Tracking Preschool Children With Developmental Delay: Third Grade Outcomes

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Abstract

Educational outcomes were evaluated for 2,046 preschool children identified with developmental delay. Results indicated that at third grade, 26% were in regular education and the remaining 74% were receiving special education services. The most common disability classifications at outcome were specific learning disabilities and educable mentally handicaps. Regular education, but not special education, children had higher retention rates than did the general population. The presence of one or more secondary exceptionalities in preschool was more common for special education than regular education children. Regular education and special education children did not differ on other factors studied. This study highlights the importance of developmental delay as an exceptionality category and advances our understanding of the long–term implications of such delay.

The Individuals With Disabilities Education Act (IDEA) and the 1991 amendments (P.L. 102–119) introduced developmental delay as a category of preschool eligibility. *Developmental delay* is a general term that characterizes preschool-age children who demonstrate significant delays in one or more domains of mental, emotional, or physical development. Although the specific criteria for developmental delay vary by state, they typically involve measures of delay based on standard deviation (*SD*) from the mean or percentage of delay (Danaher, 2004). In addition, although some states have added developmental delay to the list of potential disability classifications allowed under IDEA, in other states the developmental delay label subsumes all or some of the other disability categories (Danaher, 2004; Division for Early Childhood of the Council for Exceptional Children, 2001).

The existence of developmental delay as an eligibility category allows children to receive needed services without being assigned a specific disability label (Bernheimer, Keogh, & Coots, 1993; McLean, Smith, McCormick, Schakel, & McEvoy, 1991). The use of this general label is beneficial in that it eliminates the potentially harmful effects of labeling young children with a specific disability and accommodates the limited reliability of assessment instruments in identifying diagnostic categories for young children (Division for Early Childhood, 2001; Holland & Merrell, 1998; Mallory & Kerns, 1988). The application of traditional disability categories to young children is often difficult and may result in the premature categorization, miscategorization, and underidentification of children with delays who do not fit into traditional categories (Division for Early Childhood, 2000, 2001).

The limited age range associated with developmental delay (up to 5 to 9 years, depending on the state) requires that as children mature they must be labeled with a more traditional disability to remain eligible for special education services. Surprisingly, very little research has been done on the outcomes of children identified with developmental delay prior to school entry.

A series of studies conducted at the University of California, Los Angeles (UCLA) represent the bulk of the extant research on the longitudinal outcomes of children identified as developmen-

tally delayed prior to school entry (Bernheimer & Keogh, 1988; Bernheimer et al., 1993; Gallimore, Keogh, & Bernheimer, 1999; Keogh, Bernheimer, & Guthrie, 2004; Keogh, Coots, & Bernheimer, 1996). This research supports the idea that the delays inherent to developmental delay are relatively stable. This series of studies indicated that although some children moved into regular classrooms, the majority of children identified with developmental delay at ages 3 to 4 were moved directly into special education programs upon entrance into elementary school (Bernheimer et al., 1993; Keogh et al., 1996). The majority of children who continued to receive special education services were enrolled in programs for learning handicaps, severe handicaps, and speech and language handicaps at ages 6–7 (Bernheimer et al., 1993) and at ages 9–10 (Keogh et al., 1996). In addition, the cognitive level of these children at age 3–4 was highly correlated with cognitive level at age 6–7, providing further support of stable deficits (Bernheimer et al., 1993). Although a wide range of outcomes were found for these subjects at age 22, many of them demonstrated continued problems in early adulthood (Keogh et al., 2004).

Similarly, an additional set of longitudinal studies of 3- to 7-year-olds enrolled in programs for preschool children with developmental delay indicated that the majority of these children were enrolled in special education classes at 9, 12, and 16 years of age (Dale, Jenkins, Mills, & Cole, 2005; Mills, Dale, Cole, & Jenkins, 1995).

Although these researchers provided an important foundation for research on children with developmental delay, their studies contained relatively small longitudinal cohorts with initial sample sizes ranging from 44 to 205. Research on larger samples of children is needed to more fully understand the stability and nature of the deficits associated with developmental delay and to evaluate the efficacy of developmental delay as a preschool exceptionality category.

