupational therapy (OT), paraeducator support, and behavioral support. The grade of the students was significantly correlated with setting (inclusion versus non-inclusion) and services (OT, Paraeducator, and Behavioral). Younger students with autism (grades Kindergarten through four) were more likely to have OT services in their IEPs, while older students (Grades 5 through 9) were more likely to have behaviorist and paraeducator supports in their IEPs. Setting was also significantly correlated with paraeducator support, in that students who were included in general education were more likely to have Paraeducator supports written into their IEPs than students who were not included.

<Table 8 here>

Discussion

The students with autism in this study had a significant number of IEP goals and services throughout their education. However, we found a shift in the number of goals, services, and accommodations as students enter adolescence for both students who were included and students who were not included. Students in elementary school had more goals than students in middle

school, along with more curricular adaptations in middle school. Students in elementary school were more likely to have remedial services (e.g. occupational therapy) whereas students in middle school were more likely to have support services (e.g. behaviorist and paraeducator supports). While the type and amount of services and adaptations were correlated with student placement in inclusion and non-inclusion settings, it is possible that factors such as student maturation and development exerted a powerful influence on IEP team decision making as well. Altogether, however, these results suggest that educational priorities shift as students enter adolescence and that age appears to influence IEP development and content. During elementary school, IEP teams developed more total goals, likely in an effort to remediate skill deficits while participating in elementary grade curriculum. However, by middle school, curriculum becomes more abstract and inferential, is delivered at a faster pace, and students are expected to work independently and demonstrate adult-like work habits in terms of organization and thoroughness (Mastropieri & Scruggs, 2001). When this curricular shift occurs, we found that students have fewer goals, more curricular adaptations, and more support services.

As such, it appears that IEP teams have lesser expectations of student ability to participate in the core general education curriculum over time. This is evident in the finding that students did not have goals tied to middle school standards; middle school students were being instructed in Kindergarten through fourth grade standards presumably because students lacked the skills to access this more abstract curriculum. Furthermore, students were provided more curricular adaptations likely because the students were being provided instruction that differed from their same aged peers, thus necessitating curriculum adaptations. Finally, student IEPs contained support services so student individualization needs, via paraeducator supports, could

be provided, along with behavioral supports so students would be provided positive supports to maintain their ability to participate in school activities.

Students in inclusion and non-inclusion programs both had a high number of IEP goals and services, along with limited success in attaining each of their goals. This suggests that number of goals and skill development may have an inverse relationship. In other words, with more goals, students become less likely to make sufficient educational progress to meet their goals. Wilczynski and colleagues (2007) have suggested that providing a large number of goals within IEPs can be detrimental in that sufficient time to teach the skills and monitor progress on each goal is not feasible. This claim appears to be substantiated in the results of this study: students had a high number of goals and were unlikely to meet their goals as evidenced by teacher reports of goal progress and the frequency with which IEP goals were repeated. It is likely that students did not receive the amount of instruction needed to make reasonable progress on each goal. Other factors certainly contribute to student IEP progress, including the quality of instruction and relevance of goals to the daily lives of students. However, the sheer volume of goals present in this sample indicate that even high quality teachers delivering instruction focused on high quality goals would have insufficient time and attention to adequately provide instruction for each goal.

Likewise, teacher ability to monitor progress on each goal was clearly lacking in this sample. Teachers were unsuccessful in reporting goal progress a large percentage of time, indicating that perhaps there were simply too many goals, services, and accommodations to balance within each IEP. It is likely that teachers were unable to devote adequate time and resources to provide instruction in and measure progress on each goal. This balancing act is further complicated when No Child Left Behind and IDEA's requirements for participation in

and access to the core general education curriculum are accounted for. Teachers have the task of not only providing instruction in IEP goals and objectives that target individual learning needs, but also of providing instruction in the core curriculum. With a large number of IEP goals, teachers likely did not have enough instructional time to provide adequate instruction in each area. It is possible that teachers would be more successful in allocating appropriate instructional time on each goal if there was more similarity between IEP goals and the core curriculum.

