



The triangulation of intersubjectivity, intertextuality, and interfacial communication in the neurodevelopmental model of hyperlexia

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Abstract

Hyperlexia is a neurodevelopmental reading profile marked by precocious, self-taught word-decoding abilities that significantly outpace age expectations while co-occurring with difficulties in language comprehension, social communication, and pragmatic use of language. Most frequently observed in autistic populations, hyperlexia is defined by a pronounced dissociation between fluent decoding and limited semantic and contextual understanding. Rather than representing merely advanced reading, hyperlexia reflects an atypical pathway of language acquisition in which written symbols become a primary gateway to language, often substituting for socially mediated oral interaction. This paper situates hyperlexia as a topic of interest within the social sciences, arguing that it challenges normative assumptions about literacy development, cognition, and social interaction by demonstrating that technical literacy can emerge independently of shared meaning-making. Drawing on developmental psychology, education, disability studies, sociolinguistics and others, the discussion reframes hyperlexia as a socially and culturally embedded phenomenon rather than a purely cognitive anomaly. Central to this analysis is the proposed Triple-I Model, which conceptualizes comprehension in hyperlexia as arising from the impaired interaction of intersubjectivity, intertextuality, and interfacial communication. Together, these dimensions explain why children with hyperlexia may read with exceptional accuracy yet struggle to demonstrate functional understanding. The model underscores the need for instructional and therapeutic approaches that prioritize shared meaning, contextual linkage, and multimodal mediation over decoding-focused instruction alone.

Keywords: Autism spectrum disorder, comprehension, hyperlexia, interfacial communication, intersubjectivity, intertextuality

Introduction

Hyperlexia is a neurodevelopmental reading profile characterized by precocious and self-taught word-decoding ability that is significantly advanced relative to a child's age, often emerging before the age of five, and occurring alongside delays or difficulties in language comprehension, social communication, and pragmatic use of language (Chia, 2000; Silberberg & Silberberg, 1967, 1969, 1971) [4, 10, 11, 12]. Children with hyperlexia demonstrate an intense fascination with letters, numbers, or written symbols and are able to decode words fluently, sometimes at a level far beyond their general cognitive or linguistic development, despite limited understanding of what they read (Grigorenko *et al.*, 2002) [6].

Clinically and empirically, hyperlexia is most frequently observed in children on the autism spectrum, although it is not exclusive to autism. The defining feature is a marked dissociation between decoding and comprehension: while phonological and orthographic processing is highly efficient, semantic integration and contextual interpretation are comparatively weak. This pattern contrasts with typical reading development, in which decoding and comprehension progress in tandem (Nation, 1999; Grigorenko *et al.*, 2002) [6, 7]. As a result, children with hyperlexia may read aloud accurately and rapidly yet struggle to answer questions about meaning, infer intent, or integrate text with real-world knowledge.

From a developmental perspective, hyperlexia is understood not merely as advanced reading but as an atypical pathway of language acquisition, in which print becomes a primary entry point into language rather than spoken interaction. This shift may reflect reduced reliance on social-linguistic

cues and increased dependence on visually stable symbolic systems, such as written words (Frith, 1989) [5]. Consequently, hyperlexia is often associated with challenges in intersubjective communication and pragmatic language use, even when structural language skills such as vocabulary recognition appear strong.

Importantly, hyperlexia is not a formal diagnostic category to be found in the Diagnostic and Statistical Manual of Mental Disorders-5th Edition-Text Revision (DSM-5-TR; American Psychiatric Association/APA, 2022) [1] or International Classification of Diseases-11th Revision (ICD-11; World Health Organization, 2022) [14], but it can be found in The Educator's Diagnostic Manual of Disabilities and Disorders (EDM, Pierangelo & Giuliani, 2007) [8]. The term hyperlexia is widely recognized in the research literature as a meaningful descriptive construct with implications for assessment and intervention. Contemporary models emphasize that hyperlexia should be evaluated in terms of its functional impact on comprehension, communication, and learning, rather than viewing advanced decoding as inherently advantageous or pathological (Grigorenko *et al.*, 2002) [6].

Why is Hyperlexia a Topic of Interest in Social Sciences?

Hyperlexia is considered a topic of interest in the social sciences because it challenges conventional assumptions about how literacy, language, cognition, and social interaction develop together. In typical developmental models, reading ability is expected to emerge from oral language, social communication, and shared meaning-making. Hyperlexia disrupts this sequence by demonstrating that advanced decoding skills can develop independently of,

or even prior to, social-communicative competence. This dissociation raises important questions for social science disciplines (particularly in developmental psychology, education, linguistics, and sociology) about how symbolic systems such as written language can be acquired outside normative social pathways (Grigorenko *et al.*, 2002) [6].