We utilized integrated statewide datasets to examine third grade outcomes for 2,046 preschool children identified with developmental delay. Outcomes were measured in terms of both special education placement and grade retention. In addition, the availability of birth certificate records for these children allowed for the evaluation of factors that could potentially differentiate preschool children with developmental delay who continued to receive special education services from those who did not. The factors examined represented disability risk factors (gender, birth weight, gestational age, maternal age, and maternal education), racial/ethnic information (child race, maternal ethnicity), and a severity indicator (secondary exceptionality). A better understanding of the outcomes of children with developmental delay and the factors that influence those outcomes will enhance the projection of service needs, the management of resources, and the provision of services to children with developmental delay.

Method

For the purposes of the present study, we integrated data from the following Florida statewide databases: birth certificate records, preschool exceptionality records (from the Children's Registry and Information System), and public school records. A description of each dataset and the information obtained is provided below.

Birth Certificate Records

Birth certificate record data (i.e., gender, birth weight, gestational age, maternal age, maternal education, child race, and maternal ethnicity) were obtained from the Florida Department of Health for the purposes of conducting health-related research. The data contained in the birth certificate records are standardized by the National Center for Health Statistics, a division of the Centers for Disease Control and Prevention. Information for the records is obtained shortly after the child's birth from medical records and through parent report.

Children's Registry and Information System

Preschool primary and secondary exceptionality information was obtained from the Children's Registry and Information System, a database project funded by the Florida Department of Education. This system was developed in 1990 in response to the need to track children who are potentially eligible for services under IDEA, Part B. The database contains referral, screening, evaluation, and eligibility information for preschool-age children throughout the state of Florida who have been referred to the Florida Diagnostic and Learning Resources System. In addition, service coordination information (e.g., appointments, family contacts, follow-up actions needed) may be entered into the database and is available for ser-

vice providers who work with individual children to ensure the efficient use of time and resources. The data contained in the Children's Registry and Information System provide the Florida Department of Education with a means of documenting Child Find efforts to locate, evaluate, and provide necessary services to at-risk preschool-age children.

Public School Records

Primary exceptionality and grade level were obtained from the Florida Department of Education public school records datasets for the 1996–2002 school years. These datasets contain educational information for all children attending a Florida public school.

Database Integration

The integration of datasets was accomplished using automated deterministic data linkage techniques whereby a computer program identified each child's unique record in each dataset and joined them to establish one record. This data linkage method was based on previously established techniques (Boussy & Scott, 1993; Newcombe, 1988; Redden, Mulvihill, Wallander, & Hovinga, 2000). Records were linked based on an exact match of a child's last name, first name, and date of birth. If any of the matching variables differed, the pair was considered a non-match and was not included in the linked sample. Combining records in this way allowed for the tracking of children from birth, through preschool evaluation and placement, and into the public school system. All identifying information was removed immediately following the automated data linkage process and prior to data analysis to maintain confidentiality.

Diagnostic Criteria for Developmental Delay

In the present study we utilized statewide exceptionality data from Florida, which classifies preschool children using developmental delay in addition to traditional disability categories. Children identified with developmental delay do not qualify for one of the other disability categories (e.g., educable mentally handicapped, specific learning disabled, speech impaired, language impaired, emotionally handicapped). This approach was implemented to identify and provide services to preschool-aged children with delays who would otherwise remain unidentified and likely be referred for special education services in the future. The state of Florida defines *developmental delay* as (a) performance at least 2 *SD*s below the mean or a 25% delay on measures, yielding scores in months in one of the following areas: adaptive, cognitive, communicative, social/emotional, or physical development; (b) performance at least 1.5 *SD*s below the mean or a 20% delay on measures yielding scores in months in two or more of the previously listed areas; or (c) recommendation by the eligibility staffing committee that a developmental delay exists and exceptional student education services are needed (Florida Statutes, 2001). The state of Florida limits the use of the developmental delay classification to children younger than 6 years of age. Therefore, upon turning 6 children must be labeled with a more traditional disability to remain eligible for special education services.

