Exploring the contributions of home and school environments to English language production in Spanish-English bilingual children

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Abstract

Bilingual children's language development is shaped by interactions among individual, linguistic, and contextual factors, yet it remains unclear which of these factors most strongly predict grammatical performance in narrative contexts. The present study examined predictors of narrative productivity and complexity in Spanish–English bilingual children, with a focus on age, morphosyntactic scores, and home literacy environment (HLE) variables. Participants were 94 bilingual children aged 6 to 11 who completed oral narrative production tasks and standardized language assessments. Narrative samples were analyzed for measures of productivity and complexity, and regression analyses were conducted to evaluate the contribution of individual and contextual predictors. Results indicated that age and morphosyntactic skills were significant predictors of both productivity and complexity, suggesting that developmental maturation and grammatical accuracy play a central role in bilingual children's expressive language. In contrast, English HLE variables, including shared reading frequency and access to English books, were not significant predictors of English narrative outcomes. These findings likely reflect the strong influence of school-based English input in this sample and the relatively limited variability in English home literacy practices. Together, these results highlight the value of oral narrative production as an integrative measure of bilingual language ability and underscore the importance of combining narrative-based analyses with standardized assessments of morphosyntax. This study offers implications for clinicians and educators seeking to better understand bilingual language development through approaches that account for developmental, linguistic, and contextual influences.

Keywords: Child language development, bilingual, home literacy

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Strong language skills are foundational for academic, cognitive, and social development (Bornstein et al., 2013; Pezold et al., 2020). Understanding how language development presents in children from different backgrounds is fundamental for understanding broader cognitive and social processes. Bilingual children often navigate different language environments (e.g., home vs. school), leading to developmental patterns that differ from monolingual norms (Wood et al., 2017; Huang et al., 2021). For example, in the U.S. context, children who speak Spanish at home have been shown to enter pre-kindergarten and/or kindergarten with strong Spanish skills, but after years in English-dominant schooling systems, their Spanish may show stagnant growth or even slight decline due to the heavy influence of English use in the classroom (Castilla-Earls et al., 2019, 2021, 2023). This case illustrates the influence of educational and societal factors on language dominance and suggests possible shifts in dominance in different environments.

For these linguistically diverse children, assessing their language abilities can be challenging if one fails to consider them from a culturally responsive perspective. A study by Fiestas & Peña (2018) demonstrated that when children were tested using monolingual norms, they were often misclassified as having a language disorder or poor skills. To better support bilingual learners, it is imperative that language assessments are developed that reflect their unique developmental trajectories and depth of linguistic knowledge (Huang et al., 2021). While prior work on bilingual children has shown the importance of testing in both of a child's languages to gain a holistic observation of their linguistic knowledge (Bedore et al., 2023; Castilla-Earls et al., 2023; Peña et al., 2011, 2020), this can be difficult in real world settings where there are not personnel available (i.e., bilingual speech language pathologists, bilingual

teachers) to conduct this level of testing. Therefore, there is a growing push for assessment frameworks that account for the dynamic, context-sensitive nature of bilingual development that can be widely administered across different contexts (Castilla-Earls et al., 2023; Murphy et al., 2022).

Recent work also shows that the home literacy environment and children's bilingual proficiency interact to shape reading outcomes, underscoring the importance of family-level influences in language development (Wagley et al., 2022). Prior research has shown that rich home language practices such as storytelling, book reading, and conversational turn-talking in a child's heritage language create opportunities for cultural engagement, socioemotional learning, and guardian-child bonding (De Houwer, 2009). These experiences help children to develop vocabulary, discourse skills, and narrative structures, all of which prepare children for later academic success (Peets et al., 2019). Children with strong early heritage skills also benefit from expressive vocabulary and grammatical growth, which can transfer to their second language, supporting bilingual outcomes (Peets et al., 2009; Purdie & Oliver, 1999). This emphasizes why it is so important for school assessments to account for diverse language backgrounds, and what is lost from a child's unique developmental trajectory when academic institutions do not. To combine these two lines of research, the present study aims to investigate how children's home-language environment for English may impact their performance on a commonly used, holistic measure of English language proficiency: oral narrative production.

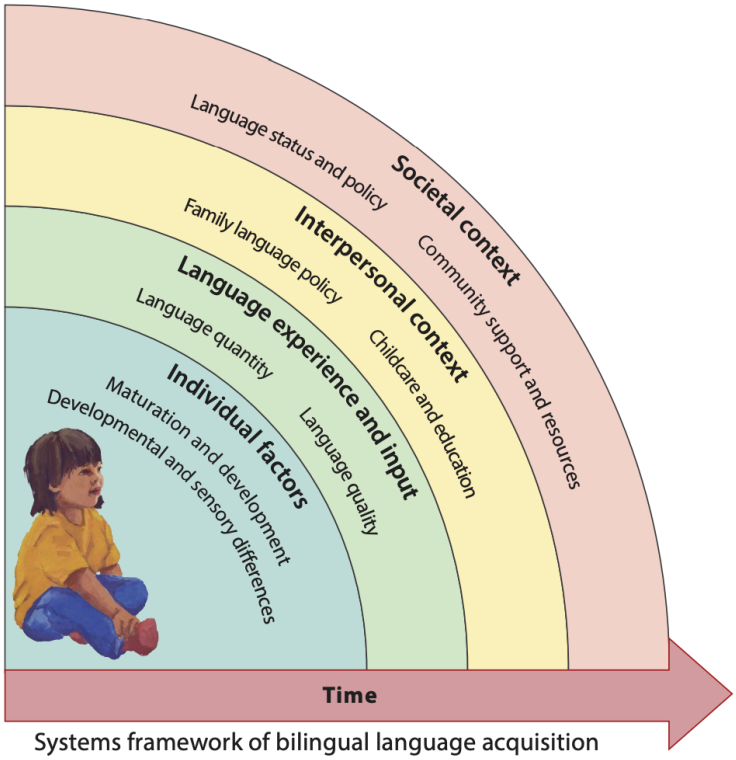
Theoretical Frameworks

Systems Framework of Bilingual Language Acquisition

To situate the present study within a broader theory of bilingual development, this paper draws on the Systems framework of Bilingual Language Acquisition proposed by

Byers-Heinlein, Kircher, and Lew-Williams (2025). This framework conceptualizes bilingual language development as the product of dynamic interactions among multiple nested systems, rather than as the outcome of isolated linear pathways. As illustrated in Figure 1, bilingual development unfolds over time through the interaction of individual factors, language experience and input, interpersonal contexts, and broader societal influences.

Figure 1.
Systems Framework of Bilingual Language Acquisition



Note. This model illustrates how bilingual language development emerges from dynamic interactions among individual factors, language experience and input, interpersonal contexts, and broader societal influences over time. Image from Byers-Heinlein, Kircher, and Lew-Williams (2025).

At the individual level, children bring developmental capacities that shape how language is processed and acquired over time. Maturational changes, age-related cognitive growth, and individual differences influence children's ability to organize and produce language. In the

current study, age represents this developmental dimension, reflecting both biological maturation and cumulative exposure to language across contexts. As children grow older, they gain greater capacity to integrate grammatical knowledge into expressive language, which is expected to support increases in both narrative productivity and complexity.

