

Motor, Social, and Cognitive Skills Among Pre-Kindergarten Children with Developmental Disabilities

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This study examined how fine and gross motor skills, cognitive skills, and social skills were related among preschool children with various developmental disabilities. For children with intellectual disability and specific learning disorder, fine motor skills were associated with cognitive skills, though these skills were less related for children with other disability types. Gross motor skills were not related to cognitive or social skills for any of the disability groups.

Background:

Young children need to coordinate many different skills to be successful in preschool (see Sidebar 1). In the classroom, all children—with or without disabilities—are engaging in novel cognitive tasks like recognizing letters and learning to count. At the same time, they are exposed to group settings with similar-aged children and must learn effective social skills. Because preschool is the first school experience for many children, identifying the readiness skills that support their success is crucial.

Recent research has identified motor skills as important for children’s learning and development. Motor skills include both gross motor skills, which involve using larger muscles in activities like crawling and walking; and fine motor skills, which involve using smaller muscles such as fingers and hands. Motor skills are essential for many tasks that children perform in classrooms, such as writing, drawing pictures, and pointing to objects. Further, the ability to easily perform motor tasks means young children can focus their limited attention toward learning more complex cognitive and social skills rather than motor movements. Having motor skills automated is particularly beneficial when children must engage in classroom tasks simultaneously, such as picking up a pencil and counting objects while also interacting with adults and peers.

Most of what we know about children’s motor, cognitive, and social skills comes from research on typically developing children. Less is known about how these skills relate in children with various developmental disabilities. These children are of particular interest because different developmental disabilities may have a shared origin, with poor motor skills a common factor. In addition, despite

sharing certain features, children with developmental disabilities exhibit different combinations of symptoms, and previous research has not explored how motor skills may differentially contribute to social and cognitive skills depending on the type of disability.

Examples of Developmental Skills

Fine Motor Skills

- Copying a model in two or three dimensions
- Holding and writing with pencils, crayons, or markers

Gross Motor Skills

- Balancing on one foot
- Using hands to successfully catch a ball

Cognitive Skills

- Counting blocks
- Matching similar pictures

Social Skills

- Handling frustration well
- Taking turns when playing a game

Sidebar 1

The Study:

The current study was part of a larger, university-community collaborative evaluation of early childhood programs and services located in a large urban area of a Southern U.S. state. The study’s purpose was twofold: (1) to examine how motor, cognitive, and social skills are related among preschool-age children with developmental disabilities; and (2) to investigate differences in associations between motor skills and cognitive and social skills depending on children’s disability type.

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A total of 2,029 preschool children ($M = 4.61$ years; $SD = 0.33$) were assessed. Two-thirds (67%) percent of children were male; 67% identified as Hispanic/Latino, 21% identified as African American, and 12% identified as White or Other. Of the full sample, 25% were diagnosed with Intellectual Disability, 10% with Speech/Language Impairment, 44% with Specific Learning Disorder, and 21% with Autism Spectrum Disorder (see Sidebar 2).

At the beginning and end of the year, pre-kindergarten teachers completed two survey measures about individual children: the Learning Accomplishment Profile-Diagnostic¹ (LAP-D) about children's cognitive and motor skills, and the Devereux Early Childhood Assessment² (DECA) about children's social skills.

Descriptions of the Four Developmental Disabilities in this Study^{3,4}

Specific Learning Disorder

Cognitive deficits in one or more academic areas, like reading or math

Speech Language Impairment

Deficits in the broader language system that interfere with the ability to communicate

Intellectual Disability

Impairments in general cognitive capacity and adaptive behavior

Autism Spectrum Disorder

Different severities of deficits in social interaction and communication across multiple contexts, as well as displaying repetitive, stereotype behaviors and restricted interests

Sidebar 2

Findings and Practical Significance

Across the entire sample of children with developmental disabilities, fine motor skills were more closely related than gross motor skills to improvements in cognitive and social skills during preschool. However, the type of disability also

mattered. Specifically, when looking at children with Intellectual Disability or Specific Learning Disorder, good fine motor skills were important for improvements in cognitive skills, but not social skills. In contrast, for children with Autism Spectrum Disorder or Speech/Language Impairment, fine motor skills were not meaningfully related to cognitive or social skills.

These findings generally support what we know about motor development during early childhood. Theory suggests that fine motor skills may help preschoolers to better interact with the physical and social environment; thus, it makes sense that fine motor skills are strongly related to cognitive and social skills, even for children with disabilities. Notably, this study is the first to show that this association between fine motor skills and cognitive and social skills is stronger among children with Intellectual Disability and Specific Learning Disorder compared to children diagnosed with Autism Spectrum Disorder or Speech/Language Impairment.

This research has important implications for practice. There may be a tendency for teachers to focus on cognitive and social skills to enhance development in those areas; however, attention to children's fine motor skills may also be an equally important focus for teachers.

This study reveals a great deal of variation among preschool children with developmental disabilities. While certain developmental disabilities may share similar symptoms, schools often identify children using mutually exclusive disability categories. Practitioners should be made aware that teaching an entire classroom with a single, blanket approach may not be an effective instructional strategy.

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² Nehring, A. D., Nehring, E. F., Bruni, J. R., Randolph, P. L. (1992). *LAP-D: learning accomplishment profile diagnostic standardized assessment*. Kaplan Press, Lewisville, NC.

³ LeBuffe, P. A. & Naglieri, J. A. (1999). *The Devereux early childhood assessment (DECA)*.

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⁴ American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*. Arlington: American Psychiatric Publishing.

⁵ Hill, E. L. (2001). Non-specific nature of specific language impairment: A review of the literature with regard to concomitant motor impairments. *International Journal of Language & Communication Disorders*, 36, pp. 149-171.

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