Sample

The sample consisted of 2,046 children (1,473 males) born in Florida and identified with a primary exceptionality of developmental delay as the result of a staffing conducted between the ages of 2.5 and 4.92 years (average age 3.75). They were in the third grade in a Florida public school during the 1999–2000, 2000–2001, or 2001–2002 school years.

Analyses

We determined outcome disability status using the primary exceptionality code listed in the public school record for the academic year in which the child attended third grade. The proportion of children in regular education versus special education in third grade was determined as was the distribution across disability categories.

We determined retention status by reviewing grade levels for the 3 years prior to third grade. This allowed for the identification of children who were retained following first or second grade. Descriptive information on retention rates was computed.

Risk indicators obtained from birth certificate records (i.e., gender, birth weight, gestational age, maternal age, maternal education, child race, and maternal ethnicity) and preschool disability records (i.e., secondary exceptionality) were compared between children in the regular education and special education outcome groups. Independent sample *t* tests and chi-square analyses were utilized for these comparisons.

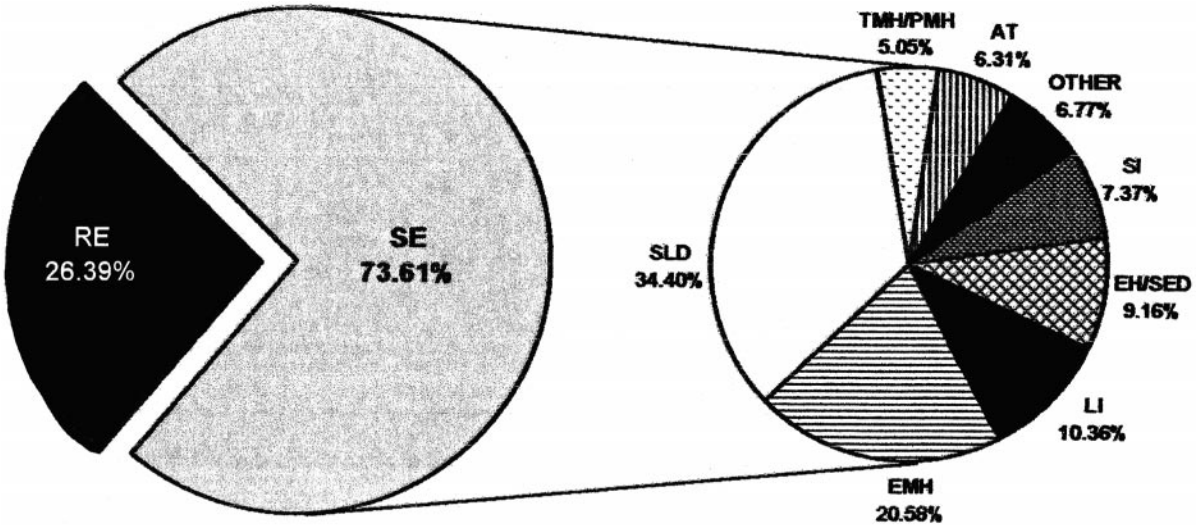

Figure 1. Third-grade primary exceptionality status for preschool children identified with developmental delay. RE = regular education; SE = special education; TMH/PMH = trainable mentally handicapped/profoundly mentally handicapped; AT = autistic; SI = speech impaired; EH/SED = emotionally handicapped/severely emotionally disturbed; LI = language impaired; EMH = educable mentally handicapped; SLD = specific learning disabled.

Results

Special Education Status

Third grade outcome disability status was examined for children with preschool diagnoses of developmental delay. Twenty-six percent of children diagnosed with developmental delay as preschoolers (n = 504) were no longer receiving special education services by third grade (regular education group). The remaining 74% (n = 1,506) of children, however, had an identified primary exceptionality in third grade (special education group). These results are presented in Figure 1. The most common primary exceptionality classifications for these children were specific learning disabled and educable mentally handicapped. Fifty-five percent of children were classified with these disabilities in third grade. Nearly 18% of children had speech or language impairment, 9% had emotional handicaps, 6% had autism, and 5% had moderate or severe mental handicaps.

