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The Application of Noam Chomsky's Language Development Theory in Special Education for Students with Complex Communication Needs

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Abstract: *This conceptual paper explores the application of Noam Chomsky's Language Development Theory in special education, with a particular focus on students with Complex Communication Needs (CCN). Drawing on the concepts of the Language Acquisition Device (LAD) and Universal Grammar (UG), the paper examines how Chomsky's emphasis on innate linguistic capacity offers valuable insights into language development among neurodivergent learners. Through a synthesis of existing literature, this paper discusses how evidence-based practices such as Augmentative and Alternative Communication (AAC), Shared Book Reading (SBR), and Naturalistic Language Intervention (NLI) can be understood as teaching strategies that align with Chomsky's theoretical principles by providing meaningful and accessible linguistic input. The paper also highlights the potential of these practices to enhance communication, classroom participation, and social interaction for students with CCN. Within the Malaysian special education context, the paper addresses challenges related to speech focused instructional practices, limited teacher training, and insufficient collaboration between educators and speech language therapists. By linking linguistic theory with classroom practice, this paper aims to contribute to a more inclusive and theoretically informed approach to language support in special education settings.*

Keywords: Noam Chomsky, Language Development Theory, Complex Communication Needs, Special Education, Augmentative and Alternative Communication, Shared Book Reading, Naturalistic Language Intervention

1. Introduction

Language development is a crucial aspect of human growth that supports communication, learning, and social interaction (McEvoy, 2018). One of the most influential perspectives on language acquisition is Noam Chomsky's Language Development Theory, which proposes that humans are biologically endowed with an innate capacity for language. Through the concepts of the Language Acquisition Device (LAD) and Universal Grammar (UG), Chomsky argued that children are able to acquire complex grammatical structures despite receiving limited and imperfect linguistic input from their environment (Barman, 2014; Chomsky, 1982, 1995). This theory positions language acquisition as an internally driven cognitive process rather than one shaped solely by environmental exposure.

Although Chomsky's theory was originally developed to explain typical language development, its emphasis on innate linguistic capacity provides valuable insights for understanding language acquisition among individuals with Complex Communication Needs (CCN). CCN includes individuals with neurodevelopmental conditions such as autism, Down syndrome, and ADHD who experience significant challenges in verbal communication (Szarkowski et al., 2024). Research indicates that approximately 25% to 35% of autistic children are minimally verbal or non-verbal, not because of a lack of language competence, but due to differences in cognitive processing, social interaction, and sensory integration (Rose et al., 2016; Szarkowski et al., 2024). These learners may not follow typical developmental trajectories; however, this does not imply an absence of internal language potential.

In special education contexts, applying Chomsky's theoretical principles involves recognising that language learning does not depend exclusively on spoken output. Augmentative and Alternative Communication (AAC) provides students with CCN access to language through visual, symbolic, or aided modes of communication, enabling participation and interaction in educational settings (Mat Rabi & Nordin, 2021; Wu et al., 2020). From this theoretical perspective, language development can occur through multiple modalities, as long as meaningful linguistic input is available to activate innate language mechanisms.

Despite increasing emphasis on inclusive education, the Malaysian special education system continues to face challenges in supporting the language development of students with CCN. Classroom practices remain largely speech-focused and are often insufficiently adapted to diverse communication profiles (Chua & Low, 2024; Goh et al., 2024). Although Individualised Education Plans (*Rancangan Pendidikan Individu*; RPI) are intended to provide personalised support, their implementation is frequently inconsistent due to limited teacher training and a lack of practical guidance (Ibrahim & Toran, 2023; Md Isa & Toran, 2024). Language intervention is commonly viewed as the responsibility of speech-language therapists (SLTs), while teachers receive limited exposure to speech-language intervention practices and demonstrate low awareness of collaborative roles (Ahmad et al., 2024). This lack of collaboration persists despite evidence that interprofessional practices improve outcomes for students with communication needs (Armstrong et al., 2023; Mathers et al., 2024). Furthermore, although AAC is an evidence-based practice, many educators lack formal training or hold misconceptions about its use, and there are currently no structured national guidelines for AAC implementation in Malaysian (Abdul Razak et al., 2022; Joginder Singh et al., 2020). These challenges highlight the need to reconceptualise language support in special education by aligning linguistic theory with inclusive and practical teaching strategies.