The results of this study further indicate significant differences in educational programs for students with autism who are placed in inclusion and non-inclusion settings. Although the students in the sample had statistically equivalent intelligence and adaptive behavior skills, the types of educational goals in student IEPs varied by setting. Students who are included in general education have more IEP goals targeting higher-order academic skills such as reading comprehension, writing passages for expressive communication, and solving word problems. Students in non-inclusion programs had goals primarily addressing functional rote and procedural learning tasks such as writing neatly, calculating sums and differences, and reading word lists. Altogether, these results suggest that educational setting influences IEP development and contents.

While students who were included also had goals derived from Kindergarten through fourth grade standards, their goals were more likely to reflect applied skills, suggesting students received instruction in these skill areas and participated in higher order thinking skills such how, when, and why to apply these procedures. These problem solving skills have both academic and quality of life applications. Academically, the ability to solve increasingly complex problems allows one to progress in a curriculum and achieve greater skill development. This is evidenced in the introductory statements in both the California Mathematics and English Language Arts

content standards. Both acknowledge the foundational nature of procedural and rote tasks but insist these foundational skills should lead to participation in and understanding of the applied uses of these skills. For example, the ELA standards note that "It is assumed that earlier skills are foundational and requisite for later, more complex higher-order skills and knowledge" (Ong, p. 10, 1998).

In this study, we found that regardless of age, students in non-inclusion settings were more likely to have goals addressing procedural skills rather than applied skills, suggesting they were likewise not receiving instruction in the applied uses of these skills. In terms of quality of life outcomes, the ability to solve problems and apply knowledge has broad implications. Applied instruction and learning advances competence and independence in that students learn to identify, solve, and self-monitor the problems and potential solutions within their own lives (Agran, Blanchard, Wehmeyer, & Hughes, 2002). While the IEP is a highly individualized document, it appears that IEP teams consider student placement in developing goals. It further appears that placement in non-inclusion settings limits student skill development via access to higher order skill instruction.

Limitations and Implications

In all, the results of the present study suggest that placement and age may influence IEP team decisions and IEP development for adolescents with autism. That is, IEP teams appear to be influenced both by individual student characteristics and student age and placement when developing IEP goals, services, and adaptations. This is striking given that IEP contents (i.e. goals, adaptations, and services) are intended to be driven solely by individual student need. Based on the findings of this study, it appears that teachers may consider classroom settings and

the age of students as important factors in student IEP development. More research is needed to understand the basis for these IEP team decisions and to determine why and how the variables of placement, age, and disability diagnosis influence the content of student IEPs.

Emerging research indicates positive student outcomes when instruction and IEP goals are tied to state standards (Browder, Spooner, Wakeman, Trela, & Baker, 2006; Clayton et al., 2006; Cushing, Clark, Carter, & Kennedy, 2005; D. Fisher & Frey, 2001). For example, Browder and colleagues (2006) note that by linking goals to grade level standards, students are provided with a sequential and increasingly challenging curriculum. Despite the good intentions of linking IEP goals to state standards, in practice teachers struggle with how to effectively accomplish this (Agran, Alper, & Wehmeyer, 2002; Browder, Spooner et al., 2006; Flowers, Ahlgrim-Delzell, Browder, & Spooner, 2005; Lynch & Adams, 2008; Walsh, 2001). Continued research is needed to describe how to effectively incorporate IEP goals and individualized instruction within the context of the general education curriculum, particularly in secondary schools.

Furthermore, the importance of a challenging and sequential curriculum cannot be underestimated for students with autism. The curriculum provided in general education is generally tied to state content standards and assessments, ensuring that teaching practice targets the skills students need to meet standards and pass mandated assessments (Browder, Wakeman, & Flowers, 2006; Ward, Van De Mark, & Ryndak, 2006). Often, however, it has been our experience that special education curriculum is rather piecemeal, largely because special educators use a catalog approach to selecting and implementing curriculum (Spooner & Browder, 2006). For example, a special education teacher wishing to address a goal related to telling time may purchase and use a workbook, or pages from a workbook, addressing telling

time. While the IEP goal is being targeted for instruction, a scope and sequence for this instruction is missing, and as a result the student may not receive increasingly challenging instruction or instruction in generalized contexts.

