

## Early Educational Inclusion and Language Component Development in Children with Speech and Language Deficits: A Comparative Study

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### Abstract

This study investigates the impact of early school inclusion on language development components in children with speech and language deficits aged 2.5 to 5 years. Using a comparative analysis between two groups-children who received early school placement plus language therapy and those who received only language therapy without school inclusion-this research examines outcomes across multiple language domains. Results indicate that early inclusion offers significant benefits for pragmatic language skills and vocabulary acquisition, while showing variable effects on syntax and morphology development. These findings suggest that structured peer interaction in educational settings may complement traditional language therapy interventions, particularly for social-communicative aspects of language development.

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### 1. Introduction

Speech and language deficits affect approximately 7-10% of preschool-aged children worldwide and can have cascading effects on academic success and social growth, and emotional well-being (Bishop *et al.*, 2017; Law *et al.*, 2019). Early intervention is widely recognized as crucial for optimizing developmental outcomes (Guralnick, 2017), yet considerable debate exists regarding most effective intervention settings and approaches for young children who are delayed in speaking.

Traditional approaches to early language and speech intervention have primarily focused on direct therapy services delivered in clinical settings or home environments. However, increasing attention has been directed toward inclusive educational environments as potential contexts for language learning and development (Justice *et al.*, 2018). Educational inclusion provides children having language impairments access to typically developing peer models and naturalistic communication opportunities that may supplement structured therapeutic interventions.

This study addresses a critical gap in literature by examining how early inclusion in educational settings-defined as school enrolment between ages 2.5 and 5 years-affects specific

components of development of language in children having diagnosed language and speech deficits. By comparing children who receive both early school placement and language therapy with those who receive only language therapy without school inclusion, this research aims to isolate the potential contribution of educational inclusion to language outcomes.

### 2. Literature Review

#### 2.1 Components of Language Development

Language development encompasses multiple interconnected components: phonology (sound system), semantics (vocabulary and meaning), morphology (word structure), syntax (grammar), and pragmatics (social use of language) (Hoff, 2014). Children with speech and language deficits may demonstrate challenges across one or more of these domains, with varying profiles of strengths and weaknesses (Leonard, 2014).

#### 2.2 Early Intervention Approaches

Evidence supports the efficacy of therapy of speech-language for young children having language delays (Law *et al.*, 2017). Intervention approaches vary widely, including clinician-

directed therapy, parent-implemented intervention, and hybrid models (Roberts & Kaiser, 2011). These interventions typically target specific language domains through structured activities and practice.

### 2.3 Educational Inclusion and Language Development

Research examining the impact of inclusive educational settings on language development has produced mixed findings. Some studies suggest that preschool inclusion facilitates language growth through peer modelling and increased communication opportunities (Justice *et al.*, 2014; Mashburn *et al.*, 2009). Conversely, others raise concerns about whether children with language deficits receive sufficient individualized support in inclusive settings (Odom *et al.*, 2011). Few studies have specifically examined how inclusion affects discrete components of language. Previous research has primarily focused on overall communication skills or generalized language measures rather than analysing effects on phonology, semantics, morphology, syntax, and pragmatics separately (Guralnick *et al.*, 2008; Phillips & Meloy, 2012).

### 2.4 Theoretical Framework

This study is grounded in Vygotsky's sociocultural theory (1978), that emphasizes role of social interaction in cognitive and linguistic development. According to this perspective, language learning occurs through guided participation in communicative exchanges with more skilled partners-both adults and peers. Educational settings provide structured opportunities for such exchanges that may complement traditional therapy approaches.

## 3. Methodology

### 3.1 Research Design

This study used a quasi-experimental design with two comparison groups:

- Inclusion Group:** Children with speech and language deficits who received both early school placement (between ages 2.5-5 years) and traditional language therapy
- Therapy-Only Group:** Children having speech and language deficits who obtained language therapy without school inclusion during the same developmental period

Participants were assessed at baseline and after 12 months of intervention using standardized language measures and observational protocols.

