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Writing Development and Translanguaging in Signing Bilingual Deaf Children of Deaf Parents

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Abstract: Translanguaging allows for a holistic lens on the natural language practices of multilinguals and the strategies they use to communicate and to make meaning, such as writing. Multilinguals have a single, integrated linguistic repertoire and reasoning in which all languages are naturally activated in the brain throughout the writing process. Some deaf children are raised in environments where signed language is first acquired and then used to support the development of a written language. The current literature on translanguaging is scant in capturing signing bilingual deaf writers' translanguaging practices. This study took a closer look at the written texts produced by three deaf siblings within an American Sign Language/English bilingual deaf family across the course of their childhood between three and ten years old. Their applications of linguistic features in writing over time were qualitatively identified, described, and analyzed. This study's findings provided rich descriptions and examples of the ways signing bilingual deaf children leverage their whole linguistic repertoire to express ideas in print. Because translanguaging practices were modeled at home and school during natural interactions and direct instruction, these siblings' language and writing skills continued to flourish over time.

Keywords: translanguaging; deaf; Sign Language; bilingual

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1. Introduction

Writing has become increasingly important and useful for society in the twenty-first century. People have social goals they want to accomplish, such as sharing experiences, providing facts, or persuading, and these efforts are often achieved by writing (Graham 2019). Early language and literacy experiences lead children to express their ideas through print, initially by drawing and scribbling, and then onto writing letters, words, and phrases (Gentry 2000; Puranik and Lonigan 2014; Rubin and Carlan 2005). Exposure to multiple languages is conducive to writing development. Genesee and Lindholm-Leary (2021) found in their meta-analysis "extant evidence…that young learners have the capacity to learn more than one language without jeopardizing their development and that DL [dual language] education is suitable and effective for students with diverse characteristics" (p. 1). Children show growth and strengths in all their languages when home environments and academic instruction include a multilingual focus. Implicit acquisition and explicit instruction of writing concepts, vocabulary, and print during purposeful interactions were found to support multilingual students' writing development (Olson et al. 2015). Multilingual writers capitalize on all their languages to engage throughout the writing process (e.g., idea generation, meaning construction, language formation, editing, and reflecting). For example, deaf children may use American Sign Language (ASL) to develop ideas for a piece of writing, use English and ASL while writing, and then use ASL to discuss the revisions of the written text. If people around the child do not support development in all languages the child knows, the opportunities to expand on the child's language and writing repertoire may be restricted (Williams and Lowrance-Faulhaber 2018).

2. Translanguaging

Translanguaging is a relatively new way of understanding, describing, evaluating, and even appreciating how individuals use linguistic and semiotic resources during meaning-making processes (García 2009; Otheguy et al. 2015). Translanguaging is understood to have cognitive (the inside perspective) and socio-political (the outside perspective) aspects to how and why people, monolinguals and multilinguals, use language in certain ways (García and Kleyn 2016). Translanguaging scholars push the consideration of the inside perspectives of language while interrogating socio-political influences on language uses.

2.1. The Inside Perspective of Translanguaging

On a cognitive level, brain imaging studies provide evidence that multiple languages are processed as one and the same in the brain (Dijkstra and Van Heuven 2002; Kroll et al. 2010). For example, the brain does not compartmentalize words, such as "English" and "Spanish," nor does it cognitively process these expressions "the dog is sitting" and "el perro esta sentado" as two separate linguistic systems (Kroll et al. 2008; Martin et al. 2009). Rather, the brain readily learns language as a language and acquires words and linguistic features based on the frequency of exposure and experience without assigning names (e.g., English or Spanish) and linguistic features (Malik-Moraleda et al. 2022) to these words. The most important point of the inside perspective of translanguaging is the promotion of "the deployment of a speaker's full linguistic repertoire without regard for watchful adherence to the socially and politically defined boundaries of named (and usually national and state) languages" (Otheguy et al. 2015, p. 283). It is argued that people, especially children, should be allowed to freely utilize linguistic features from all languages they know to express meaning (Velasco and García 2014) without being restricted to selecting fewer words from their overall repertoire for the sake of using the "right language".

Although it would be reasonable for translanguaging to be perceived favorably because it is based on natural language practices, the emphasis on monolingualism in the U.S. education system has led to repugnance toward ways of learning, thinking, and using languages that diverge from the standards of monolinguals (Jonsson 2017). The monolingual view or bias considers the multilinguals' natural expressions, or translanguaging, as errors that are problematic and, therefore, in need of remediation through interventions (Soltero-González et al. 2012). For example, the monolingual bias found in the construct of positive and negative linguistic transfers connotes that utilizing one's knowledge and strategies associated with various languages can be beneficial at times and be a hindrance at other times (Arıbaş and Cele 2021; Hornberger and Link 2012). From this perspective, the language and writing practices of multilinguals are assessed based on how closely they resemble the norms of typical white middle-class hearing monolingual English speakers (hereafter called monolinguals) (Escamilla et al. 2018). Moreover, the monolingual bias is also inherent in the conception of additive and subtractive bilingualism. García et al. (2021) elaborated:

> "Dynamic bilingualism does not start from monolingual endpoints from which languages are added or subtracted . . . because students are acting not with one language system or another but with a unitary network of meanings. Nothing is being transferred; everything is being accessed". (p. 214)

In other words, translanguaging recognizes that multilinguals have a single linguistic system in which all languages work in tandem to make meaning rather than working as separate linguistic systems that confound or help each other (Velasco and García 2014; Vogel and García 2017). In contrast to the monolingual bias, translanguaging provides a holistic view of how people use language(s) by embracing multilingual practices as legitimate, conventional, and even desirable (Otheguy et al. 2015).

2.2. The Outside Perspective of Translanguaging

On a socio-political level, we learn through socialization and conditioning that certain linguistic features are called "English" while other linguistic features are called "Spanish" (Otheguy et al. 2015). We are taught that we should not mix words or linguistic features from English and Spanish in our expressions (García and Wei 2014). Similarly, we are taught that phrases, such as "May I go to the restroom", are formal, while the expression "I need to pee" is informal (Canagarajah 2011). The outside perspective of translanguaging points to the influence of social conditionings by nationalities, cultures, and values on how people perceive and describe the boundaries of languages, leading them to alter their language uses to match social contexts and demands (Otheguy et al. 2015). The most important point of the outside perspective of translanguaging is that people are often pushed to engage in a "watchful adherence to the socially and politically defined boundaries of named (and usually national and state) languages" (Otheguy et al. 2015, p. 283). In some societies, such as the U.S., there is a strong social expectation for people to compartmentalize languages. The rationale driving these expectations may vary from group to group (Cenoz and Gorter 2017). Some groups may believe in the superiority of register-specific monolingual standards over translanguaging practices (García et al. 2021). Other groups may want to protect their minoritized language from the "takeover" of the dominant language (De Meulder et al. 2019). Not to mention, bilinguals may naturally find themselves needing to select more specific and fewer words (e.g., English only) from their whole linguistic repertoire (e.g., English and Spanish) in order to effectively communicate their messages to monolinguals (Otheguy et al. 2015). These above examples refer to the cases when individuals are prompted to separate languages so that the socio-political demands of communication are met. However, the dominance of monolingual norms can come across as rigid, unnatural, and unconstructive to language and writing development in multilingual children. For effective writing development, there should be spaces where children can express themselves freely using any linguistic features at their disposal rather than always conforming to the external pressures to keep languages separate, to adhere to monolingual ways of communicating, or to use specific language registers (Wei 2018; Hamman 2018).