This suggests the importance of providing instruction based on general education curriculum to students with autism. A strong research base further supports the success of embedding IEP goals into general education curriculum (e.g. Jameson, McDonnell, Johnson, Riesen, & Polychronis, 2007; Johnson, McDonnell, Holzwarth, & Hunter, 2004). By providing instruction in IEP goals alongside with instruction in core curriculum, students with autism are provided instruction that targets individualized, functional needs, while also accessing and participating in a challenging curriculum. Thus, aligning IEP goals to content standards is not inconsistent with providing a unique, special education to students with autism, neither it is an expectation that students with autism should perform at grade level. Rather, alignment ensures that instruction is based on a challenging core curriculum that will enable students to make academic progress at his or her individual level. As previously discussed, academic progress has life enhancing implications in terms of developing work and independence skills. In short, aligning IEP goals to content standards provides instruction that is based on, not necessarily equivalent to, the core curriculum. Further research is needed to describe methods for adapting the core general education curriculum to be meaningful and enriching for adolescents with autism.

In addition aligning IEP goals with state standards in general education, teachers must also develop and implement effective data collection strategies for monitoring student progress on IEP goals. Data help teachers evaluate the success of their teaching, to document skill acquisition, and to determine when more instruction or supports are needed (Raver, 2004;

Stecker, Lembke, & Foegen, 2008). Additionally, data provides authentic measures of student ability in day-to-day situations in naturalistic contexts (Gettinger & Stoiber, 1998). Clearly, on-going data collection is an important tool for special education teachers to utilize during their regular instruction and assessment routines. As demonstrated in these results, however, teachers were not successful in documenting student progress on IEP goals, suggesting teachers were likewise unsuccessful in documenting student progress with routine data collection. This illustrates the need to provide teachers with efficient, effective and objective data collection procedures that can be used with relative ease across settings. More research is needed to describe effective and efficient methods to collect and report progress data.

The results of this study indicate positive outcomes for students with autism who are included in general education settings. Several limitations apply to the generality of these findings, however. First, the small sample size and geographically limited nature of these participants prohibits broad generalizations of these findings. Future research is needed to recruit a larger number of student participants from geographically diverse areas, including urban and rural areas. Second, the participants were not placed in inclusion or non-inclusion settings by the authors, and we therefore were unable to carefully document why individual students were placed in inclusion or non-inclusion settings. In the comments sections of some IEP records, a discussion regarding placement was noted. In several instances students appeared to be placed in "autism classes" simply by nature of having an autism diagnosis. However, one school district in the study had a full-inclusion philosophy and no segregated classes existed, and therefore all students were included by default. Efforts were made to match students by IQ and adaptive behavior regardless of setting, but future studies are needed to control for placement

decisions and to further describe why students may or may not be placed in more restrictive settings.

Third, our efforts to determine what kinds of IEP goals were more or less likely to be met were thwarted by the lack of data recorded in cumulative IEP records for these participants. Additionally, due to a lack of available data documenting student success in meeting IEP goals, one plausible explanation appeared to be that repeated goals were those that had not yet been mastered and discontinued goals were hypothesized to have been met. It is clear, however, that a number of factors may contribute to a goal being retained or dropped from subsequent IEPs, including the meaningfulness, age-appropriateness, and the value of the goals for the student. Thus, future research is warranted to explore what kinds of goals students are more or less likely to attain in various settings, controlling for these and other factors. Fourth, evaluating the quality of goals and accommodations, including their meaningfulness to individual students and the myriad of student variables that contribute to student goal progress, was beyond the scope of the present study. The implementation of goals and accommodations from the written IEP document to actual classroom practice was likewise not included in this study. Future research is needed to determine the correlation between the quality of goals and accommodations in terms of student meaningfulness and student progress in the curriculum, as well as the actual implementation of written goals and accommodations in daily classroom life.

