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Paired Repetition in Early-Childhood Bilingualism: A Design-Theoretic Account

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Abstract

The article presents a design-theoretic analysis of the paired repetition method as a new model of experimental planning in the study of early bilingual development. The work is conducted within a cognitive-psycholinguistic framework that integrates evidence on early grammatical generalization, speech segmentation mechanisms, and discourse-based support during sentence reproduction. The study draws upon a comparative synthesis of recent international publications addressing grammar acquisition, cognitive strategy formation, and the assessment of linguistic abilities in bilingual children. Particular attention is given to substantiating paired repetition as a theoretical construct that combines the cognitive sensitivity of early language acquisition with the ecological validity of contextual tasks typical of school-age assessment. The article elaborates the principles of integrating segmentation and discourse mechanisms within a unified design approach that ensures continuity between early and later stages of language development. The novelty of the research lies in the formulation of paired repetition as a cognitive-diagnostic model aligning theoretical and practical aspects of evaluating grammatical competence in bilingual children. The article will be of interest to scholars and practitioners in psycholinguistics, bilingual education, and cognitive science.

Keywords: bilingualism, cognitive development, language acquisition, sentence repetition, generalization, discourse context, design-oriented approach.

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1. Introduction

Sentence repetition tasks are one of the key tools for diagnosing language abilities in bilingual children of preschool and early school age. They allow for the assessment of the formation level of grammatical structures and the determination of the relationship between memory, speech perception, and meaningful reproduction. However, despite their prevalence, such tasks retain methodological ambiguity (Kałowski et al., 2025). It remains unclear what exactly is being measured—mechanical retention of information, linguistic competence, or the interaction of cognitive and speech processes.

The most notable limitation of traditional methods is the absence of a coherent context. When a child is presented with isolated sentences, the experiment loses its naturalness and does not reflect the real conditions of speech interaction. This situation reduces participant engagement and makes the results sensitive to memory peculiarities rather than to the deep mechanisms of

grammar acquisition. The problem is exacerbated by the fact that speech development in bilingual children occurs unevenly (Andreou et al., 2021). Some structures are acquired through simple memorization, others through generalization and the construction of patterns. Accordingly, during diagnosis, it is important to distinguish between the two types of language acquisition. The first is related to the extraction of stable speech fragments and their memorization—a segmentation mechanism. The second reflects the child's ability to extend acquired grammatical rules to new situations—a generalization mechanism. It is this second path that ensures the transition from mechanical repetition to the meaningful syntactic construction of an utterance.

Existing sentence repetition tasks rarely allow for the capture of the interaction between these two mechanisms, as they rely either on purely mechanical memory or on speech anticipation (Nencheva et al., 2024). To overcome this contradiction, the concept of paired repetition is proposed, in which the child is presented with both individual sentences and interrelated utterances that form a short narrative.

The scientific novelty of the work lies in conceptualizing paired repetition as a connecting link between artificial language learning experiments in infants and narrative repetition tasks in school-age bilinguals. Such a design allows for the combination of early manifestations of unconscious linguistic generalization with later forms of discourse planning.

The purpose of the study is to develop conceptual approaches to the use of paired repetition as a key tool for experimental planning, allowing for the alignment of the cognitive mechanisms of early language acquisition and the processes of organizing coherent speech in bilingual children.

2. Materials and Methods

The methodological foundation of the study is formed at the intersection of cognitive psycholinguistics, experimental diagnostics of bilingualism, and a design-oriented analysis of linguistic procedures. The goal was to form a theoretical justification for the paired repetition methodology, which integrates segmentation-memory and discourse-contextual mechanisms of language acquisition. This approach allows for the reproduction of the dynamics of the transition from isolated repetition to contextually motivated repetition, ensuring a balance between the cognitive sensitivity and the ecological validity of the experiment.

The paired repetition methodology includes two interconnected formats for presenting speech material—isolated sentences, aimed at identifying processes of mechanical retention and phonological memory, and paired constructions, in which the subsequent sentence is linked to the previous one using anaphoric or causal elements. This organization provides the opportunity to observe how context affects accuracy, syntactic restructuring, and semantic coherence during reproduction.

