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ARTICLE

# *Hablando* at home: Examining the interactional resources of a bilingual autistic child

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**Abstract**

Daily language interactions predict child outcomes. For multilingual families who rear neurodiverse children and who may be minoritized for their language use, a dearth of research examines families' daily language interactions. Utilizing a language socialization framework and a case study methodology, 4,991 English and Spanish utterances from a 5-year old autistic child and his family were collected during naturally occurring interactions over 10 days. Utterances were analyzed for patterns of code-switching by speaker, activity setting, English or Spanish initial language, and code-switch function. Spanish was spoken in most activities. For reading, both languages were equally employed by the father. While participants used both languages across all activity settings, significant variations in code-switching type and function were observed by activity setting and speaker. We discuss implications for how home language resources can be integrated into autism interventions.

**Keywords:** autistic children; bilingual families; language socialization

## Introduction

Home language interactions are among the strongest predictors of young children's language and cognitive development (Hoff et al., 2012). This is especially true for young children with developmental disabilities growing up in multilingual homes, a population on the rise (Castro & Artiles, 2021; Maenner et al., 2020). Strong evidence exists for bilingual families to use their multilingual interactional resources to support their children's language development (Bialystok & Craik, 2010; Marian & Shook, 2012). Yet, children's language background is not always reported, or investigated as an interacting factor, in developmental and intervention research (Byers-Heinlein et al., 2019; Huerta et al., 2021), reinforcing a pervasive deficit perspective favoring middle-class, monolingual practices (Castro et al., 2021; Kay-Raining Bird et al., 2012). Cioé-Peña (2020) found that Latinx parents internalize the deficit perspectives of providers,

accepting intervention services in English only for their bilingual children despite initial resistance. Developmentally appropriate, linguistically diverse, and culturally responsive early interventions that support the language diversity, the educational expectations, and the cultural practices of bilingual families and their autistic children[1] are needed (Cohen & Miguel, 2018; DuBay et al., 2018; Stahmer et al., 2019).

Autism Spectrum Disorder (ASD) is a neurocognitive disability linked to significant language and communication impairments (American Psychiatric Association, 2013). Research shows that early interventions hold promise for fostering autistic children's development (Fuller & Kaiser, 2019; Landa, 2018). Bilingual autistic children are significantly underrepresented in early intervention (EI) across the U.S. (Morrier & Gallagher, 2012). Few studies have utilized a culturally and linguistically responsive, asset-based approach to integrate autism interventions into the daily lives of culturally diverse families that build on their linguistic and cultural resources (Jegatheesan et al., 2010; Larson et al., 2020). Some scholars have begun to investigate families' daily routines and identify targeted opportunities for adapting culturally relevant interventions into immigrant families' daily activities (Cohen, Miguel, & Wishard Guerra, 2020). Yet, these studies have not fully considered how language interactions may be critical, malleable factors that shape autism interventions and ultimately impact children's language outcomes.

The following literature review will begin with a discussion of the theories of language use in multilingual communities. Then we describe how language has been studied and used in multilingual communities and how an analysis of code-switching can shed light on linguistic resources used by multilingual families. Finally, we review how autistic children develop language differently than non-autistic children, and the aims of the current study.

### *Language socialization theory in multilingual communities*

Grounded in ethnographic methodology and informed by sociocultural theory, language socialization theory emphasizes the social, cultural, and cognitive processes of language development (Ochs & Schieffelin, 2011). Routine interactions between children and their primary caregivers are the culturally specific contexts in which children are socialized (Garrett & Baquedano-López, 2002). Language socialization occurs through novices' routine participation in semiotically mediated activities that integrate communicative environments (e.g., activities, artifacts, and technologies) with interlocutors' beliefs about communication and language. Novice speakers are purposefully positioned in these communicative interactions to develop their semiotic repertoires and their language habits (Ochs & Schieffelin, 2011).

Language socialization theory also allows for the integration of multiple languages to develop activity specific language habits (e.g., more frequent use of English in activities mediated by English print materials). Children who engage in translanguaging – integrating multiple languages into their language repertoire, and recognizing their hybrid identities and language ideologies – are agentic, creative, and cognitively flexible (McCabe et al., 2013; Song, 2019; Tönsing & Soto, 2020; Wang, 2019). Few studies have

[1]To honor the language preferences of disabled individuals, researchers used identity-first language throughout the manuscript. For further reference see Bottema-Beutel et al. (2021) and American Psychological Association (2020) publication manual guidelines.

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investigated bilingual autistic children's experiences with code-switching practices nested within routine family activities (Yu, 2016; Yu & Sterponi, 2023). Yu's (2016) work is one exception. She and her colleagues challenge assumptions that one language can be separated from another; parents deploy their full language repertoires when interacting with their autistic children. Her work recognizes that formulations of bilingualism as two distinct languages existing as separate cognitive entities is antiquated and does not align with families' daily, bilingual experiences. For many bilingual families, language use is a dynamic experience, influenced both by macro sociohistorical contexts and by the individuals with whom they speak within their micro contexts (Rogers et al., 2021). Situated within a transnational context in which families have historically been oppressed by social policies driven by white supremacy and power, the current study builds on Yu's work by exploring normative code-switching practices used within one family living on the border between the U.S. and Mexico, where English and Spanish are both commonly used. Home language practices will be analyzed to understand how code switching is used to communicate and to empower individuals (Rogers et al., 2021)

### *Code-switching in multilingual communities*

Code-switching is the act of alternating between two languages while concurrently using both languages in conversation (Reyes, 2004; Vu et al., 2010). From a language socialization perspective, code-switching serves as a contextual cue guiding the speaker's complex understandings of local contexts (e.g., the language of the other interlocutors, the language setting – Ochs & Schieffelin, 2011; Song, 2019; Zentella, 1997). Developmental age, language setting, interlocutors, and content of the discourse are known to shape the form and function of code-switching (Vu et al., 2010; Zentella, 1997). Younger children (under age 5) may use code-switching to bridge lexical gaps while older family members may use code-switching to achieve sociopragmatic functions (Vu et al., 2010). The way multilingual speakers switch between languages in the context of daily activities is a key component of implicit language socialization (Zentella, 1997).

