

An empirical examination of toddler development in inclusive childcare

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An increasing number of families are enrolling their children in out-of-home early childcare services. In addition, a growing number of community childcare programs are including children with developmental disabilities. While some studies have explored the effects of inclusion for preschool children with disabilities, there is little knowledge about the effects of inclusion for typically developing toddlers enrolled in such programs. We recently published a study examining parent perceptions of the benefits and limitations of their child's toddler program (inclusion or typical), which found that parents were satisfied with and saw many benefits to inclusion. In the current study, we expand on that research by examining the social, behavioral, communication and cognitive development of toddlers enrolled in the same inclusion program. Scores on standardized assessments were compared with norms for those assessments, and outcomes indicate excellent gains in cognitive and language development and no detrimental behavioral effects of inclusion.

Keywords: *Inclusion; Standardized assessment; Toddler development*

Introduction

An increasing number of families are utilizing early childcare services. Estimates indicate that, in 1999, 60% of all preschool age children in the United States attended center-based, out-of-home child care programs, compared with 52% in 1991 (National Center for Education Statistics, 2001). The number of infants and toddlers in non-relative childcare has likewise increased (see West *et al.*, 1995). Finding enriched and effective out-of-home childcare is important for parents as the literature repeatedly states that quality childcare programs have longstanding positive effects on children's development (cf. National Institute of Child Health and Human Development

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[NICHD] Early Child Care Research Network, 2003a; Votruba-Drzal *et al.*, 2004), and poor programs may have detrimental effects (Loeb *et al.*, 2004). Program factors associated with positive outcomes include a low child-to-teacher ratio, higher staff education, and an environment rich in language experiences and other opportunities for adult modeling and child participation.

Research examining the effects of childcare on development has often focused on cognitive and language development. Controlled studies of center-based childcare have found that quality childcare programs showed positive effects from preschool into adulthood in terms of higher levels of school readiness, educational level, IQ and employment rates (Barnett, 1995; Yoshikawa, 1995; Barnett *et al.*, 1998; NICHD Early Child Care Network & Duncan, 2003; Loeb *et al.*, 2004). For example, Peisner-Feinberg *et al.* (2001) examined the cognitive development of 733 children as a function of the quality of their preschool experiences in community childcare centers. After adjusting for selection bias, childcare classroom practices were measured and child measures were employed including child standardized assessments as well as teacher and parent surveys. Researchers reported that receptive language ability, mathematics ability, and cognitive and attention skills were all positively related to the quality of the childcare center environment. That is, higher mathematics scores in second grade were associated with better preschool childcare practices, and teacher-child closeness showed modest effect sizes for language ability over time.

Studies have also looked at the social development of children enrolled in childcare programs. While some negative results have been found in a few investigations (e.g. increased aggressive behavior in relation to the time spent in daycare and increased levels of cortisol levels during the day) (see NICHD Early Child Care Research Network, 2003b; Watamura *et al.*, 2003), these have been attributed to increased risk factors such as family stress, sensory processing and modulation challenges, and lack of sensitive, nurturing interactions associated with poorer quality childcare (Greenspan, 2003). Additionally, other studies have found very positive social and behavioral effects of early childcare programs. For instance, Barnett (1995) examined the literature on long-term effects of childcare on different developmental domains. He reported that in reviewing studies on socialization, long-term positive effects were evident in parent and teacher ratings. Also, positive effects on delinquency, such as lower rates of contact with law enforcement, were also shown (see also Yoshikawa, 1995). Several early childhood education programs reviewed were associated with increased pride in school achievement, increased pride in school, better relationships with friends and neighbors, and greater adult economic success (Royce *et al.*, 1983; Lally *et al.*, 1988). Thus, there are positive effects for the increasing numbers of children who are now attending out-of-home childcare.

In addition to the increase in typically developing children seeking childcare, the number of children with developmental disabilities receiving early intervention has risen dramatically in the past 10 years. There has been a push within early intervention to provide the most naturalistic educational experiences possible. In fact, US Federal regulations state 'To the maximum extent appropriate to the needs of the

child, early intervention services must be provided in natural environments, including the home and community settings in which children without disabilities participate' (Part C of the Individuals with Disabilities Education Act, 34 CFR Part 303, Early Intervention Program for Infants and Toddlers with Disabilities, section 300). Often, this includes educating children with disabilities alongside typically developing children of the same age in preschool settings. Inclusion programs integrate children with disabilities and typically developing children into the same classroom. This frequently includes incorporation of specialized services, such as having a speech therapist or physical therapist working with the children in the classroom. With the rise in the number of parents seeking high-quality childcare for their toddlers, and new federal regulations mandating inclusion opportunities, the option of full-time inclusion programming is more common. In fact, Wolery *et al.* (1993) reported that the percentage of programs that enrolled at least one child with disabilities was 74.2% in 1990.

