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**USAGE-BASED THEORY AND THE GESTALT LANGUAGE PROCESSING:
AN INTEGRATIVE PERSPECTIVE ON LANGUAGE PROCESSING**

**TEORIA BASEADA NO USO E PROCESSAMENTO GESTALT DE LINGUAGEM:
UMA PERSPECTIVA INTEGRATIVA NO PROCESSAMENTO DE LINGUAGEM**

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ABSTRACT: This study presents a scoping review aimed at mapping the existing literature on Usage-Based Theory and Gestalt Language Processing, analyzing their convergences and divergences in the stages and processes of language acquisition of children with typical and atypical developmental trajectories. The review was conducted following the Joanna Briggs Institute (JBI) guidelines. The databases PsycINFO, Web of Science, Scopus, LILACS, EMBASE, and PubMed were consulted, complemented by hand searching. The search strategy followed the PCC model (Population, Concept, Context), with no temporal restrictions. Out of 12,104 retrieved articles, 20 met the inclusion criteria; hand searching added 23 texts, totaling 43 analyzed studies. The results show that Usage-Based Theory and Gestalt Language Processing converge in describing acquisition as starting from holistic units (chunks/gestalts), which are gradually analyzed and recombined. The main divergence lies in their structure: Usage-Based Theory proposes a continuum with a broad empirical basis, whereas Gestalt Language Processing organizes development into clinical stages focused on echolalia in Autism Spectrum Disorder, relying primarily on qualitative descriptions and clinical reports. The study suggests that Gestalt Language Processing has comparable stages and processes to the Usage-Based Theory that need further research.

RESUMO

Este estudo apresenta uma revisão de escopo que teve como objetivo mapear a literatura existente sobre a Teoria Baseada no Uso e o Processamento Gestalt de Linguagem, analisando suas convergências e divergências nos estágios e processos de aquisição de linguagem de crianças com trajetórias de desenvolvimento típico e atípico. A revisão foi conduzida seguindo as diretrizes do Joanna Briggs Institute (JBI). Foram consultadas as bases de dados PsycINFO, Web of Science, Scopus, LILACS, EMBASE e PubMed, complementadas por busca manual. A estratégia de busca seguiu o modelo PCC (População, Conceito, Contexto), sem restrições temporais. Dos 12.104 artigos recuperados, 20 preencheram os critérios de

inclusão; a busca manual adicionou 23 textos, totalizando 43 estudos analisados. Os resultados mostram que a Teoria Baseada no Uso e o Processamento Gestalt de Linguagem convergem ao descrever que a aquisição se inicia a partir de unidades holísticas (chunks/gestalts), as quais são gradualmente analisadas e recombinadas. A principal divergência reside em sua estrutura: a Teoria Baseada no Uso propõe um continuum com ampla base empírica, enquanto o Processamento Gestalt de Linguagem organiza o desenvolvimento em estágios clínicos focados na ecolalia no Transtorno do Espectro Autista, baseando-se principalmente em descrições qualitativas e relatos clínicos. O estudo sugere que o Processamento Gestalt de Linguagem possui estágios e processos comparáveis aos da Teoria Baseada no Uso que necessitam de investigações adicionais.

KEYWORDS: Language development. Gestalt Language Processing. Echolalia. Child language.

PALAVRAS-CHAVE: Desenvolvimento da Linguagem. Processamento Gestalt de Linguagem. Ecolalia. Linguagem Infantil.

NON-SPECIALIST SUMMARY: This study investigated how two language theories explain the development of speech in children. On one hand, Usage-Based Theory posits that children learn from whole "chunks" of sound (for example, "howareyou?") and gradually break them down. On the other hand, the Gestalt Language Processing model, created to understand language in autism, also starts from this idea but focuses specifically on echolalia - which is when a child repeats segments of speech they have heard, such as lines from cartoons or phrases from other people. The review showed that these two perspectives are in dialogue. The way Gestalt Language Processing describes the developmental stages of autistic children - beginning with echolalia and progressing to more spontaneous speech - fits with the general principles of Usage-Based Theory. This is important because it helps reframe echolalia: far from being meaningless behavior, it is a crucial starting point for communication. This understanding supports more respectful and individualized clinical and educational practices, which start from each child's own way of expressing themselves to help them develop their language.

Introduction

Language acquisition is a complex phenomenon, investigated across multidisciplinary fields, such as linguistics, psychology, and neuroscience. Over time, various theories have emerged to explain its ontogeny. Some emphasize innate mechanisms (Chomsky, 1965; Pinker, 1994), while others highlight social interaction (Bruner, 1983; Snow, 1977), communicative function (Halliday, 1975, 1978), the capacity to perceive patterns in auditory input (Thiessen; Hill; Saffran, 2005), or the frameworks of cognitive grammar and construction grammar (Langacker, 1987; Goldberg, 2006).

Among these perspectives is the premise that language emerges from use. This is the foundation of Usage-Based Theory (UBT), primarily associated with Tomasello (2003), where individuals are not born with pre-existing grammatical rules, but rather construct them

gradually from concrete communication experiences. This framework is supported by a robust body of empirical research across diverse linguistic contexts.

Concurrently, in the clinical field, the Gestalt Language Processing (GLP) model has emerged from clinical insights to characterize atypical developmental profiles, specifically within Autism Spectrum Disorder (ASD) (Blanc, 2005a, 2005b, 2005c, 2005d). This model proposes that the child begins by using memorized expressions (referred to as "gestalts" or echolalia's), which are only later broken down into smaller parts and analyzed (Blanc, 2005a, 2005b, 2005c, 2005d; Blanc; Blackwell; Elias, 2023). However, while the theory is grounded in clinical observations and series of case descriptions, it currently lacks comprehensive scientific validation. To examine these perspectives, both frameworks are described in detail in the following sections.

1. Usage-Based Theory

In UBT, as described by Tomasello (2000a, 2003), acquisition begins with the production of linguistic chunks (holophrases or whole phrases) frequently heard in specific contexts. These units are initially memorized as whole and later decomposed. Grammatical rules then emerge from the abstraction of patterns based on contextual meaning (semantics and pragmatics), rather than from learning isolated words and rules.

This focus on real-world language use has philosophical roots, dating back to Wittgenstein (1953) and other thinkers in pragmatics, who investigated how language use establishes patterns for social interactions (Langacker, 1987, 1991; Croft, 1991; Givón, 1995; Tomasello, 2003; Bybee, 2010; Goldberg, 2006). In this view, linguistic complexity results from the interaction between cognitive capacities and experience (Tomasello, 2003). This proposal directly contrasts with nativist views, especially with Chomsky's Universal Grammar (UG), which postulates innate grammatical principles and rules (Chomsky, 2014; Novák, A.; Novák, B., 2022).