Separate attention was paid to controlling grammatical complexity and lexical frequency so that the differences between conditions reflect the cognitive effect of the context itself, rather than the structural properties of the stimuli.

The theoretical basis of the study was formed from works revealing the relationship between memory, grammatical competence, and contextual processing. The study by Andreou et al. (2021) substantiated the influence of working memory capacity and vocabulary size on sentence repetition accuracy, which made it possible to isolate the segmentation component within paired repetition. Grimm (2022) showed that nonword repetition reflects pure retention mechanisms without the involvement of grammar, thereby setting a criterion for delineating cognitive levels. The review by Kałowski et al. (2025) identified the need for unified design parameters when analyzing bilingual data, which formed the basis for the principle of stimulus comparability. The work by Lally et al. (2025) demonstrated that objective assessment of bilingual children is possible using a standardized response coding system, independent of the researcher's linguistic background. This allowed for the development of a universal scale for interpreting paired repetition results. The study by Lester et al. (2022) revealed that structural repetition in adult speech performs a learning function, forming predictive templates for perception and reproduction in the child. Data from Monaghan et al. (2023) showed that a child's ability to generalize grammatical rules forms earlier than the ability to segment speech, which helped determine the focus of paired repetition analysis on integrating both mechanisms. The work by Nencheva et al. (2024) emphasized the interaction of isolation and repetitive experience in early childhood, creating the basis for stable cognitive schemas. The study by Neveu et al.

(2024) revealed that bilinguals demonstrate similar mechanisms of associative binding when acquiring words, confirming the possibility of transferring the pairing principle to the syntactic level. Of particular importance for forming the methodological foundation was the work by Tal et al. (2024), which showed that as a child matures, the redundancy of adult speech decreases, enhancing the importance of context for interpreting utterances. The logic of the study by Torregrossa et al. (2024) is built on this basis, proving that adding a narrative context to sentence repetition tasks increases the accuracy of grammatical reproduction in the less dominant language.

Thus, the methodological strategy of this study relies on a synthesis of two approaches: the cognitive, aimed at identifying the internal patterns of linguistic generalization, and the contextual, ensuring the naturalness of speech interaction. The paired repetition methodology is viewed as a design platform capable of uniting these principles and creating a basis for assessing the real mechanisms of grammar acquisition in bilingual children.

3. Results

The analysis results showed that the paired presentation format has a systematic influence on the accuracy of sentence reproduction in bilingual children. When discourse context is included, an increase in syntactic correctness and a decrease in errors related to agreement violations and the omission of functional elements are observed. This effect is most pronounced in conditions of lower language dominance, where the child relies on semantic links between utterances to compensate for limited working memory resources.

In the study by Torregrossa et al. (2024), it was established that adding a narrative context to sentence repetition tasks increases reproduction accuracy in the heritage language without reducing the reliability of cognitive measurements. This result aligns with the logic of paired repetition, where context serves as a cognitive support, integrating perception, retention, and grammatical reconstruction. In the study by Andreou et al. (2021), it was noted that when the task is complicated by context, children with a high level of working memory show a significant increase in accuracy, whereas a pronounced compensatory effect is observed in less dominant participants. Parallel observations by Grimm (2022) and Kałowski et al. (2025) indicate that structurally organized stimuli allow for a more precise diagnosis of differences between monolingual and bilingual speech processing strategies. The work by Lally et al. (2025) emphasizes that the introduction of context contributes to a clearer differentiation between grammatical and cognitive errors, which increases assessment reliability in bilingual samples. Table 1 reviews the parameters of the linear mixed model, demonstrating the interaction between task type and the language variable.

Table 1: Parameters of the generalized linear mixed model (GLMM) showing the influence of SRT format and language on reproduction accuracy (Compiled by the author based on the source: Torregrossa et al., 2024).

Factor	β	SE	z	p
Intercept	0.84	0.24	3.52	<0.001
SRT type (with discourse)	0.50	0.11	4.43	<0.001
Language (German)	0.96	0.11	8.78	<0.001
SRT × Language interaction	−0.37	0.16	−2.41	0.02

Note: The Factor column denotes the variables studied (SRT type, language, their interaction); β — standardized coefficient showing the direction and strength of the effect; SE — standard error; z — ratio of the coefficient to the error, characterizing the effect size; p — level of statistical significance.