2.3. Translanguaging in Multilingual Writers

Translanguaging in the context of the U.S. educational system entails divorcing the expectation that everyone should think and produce language in the same ways as monolinguals and their standard registers (García et al. 2021). While there can also be a focus on translanguaging in monolinguals by analyzing their language and written expressions with considerations of inside and outside perspectives (Canagarajah 2011), the focus of this section targets translanguaging in multilingual writers. As translanguaging theories indicate, multilingual writers are working from their single, unified linguistic system during meaning-making processes, tapping into all words, linguistic features, and semiotic resources they know to express ideas in print. This lens includes the recognition that all languages are naturally activated on a cognitive level throughout the writing process (García and Wei 2014), enabling multilinguals to engage in certain translanguaging practices not found in monolingual writers (Gort 2006, 2019).

Multilinguals may apply phonology, vocabulary, and syntax from various languages in their written expressions. An example of phonological application is when a child accesses how a word sounds in one language to assist with writing in the other language. A child who knows Spanish and English may write "si" to represent "see" because the vowel "i" in Spanish has the same sound as the long "e" in English (Rubin and Carlan 2005). Similarly, a child who uses ASL and English may write "55" to represent "bear" because the handshape "5" is used with two hands to produce the ASL sign for "bear". Writing "55" to represent "bear" allows them to access their phonemic knowledge of handshape-print correspondences (Wolsey et al. 2018). An example of syntax application is drawing upon one's knowledge of the word order structure of one language to write in another language. The same two students mentioned above may write "car red" instead of "red car," follow-

ing the word order commonly found in Spanish and ASL expressions (Rubin and Carlan 2005; Wolbers et al. 2014). Through the lens of translanguaging, these children are effectively using their whole linguistic repertoire to document their thoughts and ideas without compartmentalizing words or linguistic features based on monolingual standards or language borders.

2.4. Learning a New Target Language

While learning a new target language (e.g., English or Spanish), people typically use translanguaging strategies to make sense of the new words found in the target language as they begin to apply these linguistic features in their written expressions (Kobayashi and Rinnert 1992). For instance, an individual may use translations and back translations, which means providing words or phrases in one language (e.g., ASL), providing words or phrases with similar meanings in the other language (e.g., English), and then translating them back to the initial language (e.g., ASL) as a way to confirm the intended meaning (Wolfersberger 2003). Another common strategy is rehearsing, which means that an individual may try using different possible words in a language (e.g., ASL) before choosing the one that seems to be the best fit for the meaning they had in mind in their other language (e.g., English) (Velasco and García 2014). Placeholder is another strategy where an individual may write down a word in a language (e.g., ASL) and then return to it later to replace it with a word in another language (e.g., English) that has equivalency in meaning (Bauer et al. 2020). These strategies show how people, including children, self-regulate as they use their whole linguistic repertoire to support the learning of a new target language. The lack of a translanguaging lens is liable to result in a narrow understanding of the richness and complexity of practices and skills found in multilingual writers (Escamilla et al. 2018).

2.5. Assessing Writing in Multilingual Children

Multiliteracy does not hinder development in either language; rather, the whole repertoire expands (Makalela 2015). However, multilingual children's language and writing skills are typically assessed in a single target language based on monolingual norms (Holcomb and Lawyer 2020). There is a push by translanguaging scholars to move away from these approaches and to evaluate multilingual children's language and written expressions more holistically and comprehensively (Soltero-González et al. 2012). Writing should be assessed with considerations of how words and linguistic features are applied to generate meaning, regardless of the languages used within the expression. Linguistic experience, space, audience, topic, or context may impact decisions to use specific linguistic features in written expressions, which could become a meaningful source of analysis. For example, it makes sense for writers to incorporate Spanish and English features in their writing if the readers are Spanish/English bilinguals. If writers want to express specific concepts in a target language but have not learned how to yet, it also makes sense for them to express it in any other way they know how, such as drawing upon other languages or semiotic resources. These efforts to communicate meaning could be recognized as a form of aptitude rather than marked as errors (Soltero-González et al. 2012).

3. Writing Development in Deaf Children

The brain is indifferent to whether the language is signed or spoken and processes it as a language (Petitto et al. 2016). Yet, many deaf children experience language deprivation due to not being able to adequately hear spoken language and not being given opportunities to access signed language (Hecht 2020). Experiences of language deprivation alter neurological structures that impair cognition and restrict language and literacy practices (Hall 2017). There are disagreements among scholars on whether signed language is necessary for deaf children to prevent language deprivation from occurring and whether multilingualism, including signed language and written language, is helpful or is a hindrance to deaf children's writing development (Mayer and Trezek 2020; Scott et al. 2021).

3.1. Deficit Model in Writing Research

There is a dominant belief driving the field of deaf education that deaf children have writing deficiencies because they do not access spoken language, they use signed language, and/or they are bilinguals (Mayer 2007; Mayer and Trezek 2019, 2020). These scholars apply the monolingual view in which the norms of monolinguals are upheld as the standard. For example, multiple comparative studies provide evidence that deaf children are delayed in language and literacy compared to hearing monolinguals (Kyle and Harris 2011; Mayer and Trezek 2020; Vizzi et al. 2022). Vizzi et al. (2022) said, "Deaf individuals generally present with difficulties in reading and writing acquisition . . . One of these factors is late exposure to spoken language compared to hearing children" (p. 1). These scholars do not advocate for the inclusion of signed language in deaf children's experiences because there is little evidence that shows signing deaf children using language and writing in the same ways as hearing monolinguals (Mayer and Trezek 2020). For example, Mayer (2007) described a deaf child's application of handshape knowledge to writing (e.g., "kissb" to represent "skunk") as an ineffective approach to writing because they do not come close to standard English that is comprehensible by other monolingual readers. The examples above show a lens that does not embrace translanguaging practices, nor that the translanguaging model is viable. Strong and prevalent bias in considering English monolingualism as the preferred norm has led to concerns about cognitive, language, and literacy sciences being skewed (Blasi et al. 2022). For example, many studies do not account for the fact that English grammar and word order are considered peculiar and rigid when compared to most other languages. Not to mention, 40% of the world's languages do not have a writing system (Blasi et al. 2022).

3.2. Translanguaging Model in Writing Research

Research utilizing the translanguaging model is scant in the literature on deaf writers. To date, no study has applied a translanguaging model on deaf children raised in signing multilingual environments. Notwithstanding, a few scholars have made the argument that the diversity in deaf learners' trajectories and language uses in writing should not be problematized based on how they differ from monolingual norms (Scott et al. 2021). These scholars placed their focus on the systemic factors that cause deaf children to develop cognitive and language disabilities due to insufficient access to language, typically in environments where the spoken language is used exclusively. With accessible linguistic environments at home and in school, they argued that linguistic repertoires could bloom in signed, spoken, and written languages.