Tomasello (2003) structures UBT on two fundamental principles: the idea that meaning is derived from use and that linguistic structure emerges from actual language use. To achieve this, the child needs two central cognitive abilities: intention-reading and pattern-finding (Tomasello, 2009). According to UBT, linguistic development (Tomasello, 2003, 2009) starts with whole utterances, laden with communicative intention, progressing through predictable phases: pivot schemas (fixed, non-generalizable combinations. e.g., "more water", "daddy gone"); item-based constructions (structures with syntax but tied to specific

words, e.g., "throw ball"), replicated as they were heard; and abstract constructions (generalizable structures that allow the creation of novel utterances, resulting from the abstraction of regularities from the input). A crucial phase is the "verb island" stage (Tomasello, 2000b, 2009). Each verb is used in specific contexts before wider grammatical generalization occurs. This process is regulated by cognitive mechanisms such as entrenchment and preemption (Tomasello, 2000b, 2009), preventing overgeneralizations and aligning their use with adult conventions.

2. Gestalt Language Processing

The term *gestalt* is rooted in psychology, positing that human perception organizes itself into meaningful patterns and wholes, prioritizing the global form over the sum of isolated parts (Köhler, 1929; Wertheimer, 1923). This principle later influenced the field of language acquisition, providing the idea that some children initially process speech in integral units (such as memorized phrases or segments), and only later segment them into smaller, combinable elements (Blanc, 2005a; Prizant, 1983).

In the 1970s and 1980s, scholars proposed the concept of GLP, initially as a description of a typical developmental profile (Peters, 1977, 2021). According to this view, language acquisition would begin with multi-word utterances learned as memorized chunks, which would later be analyzed into smaller constituents (Peters, 1977, 2021).

Subsequently, Barry Prizant (1983) associated GLP with autistic children with predominant echolalia, establishing three fundamental concepts: "gestalt forms," which correspond to speech chunks; the "gestalt style of language acquisition," a process where early productions consist mostly of holistic units requiring subsequent analysis; and the "gestalt mode of cognitive processing," referring to the retention of experiences as non-analytic mental representations (Prizant, 1983).

Based on these pillars, he proposed four stages: (1) predominant use of echolalia, serving as turn-taking or self-stimulation, with little comprehension; (2) echolalia gains more functions (requests, self-regulation), and the analysis of echolalic phrases begins; (3) transition to spontaneous speech through novel combinations, and a decrease in echolalia; (4) spontaneous and flexible speech with creative language use, with residual echolalia during fatigue or distraction. Prizant (1983) emphasized, however, the need for further investigation of the model.

Building on these studies, Marge Blanc (2012) developed the "Natural Language Acquisition" (NLA) model, aimed at supporting autistic individuals or those with significant echolalia, termed "gestalt processors." This work will adopt the term GLP to also encompass the NLA framework. Blanc expanded Prizant's (1983) proposal, describing two additional stages in her model (totaling six stages) that advance toward complete grammar, including the use of verb tenses, pronouns, complex structures, and conjunctions. This progression is not rigidly tied to specific ages but follows an expected sequential order.

Recently, GLP has gained visibility regarding delayed echolalia in autism (Blanc; Blackwell; Elias, 2023). However, the framework faces rigorous academic appraisal. Critics argue that the binary distinction between 'gestalt' and 'analytic' processors lacks empirical substantiation and oversimplifies autistic linguistic trajectories (Hutchins; Knox; Fletcher, 2024). From a linguistic perspective, Beals (2024) contends that the model is implausible, as echolalia itself requires underlying analytic phonetic processing, suggesting that reliance on 'chunks' may be a symptom of language delay rather than a distinct processing mode. Furthermore, systematic reviews highlight a critical lack of replicable research, noting that GLP relies almost exclusively on anecdotal clinical reports rather than validated efficacy data (Bryant *et al.*, 2024; Venker; Lorang, 2024). For a contextualized analysis of GLP, it is relevant to consider its intersections with the characteristics of ASD, which will be addressed next.

2.1 Autism Spectrum Disorder

The first descriptions of ASD date back to the work of Kanner (1943) and Asperger (1944). While Kanner focused on impairments in social interaction, communication, and repetitive behaviors, Asperger reported profiles with similar social difficulties but with apparently preserved formal linguistic skills. This historical duality pointed to the diversity that would become a hallmark of the disorder.

Over the decades, the understanding of ASD solidified as a neurodevelopmental disorder with a neurobiological basis (Lord, 2018), moving away from psychogenic explanations (Lord, 2020).

According to the American Psychiatric Association's (2022) Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR), ASD is defined by persistent deficits in social communication and social interaction, associated with restricted, repetitive patterns of behavior, interests, or activities, with onset in the early developmental years. Its main

manifestations include difficulties in socio-emotional reciprocity, in the communicative use of gestures and facial expressions, in developing relationships, and the presence of repetitive behaviors, inflexible adherence to routines, and particularities in sensory processing (American Psychiatric Association, 2022), resulting in impairments in social, academic, or occupational functioning (Kim; Udhmani; Lecavalier, 2024).

Heterogeneity is a fundamental characteristic of ASD, justifying the notion of a "spectrum" (Georgiades, 2012; Bishop *et al.*, 2017). ASD does not constitute a single, homogeneous condition, but rather a broad construct encompassing a diversity of developmental profiles (Lord, 2020). This phenotypic variability poses significant methodological challenges. Symptomatic diversity and the frequent occurrence of co-occurring conditions complicate the identification of consistent phenotypes and the search for unified causal mechanisms (Lord, 2020). Studies show, for example, that different early developmental trajectories are associated with distinct linguistic and social outcomes (Landa *et al.*, 2012). Similarly, neuroimaging investigations reveal heterogeneous patterns of brain development in early childhood, which predict subsequent variations in cognitive and adaptive skills (Hazlett *et al.*, 2017).

This complexity translates into concrete methodological challenges. Differences in participant recruitment, levels of functioning, age ranges, and instruments complicate the generalization of findings (Bishop *et al.*, 2017). Furthermore, variability over time - influenced by early interventions and contexts - makes defining normative trajectories complex (Lord, 2020; Pickles *et al.*, 2022). Given this phenotypic and methodological variability, many studies focus on pragmatic aspects. However, a significant gap persists regarding underlying mechanisms for acquisition of form (grammar) and content (semantics) in ASD.