The obtained results confirm that discourse context within paired repetition contributes to improved accuracy indicators, especially in conditions of uneven language dominance. Parallel results from Nencheva et al. (2024) show that early experience with word repetition and isolation forms stable cognitive templates that are activated when transitioning from isolated utterances to coherent speech. These data confirm that contextual repetition is not an external enhancement but reflects an internal pattern of speech acquisition. The work by Lester et al. (2022) showed that structural repetition in adult speech plays the role of a cognitive marker, forming predictive models of perception. The entirety of these observations allows the discourse component of paired repetition to be viewed as a mechanism for the natural enhancement of cognitive processing, which integrates memory, attention, and grammatical reconstruction into a unified system.

Analysis of data related to the early stages of language acquisition showed that the cognitive mechanisms of generalization and segmentation exhibit varying degrees of connection to subsequent language development. Within the paired repetition concept, these mechanisms are viewed as complementary: segmentation ensures the retention of sound sequences, while generalization forms the ability to identify grammatical patterns and transfer them to new contexts. This dualism of cognitive processes, identified at an early age, subsequently determines the effectiveness of reproducing discourse structures in bilingual conditions.

In the study by Monaghan et al. (2023), it was established that a child's ability to generalize language rules at around one and a half years of age predicts the level of grammatical and lexical competence development three years later. This effect manifests independently of the specific language and illustrates a basic cognitive principle: the transition from perceiving sound segments to the systemic acquisition of structural dependencies. Table 2 reflects the correlations between early artificial language measures and subsequent test results, demonstrating a stable link between generalization and the subsequent language index.

Table 2: Correlations between early artificial language measures and language outcomes at 54 months (Compiled by the author based on the source: Monaghan et al., 2023)

Variables	r	p
Generalisation ↔ BPVS-3	−0.31	<0.05
Generalisation ↔ TROG-2	−0.29	<0.05
Segmentation ↔ Generalisation	−0.07	n.s.
BPVS-3 ↔ Renfrew Vocabulary	0.47	<0.001

Note: The r column reflects the strength and direction of the relationship, and p — the level of statistical significance. Negative correlations indicate a difference in acquisition strategies, positive ones indicate their alignment in development.

The obtained data are consistent with the idea that the subsequent accuracy of paired reproduction is based on the child's early ability for systematic generalization. According to observations by Nencheva et al. (2024), early experience with isolation and repetition forms stable cognitive schemas that are activated when transitioning from individual utterances to coherent speech. Similarly, the study by Lester et al. (2022) showed that regular structural repetition in adult speech creates predictive models that prepare the child for understanding grammatical dependencies. These data allow paired repetition to be viewed as a natural continuation of early generalization processes, where the discourse context becomes an external projection of internal cognitive patterns.

Consequently, the identified correlations confirm that the cognitive ability to generalize determines the pace of language development and forms the basis for the successful completion of paired tasks in bilingual diagnostics. Paired repetition, in this context, acts as a

tool that allows for the capture of continuity between early language acquisition mechanisms and the subsequent development of syntactic productivity, ensuring the cognitive validity of the assessment.

4. Discussion

Analysis of the obtained results shows that cognitive mechanisms formed in the early stages of language acquisition maintain functional continuity in subsequent stages of bilingual development. The study by Monaghan et al. (2023) noted that a child's ability to generalize linguistic patterns before the age of one and a half years acts as a stable predictor of the subsequent level of grammar and vocabulary proficiency. This data indicates that the type of cognitive strategy determining the effectiveness of further language learning is established in infancy.

A comparison with the results of Torregrossa et al. (2024) makes it possible to trace how similar principles manifest at a later age, in school-age bilingualism. Adding discourse context to sentence repetition tasks enhances the accuracy of grammatical reproduction in the heritage language. This effect is interpreted as a manifestation of cognitive support. Discourse reduces the load on working memory, providing the child with the opportunity to rely on contextual links, thereby compensating for the insufficient automation of grammatical structures in the less dominant language. Table 3 reviews the key effects of cognitive transfer between early and school-age bilingualism, reflecting the relationship between the early ability to generalize and subsequent sensitivity to the discourse organization of speech.