From a developmental and psychological perspective, hyperlexia is of interest because it exemplifies uneven cognitive profiles, where specific abilities (e.g., word recognition) are highly developed, while related domains (e.g., comprehension, pragmatics, theory of mind) lag behind. Such profiles challenge unitary models of intelligence and language development and support modular or domain-specific accounts of cognition. Research on hyperlexia has contributed to broader debates about whether reading is fundamentally a socially mediated skill or whether certain components of literacy can emerge through non-social, perceptual, or pattern-based learning mechanisms (Nation, 1999; Frith, 1989) [5, 7].

In the context of Social Science (e.g., developmental psychology, disability studies, educational and literacy studies, and sociolinguistics), hyperlexia is also relevant because of its strong association with autism spectrum conditions, which are themselves central to inquiries about social cognition, intersubjectivity, and communication. Hyperlexic reading highlights how meaning-making is not guaranteed by technical proficiency alone; rather, comprehension depends on social context, shared reference, and pragmatic interpretation. The phenomenon therefore provides a natural case study for examining how social interaction scaffolds understanding, and what happens when access to those social scaffolds is limited or atypical (Frith, 1989; Trevarthen & Delafield-Butt, 2013) [5, 13].

Educational and sociocultural perspectives further frame hyperlexia as a socially significant topic because it exposes mismatches between institutional expectations and learners' actual profiles. Hyperlexic children may be perceived as academically advanced due to fluent reading, yet struggle with classroom discourse, inferential comprehension, and social participation. This discrepancy raises questions about how societies define literacy, competence, and achievement, and how educational systems may inadvertently disadvantage learners whose strengths do not align with normative developmental trajectories (Grigorenko *et al.*, 2002) [6].

Finally, hyperlexia attracts interest in social science because it reframes literacy as a cultural and relational practice, not merely a technical skill. It underscores that reading comprehension is embedded in social meaning, shared narratives, and communicative intent. By studying hyperlexia, social scientists gain insight into how written language can function both as a bridge to participation and as an isolating system when social integration is limited. As such, hyperlexia serves as a critical lens for understanding the social foundations of language, learning, and human communication (Nation, 1999) [7].

Intersubjectivity, Intertextuality, and Interfacial Communication

In children with hyperlexia, meaning-making during reading and listening emerges from the impaired interaction of Intersubjectivity, Intertextuality, and Interfacial communication (also known as Triple-I Model) rather than from decoding alone. Briefly described, the first term

Intersubjectivity (see Figure 1) refers to the shared construction of meaning between individuals through mutual awareness of intentions, emotions, and perspectives. In the typical development of language, reading comprehension is supported by the reader's capacity to align textual meaning with socially shared understandings and communicative intent. However, many children with hyperlexia demonstrate advanced decoding skills alongside reduced intersubjective engagement, resulting in reading that is technically accurate but weakly connected to shared human experience or authorial intention (Trevarthen & Delafield-Butt, 2013; Richman, 1997) [9, 13]. This phenomenon can be observed in children with autism spectrum disorder (ASD).

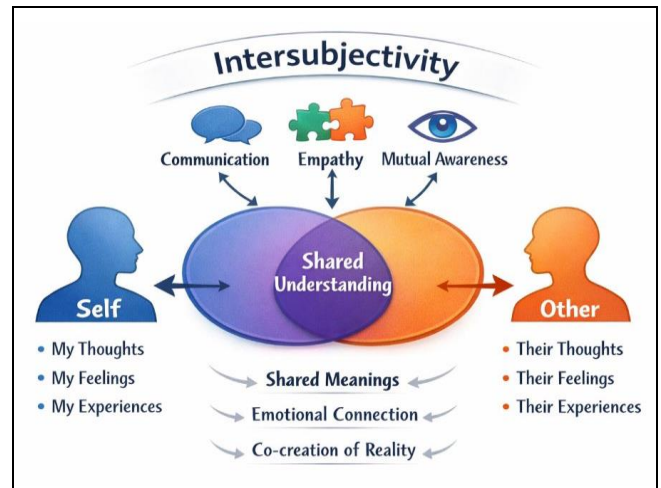


Fig 1: The Construct of Intersubjectivity

Another term, Intertextuality (see Figure 2), further shapes comprehension by allowing readers to connect a given text to prior texts, experiences, and conceptual schemas (Chia, 1996) [3]. Meaning does not reside solely in the printed words (Chia, 1995) [2] but is constructed through the reader's ability to relate what is read or heard to previously encountered narratives, knowledge structures, and symbolic systems. In typically developing readers, intertextual connections support inferencing, abstraction, and narrative coherence. In hyperlexia, however, these connections are often underdeveloped, leading to a fragmented comprehension (reading and/or listening) profile in which words are read fluently but remain insufficiently integrated into broader semantic or conceptual networks (Frith, 1989; Richman, 1997) [5, 9].