Despite their different epistemological roots - UBT being a socio-pragmatic theory of typical development and GLP a clinical framework for neurodivergence - both models converge in describing language acquisition as a process anchored in concrete use, input frequency, and the initial processing of holistic linguistic units (holophrases or gestalts) prior to internal analysis (Bybee, 2010; Blanc; Blackwell; Elias, 2023). However, as previously noted, while UBT is supported by extensive empirical evidence, GLP remains primarily based on clinical observation and requires a more rigorous theoretical and empirical framework. Therefore, a scoping review is necessary to map the available evidence regarding both models. This study aims to identify and examine the literature that addresses the parallels between the developmental stages and processes of UBT and GLP.

3. Methods

A scoping review was conducted following the Joanna Briggs Institute framework (Aromataris *et al.*, 2024) and PRISMA-ScR recommendations (Tricco *et al.*, 2018). Although the study was not pre-registered prior to data collection, the review protocol was registered on the Open Science Framework platform on January 30, 2026 (<https://doi.org/10.17605/OSF.IO/U2KfV>) for transparency.

The guiding question, based on the PCC structure, was: "What are the similarities and differences between stages and processes of the Usage-Based Theory (UBT) and the Gestalt Language Processing (GLP) model in explaining the linguistic development of children with typical and atypical development?"

3.1. Search Strategy and Selection

The systematic search was conducted in September 2025 in the databases: PsycINFO, Scopus, EMBASE, PubMed, LILACS and Web of Science. Search strings included terms such as "usage-based theory", "usage-based model", "Autism Spectrum Disorder", "Autistic Disorder", "typically developing", "Language Development", "Gestalt Language Process*".

Inclusion criteria targeted children with typical development or on the Autism Spectrum (ASD) and research addressing UBT, GLP/NLA, or related phenomena (echolalia and formulaic language). To ensure a comprehensive mapping of these frameworks, all publication types were considered, including peer-reviewed articles, book chapters, clinical guides, and non-peer-reviewed materials (grey literature), such as website documents. Exclusion criteria were applied to records involving unrelated populations or focusing on non-linguistic domains, such as pharmacological treatments, motor milestones, or standardized clinical assessments that did not analyze the qualitative process of language construction.

Following scoping review guidelines, which recommend a comprehensive search when database indexing may be insufficient, a structured hand-search was performed. This was essential given the limited scientific literature for GLP. For this, an initial exploratory screening was performed via Google Scholar (first two pages) to identify relevant repositories and organizations. This was followed by targeted searches within specific platforms, resulting in 23 included documents from: Websites, including ResearchGate and the Communication

Center; Professional Organizations, specifically the American Speech-Language-Hearing Association (ASHA); and Other academic sources, such as Frontiers, SpringerLink, and Cambridge University Press.

3.2. Data Extraction and Synthesis

The selection process (screening of titles, abstracts, and full texts) was conducted by the first author and independently verified by a research assistant. Disagreements were resolved by consensus with the co-author. To ensure comprehensiveness, 23 additional texts (including grey literature) were identified through manual searching (hand searching).

Data were extracted into a structured Microsoft Excel spreadsheet containing: Reference, Year, Country/Language, Publication Type, Objective, Theory, Definitions/References to theories or authors, Stages, and Main Results. This specific categorization was designed to enable a comparative analysis between the theoretical frameworks. The extraction of 'Definitions' aimed to trace the origins and conceptual similarities between the theories. The 'Stages' were extracted to compare the procedural development and operational flow of each model.

The complete data extraction sheet is available in the study repository (<https://doi.org/10.7910/DVN/JR8PYP>) and for ease of identification, all sources included in the final synthesis are marked with an asterisk (*) in the reference list of this article. The synthesis was descriptive and narrative, using a deductive-inductive approach to construct comparative categories based on the core tenets of UBT and GLP. In line with scoping review guidelines, a formal risk of bias assessment was not performed.

4. Results

4.1 Selection of Texts

Initially, 12,104 records were retrieved from the databases. After the removal of 5,160 duplicates, 6,924 records were excluded based on title and abstract screening, primarily for not addressing the population or the concept (UBT/GLP) of interest. This stage resulted in 20 eligible studies.

The supplementary manual search identified 23 additional documents (including websites, organizations and other academic sources). All 23 were screened and included due to their theoretical relevance. Therefore, the final corpus for analysis consisted of 43

documents: 20 from indexed databases and 23 from manual searching. The identification and selection process of the texts is summarized in the PRISMA-ScR flowchart (Figure 1).