Previous studies showed that children switched from Spanish to English when they engaged with researchers; they assumed that researchers were authority figures similar to teachers, and the expectation was to speak in English (Vu et al., 2010). When bilingual children from Puerto Rico encountered non-familiar adults, they were more likely to speak English until they were sure that the adult spoke Spanish (Zentella, 1997). In other studies, code-switching from Spanish to English was an acceptable practice in the United States given the assumption that Spanish speakers living in the U.S. understood some English (Ardila, 2005). When interlocutors integrate multiple languages in conversation using cross language strategies like code-switching, this language practice is a sign of linguistic control and cognitive flexibility for children with and without language disorders (Gonzalez-Barrero & Nadig, 2017; Kapantzoglou et al., 2021; Yow et al., 2018). Studies are beginning to show how bilingual autistic children who use both languages simultaneously have enhanced cognitive flexibility, strong executive function skills, and the ability to understand "false beliefs," as compared to their monolingual autistic peers (Gonzalez-Barrero & Nadig, 2017; Peristeri et al., 2021a). These cognitive skills have historically been seen as deficits among autistic individuals (Mostert-Kerckhoffs et al., 2015). In fact, recent studies have shown that bilingual language exposure, in the form of

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enhanced language experiences, may compensate for the limited executive functioning skills that some autistic children exhibit (Peristeri et al., 2021b).

### *Language development of autistic children*

Echolalia, the repetition of words or sentences spoken by others, the absence or loss of language in the first two years of life, and the use of neologisms describe some of the language differences that characterize autistic children's language (Tager-Flusberg, 1999). Many autistic children also struggle with the sociopragmatic functions of language learning; the ability to understand nuanced and complex aspects of language that vary by context (Naigles & Tek, 2017). Like caregivers of non-autistic children, it is likely that caregivers of autistic children use code-switching as a cue to support their child in understanding language functions and social nuances within their cultural communities.

Qualitative studies have shown that autistic children, including multilingual autistic children, engage in a variety of sophisticated interactional processes across a range of situations (Angulo-Jimenez, 2020; Bottema-Beutel, et al., 2020; Klein 2021; Yu, 2016). Some aspects of multilingual autistic children's expressive language are similar to that of their monolingual peers (Gonzalez-Barrero & Nadig, 2017; Prévost & Tuller, 2022; Siyambalapitiya et al., 2021). Bilingual autistic children have stronger dominant language abilities in their native language as compared to monolingual autistic children (Hambly & Fombonne, 2012), suggesting that there is no advantage to speaking English only for children with communication challenges (Conner et al., 2020; Prévost & Tuller, 2022). In fact, recent studies have shown no negative impact of bilingual language environments on autistic children's language development (Siyambalapitiya et al., 2021; Zhou et al., 2019). Understanding how bilingual families strategically integrate their two languages with young autistic children -- for bridging lexical gaps, or for navigating the sociopragmatic functions of language in different activity settings -- can support more targeted language interventions to address children's specific language needs.

### *Research aims*

As new evidence shows the cognitive benefits of autistic children speaking multiple languages (Gonzalez-Barrero & Nadig, 2017; Prévost & Tuller, 2022), it's important to understand how children are engaged in bilingual language practices in their daily routines. This new knowledge can inform more precise and focused intervention approaches to capitalize on autistic bilingual children's language strengths. In addition, new studies consistently call for ethnographic and sociolinguistic studies that examine the bilingual language development and code-switching practices of multilingual children (Wang, 2019). This study addresses these significant research gaps by investigating the code-switching patterns and functions of a bilingual, immigrant family raising an autistic child. Using an exploratory, multivariate, case study design (not driven by *a priori* hypotheses) we examined the language, type, and function of code-switching. We addressed several research aims. The first was to describe the prevalence of code-switching within a bilingual family during multilingual interactions. Specifically, we examined the proportional presence and language of code-switching across activity settings and speakers. The second was to look within code-switching interactions to identify whether the language, the type and the function of the code-switch varied across activity settings and speakers. Informed by language socialization theory, we expected

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language, type, and function of code-switching to vary across activity settings and speakers.

## Materials and methods

### Researcher positionality

The lead author and the third author share a linguistic and ethnic background with study participants. They collected the data and developed a rapport with the family over the three-year study. The first author has clinical experience diagnosing bilingual autistic children. She has also worked as an Applied Behavior Analysis (ABA) therapist, a special education preschool teacher, and an advocate for bilingual families with neurodiverse children. The second author has lived in Central and South America, is fluent in Spanish, and has experience examining language as a cultural practice among immigrant families with young children. The third author has been a primary school teacher and an aide in bilingual and special education classrooms. The fourth author has worked with bilingual autistic children in a variety of educational settings, and the fifth author is a Latin American ethnographer who has worked with immigrant families for more than a decade. From these experiences we have learned that some bilingual families did not feel empowered to interact in their preferred language with their neurodiverse children. Existing literature upholds parent perceptions, noting practitioners and educators advise against the use of two languages (Hampton et al., 2017; Howard et al., 2021; Trelles & Castro, 2019; Yu, 2013). Parents shared that they were expected to use English even if they did not feel comfortable speaking it. Our analyses are informed by our experiences and are designed to link research to practice.