Table 3: Comparison of early generalization and discourse-context effects (Compiled by the author based on the sources: Monaghan et al., 2023; Nencheva et al., 2024; Torregrossa et al., 2024)

Age	Task type	Main effect	Statistical significance
17–54 months	Artificial language	Generalization predicts language index	$p < .05$
7–12 years	SRT with/without discourse	Discourse improves accuracy in heritage language	$p < .001$

Note: The Main effect column records the primary observation, and Statistical significance records the confidence level of the results. The comparison shows the continuity of cognitive mechanisms between the early and school stages of language acquisition.

The compared results demonstrate a unified vector of cognitive development, from the early stage, where generalization ensures the formation of basic language processing schemas, to school age, where the same cognitive mechanisms are actualized during the perception of coherent speech. In both cases, a transition is observed from the fragmentary perception of the linguistic stream to reliance on broader contextual structures. Data from Nencheva et al. (2024) and Lester et al. (2022) confirm that repetition and the structural redundancy of child-directed speech serve as catalysts for these processes, and results from Neveu et al. (2024) indicate the universality of associative binding mechanisms that operate independently of the specific language. Collectively, this allows for the assertion that the cognitive function of generalization and reliance on discourse are not local effects but fundamental patterns of bilingual development.

Consequently, the identified relationship between early and school-age manifestations of linguistic competence allows discourse context to be viewed as a natural continuation of early generalization mechanisms. This opens up the possibility of using tasks with context for diagnosis and targeted support of grammatical system development in bilingual children, especially in conditions of asymmetric language dominance.

The concept of paired repetition is formed at the intersection of cognitive modeling of early language acquisition and the experimental diagnostics of bilingual abilities in school-aged children. It combines the segmentation-generalization principle, identified in the study by Monaghan et al. (2023), and the discourse-contextual approach, which proved its effectiveness in the experiment by Torregrossa et al. (2024). This synthesis allows repetition to be viewed not as a mechanical process of reproduction, but as a tool of cognitive control that integrates perception and productivity within a unified system of language processing.

From the perspective of cognitive structure, paired repetition ensures the transition from the child's early ability to extract patterns and form statistical predictions to the conscious processing of coherent speech characteristic of later childhood. As shown in the work by Nencheva et al. (2024), early forms of isolation and repetition stimulate the development of cognitive templates that are subsequently activated during the perception of coherent contexts. This observation correlates with the conclusions of Lester et al. (2022), which emphasized that the repetitiveness of structural elements in adult speech provides the child with a predictive basis for subsequent grammatical generalization.

At a later age, similar mechanisms manifest through the ability to use context as a support for interpreting grammatically complex constructions. The work by Neveu et al. (2024) showed that bilinguals are inclined to activate semantic links between words in paired-association conditions, which increases acquisition efficiency. Consequently, combining the principles of generalization and contextual repetition creates a methodological platform for a balanced assessment of language abilities. Cognitive sensitivity captures the internal patterns of acquisition, while discourse organization captures the external conditions of their manifestation.

From a methodological standpoint, paired repetition represents a design that integrates two measurement logics—predictive (characteristic of early age) and interpretative (characteristic of the school stage). This construction allows for the measurement of the cognitive dynamics of the transition from unconscious processing to the meaningful reconstruction of linguistic structures and maintains high ecological validity of the experiment, approximating the natural conditions of speech interaction.

It is believed that such a design reflects a more realistic model of bilingual development, in which perception and productivity are not opposed but mutually reinforce each other. The use of paired repetition creates conditions for observing how a child not only reproduces what is heard but also reconstructs the structure of the utterance, guided by context and communicative goals. Reliance on experimental observations accumulated within research in the field of child bilingual diagnostics allows for the assertion that it is precisely this approach that ensures the alignment of cognitive accuracy and the practical applicability of testing procedures.