Much of the literature promotes inclusion programs for children with disabilities. Most research on inclusive preschool programs reports that children with developmental disabilities in integrated classes make gains in language, cognitive and motor development that are above or comparable with peers in special education classrooms (for example, Fewell & Oelwein, 1990; Peck *et al.*, 1993; McGee *et al.*, 1999; Odom, 2000). Additionally, a study by Burack and Volkmar (1992) demonstrated that students with special needs in integrated (as compared with segregated) programs are better able to learn, accept individual differences, interact, communicate and develop friendships. Toddler-age children have been included in these studies, indicating that very young children with disabilities benefit from education that includes typically developing peers (McGee *et al.*, 1999; Ingersoll *et al.*, 2001). Benefits demonstrated by toddlers in these investigations include improved language and communication, improved social skills, improved play skills and marked gains on cognitive assessments. Research clearly indicates that inclusive classroom programs offer many advantages for children with disabilities and those demonstrating special needs; however, little is known about how these programs affect typically developing children.

A small number of studies have focused on the benefits of inclusive school programming for typically developing preschool and school-age children, although the majority of these studies have focused on social development. One study reported that typically developing children from inclusive classrooms gave significantly higher acceptance ratings to hypothetical peers with disabilities than did children from settings that did not include children with disabilities (Hestenes & Carroll, 2000). These investigators concluded that early childhood inclusive environments encouraged positive interactions and thus promoted learning for all children in the classroom. Daly (1991) also reported that typically developing children exhibited advanced social skills such as how to get along with others. Strain and Cordisco (1994) reported that typically developing children in inclusive settings displayed both improved social skills as well as fewer disruptive behaviors when compared with children in non-inclusive settings. In a study of parent perceptions, parents reported that

typically developing preschool children enrolled in integrated settings displayed less prejudice and fewer stereotypes, and were more responsive and helpful to others, than were children in other settings (Peck *et al.*, 1992). Additionally, teachers have reported that children without disabilities became increasingly aware of the needs of others when they participated in inclusive settings (Giangreco *et al.*, 1993). Other studies report that inclusion programming has been shown as integral to improve the social and academic development of students with and without special needs (for example, Egel & Gradel, 1988; Odom & McEvoy, 1988; Sailor, 1991). Furthermore, typically developing children have been found to rate higher levels of acceptance of peers with disabilities after participating in an inclusive classroom (Peck *et al.*, 1992; Diamond *et al.*, 1997).

Unfortunately, the literature on understanding the effects of inclusive programs for typically developing children is minimal in comparison with the number of studies examining outcomes from inclusion programming for children with disabilities. Additionally, there have not been studies conducted in early intervention programs with toddler-age children; the previous studies all involved older preschool children and/or school-age children. Parents of very young children may have specific concerns regarding placing their toddler in an inclusion program during this critical period of language and social development. Because inclusion programs have been proven beneficial to children with special needs, it is likely the availability of these programs will be increasing. In order to ensure that parents of typically developing toddlers are comfortable with inclusion and the quality of childcare for their children in these settings, the cognitive, social and behavioral development of children in these programs needs to be examined.

We recently conducted a study examining toddler programs from the parents' perspective (Stahmer *et al.*, 2003). Parents of typically developing children enrolled in an inclusive childcare program were compared with age-matched typically developing children enrolled in a typical community childcare program. Results yielded several interesting findings. First, the perceptions of parents of toddler-age children are very similar to those of preschool and school-age children (cf. Miller *et al.*, 1992; Guralnick, 1997). Second, results indicate that there are many similarities between parent perceptions of the benefits of inclusion programs and regular childcare programs. Parents did not perceive any detrimental effects for their typically developing children enrolled in a childcare program alongside children with developmental disabilities. In fact, they felt there may be additional benefits of participation for all children in a well-defined inclusion model program, including gains in positive social skill and behavioral development.

The current investigation expands on the earlier research by examining the development of toddlers enrolled in an inclusive preschool program using standardized assessments. The purpose of this study is to compare the cognitive, communicative, social and behavioral development of toddlers enrolled in a structured inclusion program (which includes children with pervasive developmental disorders) with the norms on those specific assessments. It is our hypothesis that typical toddlers in this program will not suffer any cognitive, social or behavioral

deficits, and may, in fact, demonstrate some gains in language skills due to inclusion programming.