The language experience and input level emphasize the quantity and quality of exposure children receive in each language. Bilingual children's input is often asymmetrical and context-dependent, with different languages serving distinct functional roles. For Spanish–English bilingual children in the United States, English exposure typically increases rapidly upon school entry, while Spanish is primarily maintained through home and community interactions. This distinction is particularly relevant for interpreting grammatical development, as cumulative exposure to English through schooling may strongly shape morphosyntactic accuracy, while heritage-language outcomes remain more sensitive to home-based input.

At the interpersonal context level, family language practices, home literacy environments, and educational settings structure children's opportunities to use and practice language. Family language policies, shared reading, and daily conversational routines influence how language is embedded in social interaction. However, the systems framework emphasizes that the impact of these practices depends on their interaction with other system levels. In contexts where English input is already robust through schooling, variation in English home literacy practices may exert a weaker influence on English language outcomes, even when such practices are present.

The societal context at the level of the society further shapes bilingual development by influencing language status, access to resources, and community support. In English-dominant educational systems, societal pressures and institutional structures often promote English growth

regardless of home practices, while heritage languages rely more heavily on family and community support for maintenance and development. This broader context helps explain why home language environments may differentially affect English and Spanish outcomes.

Importantly, the systems framework conceptualizes bilingual development as nonlinear and dynamic, allowing for shifts in dominance and changes in the relative influence of different systems over time. This perspective aligns closely with the use of oral narrative production as an outcome measure. Narrative tasks require children to integrate grammatical knowledge, lexicosemantic networks, and discourse organization in real time, making them particularly sensitive to the convergence of multiple system-level influences. Measures of narrative productivity and complexity, therefore, provide a window into how individual development, language experience, and contextual factors interact during authentic language use.

By adopting a systems perspective, the present study frames linguistic development not as the result of a single pathway, but as the outcome of interacting developmental, experiential, and contextual influences operating across time. This framework offers a theoretically appropriate lens for interpreting patterns of age, morphosyntax, and home language environment observed in bilingual children's narrative performance, and it supports the study's emphasis on examining productivity and complexity as integrative markers of bilingual language development.

The Index of Narrative Microstructure (INMS)

Narrative retell and production tasks provide a natural yet structured context to observe the complex dimensions of linguistic development, revealing not only what children know but also how they use language when prompted to organize and communicate a story. Narrative retell and production are commonly captured through two levels of linguistic evaluation:

macrostructure and microstructure. Macrostructure involves observing a child's output through macro-level indices, including narrative organization, the kinds of terminology used (i.e., internal-state terms), and the inclusion of story grammar elements (e.g., characters, settings, cause-and-effect situations). Microstructure is the evaluation of a child's output through fine-grained linguistic metrics, typically aimed at capturing lexical and syntactic ability. In his seminal work, Brown (1973) introduced a theoretical model, the five stages of linguistic development, which provided a developmental lens for interpreting children's linguistic growth through measurements now associated with microstructural evaluation. Brown's stages of development describe the progression from simple word combinations to increasingly complex sentence structures. The early stages of a child's English language production often reflect their growing productivity, as evidenced by increasingly longer mean length of utterances and the use of bound morphemes. Later stages capture complexity, marked by the emergence of features such as auxiliary verbs, possessives, and embedded clauses.

Drawing on the theoretical work of Brown and years of clinical and practitioner-focused language research, Justice et al. (2006) proposed a framework, the Index of Narrative Microstructure, designed to provide a straightforward conceptualization of narrative retell and production for those interested in capturing childhood language development. The authors emphasized that measures such as mean length of utterance (MLU), number of different words (NDW), and subordination index (SI) can serve as meaningful indicators of a child's developmental level, making them ideal tools for assessing microstructural growth in narrative contexts. Whereas language-related research and practice had typically employed these measures individually, reporting every fine-grained measure separately, Justice and colleagues (2006) felt it would be more feasible to combine these commonly employed microstructure measures into a

two-factor approach informed by Brown's original theory. This led to the authors defining two key aspects of children's microstructure: productivity, the child's ability to generate diverse and abundant linguistic content (e.g., number of total words, number of different words, mean length of utterances), and complexity, which reflects the syntactic sophistication of that language, such as the use of embedded or subordinate clauses (e.g., the inclusion of subordinate clauses and coordinating conjunctions, as well as the proportion of utterances including these complex structures). These constructs are grounded in the idea that linguistic development is not just about accuracy, but also about how richly and flexibly children use language to express their ideas.

These frameworks underscore the need to move beyond simple exposure metrics when evaluating bilingual language development. Language learning is not merely the acquisition of vocabulary or grammar; it also supports broader developmental outcomes, including cognitive flexibility, academic achievement, and emotional regulation (Bornstein et al., 2013). In this way, theories of language acquisition explain not only how children internalize linguistic structures, but also how language serves as a tool for thinking, learning, and building social connections. By recognizing the interactive influence of cognitive processes, home environments, and sociocultural experiences, these perspectives offer a dynamic, context-sensitive understanding of how bilingual children develop expressive abilities.

Background

Childhood Language Development

Children typically follow a predictable trajectory of language development marked by various milestones that reflect increasing linguistic complexity. They progress from basic vocabulary to complex syntax, gaining expressive flexibility as they grow (Andreou & Lemoni,

2020). In monolingual language development, early childhood (0-5 years) is characterized by early vocalizations, including babbling and holophrastic speech, during infancy. By age 3, children typically begin to develop early syntactic structures, as evidenced by their use of multi-word utterances (Andreou & Lemoni, 2020). During the school-age years (6-12), children refine their language skills, including sentence complexity, vocabulary, and narrative abilities (Winters et al., 2022). By the end of this stage, children's ability to use language for storytelling has become more advanced, enabling them to incorporate multiple elements, such as characters, settings, and events. This narrative ability, especially syntax within narratives, strongly indicates broader language development (Justice et al., 2006; Winters et al., 2022). Later language abilities, including narrative and grammar skills, are built on these early developmental milestones (Winters et al., 2022). These developmental stages are shaped by biological readiness and social interaction, including caregiver speech and peer communication (Tomasello, 2003). Understanding these developmental patterns in monolingual children offers a foundation for comparison when assessing bilingual children.

Bilingual Language Development

Bilingual language development differs fundamentally from monolingual language development, as bilinguals must simultaneously navigate two linguistic systems, which influences how they acquire and process language (Huang et al., 2021). Bilingual children tend to develop stronger skills in their majority language, which is typically the dominant language of their educational and social environments (Wood et al., 2017). As a result, proficiency in the minority or home language may develop more slowly, particularly in vocabulary and syntax (Castilla-Earls et al., 2022). This lag does not reflect a deficit but rather a natural consequence of language use and exposure.