### Research design

We used a Case Study Methodology to examine the daily language interactions of one bilingual family that included an autistic boy. Case studies are used to enhance our knowledge of complex human experiences within a specific context (Stake, 2006). They provide detailed accounts of human behavior within the complex contexts in which participants live and learn (Merriam, 1998; Yin, 2017). We implemented a single case study design to develop a more comprehensive understanding of how this family uses bilingual language practices to navigate daily routine activities, and support the child to be successful in school. This approach allows researchers to examine specific family language patterns, identify commonalities, and draw a single set of case conclusions (Eisenhardt, 1991; Stake, 2006; Yin, 2017).

### Participants

The family depicted in this study was part of a broader study of 38 Mexican heritage, Spanish speaking families raising at least one autistic child (Cohen & Miguel, 2018). Families were recruited from two sources, a medical clinic near the U.S. Mexico border and a non-profit regional center. Recruitment packets were sent to Latino families rearing autistic children and interested parents were screened for eligibility requirements (i.e. availability, interest, age requirement). Once enrolled, participants could participate in individual interviews, focus group interviews, surveys, and daily video

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recordings of interactions. Prior to video recording, participants were informed of ethical considerations, including no denial of previous or future benefits, utilizing a secure online, password-protected, database to store data, applying pseudonyms to participants' names, and ensuring researchers handling data received human research subjects training. The six families participating in video recording of daily activities were provided a video camera and they kept it for 10 days. Families completed IRB approved consent forms and were provided with camera training on the day we dropped off the video recorders. They were told they could halt filming and/or withdraw permission for videos and associated data at any time. This article examined one of the six families, specifically the code-switching language interactions between a bilingual child and his family.

The Fernandez[2] family includes the target child, Herman, a five-year old autistic boy (diagnosed at 36 months), his 3-year-old sister Rocio, his 32-year-old mother Beatriz, a homemaker who was in the process of completing her Bachelor's degree, and Herman's father David, a 31-year-old merchant with a bachelor's degree. All ages were reported at the time of data collection. The family's annual household income was between $25,001-35,000. The family lived in a bicultural and bilingual border community along the U.S. - Mexico border and would regularly visit family in Mexico. The Fernandez children can be characterized as simultaneous bilinguals, having been exposed to both English and Spanish from birth. More specifically, Beatriz described their family's home linguistic practices as Spanish dominant, with some English spoken by all family members throughout the day. Beatriz reported that she and Herman's father, David, spoke more Spanish than English to Herman, and that Herman spoke equal amounts of English and Spanish at home. More recently, David has been reading to the children in English only.

Herman was receiving ABA intervention services in English approximately 15 hours per week at the time of data collection. He was also attending a state-funded preschool with an English dominant school-readiness, thematic curriculum. Given the area's large Spanish-speaking community, bilingual preschool teacher aides were employed and helped to clarify curriculum content in Spanish as needed. No language designation was provided by the preschool. Prior to his autism diagnosis, Herman received four hours per week of Spanish behavioral intervention, at a child development center 15 minutes from their home, across the border, in Mexico. This intervention was parent initiated and implemented because of their proximity to the border and their connections to the clinic (Beatriz's sister worked there). At 44-months, Herman received eight hours per week of ABA intervention in English at his home in the U.S. Beatriz described Herman as a hyperactive child who easily lost focus, and needed help to adapt to transitions (i.e., changes in his schedule) and curb maladaptive behaviors. He also required help with his fine and gross motor skills, he had difficulty maintaining and establishing gaze when spoken to, he spoke in the third person, and he had difficulty socializing and maintaining a conversation with peers. Beatriz noted that although Herman's language production was clear and he was meeting or slightly exceeding his developmental milestones, he struggled to maintain conversations with peers. Beatriz was told that he did not require speech services, he had a good memory, and he was perceived as very affectionate with family and close relatives. Rocio, Herman's younger sister, spoke

[2]Pseudonyms.

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mostly Spanish and regularly played with Herman. Beatriz cared for Rocio at home as she was not yet enrolled in school.

### Procedures

To capture daily, routine interactions, the Fernandez family was given a digital video recorder and asked to film daily typical interactions over a 10-day period. Researchers described how to use the video recorder, and the types of interactions that should be recorded (e.g., play time, dinner time). At the end of 10 days a researcher collected the video recorder, the recorded footage, and invited Beatriz to share her experiences about data collection in a short audio-recorded interview. Beatriz reported confidence that the daily video recordings accurately captured their families' naturally occurring routine activities. She explained that the recordings captured instances of teaching, conversations, and play. Reflecting on her teaching style she acknowledged learning how to teach Herman from the early intervention therapists, "cómo le refuerzan ciertas cosas o cómo le dirigen, cuando algo no está haciéndolo bien" (*How they reinforce certain things or how they direct him, when he is not doing something right*). Yet, Beatriz also encouraged Herman to play given most of his day included structured activities like school and therapy. When describing play time, she explained: "es como ese tiempo extra que él puede disfrutar ya jugar con su hermana" (*It is like that extra time that he can enjoy and play with his sister*). Beatriz reported an intentionality in Herman's daily activities.