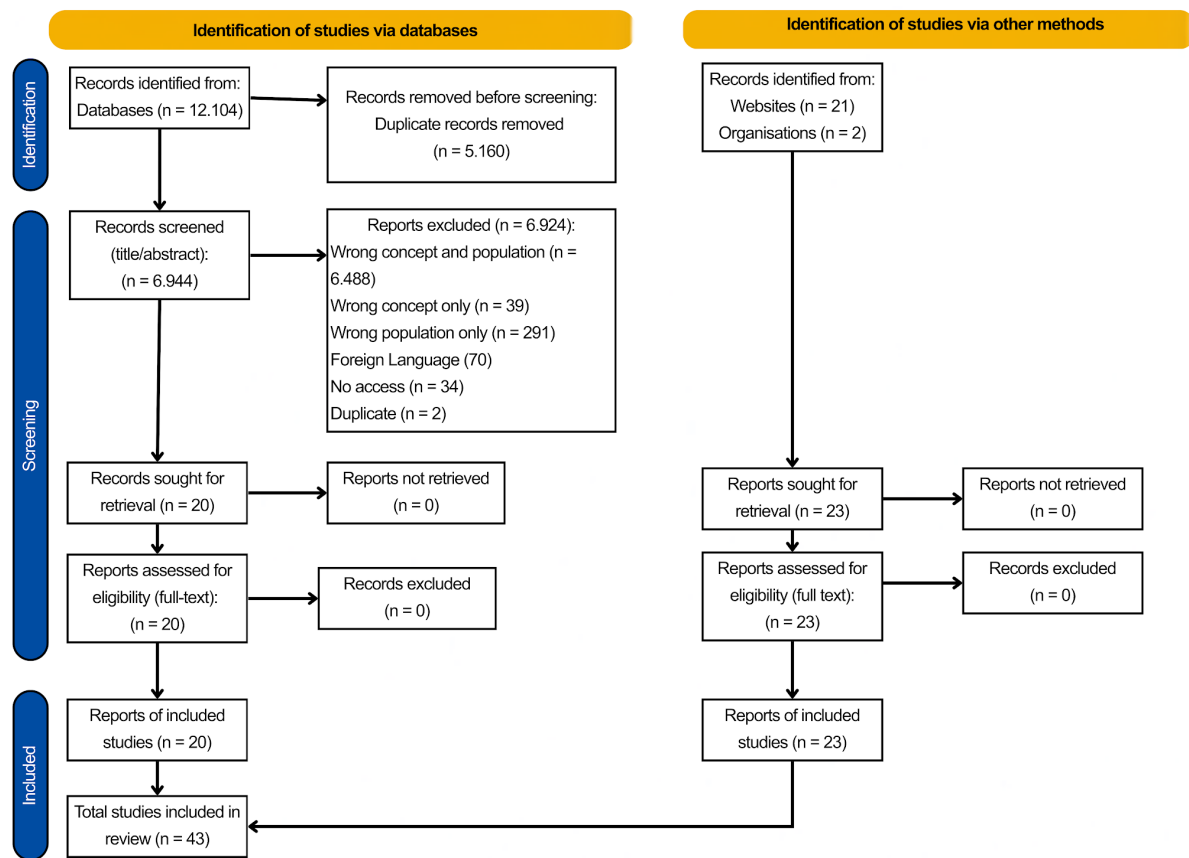


Figure 1. PRISMA-ScR flowchart translated and adapted from Campião, 2026.

ALT: Flowchart of study selection showing 12.104 records identified from databases, 5.160 duplicates removed, 6.924 excluded after title/abstract screening, including a total of 20 records from database searches plus 23 records from a manual search, totaling 43 included documents.

4.2 Identification of Articles

The 43 included studies were published between 1961 and 2025. Regarding the database search (n = 20), PubMed yielded the highest volume (n = 12), followed by Scopus (n = 4), EMBASE (n = 2), and LILACS (n = 2), while PsycINFO and Web of Science contributed no additional unique studies after the eligibility screening. Manual search records (n = 23) were sourced from academic platforms and organizations, distributed as follows: University Cambridge Press (n = 11), ResearchGate (n = 4), the Communication Center website (n = 3), SpringerLink (n = 2), Frontiers (n = 1), and the American Speech-Language-Hearing Association (ASHA) (n = 1).

4.3 Developmental Parallels: A Comparative Mapping of UBT and GLP Stages and Processes

The analysis of the 43 studies enabled a comparative mapping of UBT and GLP, organized here according to the chronological progression of language acquisition. This structure highlights how both theories, despite their different origins, describe a consistent transition from holistic processing toward analytical grammatical construction. To facilitate this comparison, the following sections follow a representative developmental trajectory, where the processes of both theories are contrasted stage by stage.

To illustrate these mechanisms in a practical context, consider a scenario where a child is watching a cartoon with an adult. On the screen, a character exclaims: "Oh no, the girl dropped the ball!"; meanwhile, the adult provides a more direct input: "Oops, the ball fell!". In this situation, the child receives two distinct linguistic models for the same event. Figure 2 provides a visual summary of this scenario, serving as a baseline to compare how each framework explains the child's processing and subsequent linguistic output throughout their development.

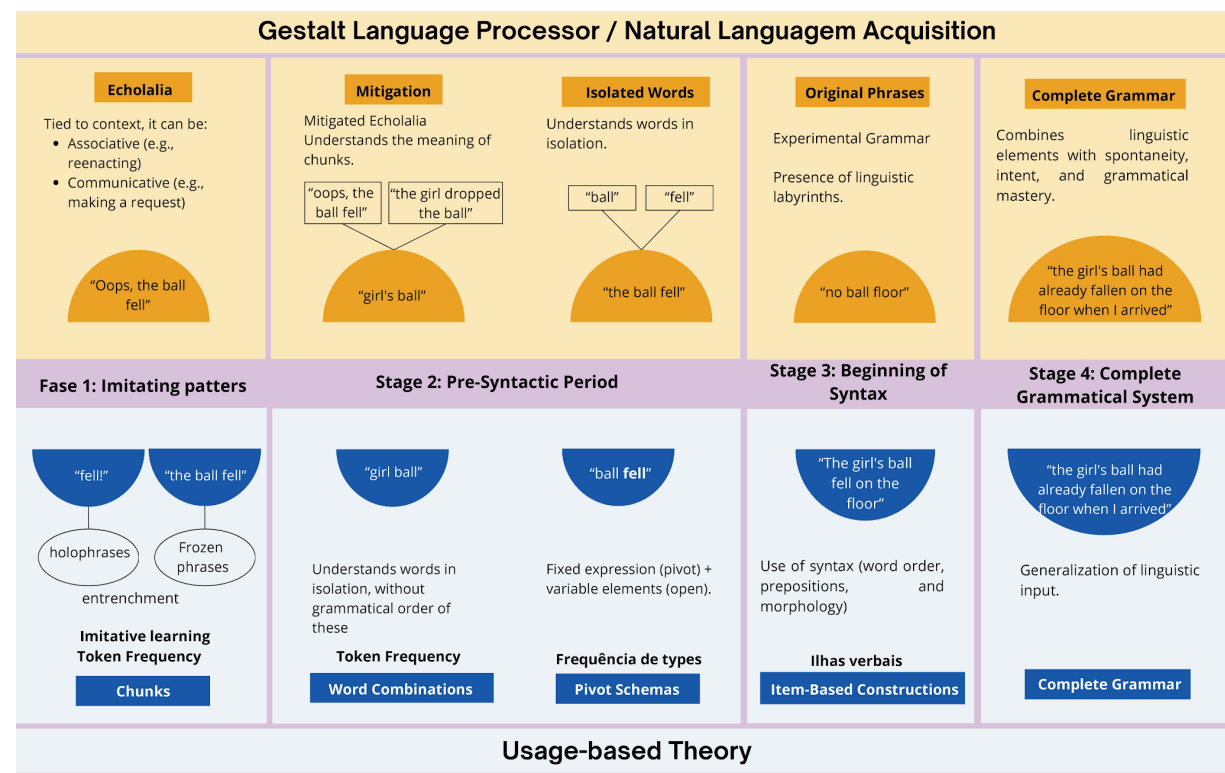


FIGURE 2: Comparison of UBT and GLP Stages

ALT: Diagram comparing the developmental progression proposed by Gestalt Language Processing/Natural Language Acquisition and Usage-Based Theory. Both begin with memorized holistic linguistic units, progress through segmentation and recombination, develop item-based syntax, and culminate in complex grammar.