Contextual factors, such as educational settings and patterns of language exposure, strongly influence language proficiency in bilingual children. Children who are primarily immersed in English at school may develop stronger English proficiency, while their Spanish skills may grow more slowly if they are only used at home (Winters et al., 2022). In contrast, children who receive balanced, meaningful input in both languages across various environments are more likely to achieve equal proficiency in both. Even in monolingual children, grammar acquisition is deeply influenced by the quality of input and opportunities for meaningful use (Tomasello, 2003; Bornstein et al., 2013). These differences in input and use influence not only how children perform on formal language assessments but also how they function in everyday communicative situations.

Bilingual language development also involves the strategic use of learning techniques that enable children to navigate two linguistic systems. Research suggests that bilingual children often rely on metacognitive and social/interaction-based strategies to enhance their language learning (Purdie & Oliver, 1999). Metacognitive strategies involve thinking about one's language use, which can include planning when to use a specific language or rehearsing words before speaking. On the other hand, social strategies involve using interaction with others to advance their learning, such as seeking clarification, asking for the meaning of a word, or imitating others' language use (Purdie & Oliver, 1999). Another strategy bilinguals use is code-switching, which is the ability to alternate between languages within or across conversations. Code-switching is a complex and adaptive skill that demonstrates the ability to adjust one's language to the social situation. These different strategies are unique to bilingual children, showing how they develop skills to navigate two linguistic systems. This use of a distinctive strategy highlights the importance of individualised language assessment of these individuals.

Structural Measures

Language development can be measured by analyzing different macrostructural and microstructural features. Macrostructures focus on the larger organization of narrative language, including narrative coherence, grammar, and organization, which contribute to the storytelling ability. Story grammar is essential in assessing a child's narrative skills as it involves organizing a story with clear beginnings, middles, and ends while maintaining coherence and logical structure (Granados Vargas et al., 2024). Microstructures focus on grammatical accuracy, examining lexical and syntactic elements closely (Winters et al., 2022). Micro- and macrostructural skills often vary across tasks and languages, underscoring the need for multimethod assessments that include both narrative and standardized measures (Granados Vargas et al., 2024; Perez et al., 2022). Specific measures used to examine microstructure features include MLU, NDW, and SI. Both MLU and NDW focus on language productivity and are used to help capture children's syntactic growth and lexical diversity in narrative contexts (Pezold et al., 2020). MLU reflects syntactic length and the developmental stage in child speech (Justice et al., 2006; Pezold et al., 2020), while NDW provides an index of lexical diversity, highlighting how flexibly and expressively children can use vocabulary (Pezold et al., 2020). Together, these measures provide insight into children's language productivity. Shifting the focus toward complexity, SI measures the frequency and complexity of embedded clauses, reflecting syntactic complexity in narratives (Justice et al., 2006; Perez et al., 2022). Leachman et al. (2025) demonstrate that fluency measures, which capture both accuracy and rate, are more predictive of comprehension than isolated metrics. This supports the value of combining multiple microstructural measures to capture productivity and complexity in bilingual grammar.

Assessing language development in bilingual children presents unique challenges, particularly when identifying language impairments with tools designed for monolingual populations. Traditional assessments often fail to account for bilingual children's varied exposure and use across two languages, which can lead to misdiagnosis or under-identification (Castilla-Earls et al., 2022). In response to this need, the Bilingual English-Spanish Assessment – Middle Elementary (BESA-ME) was developed as a linguistically and culturally responsive tool for assessing expressive and receptive language skills in Spanish-English bilingual children in grades 2 through 5 (Peña et al., 2018). The Morphosyntax subtest of BESA-ME provides a standardized measure of children's English grammatical knowledge. It includes sentence repetition and cloze tasks targeting past tense, possessives, relative clauses, and passive voice structures. Because it was explicitly normed on bilingual populations, BESA-ME offers a vital alternative to monolingual benchmarks and serves as a reliable complement to narrative-based measures of syntactic complexity, such as SI. Importantly, within-child analyses reveal that standardized measures, such as BESA-ME, and narrative-based indices often yield different patterns of performance, underscoring the value of using them in conjunction (Granados Vargas et al., 2024). Its inclusion in the present study provides a structured, clinically validated way to assess English morphosyntactic development within a bilingual framework.

Narrative Production

Narrative production has long been recognized as a rich context for studying children’s language development. Unlike isolated vocabulary or grammar tests, narratives reveal how children apply their linguistic knowledge to organize and communicate ideas. The INMS (Justice, 2006) emphasizes that narratives capture both macrostructure and microstructure. Narrative retell tasks are particularly informative because they combine scaffolding with

spontaneity. By reconstructing a story, children must use vocabulary and syntax flexibly in real-time, making narratives a natural yet structured window into expressive abilities (Justice et al., 2006; Pezold et al., 2020). When drawn from narratives, various indices provide a nuanced picture of grammatical growth that may differ from what standardized assessments capture.

Studies show that the performance of bilingual children often diverges across different task types. Some individuals may demonstrate strong morphosyntactic skills on standardized measures, like BESA-ME, but produce less complex narratives in Spanish, highlighting the need for multi-method and multi-language approaches (Granados Vargas et al., 2024; Castilla-Earls et al., 2023). Narrative production and language sample analysis, though, have been found to encapsulate lexical, semantic, and syntactic knowledge by observing children's natural use of speech (Lam et al., 2024). For instance, Lam and colleagues (2024) found moderate relationships between narrative productivity with morphosyntactic knowledge ($r = .38$, $p < .001$) and semantic knowledge ($r = .29$, $p < .001$), in addition to narrative complexity with morphosyntax ($r = .59$, $p < .001$) and semantics ($r = .49$, $p < .001$). Furthermore, when scored using microstructural measures, narrative elicitation offers a fine-grained view of a child's language use that is often more detailed than standardized measures designed to assess discrete skills. Narrative productions not only complement standardized assessments but also illuminate how productivity and complexity develop across languages and contexts, making them essential for understanding the trajectories of bilingual children when only one language can be examined.

Home Literacy Practices

Early English milestones have been studied as predictors of later bilingual outcomes, where early English word production is often linked to later grammar and vocabulary outcomes (Marchman & Fernald, 2008). Children who begin speaking English early tend to show stronger

performance on standardized English grammar tasks (Murphy et al., 2022). Although this relationship is complex, it is shaped by contextual factors. While this early English production may give children an advantage, later English onset does not always indicate lower performance; some children develop strong grammar through academic exposure (Thordardottir, 2011). Some bilingual children exhibit robust grammatical development through academic exposure and scaffolded contexts, indicating that the type and quality of input influence the timing of their first English word production (Murphy et al., 2022; Granados Vargas et al., 2024). These findings highlight the importance of examining not only when children first produce English words but also the contexts in which they learn and use language. Narrative-based measures, for example, may provide a different perspective on grammatical development than expressive vocabulary alone, capturing syntactic complexity and contextual use of language that early milestones cannot fully predict (Murphy et al., 2022).