Additionally, this study is limited in that California standards were explicitly and verbatim used to link IEP goals to state standards. As the field struggles to determine how goals and standards are linked, this simplified strategy was used. As a result, it is possible that goals were deemed “non-standard” when in fact they are associated with a different mode of a standard (for example, reading a picture schedule addresses reading for meaning). Furthermore, only one

researcher coded IEP goals as relating or not relating to California standards. Thus, inter-rater reliability was not undertaken due to the clear specifications of the alignment of IEP goals to a standard. Future research is needed, however, to further our understanding of the linkages of IEP goals to state standards in light of the potential bias inherent in this data analysis scheme. Finally, the possibility of staff turnover impacting student IEP development and progress monitoring was not accounted for in this study. Special education teachers experience a high rate of turnover (Hunter Quartz, 2003), and as such students in special education may have a different special education teacher each year. All students in our sample had numerous special education teachers during the course of their education. It is possible that staff turnover plays a role in what kinds of goals are developed and how progress is monitored. For example, a teacher who has known a student for three years will have different information and presumably write different goals for the student than a teacher who has known the student for only a few months. Future research is warranted to determine the impact staff turnover has on student IEP development and subsequent implementation and accountability.

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Figure Captions

Figure 1. Average number of goals Kindergarten through middle school

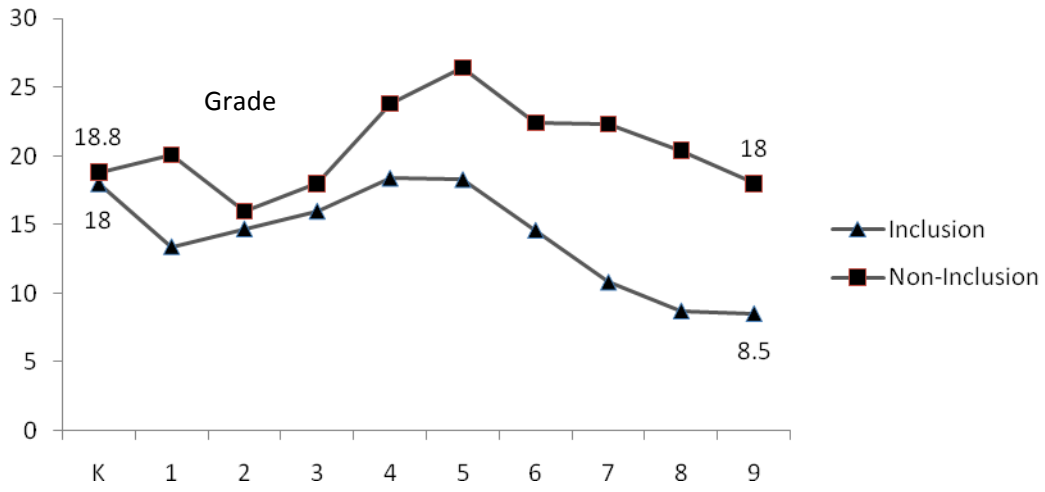

Figure 2. Percent of goals from CA standard grade level

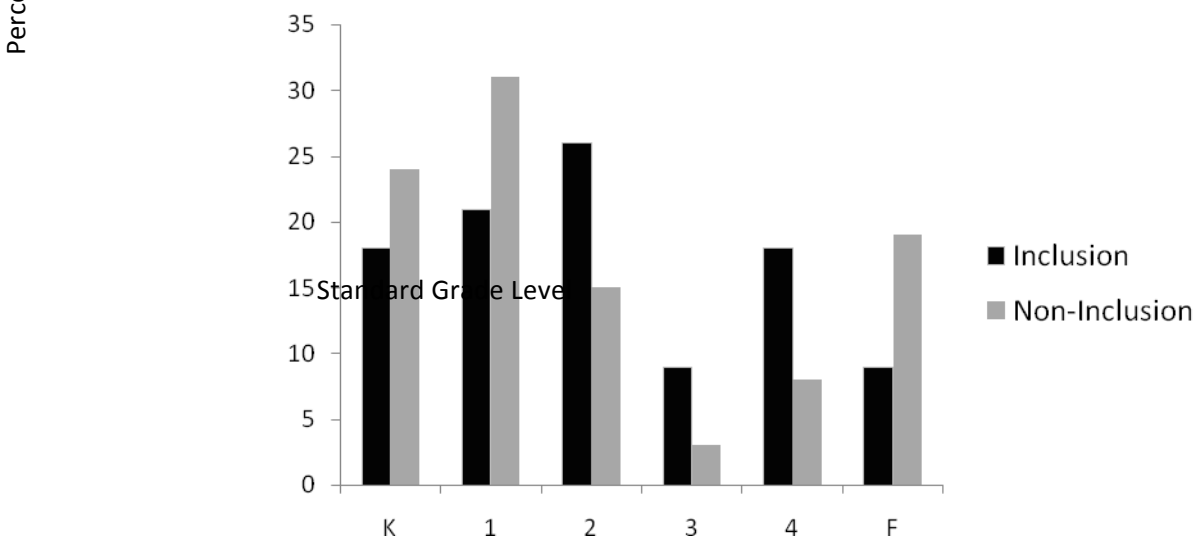