### 3.2 Participants

Participants included 78 children (42 males, 36 females) aged 2.5 to 5 years ( $M = 3.7$  years,  $SD = 0.8$ ) with diagnosed speech and/or language deficits from Kerala, India. Inclusion criteria were:

- Primary diagnosis of speech or language delay or disorder
- No severe sensory impairments (vision, hearing)
- No known diagnosed autism spectrum disorder or intellectual disability

The Inclusion Group comprised 41 children, while the Therapy-Only Group included 37 children. Participants were matched on key variables including age, gender, socioeconomic status, and baseline language severity.

### 3.3 Settings

Children in the Inclusion Group attended developmentally appropriate educational programs with typically developing

peers in Kerala. These programs included traditional preschools, early childhood education centres, and inclusive classrooms. All settings maintained at least a 5:1 ratio of typically developing peers to children with language delay and employed teachers with early childhood education qualifications.

Both groups received speech-language therapy from the same certified speech-language pathologists using comparable intervention approaches (combination of direct therapy and parent coaching). Therapy dosage was similar across groups ( $M = 90$  minutes weekly, range 45-90 minutes).

### 3.4 Measures

Language skills were assessed across five components using Language and Speech Development Chart (2nd Ed.) by Gard, Gilman, and Gorman (Pro-Ed, 2016), a comprehensive developmental assessment tool that evaluates multiple language domains across age ranges:

- Phonology:** Speech sound acquisition milestones and phonological process analysis sections of the Speech and Language Development Chart
- Semantics:** Receptive and expressive vocabulary sections of Speech and Language Development Chart, supplemented with language sample analysis for lexical diversity
- Morphology:** Grammatical morpheme acquisition section of Speech and Language Development Chart
- Syntax:** Sentence structure development section of the Speech and Language Development Chart, supplemented with Mean Length of Utterance (MLU) calculations from language samples
- Pragmatics:**
  - Social Responsiveness Scale-2 (SRS-2; Constantino & Gruber, 2012)
  - Communication DEALL Developmental Checklist (Karanth, 2007), a culturally appropriate assessment tool developed in India for evaluating social communication skills

For each domain of Speech and Language Development Chart, age-equivalent scores were calculated based on child's performance relative to developmental milestones. Additionally, a developmental quotient (DQ) was derived by dividing child's language age by chronological age and multiplying by hundred, providing a standardized metric for comparison across age groups.

### Additional Measures Included

- Parent interviews
- Teacher/therapist ratings of progress
- Observational measures of classroom participation and peer interaction

### 3.5 Procedures

After an informed consent from the parent, participants underwent baseline assessment of language skills. Data collection occurred at two time points: prior to intervention (T1) and after 12 months (T2). All assessments were administered by trained speech-language pathologists blind to group assignment. Language samples have been collected during structured play interactions and subsequently transcribed and analysed according to Speech and Language Development Chart protocols.

### 3.6 Data Analysis

Between-group differences in language outcomes were analysed using mixed-model ANOVAs with one between-subjects factor (Inclusion vs. Therapy-Only) and one within-subjects factor (Time: T1 vs. T2). Separate analyses were conducted for each language component. Effect sizes have been computed using partial eta squared. Additional regression analyses examined predictors of language growth, including intensity of inclusion (hours per week), classroom quality indicators, and child characteristics.

## 4. Results

### 4.1 Baseline Comparisons

No significant differences were found between groups at baseline on demographic variables or language measures, confirming appropriate matching. Both groups demonstrated below-average performance across language domains relative to age expectations, with greatest difficulties in morphology and syntax.

### 4.2 Treatment Fidelity

Both groups received comparable therapy dosage (Inclusion:  $M = 58.7$  minutes weekly,  $SD = 12.3$ ; Therapy-Only:  $M = 61.2$  minutes weekly,  $SD = 14.1$ ;  $p = .42$ ). Children in the Inclusion Group attended educational programs for an average of 16.8 hours weekly ( $SD = 7.4$ , range 6-30 hours).

### 4.3 Phonological Outcomes

Using the Speech and Language Development Chart's phonological components, both groups demonstrated significant improvements in speech sound acquisition over time ( $p < 0.001$ ,  $\eta^2 = .29$ ). Analysis of phonological age-equivalent scores showed mean improvements of 9.7 months for the Inclusion Group and 8.9 months for the Therapy-Only Group over the 12-month intervention period.