In addition to oral milestones, literacy-related experiences provide another lens for understanding bilingual development. Earlier exposure to English print may support standardized grammar and reading outcomes, while later exposure can still facilitate narrative complexity when scaffolded by caregivers or teachers (Peets et al., 2019; Thordardottir, 2011). Shared reading, in particular, provides children with access to more diverse vocabulary and more complex syntax than is typically used in everyday conversation. Empirical studies show that the frequency and quality of shared reading in bilingual households are strongly linked to children's vocabulary, grammar, and reading skills (Peets et al., 2019).

Parental attitudes shape whether these literacy opportunities are prioritized. Parents who actively support bilingualism, through shared reading, storytelling, or creating book-rich environments, play a central role in promoting children's balanced development (De Houwer,

2009; Purdie & Oliver, 1999). Extending beyond attitudes, intentional practices provide children with meaningful and interactive opportunities to use both languages. Recent evidence further demonstrates that the quality of bilingual home environments, including literacy resources and practices, interacts with children's proficiency to predict later reading and language outcomes (Wagley et al., 2022), highlighting that both motivation and input context are critical for children's development.

Current Study

The present study investigates the role of home literacy practices in shaping the English language development of Spanish–English bilingual children. Using the Systems Framework of Bilingual Language Acquisition (Byers-Heinlein et al., 2025) as a guiding framework, this study examines how measures of productivity and complexity in children's narratives relate to standardized morphosyntactic performance on the BESA-ME, as well as to specific home literacy practices. These practices include the age of first English word production, the number of English books at home, and the frequency of shared English reading. Together, these variables were selected to provide insight into how structural language skills emerge within the dual-language acquisition context of bilingual children.

Rather than viewing bilingual language development through a deficit lens that compares it to monolingual norms, this study adopts a context-sensitive perspective that accounts for both linguistic and developmental factors. By examining the relationship between early English expressive and literacy milestones and later grammatical outcomes, this research aims to identify meaningful variations in the expressive abilities of bilingual children. Based on the systems framework of bilingual language acquisition, we anticipated a positive relationship between narrative structure and BESA-ME performance, as both reflect language skills that are largely

shaped within school-based contexts. More specifically, because English exposure for participants in this sample was primarily supported through formal education, we expected narrative measures and standardized morphosyntax scores to draw on overlapping linguistic systems, a finding also supported by prior literature (e.g., Granados Vargas et al., 2024; Lam et al., 2024). In contrast, we anticipated weaker relations between English home literacy practices and English performance on standardized measures, given the framework's emphasis on how language development is differentially influenced by societal and institutional contexts rather than home language use alone. The ultimate goal is to contribute to more equitable assessment and support practices for bilingual populations, particularly in educational and clinical contexts where a nuanced understanding of bilingual development is essential.

Methods

Participants

The participant sample consisted of 110 Spanish-English bilingual children aged seven to eleven (M_{age}= 9.13, SD_{age}= 1.31, 52.7% females). This data is a part of an ongoing, larger study funded by the NIH. The specifics of participation in the study underwent review by the University of Michigan's Institutional Review Board (IRB) for child research and were granted permission. Participants were recruited from the Midwest, United States, through a combination of flyers, email outreach, and online postings shared with school communities and parent-focused groups. The sample generally consisted of families from middle- to high-socioeconomic backgrounds, as determined by parental education and household income reported by participants. Inclusion for the larger study was determined by children having been exposed to Spanish from birth and having had at least one year of English exposure prior to the time of testing. The variations of Spanish used by families were diverse, including Mexican,

Table 1.

Participant Demographics

	N	Mean (SD)	Minimum	Maximum	Skew	Kurtosis
Age	110	9.13(1.31)	7.01	11.69	0.01	-1.21
Grade	110	3.17(1.35)	1	6	0.04	-1.03
Female (%)	110	0.527(.50)	0	1	-0.11	-2.02
English exposure per week (hours)	107	73.07(18.37)	22	110	-0.11	-0.16
Spanish exposure per week (hours)	107	53.72(15.51)	20	105	0.82	1.30
Parental education	107	6.06(1.61)	0	8	-1.80	3.22
Number of English books at home	102	6.28(3.51)	1	13	0.51	-0.65
Age of first English word (months)	110	29.36(17.27)	6	72	0.62	-0.61
Frequency of shared reading (per week)	97	2.93(1.94)	1	8	1.01	0.46
BESA-ME Morphosyntax	110	14.36(1.73)	8	16	-1.43	2.14
BESA-ME Semantics	110	19.78(4.62)	9	28	-0.12	-0.72

Note. Bilingual English–Spanish Assessment – Middle Elementary (BESA-ME; Peña et al., 2018). English and Spanish exposure were reported by parents in terms of the percentage of time the child hears and uses each language across home, school, and community settings. Frequency of shared reading was also parent-reported, with responses indicating how often family members read English books with the child in a typical week (outside of bedtime routines). Parental education was measured as follows: 0 = 7th grade or less, 1 = junior high/middle school, 2 = partial high school, 3 = high school graduate/GED, 4 = partial college, 5 = associate's degree, 6 = bachelor's degree, 7 = master's degree or equivalent, 8 = doctorate degree.

Salvadorian, Nicaraguan, Venezuelan, Colombian, Costa Rican, Cuban, and Castilian. Bilingual status was confirmed through parent-reported language histories, which detailed usage across home, school, and social settings.

Measures

The objective of the larger study was to observe children's language skills through multiple assessments, capturing different levels of linguistic proficiency. The present study focused on the following assessments based on the information necessary to address the aforementioned research questions.

Test of Narrative Language-2

All participants were given the Test of Narrative Language (TNL; Gillam & Pearson, 2017), an assessment designed to assess participants' narrative comprehension and production skills in both English and Spanish. The English version of the TNL was administered online via Zoom. During the testing session, the researcher read three short stories and asked the child to answer a series of comprehension questions. Additionally, children were asked to produce three stories each based on an image (or series of images) presented to them by the researcher. Although the Spanish version of the TNL was administered, for the purposes of the present study, only English scores were analyzed.

Bilingual English Spanish Assessment - Middle Elementary (BESA-ME)

Participants completed the BESA-ME Morphosyntax subtest to assess their English syntactic development in a structured context, which included sentence repetition and cloze (fill-in-the-blank) tasks. These tasks target a range of grammatical structures, including relative clauses, possessives, past-tense verbs, question inversion, and passive constructions. For the sentence repetition task, children were asked to repeat increasingly complex sentences verbatim

(e.g., *"The book that she reads in the library is big."*). The cloze task required children to complete sentences using grammatically appropriate forms based on visual stimuli (e.g., *"This is a clown and this is the..."* with the target response *"clown's umbrella"*). This subtest was explicitly designed for Spanish-English bilingual children and provides a standardized measure of expressive grammar that is culturally appropriate, assessing language proficiency across a child's full linguistic repertoire. Both scores are combined to reflect children's ability to produce age-expected syntactic forms in English and Spanish.