The Fernandez family collected 334 minutes across 20 digital video recordings. Video recordings were transcribed using a professional transcription service that specializes in transcribing English, Spanish, and bilingual interactions. Recorded interactions occurred between the mother, (Beatriz), the father (David), Herman (the autistic child), the younger sister (Rocio) and additional family members including Herman's cousin, aunt, and uncle.

### Data reduction

Transcripts were analyzed to identify code-switching excerpts, a phenomenon of interest noted during a previous conversational analysis study in which researchers were guided by a process of 'unmotivated looking' (Bottema-Beutel, et al., 2020; ten Have, 2001). For this study we identified instances of code-switching – interlocutors switching between speaking Spanish and English and back to Spanish or English – in 14 of the 20 transcripts. These 14 transcripts were selected for further analysis to understand the characteristics of code-switching occurrences. The six transcripts that were excluded from the analysis included only Spanish, with no code-switching, and featured instances of pretend play, eating, and traveling between Beatriz, David, Herman and Rocio. Notably, all video recordings of reading or homework activities included code-switching.

### Transcription

All transcripts featuring code-switching were segmented by speaker and by utterance, and were coded at the utterance level. An utterance was defined as a word, a phrase, or independent clause, or a 2 second pause or more in between vocalizations (Kanaya & Santiago, 2019; MacWhinney, 2000). This process was repeated for each of the 14 transcripts resulting in 4,991 utterances, with 9.5% ($n$ = 476) featuring code-switching.

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### *Coding for activity setting, speaker, and language*

All codes were dichotomous, indicating the presence or absence of the phenomenon of interest. This allowed for proportional scores to be derived by dividing the coded utterances by total utterances ($n$= 4,991) or total code-switching utterances ($n$ = 476).

*Activity setting.* To identify the activities in which code-switching occurred, authors read each transcript, watched the associated video recording and coded the overall activity based on what the child and parent were doing (e.g., pretend play, eating) separately.

*Speaker.* Each utterance was coded for the speaker. The target child Herman, his mother Beatriz, his father David, and his sister Rocio were the primary speakers; the other three family members who appeared infrequently were combined into one group for analytic purposes.

### *Coding for code-switching frequency, language, type, and functions*

If an utterance included more than one language, the utterance was coded for the presence of code-switching (CS) (dichotomous code). All utterances coded for the presence of CS were further coded for the language of the CS, as either an English CS (from Spanish into English) or a Spanish CS (from English into Spanish). For example, an individual utterance: *le estoy echando Ketchup* 'I am putting Ketchup on it' would be coded for the presence of an English CS. A second example: *Mother: De qué color vas a pintar el moño?* 'What color will you use for the bow?' *Child: Yellow."* In this instance the first utterance would be coded for presence of a Spanish CS, whereas the second would be coded for presence of an English CS.

Each occurrence of CS was categorized as one of two types: Code mix and code change. Code mix is a single word borrowing, primarily used to bridge lexical gaps (Vu et al., 2010). Types of code-mixing included descriptions of "evidence and context of word knowledge," (Vu et al., 2010). Definitions of code mix types included noun or proper noun code mixing, where the speaker switches to English for one word: *Water es en inglés en español es agua.* 'Water is in English, in Spanish it's agua'. Code change functions included alternations between two languages, driven by underlying interactional and sociopragmatic purposes (Vu et al., 2010). Within code change, more specific codes were used to identify its function. For example, code change utterances were coded by topic shift (e.g., if the speaker shifted content topics), if speakers shifted roles (e.g., if the mother shifted from teaching a concept to nurturing the child), or if the CS was used to make requests or get someone's attention. Clarification code changes were also further sub-categorized to better understand the code change function. For example, a restatement code was used if a speaker restated a concept in the new language. A subcategory of the clarification code included an emphasis code, used to emphasize a certain command or topic. The translation code was used when the speaker directly translated a statement (this usually occurred when the mother and the child were working on school work together). A routine code was used to code for poems, songs, or rhymes that were borrowed directly from English. In this code, the tune of the song was usually an indicator that the child borrowed the song from his classroom context.

To reach intercoder consensus (Cascio et al., 2019) on the CS language, type, and function, the first and third author coded each transcript together for language (e.g., English or Spanish) and for CS type (e.g., code mix or code change) and their subcategories. When there was ambiguity about a code, researchers reviewed the coding dictionary, discussed all of the possible alternative codes for that utterance, identified the most appropriate code

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based on the definition, and revised the coding dictionary to clarify coding definitions and add multiple examples from the transcripts for each code type and function. See Appendix A for detailed definitions and examples in the final coding dictionary.

## Results

Video recordings yielded 4,991 utterances that were coded and analyzed for speaker, activity setting, language use, and code-switching features. Roughly half of the utterances were spoken by Beatriz (mother) ($n$ = 2,332, 97% Spanish), a third by Herman (target child) ($n$ = 1,529, 86% Spanish), and the remaining by Rocio ($n$ = 460, 94% Spanish), David (father) ($n$ = 233, 4% Spanish), and other relatives (e.g., cousin, aunt, and uncle) ($n$ = 437, 99% Spanish).