A recent study was the first to apply a translanguaging model to investigate the impact of language deprivation on writing development in 382 deaf students between eight and thirteen years old (Holcomb et al. n.d.). Student participants responded to a writing prompt that asked them to recount an event they experienced in the past. It was discovered that 42 out of 382 deaf students were still developing emergent writing skills (e.g., learning to write common words and form connected phrases). For example, a student wrote, "LOL John. SXOX??? 2 + 2 = waHPttHus. John Doe". Another wrote "I see cnr in see lio I see I see I see." Teachers reported that these students had difficulties in expressing themselves in any language, signed or spoken. An analysis of their writing samples provided evidence of some applications of linguistic features from ASL, English, and Spanish. In this example of handshape phonetic application, "I went xoo I s5 [scared] 2 [snake] my frind I My coles go Lunch," the student used their handshape knowledge to document the idea they had in mind on paper. In this example of Spanish vocabulary application, "Class help need your si [yes] and no are you neede hot outside Happy," the student used "si" to represent "yes." In this example of ASL syntactic application, "I go Family Beach Family Pay Fun Brother Play enjoy Beach mom and Dad look," the student wrote how they would sign this concept without adding written translations of key ASL grammatical information found in facial expressions and spatial features. Overall, their deployment of ideas, vocabulary, and linguistic features ranged from a few disconnected words to a

few phrases, illustrating their small linguistic repertoire. Because the majority of these students were raised in environments that used spoken language at home and/or in school, it was concluded that a lack of robust and accessible linguistic input and instruction was the cause of their restricted linguistic repertoire, translanguaging practices, and writing development. This study's novel application of a translanguaging model allowed for a focus on the issue of language deprivation and the benefits of translanguaging instead of comparing deaf children's developmental trajectory to the norms of monolinguals.

3.3. Writing Development in Deaf Children

To date, there has been no study that applied a translanguaging model to the language and writing practices of deaf children who escaped the experience of language deprivation and its subsequent adverse impact on neurological development, such as those who had access to signed language and written language since birth. There is research, however, on the broad developmental trajectories of signing deaf children's language and writing skills. It is documented that those with stronger signing skills are more capable of tackling the cognitively demanding skills required for writing development (Morere 2020). Those deaf children undergo similar milestones in early language and writing development found in hearing monolinguals and multilinguals (Hernandez et al. 2022; Williams and Mayer 2015).

There are some bilingual features unique to signing deaf children, such as fingerspelling (Beaujard and Perini 2022). In environments where ASL and fingerspelling are consistently provided, signing deaf infants can begin to fingerspell words as early as one year old, and this skill becomes an important stepping stone toward writing letters and words (Miller et al. 2021; Padden 1993). Three- to four-year-old signing deaf children use their knowledge of how words are fingerspelled, rather than how words sound, to assist them with writing words (Wolsey et al. 2018). A longitudinal study provided significant evidence of ASL skills positively impacting deaf preschoolers' ability to recognize letters and words in English, expediting the progression of writing development (Allen and Morere 2020). Observations of a classroom revealed ample amounts of social interactions in which deaf children were highly engaged in the discussions about their writing tasks through ASL (Williams 1999). Williams (1999) noticed deaf preschoolers giving each other feedback on the clarity of their expressed ideas in ASL and critiquing the accuracy of how these ideas were translated into written English (e.g., transcription, spelling, and fingerspelling). Wolbers and her colleagues (2014) provided abundant examples of translanguaging practices in deaf writers in which they utilized various kinds of linguistic applications from ASL in their writing; however, the construct of translanguaging was not mentioned in the study.

The positive and interdependent relationship existing between ASL and English development in deaf children (Allen et al. 2014; Allen and Morere 2020; Chamberlain and Mayberry 2000; Hoffmeister et al. 2022; Hrastinski and Wilbur 2016; Novogrodsky et al. 2014) aligns with the more extensive research on the benefits of multilingualism (Genesee and Lindholm-Leary 2021). All children's language and writing practices flourish when they are allowed to talk about, think about, and analyze language and writing using their whole linguistic repertoire.

4. Methods to Support Translanguaging Practices in Deaf Children

Translanguaging practices in deaf children can be facilitated by adults who use signed language and written language themselves. Humphries (2013) urged the importance of deaf children interacting with adults who model the fluent use of both languages while talking about any subject matter. By using ASL and English to discuss a wide variety of topics (e.g., politics or time travel) while also simultaneously raising metalinguistic awareness, deaf children's linguistic repertoire and writing skills expand (Kuntze et al. 2014). In ASL/English bilingual schools, teachers are expected to be proficient in ASL and English and utilize bilingual methods with deaf children (Humphries 2013), which could arguably

be considered part of the translanguaging pedagogy. These common bilingual methods are described next.

4.1. Chaining

Chaining is intuitively used by multilingual deaf adults to promote understanding and development in multiple languages and modalities (Humphries and MacDougall 1999). Chaining is used unconsciously in natural conversations, and it is also used as a contextualization strategy, whereas the implicit is made explicit (Quinto-Pozos and Reynolds 2012). Through chaining, adults provide different types of input in a sequence, ranging from two to four or more parts, that include: (1) showing a picture or video, (2) pointing to the printed word, (3) fingerspelling, (4) signing, and (5) speaking (if applicable). The combinations are expansive, depending on communication, languages, and learning goals, such as introducing new vocabulary or bringing attention to semantic equivalences between ASL and English (or any other languages). Quinto-Pozos and Reynolds's (2012) study found that deaf teachers used this strategy with their students every ten seconds. Chaining increases metalinguistic awareness because deaf children are consistently seeing how various languages are similar and different (Bailes 2001).

4.2. Reading Aloud

Adults model translanguaging practices by providing deaf children with access to videos and books in various languages (e.g., ASL/English bilingual storybooks) (Herzig and Allen 2022). The adult and the child sit down together to watch a video or read a book, and these texts/videos showcase the integration and/or connections across ASL, English, and other languages. As they think about, talk about, and engage with the text, deaf children develop implicit and explicit awareness of the existence of vocabulary and linguistic features in various languages and diverse ways of expressing the same concepts (Berke 2013). As a result, deaf children incorporate the perspective that there is no "one" right way to use languages, which is an important message that stands in contrast to the monolingual bias.

4.3. Interactive Signing and Writing

Interactive signing and writing involve meaningful projects relevant to deaf children's lives where adults and children co-construct a text and/or video together and reread and/or review what was written and/or signed (Graham 2019; Wolbers et al. 2022). Adults guides children through the thinking process involved in brainstorming, organizing, attending to languages, revising, and publishing. Children are scaffolded in all languages and modalities they know (Dostal et al. 2019). Through this process, children understand that communication has a real purpose; therefore, they must be cognizant of how to successfully get their message across to specific audience members (Wolbers et al. 2015). Similarly, children understand their role as readers of a written expression or recipients of a signed expression, which means they become active listeners to other people's messages. These purposeful tasks allow for authentic translanguaging practices to thrive in deaf children while also accounting for the inside and outside perspectives of language.