The Group  $\times$  Time interaction wasn't significant ( $p = 0.20$ ,  $\eta^2 = 0.02$ ), indicating similar patterns of phonological development across groups. Both groups showed comparable reductions in phonological process errors, with the most substantial improvements observed in final consonant deletion and cluster reduction.

Developmental quotient (DQ) for phonological skills improved from a mean of 76.3 to 82.1 in the Inclusion Group and from 75.8 to 80.4 in the Therapy-Only Group, with no significant difference between groups in magnitude of improvement ( $p = .39$ ).

### 4.4 Semantic Outcomes

#### 4.4.1 Receptive Vocabulary

Analysis of receptive vocabulary sections of the Speech and Language Development Chart revealed significant main effects of Time ( $p < .001$ ,  $\eta^2 = .33$ ) and significant Group  $\times$  Time interaction ( $p = 0.019$ ,  $\eta^2 = 0.07$ ). The Inclusion Group demonstrated greater gains in age-equivalent scores for receptive vocabulary (mean improvement: 11.3 months) compared to the Therapy-Only Group (mean improvement: 7.8 months) over the 12-month intervention period.

The developmental quotient for receptive vocabulary increased from 79.4 to 86.5 in the Inclusion Group compared to an increase from 80.1 to 83.2 in the Therapy-Only Group, with the difference in improvement being statistically significant ( $p = .021$ ).

### 4.4.2 Expressive Vocabulary

Similar patterns emerged for expressive vocabulary as measured by the Speech and Language Development Chart, with the Inclusion Group showing significantly greater improvements in age-equivalent scores (mean increase: 10.8 months) compared to the Therapy-Only Group (mean increase: 7.3 months,  $p = 0.016$ ,  $\eta^2 = 0.07$ ).

Analysis of lexical diversity in language samples corroborated these findings, with the Inclusion Group demonstrating a significantly greater increase in the number of different words used (mean increase: 41.6 words) compared to the Therapy-Only Group (mean increase: 28.4 words;  $p = 0.018$ ,  $\eta^2 = 0.07$ ).

### 4.5 Morphological Outcomes

Assessment using the grammatical morpheme acquisition section of the Speech and Language Development Chart showed significant improvements in both groups over time ( $p < .001$ ,  $\eta^2 = .23$ ). The Group  $\times$  Time interaction approached but didn't reach statistical significance ( $p = .054$ ,  $\eta^2 = .05$ ), suggesting a trend toward greater morphological improvement in Inclusion Group.

Mean age-equivalent score improvements were 8.9 months for the Inclusion Group compared to 6.7 months for the Therapy-Only Group over the 12-month intervention period. Analysis of specific morphological structures revealed that the Inclusion Group demonstrated significantly greater enhancement in acquisition of present progressive markers (-ing), plural forms (-s), and prepositions, while both groups showed similar development in possessive markers and past tense forms.

The developmental quotient for morphological skills increased from 72.3 to 78.6 in the Inclusion Group and from 71.9 to 75.3 in the Therapy-Only Group, with the difference in improvement approaching but not reaching statistical significance ( $p = .059$ ).

### 4.6 Syntactic Outcomes

Assessment using the sentence structure development section of the Speech and Language Development Chart revealed significant improvements in syntactic complexity for both groups over time ( $p < .001$ ,  $\eta^2 = .35$ ). Group  $\times$  Time interaction wasn't significant ( $p = .16$ ,  $\eta^2 = .03$ ), indicating comparable syntactic development across groups.

Mean age-equivalent score improvements were 8.3 months for the Inclusion Group and 7.1 months for the Therapy-Only Group over the 12-month intervention period. Mean Length of Utterance (MLU) calculations from language samples corroborated these findings, with both groups showing significant but comparable increases (Inclusion: +0.94 morphemes; Therapy-Only: +0.78 morphemes;  $p = .21$ ).