GLP/NLA presents this progression as discrete clinical stages, whereas Usage-Based Theory presents it as a gradual continuum.

Source: *Translated from Campiã, 2026.*

4.3.1 Stage 1: Holistic Units and Imitating Patterns (Chunks, Gestalt and Echolalia)

At the onset of development, both theories identify the holistic unit as the fundamental psycholinguistic starting point, although they describe its emergence with distinct emphases. According to the analyzed texts, UBT defends that language acquisition is an emergent process where grammatical structure is constructed through exposure and repeated use of linguistic "chunks" in communicative contexts (Fernández-Pena; Kaltenböck; Pérez-Guerra, 2025). This framework relies on general cognitive mechanisms - such as memory, the processing of fragments, chunking, categorization, and analogy - driven by token and type frequency, and on statistical learning (Arciuli, 2017).

Furthermore, Abbot-Smith (2020) highlights that this development is underpinned by the child's ability to engage in shared intentionality, noting a period of lexical conservatism where linguistic forms are initially learned as concrete, lexically specific items. Consequently, grammar constitutes a dynamic network of form-meaning constructions (Wertheimer, 1923; Tomasello, 2000a, 2000b; Ibbotson, 2013; Ghalebi; Sadighi, 2015; Leclercq, 2023; Bybee, 2010, 2023).

Within this stage, **UBT considers the utterance to be the fundamental unit** (Tomasello, 2000a, 2000b, 2009). It is defined as a complete speech act, bounded by a single intonation contour, through which the speaker expresses a specific intention to a listener in a concrete interactional context (Tomasello, 2000b). To understand its nature and emergence, the reviewed texts highlight the importance of two underlying cognitive abilities: intention-reading and pattern-finding (Tomasello, 2000b).

Intention-reading is central, referring to the speaker's action of directing attention to a shared referent. Around 12 months, children infer that adults communicate intentionally, forming the basis for joint attention behaviors (following gaze, imitating actions, pointing). First linguistic manifestations emerge directly from these triadic interactions (child, partner, and object), already imbued with communicative intention (Tomasello, 2000c, 2009). Simultaneously, pattern-finding manifests as the ability to identify regularities in the objects of attention, supporting future grammatical acquisition (Bishop *et al.*, 2017; Croft, 1991; Tomasello, 2000c).

Thus, after interpreting the adult's intention, the child attempts to reproduce their speech. These productions can be holophrases, which are single linguistic symbols that function as a complete utterance (e.g., "Fell!" to express "The ball fell!", as in Figure 2) (Tomasello, 2000b, 2009); or "**frozen phrases**" (e.g., "the ball fell", as in Figure 2), initially produced as undifferentiated chunks, without the child analyzing their internal constituents (Tomasello, 2000b).

This process is sustained by specific cognitive mechanisms. **Cultural or imitative learning** allows the child to grasp the adult's communicative intention and reproduce the utterance as a meaningful unit (Tomasello, 2000b). The consolidation of these initial units depends on **token frequency**, that is, the repetition of identical expressions in similar functional contexts. This repeated exposure leads to **entrenchment**, through which forms become automated and fixed in the child's repertoire as prefabricated chunks (Tomasello, 2000b).

Parallel to this, **GLP describes an acquisition trajectory that also begins with whole, unanalyzed phrases ("gestalts" or "chunks")**, memorized and reproduced as holistic units. Development progresses from the segmentation of these units to the production of analytic and spontaneous utterances (Blanc, 2005a, 2005b, 2005c, 2005d, 2012; Peters, 2021).

Both perspectives believe that language emerges from use and interaction, rejecting initial abstract rules. Only one study (Wray, 2013) explicitly connected Peters' 'formulaic language' to Tomasello's 'item-based constructions' (UBT). The main difference lies in focus: UBT explains typical development, whereas GLP focuses on clinical context in ASD, emphasizing functional echolalia (Blanc, 2005a, 2005b, 2005c, 2005d, 2012). This distinction raises a central question: the differentiation between echolalia in ASD and in typical development.

Echolalia is described as a continuum of repetitions (whether immediate/delayed or literal/mitigated) dependent on intention, context, and sociocognitive function (Schuler, 1979; McEvoy *et al.*, 1988). In children with ASD, echolalia has recently been recognized not as a purposeless symptom, but as a sophisticated interactional resource (Paccia; Curcio, 1982; Sterponi; Shankey, 2014). It is emphasized that its analysis must consider context and that its indiscriminate suppression can harm speech development (Saad; Goldfeld, 2009). Multiple functions are identified, with turn-taking being the most frequent (~61%) in children with typical development (Bybee, 2023). For delayed echolalia, there are subtypes with distinct

clinical implications, such as stereotyped, negativistic, and mitigated - the latter indicating increasing communicative intent (Dyer; Hadden, 1981).

Schuler (1979) observes echolalia in typical development (18-30 months), with a transition from literal to mitigated repetitions, favoring language acquisition. However, as a transient phase in typical development, it often persists as a primary strategy in ASD. This suggests differences of degree, duration, and function, not nature, reinforcing the need for functional analysis (Prucoli *et al.*, 2021).

But studies present distinct perspectives: Tager-Flusberg and Calkins (1990) suggest that imitation does not facilitate grammatical development in typical development, ASD, or Down syndrome. In contrast, Leung and Wu (1997) demonstrate that interventions integrating echolalia can benefit receptive language acquisition in ASD. In summary, the analyzed records indicate that while the gestalt model (Blanc, 2005a, 2005b, 2005c, 2005d, 2012; Prizant, 1983) characterizes echolalia as the starting point for analytical processing via mitigation and recombination, UBT studies describe it as a transient phase in typical development.

4.3.2 Stage 2: The Pre-Syntactic Period

In UBT, it is observed that, through the use of these holophrases and frozen phrases, the child begins a process of analyzing their parts; that is, of understanding words as isolated units with meaning. This path unfolds into pre-syntactic patterns, such as word combinations and pivot schemas (Tomasello, 2000a, 2009). Word combinations emerge around 18 months, where the child joins two relevant terms for a scene (e.g., "girl ball", as in Figure 2). These combinations, which can be produced with a pause or under a single intonation contour, represent an advance over holophrases, as they segment the experience into nameable parts. However, word order still does not carry grammatical value, being guided by frequency in the adult input (Tomasello, 2000a, 2009).