5. Current Study

This study employed a translanguaging model to explore and describe the writing development of three deaf siblings born into a deaf family who use ASL and written English at home and attend an ASL/English bilingual school. The goal of this study was to bring a translanguaging lens to understanding and explaining how deaf multilinguals develop language and writing skills and, thus, expand on recent findings in the literature that are moving away from a monolingual view on writing development. Artifacts of three deaf siblings' written expressions across the course of ten years were excavated and analyzed to answer these research questions:

1. How did the written expressions of deaf siblings from an ASL/English bilingual deaf family change over time?
2. What translanguaging features were demonstrated in their written expressions?

6. Methods

When a parent asked me to document and analyze their three deaf children's writing, I responded in the affirmative. I am a white deaf researcher who is proficient in ASL and English with some knowledge of Spanish. A qualitative case study design (Stake 2013) with diachronic perspectives (Thomas 2021) was utilized to explore translanguaging practices in three deaf siblings' writing development across a period of ten years. First, I attended to the progression in each child's writing sample over time using the stages of emergent writing development retrieved from the current literature (Gentry 2000; Puranik and Lonigan 2014; Rubin and Carlan 2005). Second, I identified translanguaging features present in each child's writing sample. Finally, I engaged in informal conversations with the parent about my observations of the writing samples and invited their added observations, which provided a fuller picture of those deaf children's writing experiences. Through these methods, I was able to answer both research questions in the exploration of writing development and translanguaging in three deaf children.

6.1. Participants

The parent of the siblings, Piper, Ivy, and Cora (pseudonyms), described to me that these children were born into a white, middle-class deaf family with both parents having higher education degrees. The whole family used ASL and accessible forms of English, such as fingerspelling, reading, and writing at home. All children were profoundly deaf and did not use spoken language. Between three months and three years old, all children received early intervention services that were facilitative of their ASL and written English development and attended center-based early intervention programs with ASL/English bilingual teachers and peers. From three years old to the present, they attended a school for the deaf that used ASL as the primary language of instruction along with accessible forms of English. At the time this article was written, Piper was fifteen, Ivy was nine, and Cora was eight years old.

6.2. Data Collection

The parent signed a form to provide consent for their own and their children's participation in the study. As additional precautions to ensure that the wishes of all participants were honored, I explicitly explained the goals of this study in ASL to all three children individually. I told each child that if they experienced any discomfort about their writing being analyzed or published, I would not include any or all of their writing samples. All children understood and verbally agreed to participate and signed the assent forms. I asked the parent to gather all unedited written expressions produced by their children when they were between 0 and 10 years old. After showing the writing samples to all three children, they expressed surprise and pride in their writing growth and gave verbal permission to include all of them. There was a total of 28 scanned documents that were written by those three children when they were between 3 and 10 years old, except for one document that was written when the oldest sibling was 13 years old.

6.3. Analysis for RQ1 on Writing Development

I utilized the five stages of emergent writing development: pre-alphabetic, emergent, transitional, conventional, and fluent (Gentry 2000; Puranik and Lonigan 2014; Rubin and Carlan 2005) to identify and categorize the changes in the stages of written expressions over time. Written expressions that included drawing, scribbling, and writing mock letters were categorized as the pre-alphabetic stage. Written expressions that had recognizable letters that were ordered randomly were categorized as the emergent stage. Written expressions that had recognizable letters that were ordered based on the phonemes of signed,

written, or spoken words were categorized as the transitional stage. Written expressions that had short phrases with some inclusion of nouns, verbs, and linguistic features were categorized as the conventional stage. Written expressions that had complete sentences with nouns, verbs, and connected linguistic features were categorized as the fluent stage. I categorized each writing sample based on its alignment with descriptions of each stage of emergent writing development (provided above). I selected the clearest example of a writing sample in each category for each child to report in this study, demonstrating their writing development over time.

6.4. Analysis for RQ2 on Translanguaging Features

Translanguaging means children are working with their unified linguistic system to apply varying linguistic features from any languages they know, such as phonology, vocabulary, and syntax, to make meaning and come up with ideas, which are then expressed in writing (Velasco and García 2014). I observed writing samples across stages and ages for indicators of translanguaging features, such as the use of handshape phonetic application (e.g., "55" for "bear"), vocabulary application (e.g., "alone" vs. "only") and syntactic application ("I leaves play"). I asked the parent to provide any information they had about the context of the written expressions in the samples to better understand and explain why and how these translanguaging features were applied.

7. Results

7.1. RQ1: How Did the Written Expressions of Deaf Siblings from an ASL/English Bilingual Deaf Family Change over Time?

Writing samples that matched each emergent writing development stage from the pre-alphabetic stage (2–3 years old) to the fluent stage (7–10 years old) are presented in this section. Scanned images of each child's writing, along with transcriptions, are provided for each stage. Although the parent reported seeing the child exhibiting specific developmental skills in writing, there were a few samples missing from each child at some stages due to limited artifacts in the family's possession.

To preface the stages of emergent writing development of three deaf siblings across the course of their childhood, Figure 1 is a snapshot that captures their written letters to Santa at Christmas. The youngest sibling (age 6) wrote two simple phrases. The second oldest sibling (age 8) wrote several sentences fluently. The oldest sibling (age 13) also wrote several sentences fluently with expanded linguistic features.

Piper (age 13) wrote, "Merry Christmas Santa! I hope you will have a wonderful Christmas. Enjoy our cookies and hot chocolate drink! Have a safe and great trip! -[real name removed]

Ivy (age 8) wrote, "Dear Santa I know you have hard time. I hope get gift from u. Enjoy cookie and chocolate milk. I suggest you try the marshmallow with the milk. From [real name removed]

Cora (age 6) wrote, "Welcome to my home santa you will gave me gift."

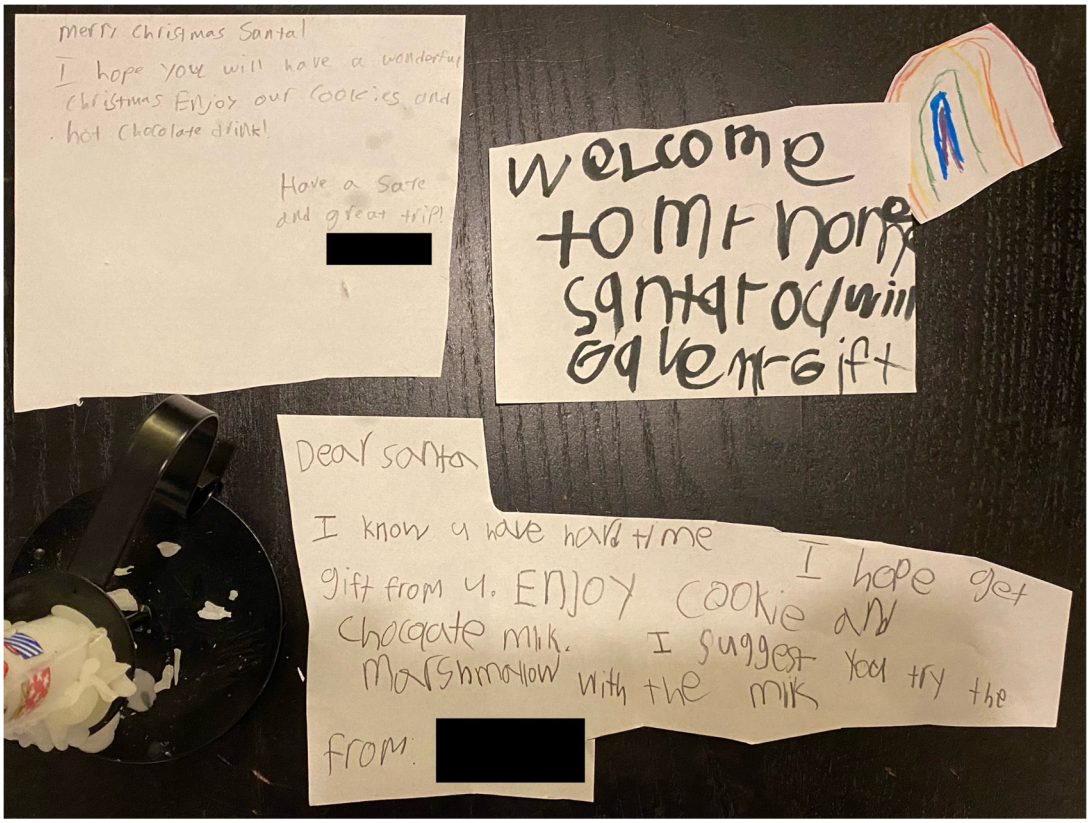
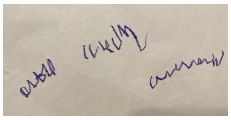