The developmental quotient for syntactic skills increased from 70.8 to 76.4 in Inclusion Group and from 71.2 to 75.3 in the Therapy-Only Group, with no significant difference between groups in magnitude of improvement ( $p = .31$ ).

### 4.7 Pragmatic Outcomes

#### 4.7.1 Social Responsiveness Scale-2 (SRS-2)

Analysis of SRS-2 T-scores (where lower scores indicate better social functioning) revealed significant improvements in both groups over time ( $p < 0.001$ ,  $\eta^2 = 0.24$ ). Group  $\times$  Time interaction was also significant ( $p = 0.005$ ,  $\eta^2 = 0.10$ ), with Inclusion Group demonstrating greater reductions in social communication difficulties.

Specifically, the Inclusion Group showed more substantial improvements in the following SRS-2 subscales:

- Social Awareness( $p = 0.006$ ,  $\eta^2 = 0.09$ )
- Social Cognition( $p = 0.013$ ,  $\eta^2 = 0.08$ )
- Social Communication( $p = 0.003$ ,  $\eta^2 = 0.11$ )
- Social Motivation( $p = 0.019$ ,  $\eta^2 = 0.07$ )

The restricted interests and repetitive behaviours subscale showed comparable improvements between groups.

#### 4.7.2 Communication DEALL Developmental Checklist

Analysis of the Communication DEALL pragmatic subscales revealed significant differences in improvement patterns between groups. The Inclusion Group demonstrated significantly greater gains in:

- Joint attention skills ( $p = 0.002$ ,  $\eta^2 = 0.12$ )
- Nonverbal communication ( $p = .004$ ,  $\eta^2 = 0.10$ )
- Social reciprocity ( $p < 0.001$ ,  $\eta^2 = 0.14$ )
- Pragmatic appropriateness ( $p = 0.002$ ,  $\eta^2 = 0.11$ )
- Communication initiations ( $p = 0.001$ ,  $\eta^2 = 0.13$ )

Both groups showed comparable improvements in the comprehension of contextual cues and gestures subscales.

Importantly, culturally specific pragmatic skills measured by the Communication DEALL (such as appropriate use of honorifics and socially appropriate greetings in the Kerala cultural context) showed particularly strong improvements in Inclusion Group compared to Therapy-Only Group ( $p < 0.001$ ,  $\eta^2 = 0.15$ ).

#### 4.8 Predictors of Language Growth

Regression analyses identified several significant predictors of language improvement within the Inclusion Group:

1. Hours of inclusion per week positively predicted pragmatic growth as measured by both SRS-2 ( $\beta = -.39$ ,  $p = .011$ ) and Communication DEALL ( $\beta = .43$ ,  $p = .006$ ), as well as semantic development on the Speech and Language Development Chart ( $\beta = .38$ ,  $p = .014$ )
2. Classroom quality significantly predicted improvements across all language domains
3. Ratio of typically developing peers to children with disabilities was positively associated with pragmatic and semantic gains

For both groups, initial language severity was negatively correlated with amount of improvement, suggesting greater potential for growth among children with milder initial deficits.

### 5. Discussion

This study examined differential impact of early educational inclusion on specific language components in young children having speech and language deficits in Kerala, India. The findings reveal a nuanced picture, with inclusion appearing to offer particular advantages for certain aspects of language development while showing comparable outcomes to therapy-only approaches in other domains.

#### 5.1 Domain-Specific Effects of Inclusion

Most pronounced benefits of early inclusion were observed in pragmatic language skills and vocabulary acquisition. Children in inclusive educational settings demonstrated significantly greater improvements in social communication abilities as measured by culturally appropriate assessment tools (SRS-2 and Communication DEALL). These

improvements were particularly evident in joint attention, social reciprocity, communication initiations, and culturally specific pragmatic skills relevant to the Kerala context.

The vocabulary advantages observed in the Inclusion Group, as measured by the Speech and Language Development Chart, may reflect increased exposure to diverse lexical input from both teachers and peers, as well as more frequent opportunities to practice word learning in meaningful contexts. Previous research has identified peer exposure as a significant predictor of vocabulary growth in typically developing children (Mashburn *et al.*, 2009), and the current findings suggest similar mechanisms may operate for children with language deficits.