Method

Participants

Participants were recruited from an inclusive childcare program at a Children's Hospital in a large metropolitan community. Children's Toddler School (CTS) is part of the Children's Autism Intervention Center and enrolls eight typically developing toddlers for full-time daycare (18 months to three years of age) along with eight children at-risk for autism (four in the morning session and four in the afternoon) for early intervention programming. Eligible participants were typically developing toddlers aged 18–30 months enrolled in CTS for a minimum of six months. Typically developing toddlers were screened using the Bayley Scales of Infant Development, 2nd edition (Bayley, 1993), to ensure there were no developmental delays before entry to CTS. During the course of recruitment for this study, one child was referred to early intervention services due to standard scores less than two standard deviations below the mean on this assessment.

Families were recruited to participate upon entry into the CTS program. Recruitment for study participation was attempted for 26 children who were enrolled in the program for at least six months. All 26 families approached (100%) agreed to participation. Three of the children were dropped from the analyses because of missing data (they did not complete the Bayley Scales of Infant Development). Therefore, data on 23 children are reported here.

The children ranged in age from 18 to 31 months (mean=23 months) at entry into the study. The average age at exit from the program when final assessments were conducted was 36 months (range = 32–40 months). The majority of the children were Caucasian (65%), 22% were Hispanic, 9% were Asian and 4% were African-American. The age of the parents at the time of entry into the program averaged 36 years for mothers (range, 28–41 years) and 38 years for fathers (range, 30–46 years). All of the parents had at least a high school education, with 35% obtaining a Bachelors level degree and 20% obtaining a Masters Degree or higher. Eighty-three percent of the parents were married at the time of entry into the program. Of the remaining families, there were two sets of parents who were separated, one mother who had adopted her child as a single parent, and one widower. The majority of families had two incomes (91%).

Setting

The CTS at the Children's Autism Intervention Center is located adjacent to the Children's Hospital main building in San Diego, California. The CTS enrolls 12 children per class session, four children with autism and eight typically developing children. The program houses one classroom. The ages of children in the classroom

range from 18 to 36 months. There are two sessions for the children with autism that run Monday through Friday, a morning session from 8:30 a.m. to 1:30 p.m. and an afternoon session from 1:00 to 5:00 p.m. The typically developing children are enrolled for full day-care, which includes lunch and a nap period (in which the children with autism are in another area of the building). At the minimum, there are four teachers in the classroom at any given time, which results in a low child-to-teacher ratio of 3:1. All of the teachers have obtained at least a bachelor's degree in child development or a related field and have completed early childhood education courses required for childcare licensing in California. On a typical day, the children follow a structured daily schedule of free play, snack time, circle time, lunch, nap and free play outside. As a part of the inclusion program, speech and occupational therapists include all of the children in specialized group activities designed to promote communication and motor development. In general, the program attempts to provide a developmentally appropriate toddler curriculum to the children enrolled in the program. Additional emphasis is placed on language, social skills and self-help skills development in order to encourage and facilitate these skills in the children with autism as well as the typically developing toddlers. Incidental teaching techniques are used with all of the children in the classroom, and additional techniques designed specifically for use with children who have autism are implemented with these children (see Stahmer & Ingersoll [2004] or contact the first author for further information about the inclusion program). While these techniques are not specifically utilized with the typically developing toddlers (e.g. picture communication), all of the children are exposed to the various teaching methods.

Measures and procedures

Children were assessed upon entry into and exit from the program. Child outcomes were determined using standardized assessment and an observation checklist. After enrolling in the CTS and before beginning the program, initial measures were completed. The children in the study then participated in the CTS program for a minimum of six months (mean = 13.4 months).