Roughly half of the utterances were captured during pretend play ($n$ = 2,560) in which speakers spoke mostly Spanish ($n$ = 2496), followed by homework ($n$ = 1,017) occurring mostly in Spanish ($n$ = 936), reading ($n$ = 740) where Spanish and English were equally used (Spanish = 367; English = 373), and traveling ($n$ = 278) occurring primarily in Spanish ($n$ = 265). Beatriz, Herman, and Rocio participated in all activities, while David participated in reading (97% of David's utterances) and other relatives participated in pretend play (99.3% of all utterances spoken by other relatives in pretend play). David was

**Table 1.** Code-Switch (CS) presence and language

| | Total CS/ Total Utterances % (n) | Spanish CS / Total CS % (n) | English CS / Total CS % (n) | Code Mix/ Total CS % (n) | Code Change/ Total CS % (n) |
|---|---|---|---|---|---|
| *Total* | | | | | |
| | 9.54% (476) | 5.67% (27) | 94.32% (449) | 78.4% (373) | 21.6% (103) |
| *Speaker* | *Total CS/ Total Speaker % (n)* | *Spanish CS/ CS Speaker % (n)* | *English CS/ CS Speaker % (n)* | *Code Mix/ CS Speaker % (n)* | *Code Change/ CS Speaker % (n)* |
| Target Child (Herman) | 11.4% (174) | 1.7% (3) | 98.3% (171) | 68.4% (119) | 31.6% (55) |
| Mother (Beatriz) | 10.0% (234) | 2.1% (5) | 97.9% (229) | 86.3% (202) | 13.7% (32) |
| Sister (Rocio) | 12.2% (56) | 23.2% (13) | 76.8% (43) | 82.1% (46) | 17.9% (10) |
| Father (David) | 1.3% (6) | 0.0% (0) | 100% (6) | 16.7% (1) | 83.3% (5) |
| Other Relatives | 1.4% (6) | 0.0% (0) | 100.0% (6) | 83.3% (5) | 16.7% (1) |
| *Activity* | *Any CS/ Total Activity % (n)* | *Spanish CS/ CS Activity % (n)* | *English CS/ CS Activity % (n)* | *Code Mix/ CS Activity % (n)* | *Code Change/ CS Activity % (n)* |
| Pretend Play (PP) | 8.2% (209) | 0.5% (1) | 99.5% (208) | 91.4% (191) | 8.6% (18) |
| Eating | 9.6% (38) | 0.0% (0) | 100.0% (38) | 86.8% (33) | 13.2% (5) |
| Reading | 10.7% (79) | 32.9% (26) | 67.0% (53) | 74.7% (59) | 25.3% (20) |
| Homework | 12.3% (125) | 0.0% (0) | 100.0% (125) | 60.0% (75) | 40.0% (50) |
| Traveling | 9.0% (25) | 0.0% (0) | 100.0% (25) | 60.0% (15) | 40.0% (10) |

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the only speaker to use mostly English utterances during his interactions. Table 1 presents the patterns of code switching by speaker and within activity setting.

To further characterize the language of the Fernandez family, below are some examples of how Beatriz often prompted Herman and Rocio with open-ended questions related to their daily activities (i.e. "*A que mas jugaron ayer platiquen me* / What else did you play yesterday tell me," "*Que buscas?* / What are you looking for?"). Herman would respond with one-word answers "B: *Quieres un hermanito?* / Do you want a little brother? H: *No*" or "B: Do you fight with your sister? H: *Si* / Yes." There were other instances where Beatriz had to prompt Herman multiple times with a question prior to responding, as he would look away from his mother or focus on objects in his hands or around him. In other instances, Herman responded using multiple word sentences. For example, in the following instance his mother asked Herman about his best friend in school,

(1) Beatriz: *Melissa es tu mejor amiga?* 'Melissa is your best friend?'
(2) Herman: *Si y tu no!* 'Yes and not you!'
(3) Beatriz: [Dramatic gasp] *Y que me dijiste ayer de Melissa?* 'And what did you tell me yesterday about Melissa?'
(4) Herman: *Melissa me va (voy a) casar con ella* 'Melissa, I am going to marry her'
(5) Beatriz: *Te vas a casar con ella?* 'You're going to marry her?'
(6) Herman: *Si* 'Yes'
(7) Beatriz: *Porque te vas a casar con Melissa, Herman?* 'Why are you going to marry Melissa, Herman?'
(8) Herman: *Porque es que se te va romper el corazon!* 'Because it is going to break your heart!'

In the scenario above, the whole family is driving. Beatriz and her kids have been engaging in conversation, reciting the months of the year in Spanish and English, and talking about their friendships. This conversation demonstrates Herman's ability to produce expressive vocabulary and respond to cognitively demanding questioning from Beatriz in Spanish.

### *Aim 1: Nature and prevalence of code-switching*

#### *Presence and language of code-switching*

Code-switching was analyzed for presence and language of the CS (into Spanish or into English). Overall, 9.5% of the utterances included some form of code-switching, mostly made up of English CS – a switch to English from a Spanish utterance (95% of all codeswitching). Code-switching was used at least once by all speakers and in all activity settings. Notably, David and other relatives did not use any Spanish CS. See Table 1.