Subsequently, pivot schemas emerge, one of the first systematic combination patterns (around 18-24 months). A fixed word (the pivot, such as "more" or "fell") combines with a variety of other words (the open words), generating utterances such as "ball fell" or "fell girl", as observed in Figure 2 (Tomasello, 2000a, 2009). This pattern is enabled by type frequency - exposure to different lexical items in the same functional position (e.g., "more milk", "more cookie")-, enabling the child to identify a variable slot in the structure (Bybee, 2010; Tomasello, 2009). This is an initial abstraction (Tomasello, 2000a).

In GLP for typical development, Peters (2021) describes a phase of segmenting chunks into smaller parts, followed by the extraction of morphosyntactic frames with slots (e.g., "I want _"), equivalent, respectively, to word combinations and pivot schemas in UBT (Peters, 1977; Tomasello, 2000a). In the NLA for ASD, this progression is slower. Prizant (1983) describes a stage in which echolalia gains pragmatic functions and segmentation of gestalts begins, followed by recombining the segments into new combinations (Prizant, 1983).

Blanc (2012), in turn, describes the second stage as the "mitigation" phase, a period of transition in which the child begins to separate gestalts, modifying elements of the phrase to adapt it to new contexts. As examples, the author cites: (1) the change from "mommy got" to "girl got"; and (2) the production of "girl's ball", derived from the original gestalts "the girl dropped the ball" and "oops, the ball fell" - as represented in Figure 2. The first case approximates the pivot schemas described by Tomasello (2000a), while the second reflects the greater complexity and length of echolalia in ASD, associated with pragmatic challenges. The third stage in Blanc's model (2012) - termed "isolated words" - shows a clear correspondence with the concept of "word combinations" in UBT. This phase is marked by the use of referential combinations, such as the production of "ball" followed by "the ball fell" (Figure 2).

4.3.3 Stage 3: Beginning of Syntactic Marking

In UBT, the beginning of syntax is marked by item-based constructions, a grammatical knowledge that is still concrete and tied to specific verbs the child already masters. In this phase, the child uses word order and other syntactic markers consistently, but only around individual "verb islands". For example, a child may know perfectly that for the verb "to fall," the agent of the action comes before the verb ("The girl's ball fell on the floor", as in Figure 2). The knowledge is, therefore, specific and non-abstract, evolving gradually from exposure to concrete uses (Tomasello, 2000a, 2003).

In GLP, especially in its clinical version for ASD, the equivalent stage is described as the emergence of original phrases (Stage 4 of the NLA model). The initial syntax here is experimental, characterized by a period of "trial and error," with productions that may seem disorganized (e.g., "no ball floor", as in Figure 2). These "linguistic labyrinths," along with the use of "minichunks" (fragments of previous gestalts), are seen as positive indicators of the active construction of grammar. The proposed intervention emphasizes the careful modeling of basic and transparent structures, avoiding initial abstract elements like pronouns, with the

aim of transforming parts of gestalts into independent words (Blanc, 2005a, 2005b, 2012).

Thus, the data extraction reveals a convergence where both approaches describe initial syntax as concrete, specific knowledge centered on lexical items (verbs or verbal frames), which gradually evolves into more general patterns. As a divergence: UBT offers a cognitive explanation of the learning mechanism (limited generalization from verbs). GLP, in turn, provides an observable clinical description of the process, highlighting the phenomenology of speech under construction and proposing intervention guidelines to support this transition in the context of ASD.

4.3.4 Stage 4: Towards Complete Grammatical Construction

Regarding the development of abstract and complex constructions, UBT responds to criticisms about its supposed limitation to simple structures by arguing that complexity emerges gradually. Tomasello (2003) demonstrates that constructions such as complement clauses (e.g., "I think that..."), relative clauses (e.g., "the toy that spins"), and complex questions are not acquired as abstract rules. Instead, the child initially learns specific, fixed lexical patterns tied to concrete verbs or expressions. Generalization to truly abstract structures occurs later, through repeated exposure to different instances of these patterns in the input. In this way, grammatical constraints (such as the dative alternation) are not innate but learned through experience with the conventional uses of the language.

In contrast, GLP describes the pinnacle of development as mastery of a complete and productive grammatical system. In the typical model, Peters (2021) describes final stages of "fusion" and "persistence at intermediate levels," where frequent combinations become pre-assembled units. In the NLA model applied to ASD, the transition from ungrammatical strings (e.g., 'no ball floor') to complex grammar is explained by the gradual process of segmentation and linguistic reanalysis, as these units become available for creative recombinations, therefore going to stages 5 and 6, that are dedicated to the spontaneous and appropriate use of complex sentences, marking the final consolidation of grammar and a significant reduction in echolalia (e.g., "the girl's ball had already fallen on the floor when I arrived", as in Figure 2) (Blanc, 2012).

In summary, the approaches converge in characterizing the final stages of acquisition as the consolidation of a productive linguistic system. In UBT, this process is described as the formation of a network of constructions that functions as a complex adaptive system (Bybee, 2010; Kretzschmar, 2015), in which abstractions emerge from the recurrent use of

contextualized linguistic patterns. Parallely, GLP defines Stages 5 and 6 of the NLA model as the phase of mastering complex and grammatically complete structures, typically marked by a significant reduction in echolalia (Prizant, 1983; Blanc, 2012).

4.3.5 Theoretical Divergence: Continuum vs. Stages

While the stages described above reveal structural parallels, the theories diverge in their conceptualization of the developmental trajectory. In UBT, development is described as a *continuum* - a gradual and continuous process where complexity emerges through progressive cognitive action without fixed phases or specific ages (Tomasello, 2009; Croft, 2004; Bybee, 2010, 2023; Lieven *et al.*, 2003).

In contrast, GLP (specifically the NLA model) organizes this journey into a descriptive sequence of stages to guide clinical assessment and intervention in ASD (Blanc, 2005a, 2005b, 2005c, 2005d; Blanc; Blackwell; Elias, 2023). The retrieved studies document a chronological evolution of this model: from a description in typical development (Peters, 2021), to an outline of stages in ASD (Prizant, 1983), to a structured clinical protocol (Blanc, 2005a, 2005b, 2005c, 2005d; Blanc; Blackwell; Elias, 2023). As acquisition progresses, GLP also emphasizes the necessity of adult mediation to interpret gestalts and model functional chunks, whereas UBT focuses on the child's spontaneous intention-reading in typical development (Blanc, 2005a; Tomasello, 2000b).