In-Lab Parent Questionnaire

Parents completed an in-lab questionnaire to gather contextual information about their child's language development and home language environment. The questionnaire included items to assess structural and attitudinal factors that could influence bilingual language use and proficiency. For instance, parents were asked how many books are available in their home, whether their child has received formal Spanish education, and how often Spanish is spoken in various contexts. The questionnaire also included items related to children's early language milestones. Key questions were: "At what age did your child say his/her first English word?" (which was then recorded in months), "How many English books does your child have (including purchased, rented, and borrowed books)?" and "In a typical week, how often do you or other family members read English to your child at times other than bedtime?" These variables were used to examine whether age of first English word production and early literacy exposure were associated with children's syntactic development in English.

Procedure

The Test of Narrative Language includes a scoring manual that can allow for scoring to be done during test administration, but it is common practice to also record the produced

narratives from participants to further analyze them using language sample analysis (LSA). All participant stories were recorded, transcribed, and hand-coded. The procedures for these processes are outlined below.

Transcription and Coding

Audio recordings from the storytelling sessions were transcribed using an automated transcription service, which were then hand checked by a group of trained research assistants. This was done by listening to the audio recordings as one or two individuals read through the automated transcription, making adjustments when necessary. The hand-checked transcripts were then analyzed using the Systematic Analysis of Language Transcripts (SALT) software to measure linguistic features produced within the children's responses. SALT is a tool for analyzing language samples and is considered to be a gold standard for language sample analysis within clinical and educational research domains. SALT offers a reliable method for evaluating a range of linguistic features, including subword, full-word, phrase, and sentence-level measures, facilitating a comprehensive analysis of language complexity (Pezold et al., 2020). Measures produced from SALT analyses can be used for diverse purposes, such as identifying language disorders, observing identifiers of linguistic development, and comparing language performance across one or more languages within and across children. The fine-grained measures produced by the software allow for identifying language patterns that might indicate developmental delays or other language difficulties, especially in cases where bilingual children may demonstrate different language use across their two languages.

Scoring for Complexity and Productivity

After coding was completed and linguistic measures were produced from SALT, scores for the narrative productions were calculated using the Interrelated Model of Narrative Structure

(INMS; Justice, 2006). Although clinicians and language researchers often report SALT measures as they are produced (i.e., mean length of utterance, subordination index, type-token ratio), such fine-grained features can be challenging for teachers, parents, and paraprofessionals unfamiliar with clinical practices to conceptualize. In order to offer an easily interpretable method for scoring narrative retell and production tasks, Justice and colleagues (2006) leveraged commonly employed measures in clinical language sample analysis to create two key constructs by which language production can be evaluated: productivity and complexity. Both constructs employ the same list of SALT-produced measures (counts of subordination clauses and coordinating conjunctions, mean length of utterance, number of total words, number of different words, and number of total utterances in the full response), but to varying degrees, to represent the nuanced differences of the constructs. By using INMS as a guiding framework, these measures provide a structured way to capture both the quantity and quality of children's expressive grammar within narrative contexts.

Data Analysis

All analyses were conducted using SPSS. For each participant, grammatical scores were averaged across the three narrative production stories to create composite scores for each measure. A partial correlation matrix was first generated to examine relationships among the primary variables when controlling for age. Following this, two regression models were run to test whether predictors, such as home literacy practices and the age of first English word, significantly contributed to children's linguistic outcomes.

Results

Final analyses were conducted with a sample of 94 participants. Sixteen participants were excluded due to either non-reported information or not completing all of the required tasks.

To examine the relationships among the variables of interest, partial correlation analyses were conducted, controlling for age. As shown in Table 2, frequency of shared reading was significantly associated with age of first English word ($r = –.29$, $p = .004$). The number of English books at home was positively correlated with productivity ($r = .26$, $p = .009$). Significant associations also emerged between BESA-ME scores and grammatical outcomes. Specifically, BESA-ME semantics scores were correlated with both complexity ($r = .263$, $p =$ 01) and productivity ($r = .248$, $p = 015$), while BESA-ME morphosyntax scores were correlated with both complexity ($r = .40$, $p < .001$) and productivity ($r = .43$, $p < .001$). Productivity and complexity also showed a significant correlation ($r = .496$, $p < .001$). BESA-ME morphosyntax scores also had significant correlations with number of English books ($r = .33$, $p < .001$) as well as semantics scores ($r = .391$, $p < .001$). Together, these findings highlight consistent links between the home literacy environment, standardized assessments, and measures of narrative grammar. Other reported correlations did not show any significant connections between them.

Table 3 presents the hierarchical linear regression model for predicting productivity. Predictor variables were entered in four blocks: (1) demographic control variables (age, gender, parental education, (2) home literacy factors (age of first english word, frequency of shared reading in english, number of english books at home, (3) BESA-ME morphosyntax, and (4) BESA-ME semantics. For predicting productivity, age and BESA-ME morphosyntax were significant. In block 1, the demographic control variables were entered and significantly explained 23% of the variance ($R^2 = .23$). Age significantly predicted a 0.626 point increase in productivity, $\beta = .418$, $SE = .139$, $t = 4.515$, $p < .001$, 95% confidence interval (CI) [0.353, 0.906]. Gender showed significant predictions, with girls having a 0.743 point increase in

Table 2.
Correlation Table, Age Corrected

	1	2	3	4	5	6
1. Complexity						
2. Productivity	.496***					
3. Age of First English Word (months)	-.067	-.01				
4. Frequency of Shared English Reading	.055	.17	-.293**			
5. Number of English Books	.135	.264**	-.172	.241*		
6. BESA-ME Semantics	.263**	.248*	.036	-.104	-.077	
7. BESA-ME Morphosyntax	.404***	.428***	-.133	.036	.33***	.391***

Note. *** p < .001, ** p <.01, * p < .05. All correlations were age corrected. Complexity and Productivity were calculated using the equation put forward in Justice et al. (2006). Age of first English word refers to the age at which a child used their first English word and was recorded, in months. Frequency of shared English reading is the self-reported frequency in which parents read with their children in English. The number of English books is the parent-reported number of books the child owns. BESA-ME is the Bilingual English-Spanish Assessment - Middle Elementary, and included subtests of semantics and morphosyntax (Peña et al., 2018).

productivity, β = .189, *SE* = .36, t = 2.063, *p = .042,* 95% CI [0.353, 0.906]. Parental education did not show any significant predictions for higher productivity. In block 2, home literacy factors were added, predicting an additional 4% of the variance (ΔR^2 = .04). None of the home literacy variables significantly predicted productivity. Age remained a significant predictor, β = .409, *SE* = .14, t = 4.395, *p* < .001*,* 95% CI [0.337, 0.894].

In block 3, BESA-ME morphosyntax was entered and predicted 11% of additional variance (ΔR^2 = .11). Morphosyntax significantly predicted a 0.153 point increase in productivity, β = .359, *SE* = .038, t = 3.971, *p* < .001*,* 95% CI [0.076, 0.229]. Age remained a significant predictor, β = .366, *SE* = .131, t = 4.214, *p* < .001*,* 95% CI [0.291, 0.811], while

Table 3.