Retention

First and second grade retention information was examined for the regular education and special education groups. A summary of the retention findings is provided in Table 1. Complete grade level information was not available for 34 regular education children and 68 special education children because these children were not enrolled in a Florida public school for the 4 consecutive years required to obtain this information. Retention in first grade was clearly evident (consecutive grades of 1, 1, missing, 3) for 2 children from each group, and, as a result, these 4 children were included in the retention counts. Due to missing information, the remaining children were classified as unknown because retention status was not apparent.

Regular education outcome. Fifteen percent of the regular education group for which retention could be determined (n = 508) were retained in either first (10.8%) or second (4.3%) grade. None of the children were retained for both first and second grade (data were not available to determine this for 2 children). One child was retained more than once for a given grade (i.e., 3 or more years in the same grade). Comparative grade retention information is not provided by the Florida Department of Education. Therefore, to provide a cross-sectional frame of reference for our results, we determined the overall retention rate for all children in regular education in first and second grade during the 2000–2001 school year. At the end of that school year, 5.3% of children in first grade and 3.0% of children in second grade were retained in the same grade. Descriptively, these results indicate that children in regular education previously identified with developmental delay as

Table 1. Retention Information for Third Grade Outcome Groups for Children Identified With Developmental Delay in Preschool

	Outcome group			
	Regular education		Special education	
Retention category	*n*	%	*n*	%
Not retained	431	84.84	1,293	89.79
Retained				
Grade 1 only	55	10.83	101	7.01
Grade 2 only	22	4.33	44	3.06
Grades 1 and 2	0	0.00	2	0.14
Unknown (missing information)	32	—	66	—
Total	540		1,506	

preschoolers have substantially higher retention rates than do the general regular education population.

Special education outcome. Ten percent of the special education group for which retention could be determined (n = 1,440) was retained in first (7.0%) or second (3.1%) grade. Two children were retained for both first and second grade. None of the children were retained more than once for a given grade (i.e., 3 or more years in the same grade); however, data to determine this were incomplete for 2 children. To provide a cross-sectional frame of reference, we determined the overall retention rate for all children in special education in first and second grade during the 2000–2001 school year. At the end of that school year 7.5% of children in first grade and 3.6% of children in second grade were retained in the same grade. Descriptively, these results indicate that children in special education previously identified with developmental delay as preschoolers have similar retention rates to the general special education population. Retention rates for children in special education are lower than the rates for children in regular education due to grade promotion exemptions available to these students. Children with disabilities may be promoted to the next grade without meeting the levels of performance required for children without disabilities.

Risk Indicators

Information obtained from birth certificate and Children's Registry and Information System records was utilized to evaluate whether children in the regular education and special education groups differed on a number of factors (see Table 2). Results indicated significant differences between the groups on secondary exceptionality, χ^2 (1, N = 2,046) = 30.7, $p < .001$. The presence of one or more secondary exceptionalities in preschool was more common among children with developmental delay who remained in special education (39%) compared to children who were in regular education (26%) at outcome. Significant differences were not found between the regular education and special education groups on the other factors studied (gender, birth weight, gestational age, maternal age, maternal education, child race, and maternal ethnicity).

Discussion

Once identified with developmental delay, the majority of children continued to receive special education services for mild disabilities, such as specific learning disabilities and mild mental handicaps. These results replicated those of past studies indicating that of children identified with developmental delay at 3 to 4 years, 83% were receiving special education services at 6 to 7 years, 78% at 9 to 10 years, and 71% at 11 years (Bernheimer et al., 1993; Keogh et al., 1996). At 9 to 10 years, children previously identified with developmental delay were receiving services for severe handicaps, 30%; learning handicaps, 25%; and other handicaps (e.g., communicative, visual, physical), 23% based on Part B categories as operationalized in California at the time of the study. In our study, which included more detailed disability classifications based on Part B categories as operationalized in Florida at the time of the study, we identified specific learning disability

Table 2. Descriptive Information and Statistical Comparisons for Factors Studied by Third Grade Outcome Groups for Children Identified With Developmental Delay in Preschool