Figure 1. Three deaf siblings' letters to Santa.

7.1.1. The Pre-Alphabetic Stage (3 Years Old)

The pre-alphabetic stage involved directional scribbling and mock letters. There was no writing sample available from Piper. Ivy (age 3) wrote a few mock letters that resembled English letters. Cora (age 3) scribbled in the direction from right to left using a crayon with a few possible mock letters. See Table 1.

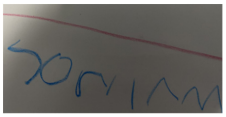
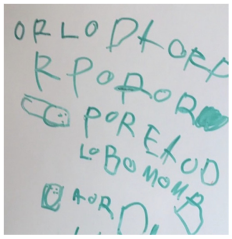
Table 1. The Pre-Alphabetic Stage.

Child	Piper	Ivy	Cora
Directional Scribbling and Mock Letters			

7.1.2. The Emergent Stage (3–4 Years Old)

The emergent stage included writing strings of letters in random order. There was no writing sample from Piper that matched this stage. Ivy (age 3) wrote a fictitious word, "sorinm", using some correct and possibly mock letters in English. Cora (age 4) wrote "orloDoRP RPoRoR PoREAoD LoBomomB AorD," using recognizable English letters. These letters were produced randomly in strings but resembled the vowel and consonant patterns in English words. See Table 2.

Table 2. The Emergent Stage.

Child	Piper	Ivy	Cora
Strings of Letters			

7.1.3. The Transitional Stage (4–5 Years Old)

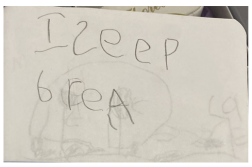
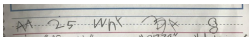
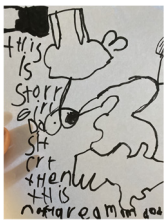
The transitional stage involved writing labels and/or relying on phonetic spelling to write words.

Piper (age 5) wrote "I seep brea" to represent his ASL expression, "I sleep and dream about rockets to the moon." The "b" is inverted in writing. According to his parent, the words "seep" and "brea" were the words he knew how to fingerspell to represent "sleep" and "dream" at that time.

Ivy (age 5) wrote a phrase, "AA 25 why 3A 8," as described by her parent, to represent the ASL expression "Love prefer pizza. Why? Pizza delicious". The use of "AA" represents the handshapes that are used in the two-handed sign for "love". The signed word "25" has the same handshape as how "prefer" is signed, "3a" resembles the handshapes used in the signed word for "pizza", and the "8" handshape is used in the signed word "delicious." The syntactic structure of this written expression aligns with the rhetorical sentence type commonly found in ASL with the inclusion of "why", which is immediately followed with an answer. Ivy knew how to fingerspell and write "why" in English and included this word in the sentence.

Cora (age 5) wrote some labels and phonetic spellings to describe her drawing, "this is storr gir! da sit crt then this not larea mom". The words are not produced from left to right in sequential order. Rather, the words function as labels, and the spelling is partly comprehensible in English. The parent explained that the words that were incomprehensible were likely how she fingerspelled these words at the time. The parent could not recall what words they represented. See Table 3.

Table 3. The Transitional Stage.

Child	Piper	Ivy	Cora
Label and Phonetic Spelling			

7.1.4. The Conventional Stage (6–7 Years Old)

The conventional stage involved writing a single or a few simple phrases with nouns, verbs, and some connected linguistic features.

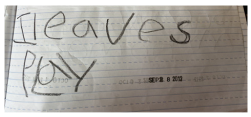
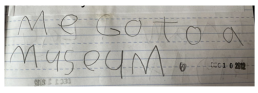
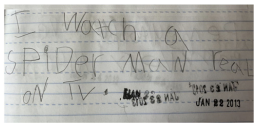
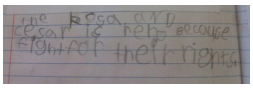
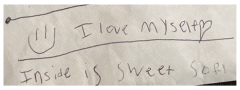
In September, Piper (age 6) wrote, "I leaves play." Piper was expressing his experience playing with leaves in writing using a syntactic structure typically used in ASL. Three months later, in December, Piper wrote, "me go to a museum." This written expression shows his expanded repertoire in which new linguistic features were added, such as the use of "to" and "a". One month later, in January, Piper wrote, "I watch a spider man

real on TV," which demonstrated the continued progression of learning and applying new linguistic features from English while also embedding translanguaging features, such as the placement of adjectives after nouns, which is common in ASL.

Ivy (age 7) wrote, "The Rosa and Cesar is hero because fight for their rights." The parent said Ivy had been learning about Rosa Parks and Cesar Chavez in school and was explicitly taught about the concepts of "hero" and "rights" in ASL and written English. The increased use of English words and features in this writing sample demonstrated a big change from her previous writing sample. There were English words in this sentence that do not exist in ASL, such as "the" and "is". Ivy also used "because" instead of "why," moving away from the rhetorical syntactic structure previously used in her writing. This written expression showed reduced integration of features from both ASL and English, in other words, reduced translanguaging.

Cora (age 6) wrote, " I love myself <3 Inside is sweet soft." According to the parent, Cora used "inside" to mean her inner self. Similarly, Cora used "soft" to mean "gentle". Both concepts are signed in the same way in ASL but written differently in English. Cora used the linking verb "is," while this feature does not exist in ASL. The inclusion of a smiley face and heart communicated added meaning, showcasing the breadth of her semiotic resources. See Table 4.

Table 4. The Conventional Stage.

Child	Piper	Ivy	Cora
Phrase Writing	  		

7.1.5. The Fluent Stage (7–8 Years Old)

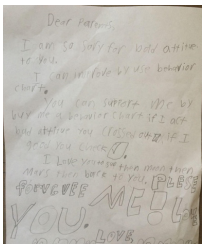
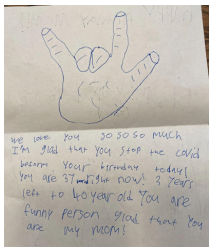
The fluent stage involved writing multiple complete and connected sentences using expanded linguistic features that add to the meaning-making processes.