2. Literature Review

2.1 Universal Grammar and Language Acquisition Device

Universal Grammar (UG) is a concept proposed by Noam Chomsky, suggesting that all human are born with a basic set of language rules in their minds. He argues that all languages have a common underlying structure, which humans are predisposed to learn (Hanoon Umarlebbe & Mat Said, 2021). This theory explains how children are capable to learn the linguistic structure of their native language so quickly, despite only hearing limited and imperfect stimuli from their surroundings (Thornton, 2015). Thornton (2015) further explains that UG includes certain rules and settings that help children figure out how their language works by making guesses and adjusting them based on what they heard. This built-in system supports the learning of grammar with little direct teaching.

Additionally, UG is strongly linked to the idea of Language Acquisition Device (LAD); a theoretical construct that suggests humans are biologically equipped to acquire language from birth (Han, 2020). The LAD enables children to process and produce language, supporting the idea that language learning goes beyond mere imitation and instead involves active mental mechanisms (Sorbeck, 2020). Han (2020) emphasizes that the LAD plays a key role in language development, highlighting it as an innate cognitive function of the brain that supports language learning beyond just environmental input.

Together, UG and LAD offer a powerful framework to understand language development, particularly in first and second language acquisition (Zhang, 2024). Both concepts highlight the significance of innate linguistic capabilities, which do not heavily rely on environmental and behavioral input. However, some scholars critique Chomsky's theory for overlooking the role of learned behavior and social interaction in language development. These differing views suggest that language acquisition is a complex process involving not only innate abilities but also environmental and social factors (Sorbeck, 2020).

2.2 Scholarly Opinion on Noam Chomsky's Theory

Noam Chomsky's theory UG and LAD has shaped the field of linguistics, but it has also been the subject of ongoing scholarly debate. Several researchers support the idea that language development involves innate structures. Yang et al. (2017) argue that language acquisition is best understood through a combination of UG, environmental input, and computational principles. Similarly, Crain et al. (2017) advocate for a biolinguistic approach, suggesting that children are biologically equipped to acquire grammar without needing explicit instruction. Modyanova et al. (2017) also provide evidence from studies on autism spectrum disorders, showing that specific grammatical impairments align with the notion of an inborn language faculty. Moreover, scholars such as Vygotsky and Bruner, based on their Interactionist Theory, agree that language acquisition results from the interaction between innate capacities and environmental factors.

However, not all scholars agree with this view. Dąbrowska (2015) strongly critiques UG, questioning its existence and arguing that linguistic knowledge can be acquired through general learning mechanisms and exposure to language. Lieven (2016) adds that language learning is highly influenced by social interaction and usage-based input, especially in early development.

From this perspective, children learn language through repeated exposure to meaningful interactions, rather than relying on a fixed set of grammatical rules present from birth.

In addition, Behrens (2021) presents a constructivist viewpoint, proposing that children's language development results from general cognitive processes and their interaction with the environment. These scholars argue that language is not simply a product of innate knowledge but is shaped through experience and learning. Supporting this middle ground, Arnon & Kirby (2024) suggest that language structure emerges through cultural evolution and statistical learning, highlighting how patterns in language can develop from social use over time, even without a built-in grammatical system.

2.3 Language Development in Neurodivergent Children

Language development among neurodivergent students, including those with Autism Spectrum Disorder (ASD), Developmental Language Disorder (DLD), and other complex communication needs (CCN), often differs significantly from the typical developmental

trajectory (Broc et al., 2021; Szarkowski et al., 2024). Broc et al. (2021) report that students with DLD may struggle with grammar and narrative structure despite having age-appropriate nonverbal cognitive skills. Zapparrata et al. (2023) further explain that these students often experience slower processing speeds and working memory limitations, which affect their ability to comprehend and produce language in real time. Szarkowski et al. (2024) emphasize that CCN students process and perceive language in ways that do not align with neurotypical models of development.