Measures were repeated approximately one week before each child exited the program due to turning 36 months old. The program psychologist administered the Bayley Scales of Infant Development, 2nd edition (Bayley, 1993), a standardized test of developmental functioning, to each child at entry and exit. A mental development quotient on the Bayley scale was used to determine change in child intellectual functioning. In addition, each child's parents completed the Gilliam Autism Rating Scale (GARS) (Gilliam, 1995), an assessment of severity of autistic symptoms based on a national sample of individuals with autism. It should be noted that no norms on the GARS are currently available for children under three years. The autism quotient on the GARS was used to determine whether the children had any symptoms characteristic of autism at entry or exit. The Child Behavior Checklist Ages 2–3 (CBCL-23) (Achenbach, 1992), completed by the child's parents, was used to estimate general emotional and behavioral problems not specifically associated with autism. The

CBCL is a widely used measure of behavior problems and social competence with established reliability and validity that has been standardized by age and gender on large populations from different socioeconomic backgrounds. Language skills were assessed using the Expressive One-Word Picture Vocabulary Test—Revised (Gardner, 1990) and the Receptive One-Word Picture Vocabulary Test (Gardner, 1985). These are normed assessments examining the children's expressive and receptive vocabulary skills using familiar pictures. Standard scores were chosen over age equivalents for all assessments because they factor in developmental maturation, and are thus a more stringent measurement of child progress. Some children did not receive standard scores on language assessments at entry due to their young age.

Data analysis

Two-tailed paired-sample *t*-tests and *z*-tests were used to determine significant differences in performance between the participants and the norm groups on standardized and norm-reference tests. *z*-tests were used when both the norm mean and standard deviation were known. *t*-tests were used when only the norm mean was known, and to compare the scores from entry to exit.

Results

A total of 23 children were assessed on the battery of tests already described. For each of the tests, the experimental group was compared with the norms used for the assessment in order to determine whether or not the children in the inclusion program were performing at a standard that was better or worse than typical on that assessment. Additionally, scores at entry were compared with scores at exit in order to determine whether there were any changes in performance over time. Results are presented in Table 1.

Bayley Scales of Infant Development, second edition

The Bayley Scales of Infant Development (Bayley, 1993) is a developmental assessment with a mean of 100 and a standard deviation of 15. At both intake and exit from the Toddler School program, the average score on this assessment was very close to 100 (see Table 1). No children scored in the below-average range of skills at entry (as this was part of our screening criteria), and all of the children continued to score in at least the average range after participation in the program. Children in the study were significantly more likely to score above the mean on this assessment than the norm group at both time periods (entry, $z = 2.57$, $p = .005$; exit, $z = 2.00$, $p = .023$). There were no significant differences in the standard scores of the children from entry to exit.

Vocabulary assessments

The Expressive One Word Picture Vocabulary Test—Revised (Gardner, 1990) and the Receptive One-Word Picture Vocabulary Test (Gardner, 1985) were both

Table 1. Standardized test scores for typically developing toddlers at entry and exit

Assessment	<i>n</i>	Mean	Standard deviation	<i>z</i> score	<i>t</i> score	<i>p</i> value ^a
Bayley Scales of Infant Development, 2nd ed (mental development index)						
Entry	23	108.04	10.5	2.57		.005
Exit	23	106.04	9.45	2.00		.023
Expressive One-Word Picture Vocabulary Test (standard score)						
Entry	9	113.89	13.83	2.78		.029
Exit	16	113.38	13.13	3.57		.0002
Receptive One-Word Picture Vocabulary Test (standard score)						
Entry	11	104.82	14.74	1.07		.14
Exit	17	111.94	14.86	3.28		.0005
Gilliam Autism Rating Scale (autism quotient)						
Entry	21	58.10	20.42		-9.40	.0001
Exit	14	49.79	25.29		-7.43	.0001
GARS Communication Scale (standard score)*						
Entry	21	5.15	3.60		-5.10	.0001
Exit	14	2.57	3.11		-9.95	.0001
GARS Social Skills Scale (standard score)						
Entry	21	1.81	1.78		-21.12	.0001
Exit	14	2.5	1.99		-14.10	.0001
GARS Stereotyped Behavior Scale (standard score)						
Entry	21	4.15	2.92		-8.94	.0001
Exit	14	3.43	3.18		-7.73	.0001
Child Behavior Checklist (overall standard score)						
Entry	12	50.75	5.48	.2598		.7950
Exit	9	51.89	5.04	.5667		.5709

* Significant difference from entry to exit, $t = 2.165$, $p = .038$

^a A significant p value represents a significant difference between children enrolled in the program and norms on the standardized assessments.

administered at intake and exit in order to obtain information regarding word use. Both of these assessments have a mean of 100 and a standard deviation of 15. At entry, few children received these assessments as they were under two years of age. Children who did complete the assessments were functioning, on average, significantly above the mean in expressive vocabulary (mean = 113.89; $z = 2.78$, $p = .029$) and at the mean for receptive vocabulary (mean = 104.82). At exit, on average, the children's expressive vocabularies remained significantly higher than the norm when the additional children were tested (mean = 113.38; $z = 3.57$, $p = .0002$). Additionally, at exit, the children's receptive vocabularies were significantly greater than the norm on average (mean = 111.94; $z = 3.28$, $p = .0005$). There were no significant

differences in standardized expressive or receptive vocabulary scores across time periods.