Regression Model for Productivity

		Regression Coefficents						Fit of Model	
Model		***B***	***β***	***SE***	***t***	***p***	**95% CI**	***R***	***R²***
1	(Constant)	-4.485		1.549	-2.896	0.005	[-7.561, -1.41]	0.476	0.227
	Age	0.629	0.418	0.139	4.515	<.001	[0.353, 0.906]		
	Female	0.743	0.189	0.36	2.063	0.042	[0.028, 1.458]		
	Parental Education	0.187	0.149	0.116	1.613	0.11	[-0.043, 0.418]		
2	(Constant)	-4.574		1.603	-2.965	0.004	[-7.939, -1.569]	0.521	0.271
	Age	0.616	0.409	0.14	4.395	<.001	[0.337, 0.894]		
	Female	0.668	0.17	0.358	1.864	0.066	[-0.044, 1.379]		
	Parental Education	0.055	0.044	0.129	0.431	0.667	[-0.2, 0.311]		
	Frequency of Shared English Reading	0.106	0.104	0.1	1.059	0.292	[-0.093, 0.306]		
	Age of First English Word (months)	0.007	0.066	0.011	0.68	0.498	[-0.014, 0.029]		
	Number of English Books	0.11	0.198	0.056	1.954	0.054	[-0.002, 0.222]		
3	(Constant)	-8.121		1.711	-4.747	<.001	[-11.52, -4.721]	0.617	0.381
	Age	0.551	0.366	0.131	4.214	<.001	[0.291, 0.811]		
	Female	0.588	0.15	0.333	1.768	0.08	[-0.073, 1.249]		
	Parental Education	0.025	0.02	0.119	0.207	0.837	[-0.213, 0.262]		
	Frequency of Shared English Reading	0.138	0.135	0.093	1.476	0.144	[-0.048, 0.324]		
	Age of First English Word (months)	0.012	0.105	0.01	1.153	0.252	[-0.008, 0.032]		

	Number of English Books	0.05	0.091	0.054	0.927	0.357	[-0.058, 0.158]		
	BESA-ME Morphosyntax	0.153	0.359	0.038	3.971	<.001	[0.076, 0.229]		
4	(Constant)	-8.211		1.703	-4.821	<.001	[-11.595, -4.826]	0.628	0.394
	Age	0.49	0.326	0.137	3.573	<.001	[0.218, 0.763]		
	Female	0.583	0.148	0.331	1.761	0.082	[-0.075, 1.24]		
	Parental Education	0.047	0.037	0.12	0.392	0.696	[-0.191, 0.285]		
	Frequency of Shared English Reading	0.011	0.095	0.01	1.044	0.3	[-0.01, 0.031]		
	Age of First English Word (months)	0.143	0.14	0.093	1.532	0.129	[-0.042, 0.327]		
	Number of English Books	0.062	0.112	0.055	1.138	0.258	[-0.047, 0.171]		
	BESA-ME Morphosyntax	0.126	0.295	0.043	2.935	0.004	[0.041, 0.211]		
	BESA-ME Semantics	0.062	0.141	0.044	1.398	0.165	[-0.026, 0.15]		

Note. Model 1 Predictors: (Constant), parental education, female, age. Model 2 Predictors: (Constant), parental education, female, age, age of first English word, frequency of shared reading, and number of English books. Model 3 Predictors: (Constant), parental education, female, age, age of first English work, frequency of shared reading, number of English books, BESA-ME morphosyntax. Model 4 Predictors: (Constant), parental education, female, age, age of first English word, frequency of shared reading, number of English books, BESA_ME morphosyntax, BESA-ME semantics.

Table 4.
Regression Model for Complexity

		Regression Coefficents						Fit of Model	
Model		**B**	**β**	**SE**	**t**	**Sig.**	**95% CI**	***R***	***R²***
1	(Constant)	-3.669		1.043	-3.517	<.001	[-5.741, -1.598]	0.451	0.203
	Age	0.419	0.419	0.094	4.459	<.001	[0.232, 0.605]		
	Female	0.373	0.143	0.243	1.536	0.128	[-0.109, 0.854]		
	Parental Education	0.042	0.05	0.078	0.534	0.595	[-0.114, 0.197]		
2	(Constant)	-3.523		1.104	-3.19	0.002	[-5.717, -1.329]	0.463	0.214
	Age	0.405	0.406	0.096	4.203	<.001	[0.214, 0.597]		
	Female	0.343	0.131	0.247	1.39	0.168	[-0.147, 0.833]		
	Parental Education	0.011	0.013	0.089	0.124	0.901	[-0.165, 0.187]		
	Frequency of Shared English Reading	0.002	0.002	0.069	0.022	0.982	[-0.136, 0.139]		
	Age of First English Word (months)	-0.002	-0.032	0.007	-0.315	0.753	[-0.017, 0.013]		
	Number of English Books	0.038	0.102	0.039	0.972	0.334	[-0.039, 0.115]		
3	(Constant)	-5.797		1.183	-4.902	<.001	[-8.146, -3.447]	0.573	0.328
	Age	0.362	0.363	0.09	4.004	<.001	[0.182, 0.542]		
	Female	0.289	0.111	0.23	1.258	0.212	[-0.168, 0.746]		

	Parental Education	-0.01	-0.012	0.083	-0.119	0.906	[-0.174, 0.154]		
	Frequency of Shared English Reading	0.023	0.034	0.065	0.353	0.725	[-0.106, 0.151]		
	Age of First English Word (months)	0.001	0.007	0.007	0.076	0.939	[-0.013, 0.014]		
	Number of English Books	-0.003	-0.007	0.038	-0.07	0.945	[-0.077, 0.072]		
	BESA-ME Morphosyntax	0.103	0.365	0.027	3.88	<.001	[0.05, 0.156]		
4	(Constant)	-5.852		1.18	-4.96	<.001	[-8.197, -3.507]	0.583	0.34
	Age	0.324	0.325	0.095	3.413	<.001	[0.136, 0.513]		
	Female	0.286	0.11	0.229	1.246	0.216	[-0.17, 0.741]		
	Parental Education	0.004	0.005	0.083	0.048	0.962	[-0.161, 0.169]		
	Frequency of Shared English Reading	0	-0.002	0.007	-0.023	0.982	[-0.014, 0.014]		
	Age of First English Word (months)	0.026	0.038	0.064	0.398	0.691	[-0.102, 0.154]		
	Number of English Books	0.005	0.013	0.038	0.124	0.901	[-0.071, 0.08]		
	BESA-ME Morphosyntax	0.086	0.306	0.03	2.915	0.005	[0.028, 0.145]		
	BESA-ME Semantics	0.038	0.131	0.031	1.245	0.217	[-0.023, 0.099]		

Note. Model 1 Predictors: (Constant), parental education, female, age. Model 2 Predictors: (Constant), parental education, female, age, age of first English work, frequency of shared reading, number of English books. Model 3 Predictors: (Constant), parental education, female, age, age of first English word, frequency of shared reading, number of English books, BESA-ME morphosyntax. Model 4 Predictors: (Constant), parental education, female, age, age of first English word, frequency of shared reading, number of english books, BESA_ME morphosyntax, BESA-ME semantics.

home literacy variables still showed no significance. In block 4, BESA-ME semantics was added and predicted, and an additional variance of 1% ($\Delta R^2 = .01$). Morphosyntax remained significant, $\beta = .295$, $SE = .043$, $t = 2.935$, $p = .004$, 95% CI [0.041, 0.211], as did age, $\beta = .326$, $SE = .137$, $t = 3.573$, $p < .001$, 95% CI [0.218, 0.763]. Semantics did not show any significant predictions. Thus, both age and morphosyntax were significant predictors of productivity.