#### *Presence of code-switching by language, speaker, and activity settings*

A univariate analysis of variance (ANOVA) was used to examine whether the presence of code-switching varied significantly by speaker, by activity setting, or whether there was an interaction between the two. One dependent variable, presence of code-switching, was included. Independent variables included speaker (Herman, Beatriz, Rocio, David, other relatives) and activity setting (pretend play, eating, reading, homework, traveling). IBM SPSS was used for the analysis, with $N = 4{,}991$ utterances included. While there were no

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main effects of presence of CS by speaker, $F(4,4990) = 2.17$, $p = .07$, or activity setting, $F(4, 4990) = 1.24$, $p = .29$, the results reflected a significant but weak interaction between speaker and activity setting, $F(11, 4990) = 6.64$, $p < .001$, $\eta^2 = .01$. See Table 2 for code-switching distributions. Beatriz, David and Rocio used code-switching most often during reading activities while Herman used code-switching least often during reading activities. Herman used code-switching most often during homework and traveling activities while Beatriz, Rocio, and David used code-switching least often during homework and traveling activities. For example, in a typical homework interaction between Beatriz and Herman,

**Table 2.** Distribution of CS presence, language, and type by Activity Setting and Speaker

| Activity Setting (n) | Speaker (n) | CS Presence % (n) | CS Spanish % (n) | CS Change % (n) |
|---|---|---|---|---|
| *Pretend Play (2560)* | Herman (805) | 9.6% (77) | 0% (0) | 18.2% (14) |
| | Beatriz (1057) | 9.6% (101) | 1% (1) | 1% (1) |
| | Rocio (262) | 9.5% (25) | 0% (0) | 8% (2) |
| | David (2) | 0% (0) | – | – |
| | Other Relatives (434) | 1.4% (6) | 0% (0) | 16.7% (1) |
| *Eating (396)* | Herman (81) | 12.3% (10) | 0% (0) | 40% (4) |
| | Beatriz (251) | 7.2% (18) | 0% (0) | 0% (0) |
| | Rocio (61) | 16.4% (10) | 0% (0) | 10% (1) |
| | David (0) | – | – | – |
| | Other Relatives (3) | 0% (0) | – | – |
| *Reading (740)* | Herman (240) | 5.8% (14) | 21.4% (3) | 14.3% (2) |
| | Beatriz (225) | 20% (45) | 8.9% (4) | 13.3% (6) |
| | Rocio (49) | 28.6% (14) | 92.9% (13) | 50% (7) |
| | David (226) | 2.7% (6) | 100% (6) | 83.3% (5) |
| | Other Relatives (0) | – | – | – |
| *Homework (1017)* | Herman (315) | 18.4% (58) | 0% (0) | 43.1% (25) |
| | Beatriz (648) | 9.6% (62) | 0% (0) | 40.3% (25) |
| | Rocio (34) | 9.3% (5) | 0% (0) | 0% (0) |
| | David (5) | – | – | – |
| | Other Relatives (0) | – | – | – |
| *Traveling (278)* | Herman (88) | 17% (15) | 0% (0) | 66.7% (10) |
| | Beatriz (151) | 5.5% (8) | 0% (0) | 0% (0) |
| | Rocio 34) | 5.9% (2) | 0% (0) | 0% (0) |
| | David (5) | 0% (0) | – | – |
| | Other Relatives (0) | – | – | – |

*Note.* CS Spanish and CS Change represent the proportion of time the CS was either Spanish or Change. The difference is attributed to either CS English or CS Mix.

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Beatriz spoke in Spanish to prompt Herman to answer the questions and Herman responded in English:

(1) Beatriz: *No, te estoy preguntando ¿de qué color son las bananas?* 'No, I am asking you, what color are the bananas?'
(2) Herman: Yellow
(3) Beatriz: *Ah, ¿de qué color son las manzanas?* 'Ah, what color are the apples?'
(4) Herman: Red

### *Aim 2: Patterns of code-switching by type, function, language, speaker, and activity setting*

#### *Type and function of code-switching*

Although all speakers across all activity settings used code mix and code change types of code-switching, code mix was the most common (78.4%) type. Code mix and code change were both most frequently observed with English CS (Spanish to English) (97.9% and 84.2% respectively). When Spanish CS (English to Spanish) was observed, it occurred most frequently during code change (66.7%). See Table 1. Code mix types included seven categories (See Appendix A). Noun code mixing (42.1%) and proper noun code mixing (36.9%) occurred frequently, while evaluation (1.6%), context specific (3.5%), proper article use (3.5%), and improper article use (1.1%) occurred less frequently. There were also uncategorizable code mix utterances (11.3%). Code change functions included 12 categories. Topic shift (23.3%) and routinized code changes (17.5%) occurred frequently. The remaining code change functions occurred less frequently: Narrative frame break (5.8%), mitigating request (1.9%), mitigating response (10.7%), attention attraction (8.7%), reading in English (1.9%), parallel speaker turn (5.8%), restatement, (10.7%), emphasis/command (3.9%), translation (7.8%), and uncategorizable (1.9%). English was the dominant language of the CS with the exception of attention attraction which occurred most frequently (67%) in Spanish.

#### *Language, speaker, and activity settings of code-switching*

Multivariate Analysis of Variance (MANOVA) was used to investigate variations in the language and type of CS by variations in speaker or activity setting. The largest categories of type of CS (code mix) and language of CS (English CS) were used as the reference group. Two dependent variables were included: proportion of CS Spanish and proportion of code change. Independent variables were speaker (Herman, Beatriz, Rocio, David, Other relative) and activity setting (pretend play, eating, reading, homework, traveling). Pillai's criterion was used to assess main effects due to unequal sample sizes across speaker and activity setting IVs (Tabachnick & Fidell, 2013). The combined DVs were significantly related to both speaker, $F(8, 918) = 37.11$, $p < .01$, and activity setting, $F(8, 918) = 39.09$, $p < .01$. The interaction term was also significant, $F(16, 918) = 18.23$, $p < .01$, with large effect sizes (partial $\eta^2 = .16$, $\eta^2 = .25$, and $\eta^2 = .24$, respectively). CS Spanish was almost exclusively used during reading and primarily by David and Rocio. For code change, Herman was least likely to use this type of CS during pretend play and reading, while David and Rocio used code change most frequently during reading. Results of this