5. Conclusion

This article has proposed a design-theoretic model of paired repetition as an integrative tool for bilingual assessment. The presented approach combines the cognitive sensitivity of early language acquisition and the ecological validity of discourse forms of speech, ensuring alignment between experimental accuracy and the naturalness of speech interaction.

The conducted analysis showed that the inclusion of contextual stimuli significantly increases reproduction accuracy, reduces cognitive load, and promotes the transition from mechanical repetition to meaningful grammatical reconstruction. Thus, paired repetition represents a method that integrates the theoretical and diagnostic aspects of speech research. It allows for the simultaneous capture of internal cognitive patterns of acquisition and the observation of their manifestation in real communicative conditions.

From a theoretical perspective, the model expands the understanding of the links between segmentation, generalization, and discourse integration, forming a conceptual basis for analyzing cognitive continuity in bilingual development. From a practical perspective, it creates the prerequisites for building multilevel diagnostic systems that reflect the balance between the child's linguistic competence and cognitive strategies. Further empirical verification will allow for the determination of the model's diagnostic accuracy and its adaptability to different linguistic environments.

References

1. Andreou, M., Tsimpli, I. M., Masoura, E., & Agathopoulou, E. (2021). Cognitive mechanisms of monolingual and bilingual children in monoliterate educational settings: Evidence from sentence repetition. Frontiers in Psychology, 11, Article 613992. https://doi.org/10.3389/fpsyg.2020.613992
2. Grimm, A. (2022). The use of the LITMUS quasi-universal nonword repetition task to identify DLD in monolingual and early second language learners aged 8 to 10. Languages, 7(3), Article 218. https://doi.org/10.3390/languages7030218
3. Kałowski, P., Obarska, M., Romaneczko, J., Walczak, D., & Banasik-Jemielniak, N. (2025). Differences in sentence repetition tasks in studies on bilingual children's language development: A systematic review. International Journal of Bilingualism. Advance online publication. https://doi.org/10.1177/13670069251358991
4. Lally, S., Banasik-Jemielniak, N., Haman, E., & Antonijevic, S. (2025). Language assessment of Polish-English bilingual children by speech and language therapists who do not speak Polish: A feasibility study of a novel scoring schema for sentence-repetition-tasks. International Journal of Language & Communication Disorders, 60(2), e70005. https://doi.org/10.1111/1460-6984.70005
5. Lester, N. A., Moran, S., Küntay, A. C., Allen, S. E. M., Pfeiler, B., & Stoll, S. (2022). Detecting structured repetition in child-surrounding speech: Evidence from maximally diverse languages. Cognition, 221, Article 104986. https://doi.org/10.1016/j.cognition.2021.104986
6. Monaghan, P., Donnelly, S., Alcock, K., Bidgood, A., Cain, K., Durrant, S., Frost, R. L. A., Jago, L. S., Peter, M. S., Pine, J. M., Turnbull, H., & Rowland, C. F. (2023). Learning to generalise but not segment an artificial language at 17 months predicts children's language skills 3 years later. Cognitive Psychology, 147, Article 101607. https://doi.org/10.1016/j.cogpsych.2023.101607
7. Nencheva, M. L., Schwab, J. F., Lew-Williams, C., & Fausey, C. M. (2024). Word repetition and isolation are intertwined in children's early language experiences. Open Mind, 8, 1330–1347. https://doi.org/10.1162/opmi_a_00172
8. Neveu, A., & Kaushanskaya, M. (2024). The role of bilingualism in paired-associate and cross-situational word learning. Bilingualism: Language and Cognition, 27(1), 41–56. https://doi.org/10.1017/S1366728923000524
9. Tal, S., Grossman, E., & Arnon, I. (2024). Infant-directed speech becomes less redundant as infants grow: Implications for language learning. Cognition, 249, Article 105817. https://doi.org/10.1016/j.cognition.2024.105817
10. Torregrossa, J., Listanti, A., Bongartz, C., & Marinis, T. (2024). Adding discourse to sentence repetition tasks: Under which conditions does bilingual children's performance improve? Research Methods in Applied Linguistics, 3(2), Article 100107. https://doi.org/10.1016/j.rmal.2024.100107