Table 4 presents the hierarchical linear regression model for predicting complexity. Predictor variables were entered in four blocks: (1) demographic control variables (age, gender, parental education, (2) home literacy factors (age of first english word, frequency of shared reading in english, number of english books at home, (3) BESA-ME morphosyntax, and (4) BESA-ME semantics. For predicting complexity, age, morphosyntax, and semantics were significant. In block 1, the demographic control variables were entered and significantly explained 20% of the variance ($R^2 = .20$). Age significantly predicted a 0.419 point increase in complexity, $\beta = .419$, $SE = .094$, $t = 4.459$, $p < .001$, 95% (CI) [0.232, 0.605]. Parental education and gender did not show any significant predictions for higher complexity. In block 2, home literacy factors were added, predicting an additional 1% of the variance ($\Delta R^2 = .01$). None of the home literacy variables significantly predicted complexity, and age remained a significant predictor, $\beta = .406$, $SE = .096$, $t = 4.203$, $p < .001$, 95% CI [0.214, 0.597].

In block 3, BESA-ME morphosyntax was entered and predicted 12% of additional variance ($\Delta R^2 = .12$). Morphosyntax significantly predicted a 0.103 point increase in complexity, $\beta = .365$, $SE = .027$, $t = 3.88$, $p < .001$, 95% CI [0.05, 0.156]. Age remained a significant predictor, $\beta = .363$, $SE = .09$, $t = 4.004$, $p < .001$, 95% CI [0.182, 0.542], while home literacy variables still showed no significance. In block 4, BESA-ME semantics were added and predicted an additional variance of 2% ($\Delta R^2 = .02$). Morphosyntax remained significant,

predicting a 0.086 point increase in β = .306, *SE* = 0.03, t = 2.915, *p* = 0.005, 95% CI [0.028, 0.145], as did age, β = .325, *SE* = .095, t = 3.413, *p* < .001, 95% CI [0.136, 0.513]. Semantics did not show any significant predictions. Thus, age and morphosyntax were significant predictors of complexity.

Discussion

The present study examined the impact of home literacy practices on English language development in Spanish-English bilingual children, as assessed by grammatical and syntactic scores. Correlations and hierarchical regression models were run to investigate these questions. The results support our hypotheses and prior literature regarding English narrative production, but not findings related to home literacy environments. The systems framework of bilingual language acquisition helps explain this pattern by highlighting how language development is shaped by interactions among individual, contextual, and societal factors. Viewed through this framework, the present findings underscore the importance of considering individual language profiles and call for further research that examines how bilingual children's experiences across contexts jointly influence language outcomes.

Relations Between Literacy and HLE Variables

A moderate negative correlation was found between the frequency of shared reading and the age of first English word, indicating that children whose parents engaged in more shared reading started speaking English with their children at an earlier age. Prior research on the impact of home literacy practices on language and reading development suggests that early exposure to shared book reading may provide consistent, meaningful input that accelerates children's expressive language development (see Pico & Woods, 2022, for a review). In line with this research, our study showed a moderate positive correlation between the number of English

books at home and narrative productivity scores, indicating that children with greater access to English books demonstrated more advanced vocabulary and grammatical expression during storytelling tasks. This suggests that the availability of literacy materials predicts children's vocabulary and sentence expansion, as similarly observed by Peets et al. (2019), whose analyses found a moderate, positive relationship between the number of books owned and children's grammatical proficiency. Similarly, Purdie and Oliver (1999) found that parents who provided richer language resources fostered greater metacognitive engagement with language, which in turn promotes expressive output through improving children's mental organization and processing–two skills necessary for narrative production tasks. Together, these findings underscore the importance of the home literacy environment as an early and influential context for promoting bilingual children's language development.

Between our language assessments, we found that semantics showed significant correlations with both productivity and complexity scores. The positive correlation between semantics and productivity suggests that children with stronger semantic abilities use a more advanced and diverse vocabulary, supporting greater expressive fluency and grammatical elaboration. This finding is consistent with Perez et al. (2022), who observed that richer semantic knowledge in bilingual children's narrative predicts more productive language use and greater lexical diversity. Similarly, Grandos Vargas et al. (2024) found that bilingual Spanish-English children showed equivalent performance in terms of complexity across languages, independent of language exposure, which they suggested may be due to semantic knowledge being a shared skill, or, in other words, not language-specific. This was the case even for children with lower syntactic proficiency in one language than the other. Taken together, these findings suggest that

semantic proficiency forms a foundation for expressive growth, even when grammatical sophistication develops at a different pace.

The positive correlation between semantics and complexity suggests that children with stronger semantic abilities are able to construct more advanced syntactic structures in their narratives. This finding supports the view that lexico-semantic knowledge provides a foundation for building hierarchical syntax during language production. Consistent with this, Perez et al. (2022) found that children with stronger semantic networks produce more embedded clauses when engaged in narrative production, demonstrating that semantic depth facilitates syntactic elaboration. Additional research on the topic has observed within-child variation, showing that stronger semantic proficiency often coincides with more sophisticated syntactic constructions (Granados Vargas et al., 2024). Together, these findings highlight how semantic development supports syntactic growth, particularly in narrative contexts where children must integrate structure and meaning simultaneously.

Morphosyntax showed significant positive correlations with both complexity and productivity scores. The positive correlation between morphosyntax and productivity was anticipated and supports prior literature (e.g., Granados Vargas et al., 2024; Lam et al., 2024) that children with stronger grammatical knowledge are able to express their thoughts and ideas more thoroughly through the structural knowledge syntax provides, supporting greater expressive fluency and grammatical elaboration. This pattern reflects broader work showing that grammatical accuracy forms a core component of oral language proficiency for bilingual children (Peña & Bedore, 2011). Murphy et al. (2022) found that narrative microstructure measures, including MLU and NDW, were consistently correlated with standardized grammar scores and uniquely predicted later oral language outcomes, indicating that children with

stronger grammatical foundations tend to produce richer and more structurally sophisticated narratives. The positive relationship between morphosyntax and complexity is consistent with expectations based on the findings of Justice et al. (2006) and provides further support for the use of the INMS scoring approach. Not much work has been done using INMS scoring, so the significant correlations found with standardized measures provide strong evidence for the validity of INMS. Together, these results suggest that morphosyntactic ability forms the structural backbone that supports both lexical productivity and syntactic complexity in bilingual children's oral narrative expression.