4.3.6 Studies reinforcing elements of the theories

Research on pronouns indicates that reversals are more linked to socio-cognitive factors and input than to structural deficits (Barokova; Tager-Flusberg, 2020) and are not solely explainable by echolalia (Fay, 1979). Such findings align with UBT's emphasis on communicative intention as a guide for development and with the GLP view that personal references emerge later, after the gestalt phase.

In a longitudinal study, Patterson (2000) described the progression of a child with language delay in three phases: 1) use of isolated words and "frozen phrases"; 2) emergence of flexible elements; 3) spontaneous construction of new sentences. The author used the term "gestalt" to describe the initial phase of unanalyzed units and, in the discussion, cited Brooks and Tomasello (1999) in emphasizing that acquisition can occur both bottom-up (part-whole) and top-down (whole-part).

Carvalho and Avelar (2002) established a dialogue between typical and pathological acquisition by analyzing repetition and error in children with and without ASD. They observed that while the child with typical development transitioned between imitation and creation, the child with ASD presented more rigid speech, characterized by echolalias and stereotypies.

Another study demonstrated that the pragmatic use of language was a better predictor of word combination than vocabulary size, reinforcing the emphasis of both approaches on the role of actual use for acquisition (Foster-Cohen; Van Bysterveldt; Papp, 2021). Finally, caregiver alignment emerged as an empirical link between the perspectives. Longitudinal studies showed that the correspondence between the child's and adult's productions (lexical, syntactic, or semantic) predicted growth in vocabulary and sentence complexity, suggesting a common mechanism underlying both approaches (Fusaroli *et al.*, 2023).

4.3.7 Studies criticizing elements of the theories

The data extraction identified a group of studies that provide critical evaluations of the theoretical and empirical foundations of the analyzed frameworks. Regarding the broader lineage of usage-based perspectives, Baker (1961) points out theoretical inconsistencies in earlier "linguistic theories of usage," noting that isolating language use from its social and emotional effects results in a loss of contextual meaning. The author reports that language cannot be separated from its social consequences, even from a strictly scientific perspective.

In relation to the GLP/NLA model, Hutchins, Knox, and Fletcher (2024) report that, although the model's principles are consistent with established theories, its stage-like progression lacks robust empirical evidence. A literature review (Beals, 2024) states that the premise that gestalt processors bypass the word level to process whole sentences is incompatible with neuroscience evidence on phonological and syntactic processing, describing the model as implausible considering current linguistic research. Corroborating the critique regarding the lack of empirical support for the NLA protocol, Dinello and Gladfelter (2025) conducted a scoping review aimed at informing speech-language pathologists about current intervention strategies targeting echolalia. The authors reported that behavioral approaches focused on reducing echolalia remain the most frequent strategy used in clinical sessions (accounting 73% of interventions). Furthermore, they highlighted that while NLA is a utilized protocol, it currently lacks robust empirical evidence.

5. Discussion

The present study conducted a mapping and comparative analysis between the stages and processes of UBT and the GLP model. The results revealed fundamental convergences, but also divergences in the described developmental stages, empirical scope, and theoretical foundation of each approach.

5.1. From Continuum to Stages: An Epistemological Divergence

A key difference between the approaches lies in the description of the developmental trajectory. UBT conceives the process as a gradual continuum, without delineating fixed phases, emphasizing the continuous action of cognitive mechanisms on linguistic input (Croft, 2004; Bybee, 2010, 2023). In contrast, GLP, particularly in the formulation of the NLA model, organizes acquisition into a descriptive sequence of stages (Blanc, 2005a, 2005b, 2005c, 2005d; Blanc; Blackwell; Elias, 2023).

Although the NLA/GLP model itself recognizes individual variability and does not establish rigid ages (Blanc, 2005a, 2005b, 2005c, 2005d; Blanc; Blackwell; Elias, 2023), the "stage" structure may, in clinical practice, be interpreted in an excessively linear way. Hutchins *et al.* (2024) point out this risk, questioning its current capacity to fully capture the heterogeneity of ASD. This skepticism is amplified by the fact that GLP's stages are predominantly descriptive and lack the robust, longitudinal validation seen in usage-based frameworks (Beals, 2024). This risk materializes if the sequence is seen as a universal roadmap, precisely underestimating the crucial role of environmental mediation - a central pillar of the model.

This distinction does not invalidate GLP but defines its different purposes. The stages of GLP function as a descriptive clinical tool that names and sequences observable phenomena (such as mitigation). UBT, on the other hand, offers an explanatory model of the underlying cognitive processes. The divergence is, therefore, one of emphasis and application: UBT explores the "why" (the mechanisms), while GLP/NLA describes the "what" (the phenomena) and suggests a "how" to intervene.

5.2. The Holistic Unit

One of the central axes of convergence identified is that both theories describe the onset of language acquisition as anchored in larger, unanalyzed units (Wertheimer, 1923; Tomasello, 2000b; Ibbotson, 2013; Ghalebi; Sadighi, 2015; Novák, A.; Novák, B., 2022; Leclercq, 2023; Bybee, 2010, 2023; Tomasello, 2000a). In UBT, these are holophrases or frozen phrases (Tomasello, 2000b, 2009); in GLP, they are gestalts, chunks, or echolalias (Blanc, 2005a, 2005b, 2005c, 2005d, 2012; Blanc; Blackwell; Elias, 2023; Prizant, 1983; Peters, 2021). This shared premise signals a view of language as an emergent system, constructed from actual use, input frequency, and its communicative function (Tomasello, 2003; Croft, 2004; Bybee, 2023). Both perspectives propose that these holistic chunks are progressively analyzed and recombined in a trajectory that goes in a top-down trajectory forming the basis for subsequent grammatical creativity (Blanc, 2005a, 2005b, 2005c, 2005d, 2012; Tomasello, 2009).

5.3. The Major Divergence: The Initial Pragmatic Abyss and the Bridge of Mediation

The convergence on the starting point, however, conceals a fundamental divergence concerning the degree of shared communicative intentionality associated with these initial units. In UBT, which describes typical development, holophrases emerge naturally from established joint attention and effective intention-reading, carrying from the outset a clear communicative intention for the interlocutor (Tomasello, 2000b, 2009). In the clinical GLP, applied to ASD, the first gestalts or echolalias with a predominantly associative or self-stimulatory function, and their communicative intent may not be transparent (Prizant, 1983; Blanc; Blackwell; Elias, 2023). This reflects the deficits in socio-emotional reciprocity characteristic of the spectrum (American Psychiatric Association, 2022).