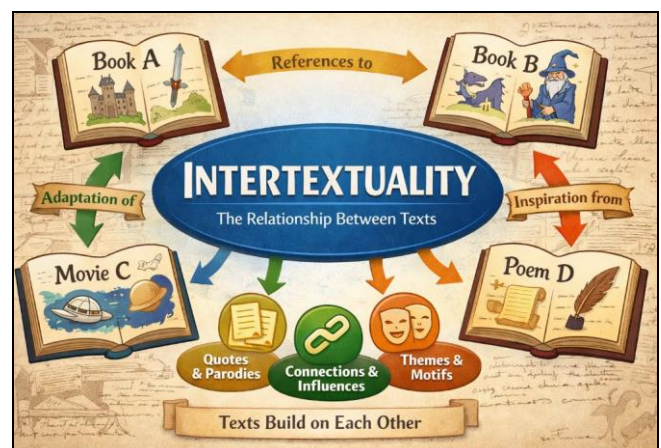


Fig 2: The Construct of Intertextuality

The third term, Interfacial communication, (see Figure 3) provides a unifying framework for understanding how intersubjectivity and intertextuality are mediated across modalities such as print, speech, visual context, and social interaction. Reading and listening are not isolated cognitive acts but interfaces that require the integration of orthographic input with semantic knowledge, and pragmatic cues within a social context. In children with hyperlexia, this interface is often uneven: orthographic processing is highly efficient, while integration with semantic, pragmatic, and interpersonal cues is less robust. As a result, the process of transition from decoding to comprehension is disrupted, particularly in tasks requiring inference, perspective-taking, or contextual interpretation (Trevvarthen & Delafield-Butt, 2013) [13].

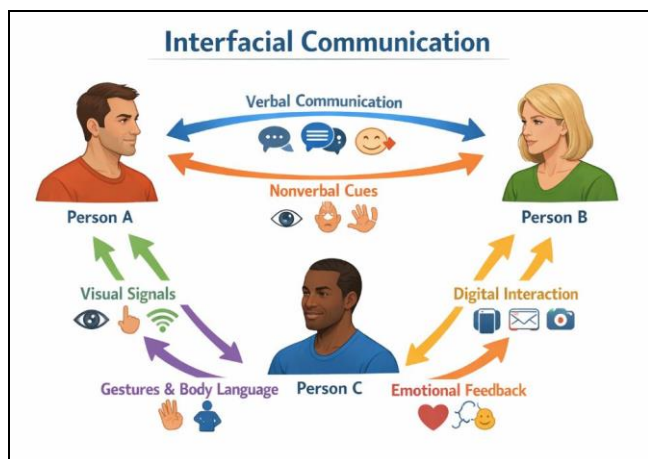


Fig 3: The Construct of Interfacial Communication

When considered together, these three constructs (i.e., intersubjectivity, intertextuality, and interfacial communication) explain why children with hyperlexia may read aloud with exceptional accuracy yet struggle to demonstrate 'real' understanding. Intersubjectivity anchors text in shared meaning, intertextuality situates it within a broader network of knowledge, and interfacial communication coordinates the cognitive and social processes that allow meaning to emerge. In hyperlexia, strengths in decoding coexist with vulnerabilities in these integrative processes, producing a distinctive comprehension profile characterized by literal interpretation and reduced contextual integration. Understanding hyperlexia through this relational lens highlights the importance of instructional and therapeutic approaches that explicitly support shared meaning-making, contextual linkage, and multimodal integration rather than focusing solely on decoding proficiency. The aim of this paper is to offer the proposed model of intersubjectivity, intertextuality and interfacial communication known as the Triple-I Model of Hyperlexia.

Examining the Triple-I Model of Hyperlexia

At the heart of the Triple-I Model sits Hyperlexia (see Figure 1), a neurodevelopmental profile marked by precocious word decoding skills that outperform comprehension and general language use, often observed in autistic populations and involving a strong orientation toward written material and pattern recognition rather than typical oral language development. This central position reflects how hyperlexic cognitive styles both shape and are shaped by the surrounding communicative dimensions.