	Outcome group						
	Regular education			Special education			
Factor	*n*	Mean	*SD*	*n*	Mean	*SD*	*t*[a]
Birth weight	539	3,107.79	832.09	1,505	3,073.48	833.14	0.82
Gestation	536	38.02	3.52	1,476	38.03	3.62	−0.06
Maternal age	540	25.63	6.06	1,505	26.05	6.31	−1.36
Maternal education	538	11.78	2.34	1,488	11.75	2.32	0.22
	n	%		*n*	%		X^{2a}
Gender							0.96
Male	380	70.37		1,093	72.58		
Female	160	29.63		413	27.42		
Race							3.70
White	328	60.85		983	65.32		
Black	203	37.66		506	33.62		
Other	8	1.48		16	1.06		
Ethnicity							0.09
Non-Hispanic	477	88.50		1,339	88.97		
Hispanic	62	11.50		166	11.03		
Secondary exceptionality							30.7*
0	399	73.89		924	61.35		
1	6	1.11		56	3.72		
2 or more	135	25.00		526	34.93		

[a]Continuous variables were analyzed using *t* tests and categorical variables were analyzed using chi-square analyses.
*$p < .001$.

(34%), educable mentally handicapped (21%), and speech or language impairment (18%) as the most common outcomes for children with developmental delay.

Additional longitudinal studies indicate that of children enrolled in programs for preschool children with developmental delay, 66% were enrolled in special education at 9 and 12 years and 61% at 16 years (Dale et al., 2005; Mills et al., 1995). Although specific disability categories were not indicated in these studies, placement category was examined at the 9-year outcome. These researchers estimated that 79% of the children in special education at outcome had disabilities in the mild to moderate range.

The high proportion of children with mild disabilities at outcome provides strong support for the use of developmental delay as a category of exceptionality for young children. Although mild learning problems, such as specific learning disabilities and mild mental handicaps, are the most difficult to identify at an early age (Meisels, 1989; Mercer, Algozzine, & Trifiletti, 1988), they are also the most responsive to early intervention (Brassell, 1977; Bricker & Sheehan, 1981; Dunst, Trivette, & Cross, 1986; Fewell & Glick, 1996; Marfo, Browne, Gallant, Smyth, & Corbett, 1991; Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992). The developmental delay classification provides a viable solution for children with nonspecific delays that do not meet criteria for more traditional disability categories.

It is important to recognize, however, that over one quarter of the children in the present study were not receiving special education services at outcome. Early identification and service provision likely played an integral role in the shift from special education to regular education for many of these children.

Severity is also an important factor to consider when examining outcomes for children with disabilities. Keogh and colleagues identified sever-

ity as the primary signal of long-term deficits in children with developmental delay (Keogh, Bernheimer, & Guthrie, 1997). Detailed information on severity was not available for use in this study, but the importance of severity is supported by the increased proportion of children with one or more identified secondary exceptionalities in preschool receiving special education services in third grade. The presence of multiple disabilities indicates additional impairments that likely make remediation more difficult.

Integral to the study of outcomes for children with developmental delay is the evaluation of the academic success of children no longer receiving special education services. Although enrollment in regular education is an indicator of positive progress, it is not a guarantee of academic success. The results of our study indicate that retention rates for children with developmental delay who were in regular education at outcome were higher than the overall rates for children in Florida public schools. Even so, the vast majority of children with developmental delay who were in regular education by third grade consistently met the criteria for grade promotion. It is important to note that retention policies may vary by school districts. As such, these results should be interpreted with this limitation in mind. Additional research is necessary to more thoroughly examine academic progress with more reliable and detailed measures, such as grades and/or standardized test scores.

Several factors present at birth were examined to evaluate potential relations to child outcome. Although most of these variables have been clearly established as risk factors for disability, no significant differences were identified between the regular education and special education outcome groups. Further evaluation of other factors (such as severity of deficits) that may be associated with child outcome is needed.

The present study supports the utilization of the developmental delay category of exceptionality for young children with nonspecific delays. Although the majority of children identified with developmental delay continue to require special education services, approximately one quarter of these children were in regular education by third grade. Identification of the outcomes of young children with developmental delay advances our understanding of the long-term implications of developmental delay and provides valuable information for projecting service needs and managing resources in order to better serve these children.

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