Piper (age 8) wrote, "Dear parents, I am so sorry for bad attitude to you. I can improve by use behavior chart. You can support me by buy me a behavior chart if I act bad attitude you crossed out X if I good you check ✓. I love you to sun then moon then mars then back to you. PLEASE FORVGVEE ME! LOVE YOU. LOVE, [name removed]." This writing sample illustrated a mixture of ASL and English features in which certain common English features, such as "am" and "-ing," were not included, likely because these linguistic features not used in ASL. By writing more fluently at this age, Piper was able to write for pragmatic purposes, such as apologizing and proposing solutions to accomplish his larger goals.

Ivy (age 8) wrote, "We love you so so so much. I'm glad that you stop the COVID beform your birthday today! You are 37 year old right now! 3 years left to 40 year old! You are funny person glad that you are my mom!" All written expressions looked similar to standard English with the inclusion of "am", "the", "are", and "to", which do not exist in ASL. Translanguaging features were not apparent in this document, but there was an increase in communicating pragmatically. In this fluent stage, Ivy was able to express herself in writing that carried humor (e.g., stop COVID before birthday) and emotional effect to honor her mother's birthday.

Cora (age 7) typed, "Hi! I am [real name removed]. I watch movies. I try to text you when I'm go to your house?! I wanna play with [name removed] and [name removed]. I can do that's something for game and good time with you. I miss u so much. Did you play game? Why you not text to me? I really wanna to read BFG. I have ideas. You can over my house on Saturday and Sunday." Cora was using multiple English features that do not exist in ASL to generate equivalency in meaning. For example, she wrote, "I'm go to your house", which demonstrated her understanding of the function of "am". Similarly, her message "Why you not text to me" was inclusive of all prominent grammatical information (e.g., noun, verb, and preposition) related to the meaning she was expressing. The expression "You can over my house" is exactly how signers would express the concept in signed language using the same words (in ASL vocabulary) in the same word order "[you] [can] [over] [my] [house]". Cora composed a lengthy text, possibly due to the medium of typing over handwriting. Like her two other siblings, her written expressions had higher levels of pragmatics when she was persuading the other person to come to her house. See Table 5.

Table 5. The Fluent Stage.

Child	Piper	Ivy	Cora
Fluent Writing			Hi! I am [the child's name removed]. I watch movies. I try to text you when I'm go to your house?! I wanna play with [name removed] and [name removed]. I can do that's something for game and good time with you. I miss u so much. Did you play game? Why you not text to me? I really wanna to read BFG. I have ideas. You can over my house on Saturday and Sunday.

7.1.6. The Fluent Stage Expanded (8–10 Years Old)

At the end of this final stage, there was a continued expansion of vocabulary, linguistic features, and varying sentence structures in writing.

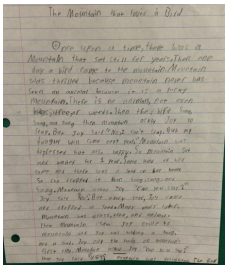
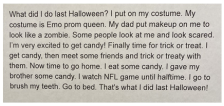
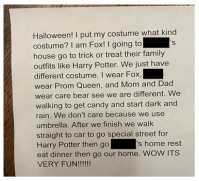
Piper (age 10) wrote, "Once upon a time, there was a mountain that sat still for years. Then one day a bird came to the mountain. Mountain was thrilled because mountain never has seen an animal because it is a rocky mountain. There is no animals, not even bugs, tree, or weeds. Then the bird sang, sang, and sang then mountain asked Joy to stay. But Joy said "No, I can't stay. But my daugter will come next year." Mountain was depressed but also happy. So mountain sat and waited for 1 year. Some kind of bird came and there was a seed on her beak So she dropped it then sang, sang, and sang. Mountain asked Joy "Can you stay?" Joy said "No". But every year Joy came and dropped a seed. Many years later, mountain has grass, tree, and animal. The mountain saw Joy come to mountain and Joy was holding a twig, not a seed. Joy put the twig on mountain's first tree. Mountain asked Joy "Can you stay?" then Joy said "Yes!" Mountain was delighted. The end." In this sample, Piper's growth in the areas of thinking, ideas, cohesion, and composition was noticeable. Looking beyond the expanded vocabulary and linguistic features, he was also applying more complex writing structures associated with the narrative genre, such as the inclusion of a story arc, character development, dialogues, and morals.

Ivy (age 9) wrote, "What did I do last Halloween? I put on my costume. My costume is Emo prom queen. My dad put makeup on me to look like a zombie. Some people look at me and look scared. I'm very excited to see candy! Finally time for trick or treat. I get candy, then meet some friends and trick or treaty with them. Now time to go home. I eat some candy. I gave my brother some candy. I watch NFL game until halftime. I go to brush my teeth. Go to bed. That's what I did last Halloween!" In ASL, there are transition words to move from one event to another, which was applied in Ivy's recount writing with her use of "finally", "then", and "now". Ivy also included a clear introduction, body, and conclusion in her writing, which extended the expression of her ideas beyond

just using vocabulary and linguistic features. As Ivy did not apply past tense verbs in her writing, the parent was uncertain if Ivy had been explicitly taught about past tense verbs in English. The use of "-ed" for past tense verbs does not exist in ASL; rather, ASL uses the signed word "finish" or provides time markers at the beginning or end of the sentence (e.g., "yesterday", "two hours ago"). Therefore, this English feature may not have been a part of her linguistic knowledge and repertoire at the time of writing.

Cora (age 8) wrote, "Halloween! I put my costume what kind costume? I am Fox! I going to [name removed]'s house go to trick or treat their family outfits like Harry Potter. We just have different costume. I wear Fox, [name removed] wear Prom Queen, and Mom and Dad wear care bear see we are different. We walking to get candy and start dark and rain. We don't care because we use umbrella. After we finish we walk straight to car to go special street for Harry Potter then go to [name removed]'s home rest eat dinner then go our home. WOW ITS VERY FUN!!!!!!" Cora continued to apply her knowledge of ASL features while expanding her written expressions to include more complex text structures. As in Ivy's earlier writing samples, Cora used a rhetorical sentence typically used in ASL at the beginning of her paragraph, "what kind costume? I am Fox!" Certain linguistic features that do not exist in ASL were used in Cora's written expressions, such as "-ing" in "going" and "walking", indicating her acquisition of these English features. Cora applied the past verb tense of the verb "finish" in ASL in her sentence. There was a clear introduction, body, and conclusion, indicating advancing literacy skills. The parent felt that this chronological order of events was written in similar ways to how she would have signed the story. See Table 6.

Table 6. The Fluent Stage Expanded.

Child	Piper	Ivy	Cora
Fluent Writing Expanded			

7.2. RQ2: What Translanguaging Features Were Demonstrated in Their Written Expressions?

Our second research question was addressed by examining translanguaging features found in the 28 writing samples provided by the parent. The familial archives of three deaf siblings' writing demonstrated translanguaging features that evolved over time. Translanguaging practices were more visible and salient during the first few stages of emergent writing development. As the siblings became older and had more years of exposure to, engagement with, and instruction in English vocabulary and linguistic features, their applications of ASL features started to diminish from their writing. However, when children did not know how a specific concept was expressed in English, they applied their ASL knowledge to writing. In this way, ASL features appeared to be used as a temporary placeholder until they learned how certain words and linguistic features could be expressed in English.