It is in this initial pragmatic abyss that the NLA/GLP model introduces its most crucial element: intentional adult mediation. Blanc (2005) proposes that the caregivers should first meet the child on their own terms, decoding their gestalts to establish a connection. In a second step, they begin strategically introducing new linguistic chunks that are, by design, more functional, predictable, and analyzable (e.g., "Where is...?") (Blanc; Blackwell; Elias, 2023).

When analyzed alongside UBT, this mediation can be described as a clinical strategy that aims to foster the conditions for shared intentionality. While critics suggest that GLP may oversimplify complex neurodivergent trajectories (Beals, 2024; Hutchins *et al.*, 2024), the mediation process described in GLP focuses on providing structured and functional input.

From a usage-based perspective, such input is the environmental requirement for cognitive mechanisms - such as intention-reading and pattern-finding - to operate. Thus, rather than a contradiction, the two models offer different entry points: UBT identifies the cognitive prerequisites for language construction, while GLP describes a clinical procedure intended to facilitate those interactions within an atypical developmental context.

5.4. From Analysis to Syntax

The results revealed parallels between the descriptions of each theory in the subsequent processes: (1) Initial Analysis: The word combinations and pivot schemas of UBT (Tomasello, 2009) find their counterpart in the mitigation stages and isolated word combinations of GLP (Blanc, 2005a; Prizant, 1983). The "mitigation" process is the observable clinical manifestation of the "pattern-finding" mechanism described by UBT; (2) Emerging Syntax: The item-based constructions or "verb islands" of UBT - where syntactic knowledge is initially tied to specific verbs (Tomasello, 2003) - mirror the phase of original phrases with experimental grammar (Stage 4 of NLA), where verbs begin to stand out as a grammatical class, albeit through trial and error (Blanc, 2005c; Blanc; Blackwell; Elias, 2023); (3) Consolidated Grammar: The development of abstract and complex constructions in UBT (Tomasello, 2003) corresponds to the final NLA stages of sentences with a complete grammatical system (Blanc, 2005d; Blanc; Blackwell; Elias, 2023).

These parallels suggest that an underlying sequence of linguistic processes - such as analysis, recombination, and generalization - may be observed across different developmental paths. Within this perspective, the heterogeneity of ASD does not necessarily invalidate this sequence; rather, it may account for variations in the starting point (such as complex echolalia) and the pace of progression. However, since GLP remains an emergent clinical framework, these observations highlight the need for further empirical studies.

5.5. Empirical Limitations and Clinical Implications

While UBT operates within a consolidated cycle of experimental and longitudinal validation, GLP remains primarily situated within clinical and non-indexed literature. This disparity implies that GLP functions as an emergent clinical framework rather than a validated scientific theory. It is crucial, however, to distinguish between the conceptual core of GLP and the NLA intervention protocol derived from it. This review proposes a potential theoretical

alignment with UBT's principles, suggesting a plausible framework to further explore these clinical observations through the lens of established cognitive science.

6. Final Considerations

This work proposed a conceptual exploration between two models of language development, identifying structural parallels across developmental stages. The analysis noted that certain cognitive mechanisms described by UBT - such as pattern-finding and entrenchment - showed conceptual correlations with the transitions observed in GLP trajectories. However, these points of contact must be viewed with caution, as UBT and GLP occupy distinct positions in the hierarchy of scientific evidence.

The implications of this review are twofold. First, for clinical practice, the results suggest that a critical adoption of the NLA model may be beneficial, prioritizing not the rigid application of its stages, but the understanding of the mediation mechanisms that facilitate the transition from holistic to analytic processing. Second, intervention could seek to create environmental conditions that align with the learning processes documented in usage-based literature, always grounded in the individual's interests and communicative forms.

In the field of research, the correlations identified in this mapping indicate a clear need for studies that investigate these mechanisms more deeply. Future directions should include longitudinal research to verify if the pattern of abstraction processes (UBT) are indeed active -during the progression through GLP stages, as well as controlled clinical trials to evaluate the NLA protocol.

The limitations of this study are acknowledged. As a scoping review, the synthesis has an inherent interpretive nature, underscores the preliminary status of the identified parallels, and highlights that they should be treated as propositions to be tested.

In summary, the articulation between UBT and GLP suggests a framework for understanding language acquisition in ASD not as a deficit process, but as a variation in the starting point, pace, and necessary conditions for activating the same fundamental usage-based learning mechanisms. This integrative view offers a theoretical path to explore clinical practices that are informed by these principles, proposing a framework that aligns with the neurodiversity perspective and seeks to be responsive to the specific needs of children with ASD.

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Competing Interests

The authors have no competing interests to declare.

Authorship Contribution

Alice Silvestre Campião: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, and Writing - original draft.

Marina Leite Puglisi: Conceptualization, Methodology, Supervision, Validation, and Writing - review & editing.

Research Protocol

We confirm the evaluation of Equator Network guidelines, and the application of available models was not deemed relevant. The study was not pre-registered prior to data collection. Instead, a retrospective, post hoc protocol documentation was deposited on the Open Science Framework platform for transparency on January 30, 2026, after the study was fully completed (link: <https://doi.org/10.17605/OSF.IO/U2KFV>). No differences exist between the procedures described in the deposited protocol and the study performed.

Data Availability Statement

The dataset supporting this scoping review is publicly archived in the Harvard Dataverse repository (DOI: <https://doi.org/10.7910/DVN/JR8PYP>). The repository comprises: (1) Search Strategy and Protocol, documenting the PCC framework, exact search strings, applied filters, and database-specific search dates; (2) PRISMA Flowchart, providing a visual summary of the screening process from the 12,104 identified records to the final 43 included studies; (3) Exclusion Log, an itemized list of 6,924 records assessed in title and abstract screening with their respective reasons for exclusion; (4) Extraction Table, containing the complete dataset and variables extracted from the included studies (e.g., theoretical frameworks, definitions, and main results); and (5) a README file, which provides comprehensive metadata, column definitions, and methodological notes regarding

deduplication and decision rules. This data is available under the Creative Commons CC-BY 4.0 license.

AI Use Statement

During the preparation of this work, the authors used DeepSeek-V3 to assist in the initial English translation and grammatical review of the whole manuscript, which is based on the first author's master's dissertation (originally in Brazilian Portuguese). All AI-assisted sections underwent human review, manual rewriting, and verification by the authors to ensure scientific accuracy and terminological precision. Because interaction logs and exact prompts were not retained during the initial drafting phase, a persistent public record of the chat history cannot be provided.

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