Predictors of Complexity and Productivity

To further our understanding of which factors contribute most strongly to children's English language development, regression analyses were conducted using narrative productivity and complexity as outcome variables. Across both outcomes, age and morphosyntax emerged as significant predictors, indicating that as children mature and their morphosyntactic proficiency increases, their narrative productivity scores also increase. This finding aligns with prior research showing that morphosyntactic ability is a core component of overall language proficiency. Similarly, Bedore et al. (2023) found that morphosyntactic and semantic skills were strongly related to early reading performance across both Spanish and English, highlighting morphosyntax as a linguistic foundation that supports higher-level language and literacy outcomes. In parallel, Castilla-Earls et al. (2023) reported that bilingual children showed increased accuracy on grammatical-structure items with age, emphasizing morphosyntax as a developmental index of language growth. Taken together, these findings explain why both age and morphosyntax consistently emerged as strong predictors in the present study: age reflects children's developmental progression and cumulative language experience, while morphosyntax

represents the structural backbone that supports both lexical productivity and syntactic complexity in bilingual children's narrative expression. This interpretation is consistent with the systems framework of bilingual language acquisition, which emphasizes the roles of maturation and proficiency as interacting influences on language development across contexts (Byers-Heinlein et al., 2025).

These results are also consistent with Lam et al. (2025), who showed that bilingual children's morphosyntactic proficiency was closely tied to both narrative productivity and complexity across a one-year period. Their work identified productivity and complexity as stable, separable dimensions of narrative skill and found that children with stronger grammatical foundations were more likely to demonstrate growth in syntactic elaboration over time. This contributes to the interpretation that morphosyntax functions as a structural support for expressive language. Stronger morphosyntactic skills not only enable bilingual children to produce more syntactically complex narratives, but also aid their overall productivity of storytelling by supporting lexicosemantic processing. All in all, this work further emphasizes the importance of morphosyntax in bilingual language development, while also supporting the use of INMS as a tool for measuring oral narrative production in bilingual children.

Consideration of Home Language Environments

Our home literacy variables were not found to be significant predictors for either narrative productivity or complexity. There are multiple potential reasons for this finding, but any interpretation of these findings must be situated within the specific home and school contexts of the children in the sample, as suggested by the systems framework of bilingual acquisition (Byers-Heinlein et al., 2025). From this perspective, the relative influence of home literacy

practices may depend on how they interact with dominant sources of language input, such as schooling and broader societal language exposure.

All participants attended English-only schools, meaning that a majority of their English input and output occurred in formal educational settings. Although some families reported using some English at home and a few children received extracurricular Spanish schooling, survey responses indicated that households were primarily Spanish-dominant in daily interactions, while most time spent using English was within the school environment. In practice, this may have led to a mismatch in anticipated outcomes. For this sample, Spanish was most likely the dominant language of the home literacy environments, whereas English was most likely associated with school-related tasks, such as standardized assessments, thus leading to a lack of significant results between English home literacy environments and English language outcomes. This profile is consistent with prior work on heritage language homes, which shows that many bilingual children develop English primarily through schooling while relying on the heritage language for family interaction, identity, and cultural practices (e.g., De Houwer, 2009; Polinsky & Scontras, 2020; Wagley et al., 2022). Within such contexts, home language practices do not operate in isolation from schooling; rather, they interact with the broader input children receive in institutional settings (Byers-Heinlein et al. 2025). Studies of Spanish–English bilinguals have shown that English exposure tends to increase rapidly once children enter school, while Spanish is maintained mostly through home and community use (Bedore et al., 2016; Lam et al., 2025). This pattern helps explain why home language environments can differentially influence each language: school tends to drive English growth, whereas families play a central role in sustaining and developing Spanish. English development in this sample may reflect a combination of

school-based instruction and home practices, making it difficult to isolate the unique contribution of English HLE alone.

By contrast, if Spanish narrative production and Spanish HLE variables had been examined, prior literature suggests we might observe stronger associations between home practices and language outcomes in the heritage language (De Houwer, 2009; Peña et al., 2023; Zhang et al., 2025). From a systems framework perspective, heritage-language outcomes are expected to be more sensitive to home-level influences when the heritage language is primarily supported within family and community contexts rather than institutional settings (Byers-Heinlein et al., 2025). Families are the primary source of Spanish input for many bilingual children, and Spanish shared reading, storytelling, and conversation are likely to play a more direct role in supporting the development of Spanish vocabulary and grammar (De Houwer, 2009; Wagley et al., 2022; Zhang et al., 2025). This underscores the importance of families sustaining their heritage language at home, especially given that children in English-language schools will receive ample English exposure regardless of home practices. Furthermore, recent work from Peña and colleagues (2023) highlighted that maintenance and further development of one's heritage language through home language and literacy practices do not delay a child's English development (a common misconception within the bilingual community), but instead contribute to an overall stronger linguistic foundation as a child matures. Taken together, these considerations highlight the need for future research that incorporates both English and Spanish HLE variables and outcomes, in order to capture a fuller picture of how home and school environments jointly shape bilingual children's linguistic development.

Limitations and Future Directions

The present study presents several limitations to be considered. First, the sample consisted primarily of English-dominant children from higher socioeconomic backgrounds in an English-dominant geographic region. The geographic region of testing has a very low percentage of Spanish-English bilinguals and few resources for formal Spanish language schooling. Across the U.S. context, though, Spanish-English bilingual children represent a large and diverse range of linguistic and cultural experiences shaped by region, culture, and community and family practices. The findings of this study, therefore, should be taken with caution, and future research should include participants from a broader range of linguistic and socioeconomic backgrounds to better capture variability in bilingual language development and to enhance the external validity of these results.

Another limitation of this study is that it focused exclusively on English testing scores and English home literacy factors. This limitation was primarily due to the incomplete availability of the Spanish data at the time of analysis. Future work will incorporate standardized Spanish measures and Spanish home literacy variables, which will allow for a more balanced examination of both English and Spanish language development. Including both languages in future analysis will provide a more comprehensive understanding of how bilingual children develop grammatical and narrative skills across contexts. Moving forward, researchers should continue to investigate the dynamics between home language environments and bilingual language proficiency, particularly by considering the level of Spanish exposure. Doing so will help capture the full picture of bilingual language development and strengthen the validity of research on bilingual assessment.

Conclusion

The present study examined how home literacy practices and underlying language skills contribute to bilingual children's oral language development, as measured through narrative productivity and complexity. By analyzing both oral narrative samples and standardized testing scores within the systems framework of bilingual language acquisition, this study aimed to identify which academic and home factors most strongly predict expressive language outcomes in Spanish-English bilingual children. Across analyses, age and morphosyntax skills emerged as the most robust predictors of both productivity and complexity. These findings indicate that as children grow older and develop stronger grammatical knowledge, they are able to produce more lexically rich and syntactically elaborate narratives. In contrast, home literacy environment variables were not significant predictors of English narrative outcome, likely due to the fact that children received most English input through formal schooling rather than at home, where Spanish was the primary language used. This study offers useful implications for clinicians and educators hoping to gain a greater understanding of bilingual language development. Our results support the use of narrative assessment as a complementary tool in clinical and educational settings, and point to the need for future research that includes both Spanish and English outcomes to capture a fuller picture of bilingual language development.

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