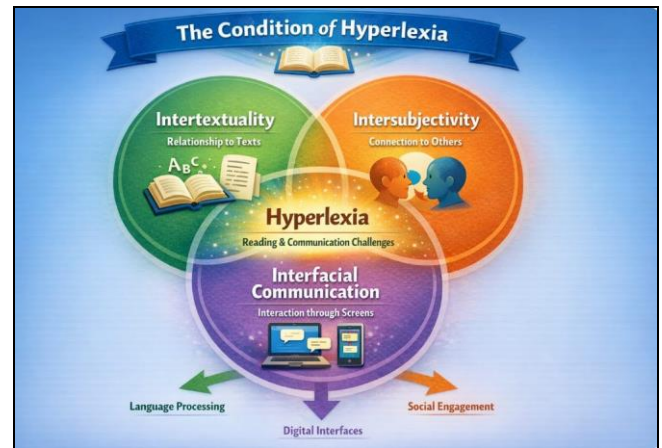


Fig 4: The Condition of Hyperlexia

Intersubjectivity (Figure 4; right) denotes the shared meaning-making that arises from social interaction, mutual understanding, and coordinated perspectives between individuals. In typical language development, intersubjective engagement supports dialogue, empathy, and negotiation of meaning. Within hyperlexia, however, differences in joint attention and social communication, often characteristic of autism spectrum disorder (ASD), may constrain conventional intersubjective routes, necessitating alternative pathways to shared understanding.

Intertextuality (Figure 4; left) refers to the cognitive and interpretive processes by which texts (broadly defined) are understood in relation to other texts and prior knowledge, such that meaning emerges through a web of references, patterns, and associations beyond any isolated text. In hyperlexia, intertextuality is especially salient because individuals often rely on visual word form recognition, pattern familiarity, and self-directed textual exploration to make sense of written material, which in turn influences how textual meaning is constructed relative to other texts and contexts.

Interfacial Communication (Figure 4; bottom) captures how individuals use external interfaces, symbols, and media, such as screens, textual displays, augmentative and alternative communication (AAC) systems, and other technological or symbolic platforms, to mediate communication. AAC research in autism highlights how interface design and symbolic representations can scaffold social participation and communicative engagement when oral language alone is insufficient. In hyperlexia, these interfaces become key loci of interaction because written patterns and symbol systems may serve as more reliable anchors for meaning than purely spoken or embodied cues. The overlapping regions between these three domains illustrate emergent processes:

- Between Intertextuality and Intersubjectivity lies meaning-making in shared contexts, where textual references become tools for negotiated understanding, e.g., when a hyperlexic reader and a communication partner co-construct their respective interpretations of a given text.
- Between Intertextuality and Interfacial Communication is symbol mediation, in which interfaces (e.g., digital text environments, AAC) structure and present textual connections that a hyperlexic individual can navigate, linking multiple texts and codes.

- Between Intersubjectivity and Interfacial Communication is the social interface, whereby interactive platforms and communicative tools support the co-construction of shared meanings even when typical social cues are limited.

At the intersection of all three domains sits adaptive communication pathways, representing the integrated strategies that hyperlexic individuals employ when meaning is built through textual pattern navigation (intertextuality), shared interpretive efforts (intersubjectivity), and mediating tools or interfaces (interfacial communication).

Together, this model illustrates that in hyperlexia, communication and understanding are not solely anchored in traditional oral social interaction but emerge from a dynamic interplay between textual relations, shared meaning through engagement, and the use of symbolic interfaces that mediate how texts and social meaning are accessed and negotiated.

Conclusion

In conclusion, hyperlexia represents a distinctive neurodevelopmental profile that illuminates the complex and non-linear relationships among decoding, comprehension, social communication, and meaning-making. Far from being merely a case of advanced reading, hyperlexia underscores how fluent word recognition can emerge independently of semantic integration and shared understanding, particularly within autistic developmental pathways (Grigorenko *et al.*, 2002; Nation, 1999) ^[6, 7]. From a social science perspective, hyperlexia challenges normative models of literacy and cognition by demonstrating that technical proficiency in written language does not automatically confer communicative competence or social participation. The Triple-I Model of hyperlexia, which integrating intersubjectivity, intertextuality, and interfacial communication, provides a coherent explanatory framework for understanding this dissociation, highlighting how difficulties in shared meaning-making, contextual linkage across texts, and multimodal integration collectively constrain comprehension despite strong decoding skills (Frith, 1989; Trevarthen & Delafield-Butt, 2013) ^[5, 13]. This relational account reframes hyperlexia as a phenomenon situated at the intersection of cognitive, social, and cultural processes, emphasizing that effective intervention and educational practice must extend beyond decoding instruction to deliberately scaffold shared understanding, contextual connections, and mediated communication. By doing so, hyperlexia serves not only as a topic of clinical and educational relevance but also as a critical lens through which social scientists can better understand the social foundations of language, literacy, and human communication.

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