Minimal between-group differences in phonology and syntax, and the marginally significant difference in morphology, suggest that these aspects of language may be less sensitive to educational context and more dependent on direct therapeutic intervention. Phonological development, in particular, appears to follow similar trajectories regardless of educational placement, perhaps reflecting the specialized nature of speech sound intervention typically provided by speech-language pathologists.

#### 5.2 Theoretical Implications

These findings support a multi-factorial model of language intervention that recognizes the complementary roles of specialized therapy and naturalistic learning opportunities. The sociocultural perspective (Vygotsky, 1978) emphasizes that language learning happens via guided participation in meaningful activities-a process that might be facilitated by inclusive educational environments that provide:

1. Access to diverse communication partners
2. Authentic contexts for language use
3. Opportunities for observational learning and peer modeling
4. Motivation for communication driven by social engagement

The results suggest that while traditional therapy approaches may effectively target structural aspects of language (phonology, morphology, syntax), inclusive educational contexts may provide unique support for functional communication skills and vocabulary expansion.

#### 5.3 Clinical and Educational Implications

These findings have several practical implications for intervention planning:

1. **Complementary Approaches:** The results support a combined approach that integrates specialized language therapy with inclusive educational experiences, potentially maximizing outcomes across language domains.
2. **Individualized Planning:** Decision-making regarding educational placement should consider a child's specific language profile. Children with pronounced pragmatic difficulties may particularly benefit from inclusive contexts, while those with primarily structural language problems might show comparable progress in therapy-only approaches.
3. **Quality Considerations:** The significant influence of classroom quality variables suggests that not all-inclusive settings are equally beneficial. Programs with higher staff-to-child ratios, well-trained teachers, and appropriate curriculum modifications appear most advantageous.

4. **Dosage Effects:** The positive correlation between hours of inclusion and language gains suggests that limited exposure to inclusive settings (e.g., only a few hours weekly) may be insufficient to yield significant benefits.
5. **Cultural Relevance:** The significant improvements in culturally specific pragmatic skills highlight the importance of considering local social and linguistic contexts when designing intervention programs in settings like Kerala, India.

#### 5.4 Limitations and Future Directions

When interpreting these results, it is important to take into account certain limitations:

1. Quasi-experimental design limits causal inferences, as families self-selected into educational programs.
2. The 12-month timeframe may be insufficient to capture long-term developmental trajectories. Longitudinal follow-up would strengthen understanding of persistent effects.
3. The study did not fully account for potential confounding variables such as differences in home language environments or parental intervention implementation.
4. The heterogeneous nature of speech and language impairments may obscure differential responses to inclusion among clinical subgroups.
5. While the Speech and Language Development Chart and Communication DEALL are clinically useful tools, additional standardized assessment measures with stronger psychometric properties for the Indian context would strengthen future research in this area.

#### Future Research Should Address These Limitations Through

1. Randomized controlled designs where ethically and practically feasible
2. Longer-term follow-up to assess maintenance of gains
3. More detailed analysis of classroom interaction patterns that mediate language outcomes
4. Investigation of individual difference factors that predict responsiveness to inclusive approaches
5. Examination of optimal timing and duration of inclusive experiences
6. Further validation of culturally specific assessment tools for measuring intervention outcomes in the Kerala context

#### Conclusion

This study provides evidence that early educational inclusion may differentially impact components of language development in young children having speech and language deficits. While both included and non-included children demonstrated improvements across language domains, inclusion appeared to offer particular advantages for pragmatic skills and vocabulary development as measured by the Speech and Language Development Chart and culturally specific assessment tools. These findings suggest that educational inclusion may provide a valuable complement to traditional therapy approaches, particularly for fostering functional communication abilities. The results highlight the importance of considering specific language profiles when making educational placement decisions for young children with communication disorders. Rather than viewing clinical and educational interventions as competing approaches, practitioners should consider how these contexts might work synergistically to support comprehensive language

development. Future research examining the specific mechanisms through which inclusion facilitates language learning will further refine our comprehension of optimal intervention methods for this vulnerable population.

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