7.2.1. Phonetic Applications

There were two kinds of phonetic applications in how Piper, Ivy, and Cora spelled words in their writing: fingerspelling and ASL phonemes. By the age of three, they started connecting each fingerspelled alphabet letter to the corresponding written alphabet letter (e.g., "A" formed on the hand in ASL matched the "A" formed in written English). By the age of four and five, they wrote words in print based on how they knew to fingerspell the words. For example, Piper wrote "seep" and "brea" because this was how he perceived and fingerspelled these

words at that time. The use of "b" was an inverse of "d", indicating a common developmental practice for young children learning to write these two similar letters.

Handshape phonetic application is another way of transferring ideas from ASL to written text. When Piper, Ivy, and Cora knew how to sign a word but did not know how to write it yet (e.g., prefer), they thought about the handshape used in the signed word. They knew that the handshape had a corresponding text that could be written (e.g., 25) and proceeded to document it. In the same manner, Ivy knew the signed word "love" used the A-handshape on both hands, so she wrote "AA" to represent the concept she wanted to express—"love". Another example of handshape phonetic application can be found in Cora's use of "o" at the end of "I heap [hear] o". The handshape in the signed word for "none" is "o". By accessing their phonetic awareness in both languages through fingerspelling and handshape-print correspondences, all siblings were not restricted from documenting their ideas in print even when they did not know the English words yet.

7.2.2. Vocabulary Applications

Vocabulary applications occur when a child uses words from various languages in their written expressions. There were a few instances of vocabulary applications in Piper and Cora's writing. Piper (age 6) wrote "I leaves play" in September, "me go to a museum" in December, and then "I watch a spider man real on TV" in January. In ASL, "I" and "me" are signed in the exact same way. This same signed word has two different meanings: being the person doing the action or being the person receiving the action. The meaning can be understood by looking at the context of the whole signed sentence. The switch back and forth between "I" and "me" in Piper's writing shows his awareness of both English words having the same signed word. It is possible that between September and December, he learned the difference between "I" and "me" in English and started using "I" to represent his meaning more closely in subsequent written expressions. Other writing samples from Cora (age 6) also displayed her use of "me" instead of "I". She wrote, "Oh you say me are here in my house. Lol!" In her other written sample when she was the same age, she wrote, "I love myself." These samples demonstrate how deaf children at that age are still figuring out the functions of these words in English. There was also evidence of Ivy using "I" to represent the meaning of both concepts, "I" and "me". Ivy (age 6) wrote, "When you tell I will I do it." This written expression is a clear indication of "I" being used to represent both meanings of "I" and "me" in Ivy's mind based on her knowledge of ASL. A year later, Ivy (age 7) wrote, "I glad we are back from school. You are funny and you help me lots". Since the use of "I/me" to represent the same concept diminished as all three siblings approached the age of seven, it is possible that there is a developmental trajectory related to heightened metalinguistic awareness of differences in ASL and English. When judgments of standard English rules are suspended, it makes sense for children to apply their vocabulary knowledge of "I/me" in ASL to English by using these words interchangeably.

Due to the limited written artifacts, there were not many examples of vocabulary applications. The only other example of vocabulary application was identified in Cora's text to her parent. Cora used "only" to mean "alone" when she (age 6) wrote, "I want to be only." Both words, "alone" and "only", are signed very similarly in ASL with a slight difference in movement. Due to the similarity in the signed word for both concepts, she may have thought the written word "only" also meant "alone". The parent told me that they explained to Cora through ASL and fingerspelling that "alone" is the English word that aligns with her meaning and that they observed Cora using "alone" in her writing from that point on.

7.2.3. Syntactic Applications

When Piper, Ivy, and Cora were in the transitional and conventional stages between four and seven years old, they used syntactic applications of common sentence structures found in English and ASL in their writing. Some of these sentence structures included shared overlaps in English and ASL syntactic properties. For example, if this written ex-

pression produced by Cora (age 6), "I see cat I smell food I taste ice crea [cream] I toych [touch] dad I hear o [none]," were translated into ASL, the vocabulary and word order would not change. The only difference would be the fact that everything is signed as opposed to written. In the same way, Ivy (age 7) wrote, "I like call friends on facetime," which has the exact same word order in ASL. Due to some shared syntactic properties between both languages, they were able to apply structures in their writing that were already familiar to them in ASL.

As the children began to express their ideas using more complex ASL with varying sentence structures, their writing reflected the same skills. For example, Ivy (age 5) wrote, "AA 25 why 3A 8", which, according to the parent, was exactly how she would have signed this thought in ASL, "I love prefer pizza. Why? Pizza delicious". As her thinking and ideas expanded in ASL, her writing mirrored this growth. At age 7, Ivy wrote, "When I play roblox my mom say off roblox I will have bad day! When my mom paint I don't want with my mom. I will have bad day." The changes in sentence structures across two years indicated the expanding linguistic repertoire along with the increasing complexity of her thoughts.

In ASL, articles (e.g., a, an, the) and linking verbs (e.g., is, was, are, were, am) do not exist except when fingerspelling is included in the signed expressions. According to the parent, Piper, Ivy, and Cora learned over time through instruction, practice, reading, and environmental prints about the functions of these linguistic features in English. At the beginning of their writing development, when they learned about the existence of the unique features of English not found in ASL, they started applying them in their written sentences without fully understanding their functions. A good example of this is a text that Cora (age 6) wrote, "Are no you're in drive. Brother is make a my legos." Cora incorporated "are", "is", and "a" in her written expressions, likely because she noticed English typically included these features. She had no previous experience using these words and was not taught their meanings and functions at that age. Another similar example would be the use of "is" in Ivy's (age 7) written sentence: "The Rosa and Cesar is hero because they fight for their rights." Ivy understood the function of "is" in English expressions, but she did not learn the difference between "is" and "are" yet. In all the siblings' later writings, they increasingly used the unique features of the English language to add meanings to their written expressions, demonstrating acquired knowledge of their functions.

It is extremely challenging to capture true equivalencies of the unique features found only in ASL and unique features found only in English. For example, descriptive words and adverbs are often located in facial expressions and movements of signed words. The documentation of these unique ASL features in written expressions did not occur in all three siblings' writing samples. This is likely because there are no easy word-for-word translations for some concepts in ASL and English. Being able to come up with phrases in English that closely capture the meaning of spatial and facial features in ASL would require higher metalinguistic awareness of both languages in which translations can take place. One evidence of higher metalinguistic awareness was Piper's (age 10) later writings which indicated greater uses of descriptive and figurative language in English that appear to be equivalent to the unique features found in ASL (e.g., "there was a mountain that sat still for years . . . it is a rocky mountain . . . some kind of bird came and there was a seed on her beak . . . "). Because Ivy and Cora were still younger, they may have needed more time and experience to build their metalinguistic awareness in both languages.