Figure 3. Progress in meeting IEP goals Kindergarten through middle school

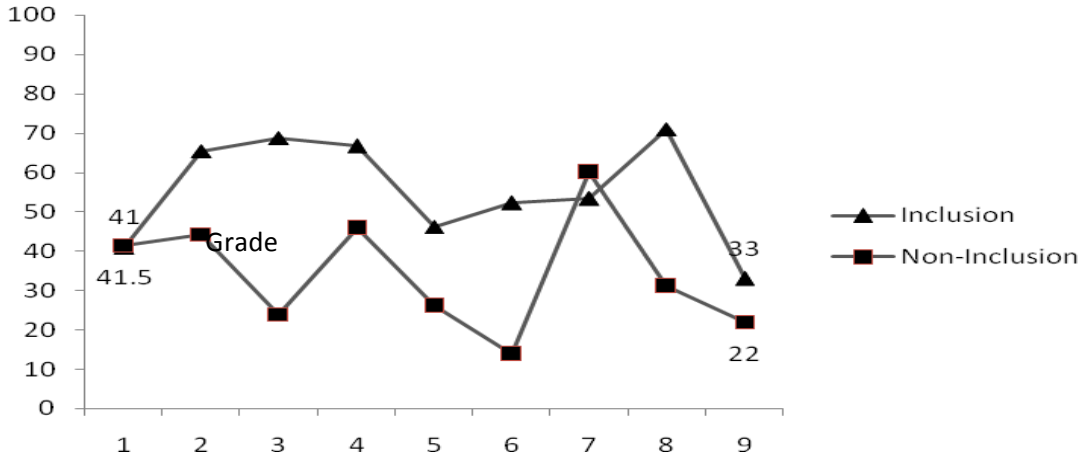

Figure 5. Average number of adaptations present in student IEPs

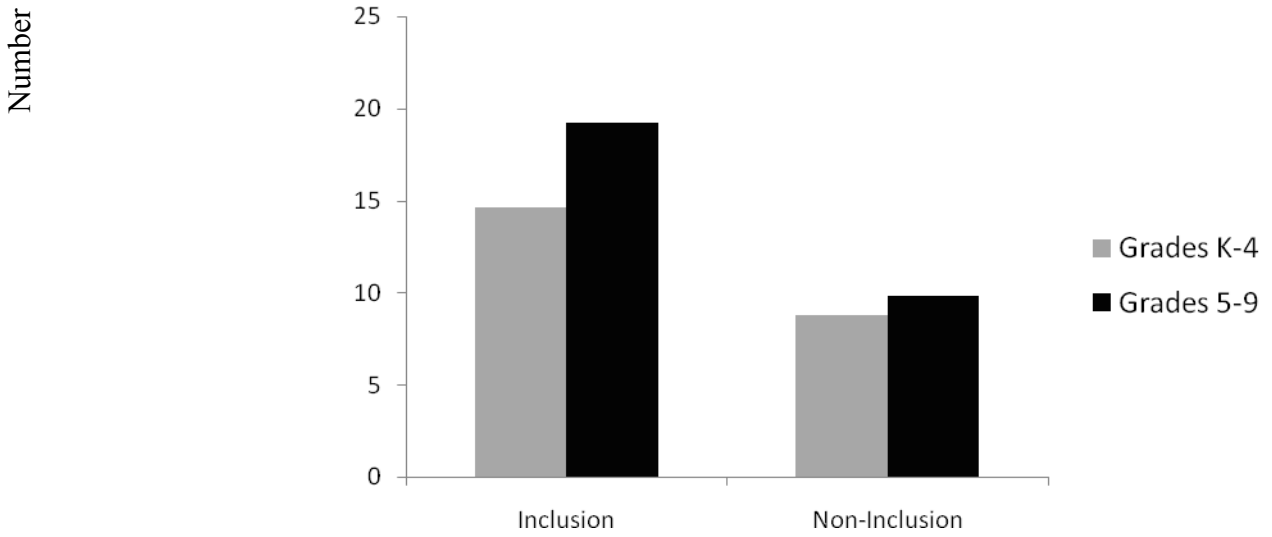

Figure 4. Percent of Time Teachers Report Progress Kindergarten Through 8th Grade

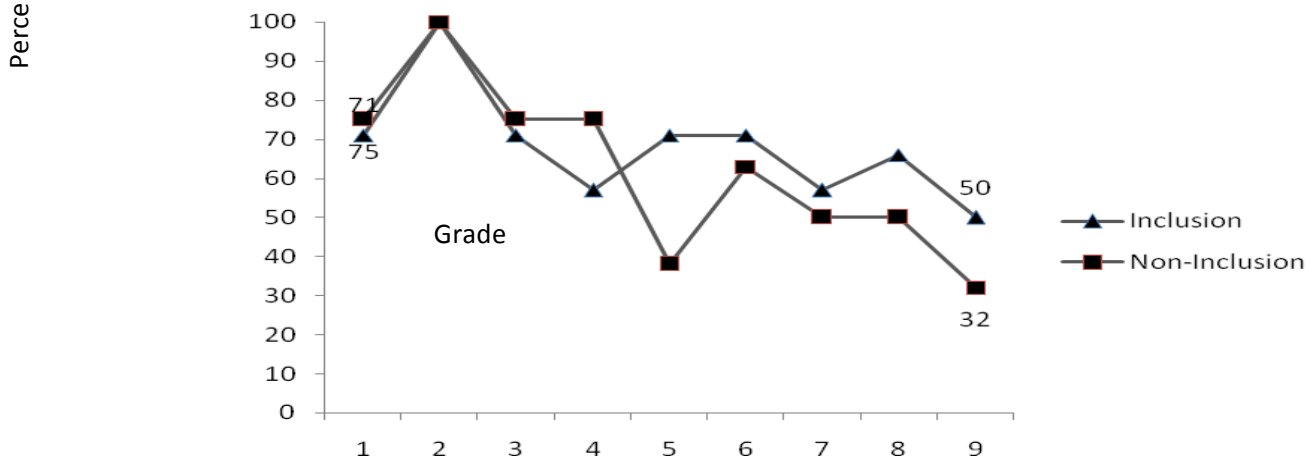

Table 1

Student Demographic Information

Student ID	Program	Grade	Age	School	Gender
1	Inclusion	8	14	A	M
2	Inclusion	9	15	C	M
3	Non-Inclusion	7	13	B	M
4	Non-Inclusion	7	12	B	M
5	Inclusion	7	13	A	F
6	Non-Inclusion	8	14	B	M
7	Non-Inclusion	8	15	B	M
8	Inclusion	9	15	A	M
9	Non-Inclusion	8	14	B	M
10	Inclusion	7	13	A	F
11	Non-Inclusion	9	15	D	M
12	Non-Inclusion	9	15	D	M
13	Non-Inclusion	7	12	D	M
14	Inclusion	8	13	C	M
15	Inclusion	7	13	C	F

Table 2

Student Assessment Scores

Variables	Included	Not Included	P-Value	F-Value	Effect Size
Number of Students	7	8	NA	NA	NA
Mean IQ	64.9	60.0	.66	.851	
Mean Adaptive Behavior	44.4	42.3	.88	1.029	
Mean Achievement	75.4	14.6	.000*	56.115	.419