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**Table 3.** Test of Activity Setting, Speaker, and Their Interaction

| IV | DV | Univariate F | df | Partial $\eta^2$ |
|---|---|---|---|---|
| Activity Setting | CS SPANISH | 106.57** | 4/475 | .48 |
| | CS CHANGE | 3.34* | 4/475 | .03 |
| Speaker | CS SPANISH | 37.11** | 4/475 | .24 |
| | CS CHANGE | 10.24** | 4/475 | .08 |
| Activity Setting | CS SPANISH | 42.09** | 8/475 | .42 |
| by Speaker | CS CHANGE | 4.48** | 8/475 | .07 |

*Note.* $^*p < .05$, $^{**}p < .01$

analysis are summarized in Table 3. For example, Herman is asking his father for help translating a word:

(1) Herman: And they have - *como se dice disfraz en Inglés?* 'And they have - how do you say costume in English?'
(2) David: Costume

### *Code mix by language, speaker, and activity settings*

To examine the distribution of language by code mix type and code mix function, two crosstab analyses were conducted. A chi-square test of independence demonstrated no statistically significant differences between speaker and code mix types, $X^2$ (20, $N = 331$) = 16.95, $p = .66$, nor between CS language and code mix types, $X^2$ (5, $N = 331$) = 10.00, $p = .08$.

There were significant differences across activity setting and code mix types, $X^2$ (20, N = 331) = 155.33, $p < .01$. Code mixing utterances in pretend play were either noun code mixing (44.9%) or proper noun code mixing (44.9%). For example, Herman stated "Mamá a Rocío le dejaron la letter B de bear. [Mom they left Rocio the letter B of bear]" or "Me das más Play-Doh? [Can I have more Play-Doh?]." Noun code mixing was the dominant type of code mixing for eating (71%), homework (77%) and traveling (78.6%), while reading included proper noun code mixing (96.6%).

### *Code change function by language, speaker, and activity settings*

There were significant differences across CS language and code change, $X^2$ (10, $n = 101$) = 32.24, $p < .01$. The most frequent functions of English code change were topic shift (22.4%), routinized (21.3%), mitigating response (12.9%), and restatement (12.9%). The most common Spanish code change functions were attention attraction (37.5%), topic shift (31.3%), translation (18.8%), and parallel speaker Turn (12.6%).

There were significant differences between speaker and code change function, $X^2$ (40, $N = 101$) = 128.52, $p < .01$. Herman's utterances were coded as routinized (33%), topic shift (22.2%), mitigating response (16.7%) and narrative frame break (11.1%). Beatriz's utterances included restatements (31.3%), topic shifts (31.3%), translations (15.6%) or

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parallel speaker turns (9.4%). Rocio's utterances were attention attraction (60%), topic shift (20%), mitigating response (10%) and parallel speaker Turn (10%). David used code change for translation (75%).

There were also significant differences between activity setting and code change functions, $X^2$ (40, $N$ = 101 = 113.98, $p < .01$. Within reading, the primary functions of code change were attention attraction (33.3%), topic shift (27.8%) and translation (22.2%), while within homework the code change function had more variance including topic shift (24%), restatements (26%), narrative frame break (12%), and mitigating response (12%).

## Discussion

This study examined bilingual language practices, specifically how code-switching is used within daily activities among the Fernandez family, a Spanish dominant family living in a southern U.S bicultural and bilingual border community. Little is known about how bilingual families who raise autistic children utilize their linguistic and cultural resources to accomplish daily tasks including academic and therapy activities. Our study addresses this gap by documenting the language, types, and functions of code-switching used by a bilingual family to engage in daily activities with their autistic child. Framed within language socialization theory, findings suggest that the Fernandez family's bilingual language practices were shaped by the context of the activity setting and the people participating in the activity.

### *Aim 1: Nature and prevalence of code-switching*

Spanish was the dominant language used by all family members and the majority of code-switching across all speakers and activity settings was from Spanish into English. Reading and homework activities, both activities mediated by English print material, had the highest proportion of code-switching across all activity settings. It is possible that the English print materials signaled to the caregivers that English should be used at home to promote children's literacy development. Immigrant caregivers have used homework routines to support children's academic skill development and to reinforce socialization norms that align with families' cultural backgrounds and immigration experiences (Alvarez, 2014; Mangual Figueroa, 2011). In our study, we identified interaction effects of speakers by activity setting pointing to important patterns of code-switching and language use in both reading and homework activities (see Table 1). During reading, David and Rocio, who were most frequently observed code-switching, were adhering to the language of the print material, mostly using a Spanish code mix for clarification. Additionally, Herman was least likely to code-switch during homework activities, suggesting his familiarity and preference to use English in this English mediated activity. The prevalence of English during reading and homework demonstrates how monolingual norms in academic settings can impose deficit language identities, even when speakers hold positive attitudes towards heritage language (Tseng, 2021). Other adult-directed activities like Herman's behavioral interventions were also in English, further evidence of the influence of monolingual norms directing learning and therapy activities. The Fernandez family were likely internalizing monolingual expectations in academic contexts and they used reading and homework activities to socialize their child into expected academic language interactions to learn new content and to build proficiency in the

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language of school, English. Previous studies have shown how families strategically used bilingual youth as language brokers in supporting homework activities and in preparation for taking standardized tests in Spanish dominant homes (Alvarez, 2014; Dorner et al., 2007). For family activities that were more child-centered and less likely to be mediated by English materials, like pretend play or eating, Spanish was the dominant language with fewer instances of code-switching (See Table 1).