Some researchers argue that language and social cognition do not always develop together in neurodivergent learners. Grau-Husarikova et al. (2024) report that some students experience language difficulties even though their social understanding remains relatively intact. This challenges traditional models that assume language and social skills are tightly linked. Their findings suggest these two areas can develop independently, calling for more flexible frameworks to account for the diversity of language development in neurodivergent populations (Grau-Husarikova et al., 2024).

One model that attempts to explain an alternative pathway is Gestalt Language Processing (GLP), which suggests that some autistic children acquire language in whole phrases—or "gestalts"—before breaking them down into individual words (Hutchins et al., 2024). However, this model has been met with criticism. Beals (2024) argues that GLP risks misinterpreting echolalia as intentional and functional language, despite lacking strong empirical support. Hutchins et al. (2024) also caution against generalizing GLP to all autistic children, emphasizing the wide variability in how language develops across individuals.

In response to these complexities, researchers advocating for the neurodiversity perspective encourage moving away from deficit-based views. Hobson et al. (2024) argue that although students with DLD may require more input to acquire vocabulary and syntax, their developmental paths are valid and should be supported with inclusive practices. Szarkowski et al. (2024) similarly advocate for communication strategies that acknowledge individual differences rather than expecting all learners to follow neurotypical patterns.

3. Discussion

Noam Chomsky's theory of language development has significantly contributed to our understanding of how language is acquired and has helped shape modern linguistic frameworks (Zhang, 2024). Many evidence-based practices align with this theory, particularly those used by speech-language pathologists (SLPs) in language intervention. These strategies, while commonly applied in clinical settings, can also be adapted for use in special education classrooms. When implemented by teachers, they offer practical and effective ways to support the language development of students with complex communication needs (CCN).

3.1 Augmentative and Alternative Communication

Augmentative and Alternative Communication (AAC) refers to methods of communication used to support or replace spoken language. According to the American Speech-Language-Hearing Association (ASHA), "augmentative" refers to adding to existing speech, while "alternative" refers to replacing speech altogether. AAC includes a wide range of tools, such as pictures, visual symbols, hand signs, or high-tech devices like speech-generating apps (American Speech-Language and Hearing Association (ASHA), 2015). Research shows that AAC has a positive impact on language development, communication, and social participation

(Mat Rabi & Nordin, 2021; Wu et al., 2020). It also allows students to share their thoughts and be active participants in learning and social settings, improving both confidence and engagement (Prinsloo Pauline, 2021). From a theoretical perspective, AAC aligns with Chomsky's view that all humans have an innate capacity for language. From a theoretical perspective, AAC provides consistent and meaningful input in visual or aided formats that supports language development, including grammar and vocabulary, by aligning with developmental models of language acquisition (Binger et al., 2024). This is compatible with Chomsky's view that humans have an innate capacity for language, which is activated through exposure to linguistic input (Chomsky, 1965).

In the context of special education, AAC is a practical and inclusive teaching strategy that can be integrated into classroom routines. Teachers can use visual schedules, voice output devices, or symbol-based supports to provide clearer instructions and scaffold learning. These strategies have been shown to support comprehension, self-directed learning, and classroom participation, especially during structured tasks like storytelling or step-by-step problem solving (Iacono et al., 2022; Zaharudin et al., 2023). However, the use of AAC in Malaysian classrooms is limited due to a lack of practical teacher training, minimal exposure to hands-on strategies, and the absence of official guidelines or modules for implementation (Abdul Razak et al., 2022; Loi et al., 2023; Yasin et al., 2020). Despite these challenges, AAC remains a powerful strategy that can be used by educators to support language access and development for students with complex communication needs.

3.2 Shared Book Reading

Shared Book Reading (SBR) is another evidence-based practice commonly used in language intervention (Dowdall et al., 2020; Noble et al., 2018). Noble et al. (2018) defines SBR as an interactive activity where adults and children read books together, with the purpose of encouraging engagement and dialogue. Research has shown that SBR can significantly improve both expressive and receptive language skills in children with developmental disabilities (Towson et al., 2021), achieved through meaningful interactions during reading sessions (Noble et al., 2018). Towson et al. (2021) highlights in their review that SBR interventions can effectively support language development in the early stages of a child's growth. While SBR is commonly framed within Vygotsky's sociocultural theory (Dowdall et al., 2020), it can also be viewed as compatible with Chomsky's theory. Through SBR, children are regularly immersed in rich, grammatical language, which provides the kind of input necessary to activate their internal language mechanisms, as proposed by Chomsky's LAD.