*p < .001

Table 3

Percent of IEP Goals by Domain

IEP Goal Domain	Inclusion Goals by Domain	Non-Inclusion Goals by Domain
Communication	40.7	37.3
Self-Help	17.7	20.8
Motor/Sensory	13.0	19.9
Social	15.4	9.8
Academic	11.1	8.3
Behavior	2.1	3.9

Table 4

Percent of Academic Goals

Academic Goals	Inclusion Percentage	Non-Inclusion Percentage
Reading	34.2	37.4
Writing	26.2	27.0
Math	39.6	35.6

Table 5

Percent of Reading Goals by California Standard Area

	Standard Domain	Inclusion Percentage	Non-Inclusion Percentage	P-Value	F-Value	Effect Size
Reading Standard Domain	Word Analysis	28.9	30.7	.916	.011	
	Reading Comprehension	48.8	32.2	.119*	2.789	.177
	Literary Response & Analysis	4.7	0	.034***	5.648	
	Non-Standard / Functional	17.6	37.1	.083**	3.528	.213
Writing Standard Domain	Writing Strategies	50.1	26.7	.100**	3.128	.194
	Writing Conventions	41.2	49.7	.805	.063	
	Listening & Speaking	1.5	2.5	.651	.215	
	Speaking Applications	0	0	NA	NA	
	Non-Standard / Functional	7.2	21.1	.156	2.269	.148
Math Standard Domain	Algebra & Functions	0	2.7	.059**	4.267	
	Number Sense	65.6	71.3	.502	.478	
	Mathematical Reasoning	20.7	7.5	.057**	4.356	0.251
	Measurement & Geometry	8.1	17.5	.535	.406	
	Statistics, Data Analysis…	3.2	1.0	.223	1.636	
	Non-Standard / Functional	2.4	0	.044***	4.964	

**Significant at p < .15; **Significant at p<.10; ***Significant at p<.05*

Table 6

Average Annual Repetition of Goals

	Inclusion Mean	Non-Inclusion Mean	P-Value
Reading Goals Repeated	2.67	2.52	.740
Writing Goals Repeated	2.32	1.67	.212
Math Goals Repeated	2.09	1.66	.290

Table 7

Average Number of Goals Repeated by Content Area

	Standard Area	Inclusion	Non-Inclusion	P-Value	F-Value	Overall Mean
Reading	Reading Comprehension	3.92	2.34	.022**	6.739	3.19
	Word Analysis	1.57	2.61	.139	2.486	2.06
	Literary Response	0.5	0	.029**	6.067	0.27
	Functional	1.08	1.5	.037**	5.405	.53
Writing	Writing Strategies	2.46	2.31	.859	.033	2.39
	Writing Conventions	1.46	0.33	.046**	4.859	.95
	Listening & Speaking	1.25	0.57	.562	.354	.93
	Speaking Applications	0	0	NA	NA	NA
	Functional	0.75	1.27	.379	.830	.99
Math	Number Sense	2.15	1.82	.551	.375	1.99
	Measurement…	1.73	1.71	.980	.001	1.72
	Mathematical Reasoning	2.5	1.0	.149*	2.348	1.80
	Algebra & Functions	0.63	0.71	.791	.073	.67
	Statistics…	0.25	0.29	.926	.009	.27
	Functional	0.25	0.5	.400	.758	.37

**Significant at p < .15; **p < .05*

Table 8

Student IEP Services

	Setting	Grade	OT	Speech	Paraeducator	Behaviorist
Setting	–					
Grade	-.387**	–				
OT		-.374*	–			
Speech				–		
Paraeducator	-.563**	.668**			–	
Behaviorist		.464**				–

Appendix A: IEP Goals

Student ID #

Date:

Grade:

Setting:

Plans:

IEP Goals:

Area	Baseline Info.	Determined By	Summarize Objectives	Progress Measured By:	Standard	Was Goal met?
Reading						
Math						
Writing						

	Total	Academic	Speech	Social	Motor	Self-Help	Behavior
# Goals							
% of Total	100						

Adaptations: (verbatim)

Services: (frequency and duration)

Speech/Language: Paraeducator: Other:
Occupational Therapy: Behaviorist:

Appendix B: IEP Goals Analysis Form

Standard Framework	Goal Area	Standard Grade Level	Example	Student ID	Grade of ID