Behavioral issues

The GARS (Gilliam, 1995) was administered at intake and exit to examine behavioral symptoms specifically related to autism. The mean of the autism quotient on this assessment for children with autistic disorder is 100; therefore children who do not have autism are expected to have scores below 70. The mean for each of the subscales is 10 for children with autism. The scores for the typical children in this study on the autism quotient, and on each of the subscales, was significantly lower than would be expected for children with autism (see Table 1). The only score that showed significant differences from entry to exit was the communication score ($t = 2.165, p = .038$). The children decreased their autistic-like communication symptoms, probably due to a developmentally appropriate increase in communication skills over time. No parent reported increases in any autistic symptoms over time on any specific scale or for the autism quotient as a whole.

In addition, the CBCL (Achenbach, 1992) was administered at intake and exit to examine emotional and behavioral issues. The mean of this assessment is 50 with a standard deviation of 15. Children with scores over 65 are at risk for behavioral difficulties. This assessment is quite extensive; therefore the number of parents who completed this assessment is somewhat lower than the other assessments presented. For those who completed the questionnaire, children averaged a score of 50.75 on this assessment at intake (range = 38–55) and 51.89 at exit from the program (range = 41–60). Scores were not significantly different from the norm at either time period, nor did they change significantly from entry to exit. No children exited the program with scores in the at-risk range on this assessment. Although only the overall scores are presented here, children were in the typical range for each of the subscales as well. One child exited the program with elevated scores on the somatic issues subscale due to frequent waking in the night, which the parent attributed to a recent move to a new home.

Discussion

There are a few limitations to the study that should be considered. This study accounts for a small number of children in one inclusion program, thus the results have limited generalizability across other programs. The program operates at a prominent Children's Hospital and has the benefit of many added resources from the hospital. Also, the inclusion program is a model program developed by clinicians and researchers with expertise in the area of early childhood development and inclusion programming. The results of this study may not generalize to typical preschool programs in which staff do not have adequate training in children with special needs, adequate space and/or resources or other factors associated with high-quality childcare practices. Results cannot be considered applicable to unstructured inclusion

programs, or programs in which children with disabilities are placed into a community preschool without the appropriate level of support. Finally, the children enrolled in the program come from primarily intact, middle-class families with high education levels. Therefore the high performance of the children in the program may not generalize to other programs with more diversity in enrollment.

Despite these limitations to the study, this is the first attempt at examining the development of typical toddlers enrolled in an inclusion program. The results suggest that typical toddlers included with a high percentage of children with autism continue to perform well across a variety of areas of functioning. These children performed in a developmentally appropriate manner on standardized tests of cognitive and language skills. Additionally, the children did not show an increase in 'autistic' behaviors such as stereotyped behaviors or reduced social skills. Indeed, the children did not 'pick up' aberrant behaviors from being in a program with children who have autism, such as stereotypic behaviors or difficulty with communication and social skills. In fact, the typical children in this program showed increased appropriate communication skills upon exiting the program, indicating appropriate development of social communication such as gesture, eye contact, social use of language, and so on.

Overall, this study represents an important step towards combating misperceptions about inclusion programming, especially during critical periods of development. As mentioned, parents and teachers have reported concern that interacting daily with children with disabilities may negatively impact typically developing children (Green & Stoneman, 1989). Anecdotally, teachers and parents have suggested that participation in inclusion programs somehow lessens opportunities for learning and growth, and they voice concerns their typical children will learn negative behaviors from their peers with disabilities. This unfounded perception is offered even more frequently for early intervention programs of children in the critical development years of toddlerhood. This study provided no evidence for such difficulties. In fact, all of children performed quite well on the standardized assessments and only developmentally appropriate increases in skills were seen. Previous research on parent perceptions of this program supports this idea as the parents from the CTS program reported positive development comparable with parents of children from a nearby regular childcare program, as well additional areas of growth in acceptance of differences and pro-social skills (Stahmer *et al.*, 2003). Thus, results of this study suggest that an inclusion program, as a childcare option for all children, provides comparable if not better services and benefits than a community childcare program. Furthermore, this study reaffirms what past research has shown; inclusion programs can be beneficial to children with and without disabilities.

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