SBR is commonly conducted in individual settings, but Towson et al. (2021) suggests that SBR can also be effective in group settings. It emphasizes the importance of considering the number of students involved to maintain the intervention's effectiveness. Hence, in the classroom, teachers can apply this strategy by offering book choices before reading, using attention-getters during reading, and summarizing the story afterward (Towson et al., 2021). Its combination of structured input and interactive support shows that book-sharing not only strengthens early language skills but also provides a foundation for literacy development (Dowdall et al., 2020).

3.3 Naturalistic Language Intervention

Naturalistic Language Intervention (NLI) is an umbrella term that includes various intervention strategies and approaches aimed at enhancing communication skills among children with developmental delays, such as autistic children (Lane et al., 2016). In general, it is a recommended approach to teach children how to express their needs, interests, and feelings

(Lane et al., 2023). NLI is an evidence-based practice supported by multiple studies that evaluate its effectiveness in language intervention (Frost et al., 2022). Among the examples of NLI are Enhanced Milieu Teaching (EMT) and Pivotal Response Training (PRT) (Lane et al., 2016). Key characteristics of NLI include promoting engagement, creating opportunities for spontaneous verbalizations, and maintaining the child's motivation throughout the session (Lane et al., 2016). It focuses on naturalistic environments (Lane et al., 2020) and gives focused attention to the child while embedding instructional opportunities within meaningful activities (Lane et al., 2023).

Lane in his papers outlines several benefits of NLI, including increased spontaneous expressive language, improved social and communication skills (Lane et al., 2016), and greater ability to use more complex forms of expressive language (Lane et al., 2023). These findings are supported by Camarata et al. (2024), who reported that participants successfully acquired target vocabulary and were able to generalize its use across different settings. In the context of special education, NLI can be effectively implemented in the classroom by creating a supportive environment that encourages communication through natural interactions (Lane et al., 2020). Teachers are encouraged to use play-based formats, embed language opportunities in daily routines, and follow the child's lead during interactions (Lane et al., 2016). Although NLI is often associated with social interactionist theory, it also aligns with Chomsky's perspective by providing structured, meaningful input in real-life contexts by supporting the activation of the child's innate language system. Therefore, (Lane et al., 2023) emphasizes the need for practical guidelines to ensure educators are able to implement NLI effectively in school settings.

In summary, the application of evidence-based practices demonstrates how theoretical principles can be translated into effective teaching strategies in special education settings. These approaches provide structured, meaningful input that supports the language acquisition process, particularly for students with CCN. Beyond improving expressive and receptive language skills, these strategies also promote engagement, social participation, and learner independence. When implemented consistently and with proper support, they hold the potential to create more inclusive, responsive classroom environments that honor the diverse ways in which neurodivergent students acquire and use language.

4. Conclusion

The application of Noam Chomsky's Language Development Theory within special education offers valuable insights into supporting students with CCN. By emphasizing innate language capabilities through concepts such as the LAD and UG, educators are encouraged to recognize and support the natural language abilities of neurodivergent learners. Effective evidence-based practices (EBPs), including AAC, SBR and NLI can be adapted as teaching strategies that reflect Chomsky's principles by providing structured, meaningful language input that activates innate language mechanisms. To bridge the existing gaps in Malaysian special education, it is crucial for educators to receive targeted training and collaborate effectively with SLPs, ensuring that these evidence-based practices are implemented effectively. Thus, Chomsky's theoretical framework not only informs our understanding of language acquisition but also serves as a foundation for inclusive and responsive language interventions in special education settings.

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Conflict of Interest Statement
The authors declare that this study was conducted in the absence of any financial, commercial, or personal relationships that could be construed as a potential conflict of interest.

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