8. Discussion

This qualitative case study with diachronic perspectives demonstrated the writing development and translanguaging features present in three deaf siblings from three years old to ten years old. Their full immersion in environments where ASL and visual forms of English were used at home and in school is unique because approximately 5% of the deaf population in the United States are born to deaf parents. An even smaller percentage of these deaf children are raised in ASL/English bilingual households, receive ASL/English bilingual early services, and attend ASL/English bilingual schools. Being in a fully acces-

sible linguistic environment with support from involved parents while also receiving instruction from trained teachers of the deaf may have contributed to the rapid expansion of deaf children's language and writing repertoire each year (Hoffmeister and Caldwell-Harris 2014).

8.1. Writing Development in Signing Bilingual Deaf Children of Deaf Parents

All three siblings progressed through the stages of emergent writing development from scribbling at the age of three to writing many connected sentences at the age of seven. They began to function as fluent writers between eight and ten years old when they were increasingly engaged in purposeful writing with authentic goals to entertain or persuade other people. Findings from this study do not depart from the literature on the strengths of ASL skills positively impacting literacy development (Hrastinski and Wilbur 2016). Hrastinski and Wilbur (2016) wrote, "high proficiency in ASL . . . does significantly increase the likelihood" (p. 166) of deaf students having higher language and literacy performance. These three deaf siblings' steady progression with English development each year also do not deviate from research on hearing bilinguals. Hearing bilinguals, typically classified as English language learners, in two-way bilingual or dual language programs (development of both languages) consistently demonstrated higher content knowledge, academic achievement, and English proficiency over those who are educated in one-way bilingual programs (development of English only) (Serafini et al. 2022). Exposure to and use of languages other than English do not hinder ongoing English development for deaf and hearing children alike.

Interestingly, as the three siblings in this study got older with more years of exposure to and practice with languages and writing, their written expressions started to mirror hearing monolinguals. The findings in this study reinforce other studies (Cawthon et al. 2022) in challenging the widespread belief that deaf students, especially those who use signed language, plateau at the fourth-grade reading level (Yan and Paul 2021). While the prevalent experiences of language deprivation causing additional cognitive disabilities in deaf children may have resulted in this plateau, findings from this study strongly suggest that it is inaccurate to generalize this data to those who had early access to ASL and visual forms of English and are developing multilingually.

8.2. Translanguaging Practices in Signing Bilingual Deaf Children of Deaf Parents

Translanguaging features found in the siblings' early writings may have served several purposes, such as leveraging language knowledge, producing unrestricted expressions of ideas, and scaffolding new language skills. All three siblings in this study began to compartmentalize ASL and English features as they got older. It is possible that their translanguaging practices were impacted by what they were exposed to in their daily lives through seeing texts in the environment, reading captions on videos, and reading books. In the mainstream media, there is very little visibility of peers or adults using both ASL and English. Because these siblings were only exposed to examples of written English that excluded ASL features, they may have gradually started assuming monolingual writing practices. It is also probable that their teachers at the ASL/English bilingual school stressed the importance of using standard English and minimizing ASL features in writing (Wolbers et al. 2014).

Translanguaging features found in all three siblings' early writing could be comparable to the writing practices of hearing children who use two or more languages. Multilingual children, hearing or deaf, naturally apply phonetic, vocabulary, syntactic, and other features that make up their whole linguistic repertoire as they engage with written text (Soltero-González et al. 2012). Although the siblings' translanguaging practices were not as apparent in writing as their English repertoire grew, translanguaging theories indicate that all languages are still, by nature, activated on a cognitive level throughout the writing process (Martin et al. 2009; Velasco and García 2014). It is likely that these siblings were still thinking in all languages but

selecting specific vocabulary and linguistic features that they know are considered English to document in print (Lee et al. 2019; Villwock et al. 2021).

Some translanguaging scholars propose that two-way bilingual programs should allow spontaneous translanguaging that occurs among students and teachers, and provide purposeful pedagogical translanguaging to increase metalinguistic awareness and scaffold skills in target languages, including minoritized languages (Cenoz 2017; Hamman 2018). This type of language programming in the education of hearing children is uncommon, as language separation is the rule for most two-way bilingual programs.

The context of ASL/English bilingual schools is quite different, with their language programming allowing for the ongoing use of both languages throughout the day (Griffin 2021). Chaining, reading aloud, and interactive signing and writing are integrated into daily instruction (Nussbaum et al. 2012; Mounty et al. 2014; Wolbers et al. 2014). Despite the lack of explicit implementation of translanguaging theories, deaf children's translanguaging practices in these ASL/English bilingual schools are already supported through the use of inside (unified, linguistic system) and outside perspectives (social demands for specific language uses) perspectives to guide interaction and instruction. This study provides a good snapshot of the writing development of three white middle-class deaf siblings raised and educated in ASL/English bilingual environments, where spontaneous and pedagogical translanguaging practices were likely to occur.

9. Limitations and Future Directions

Case studies are useful in providing an in-depth understanding of a topic in real-world situations by including details that may not be revealed in other designs. This case study was descriptive in nature regarding the writing development and translanguaging practices among deaf siblings who used ASL and written English over the course of their childhoods. It was not the goal of this design to test the research questions statistically and generalize findings to other circumstances. While the findings in this study further reinforce previous research on deaf children born into signing families having positive achievements in print literacy (Hoffmeister and Caldwell-Harris 2014), this design does not provide direct evidence of causality regarding familial language uses or school pedagogical practices.

The 28 documents that were obtained from the parents of the siblings who participated in this study were limited. There were no written artifacts when the children were between the ages of zero and three saved in the parents' archives. With the limited number of documents, it was difficult to discern whether these written artifacts were fully reflective of the full range of siblings' writing abilities and translanguaging practices. It is possible that there were additional features in their writing that were not showcased in this set of documents. Future research should collect a larger number of written artifacts from deaf children raised in signing multilingual homes to provide a more complete picture of the breadth of translanguaging practices and how they changed over time.

The lack of inclusion of the three siblings' signing samples in this study is a major limitation in fully understanding their translanguaging practices. Evaluations of multilinguals' language and writing skills should not be restricted to English as it only provides a partial picture of their whole linguistic repertoire (Soltero-González et al. 2012). There should be considerations of how features from different linguistic systems are unified and applied to make meaning across modes and languages with diverse communication partners. Deaf children should be allowed to compose and create meaning utilizing all languages they know and elucidate the strategies they use during the composing process (Rubin and Carlan 2005). Future studies on translanguaging in deaf children should include signing samples in addition to writing samples in their data collection and analysis.

10. Conclusions

Translanguaging is natural to the human experience with languages. Deaf children, like all other children, have linguistic and semiotic resources that are continuously expand-

ing through meaningful and accessible interactions with other people over time. Previous studies examining deaf children's writing development were situated in a monolingual bias in which translanguaging features found in deaf children were viewed as carrying no value, errors to be fixed, indications of delays, or evidence into why signed language should be avoided altogether. In contrast, examining language practices using a translanguaging model offers a nuanced and holistic understanding of how deaf children use their whole linguistic repertoire while developing writing skills. This current study is novel due to its focus on three deaf siblings' translanguaging practices as they developed bilingually, using ASL and written English, without being affected by language deprivation. The similarities across all three siblings' translanguaging practices and developmental trajectories yield valuable information on deaf children's potential with language expression and articulation when signed and written languages are reinforced at home and in school.

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