The socio historical context of the U.S.-Mexico border community where the Fernandez family resided further shapes the daily language practices of people living within this community. The Fernandez family described seeking services and interacting with family and service providers in both Mexico and in the U.S. This required consistent use of both English and Spanish to enhance collaborative meaning making within their border community. Previous studies have shown how multilingual speakers, or community translanguagers, contextually modify their specific language practices to optimize shared meaning making and communication (Kim et al., 2021; Worthy et al., 2016).

### *Aim 2: Patterns of code-switching by type, function, language, speaker, and activity setting*

The majority of the code-switching across activities and speakers was defined as an English code mix (i.e., English noun or pronoun inserted into a Spanish utterance). Table 2 describes the presence of the non-dominant code-switching language (CS Spanish) and type (CS Change). Children would often insert an English word into a Spanish phrase: "Ah, podemos hacer un *hot dog* [oh, we can make a hot dog]," "Mami, ¿me prestas poquito *blue*? [Mom, can you give me some blue]," "Me das poquito *white*, mami, para que pueda tener un muñeco de nieve. [Can you give me some white, mom, so I can have a snowman]," "Tienes que escuchar bien lo que diga la *teacher* que hay que hacer *okay* [You have to listen well to what the teacher says, what to do, ok]," "Mami la *cookie* también es de muchos colores. [Mom the cookie is also of many colors]." Speakers were more likely to use these types of noun word insertions rather than completely shifting languages and continue speaking in the new language (in this case, English).

When activity settings were mediated by English print material (e.g., reading or worksheet activities), family members drew from a diverse range of code change functions to clarify language pragmatics, or to change speech direction (e.g., change topics, change speaker roles, respond to a question, to get the attention of the other interlocutor). For example, during one reading interaction the father stated, "They look at the clues and ask questions. Do you remember the-" Herman interrupts to ask, "Papi quién *is this?* [Daddy who is this?]"

These findings suggest the societally dominant language was an important linguistic resource for this family. Although the Fernandez family lived in a U.S.-Mexico border community where Spanish was frequently used in the broader community, Herman was attending an English-speaking preschool and he received early intervention services at home with English-speaking interventionists. Previous studies have used a Bakhtinian approach to identify English as the discourse of power and social capital (Bakhtin, 1983; Palmer, 2007). In our study it is clear that English influenced how the Fernandez family spoke during daily routine activities. We see family members engaging in bilingual interactions that support the home language but also thoughtfully integrating English to reinforce language learned outside the home.

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David and Beatriz (Mom and Dad) used code change utterances (in English) during academic activities (See Table 2). For example, during reading, Spanish and English were equally used by David who also had the highest proportion of code change utterances. English was not his dominant language but David read books in English and code-switched into Spanish to clarify the meaning of English words or to directly translate from English to Spanish. In the following example David read the passage in English and then clarified as follows: "se quemó mira con el fuego; there's *fires* [it burned, look with the fire; there's fires]".

Herman, Rocio, and their mother used Code Changing more frequently during homework and worksheet activities as the worksheets were all in English. Herman used Code Changing for routinized utterances that he likely learned in school (e.g., singing the "Clean up" song while cleaning up his Play Doh at home). Rocio used Code Changing for Attention Attraction, to get her mother's attention when Beatriz was teaching Herman. Beatriz used Code Changing to restate ideas, to shift topics, and to clarify concepts to address her academic goals for Herman. During worksheet activities, a typical interaction facilitated by Beatriz follows:

(1) Beatriz: Circle and color the smallest object in each box. *¿Qué tienes que hacer?* 'What do you have to do?'
(2) Herman: *Mira Mama* 'Look Mom'
(3) Beatriz: *¿Qué tienes que hacer?* 'What do you have to do?' The smallest (pause). What is the smallest?
(4) Herman: Right here.
(5) Beatriz: *¿Cuál?* 'Which one?'
(6) Herman: *Ese* 'This one'

These code change utterances appeared frequently and strategically during adult directed activities in which Beatriz and David were teaching or scaffolding learning activities for academic skill development; Herman and Rocio used Code Changing to showcase newly learned songs and language or to get a parent's attention.

Herman and Rocio most frequently used code mix utterances during child centered activities like pretend play or eating activities when adults were not present (See Table 2). Code mixing included inserting an English word (e.g., hot dog, blue, dinosaur, pirate) into a Spanish utterance. Many times, one child would say the English word within a Spanish utterance and the other child would repeat the English word in a follow up Spanish utterance. It is possible that Herman and Rocio learned many vocabulary words at school or while watching TV in English, and they used these comforting home activities to share their new knowledge.

### *Research implications*

Findings from this study point to the need for more research that investigates how multilingual families raising an autistic child strategically utilize their linguistic resources to navigate academic and therapeutic contexts constrained by monolingual norms. Future research should explore how autism interventionists' language ideologies may prevent the implementation of best practices specifically suited for young multilingual autistic children. Researchers might also consider how interventionists gather information about their neurodiverse students' home language contexts and how they understand

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the research, pedagogy and policies related to multilingual language learning. Therapists and teachers should recognize the diverse language resources that their multilingual autistic students bring to school to build key cognitive and social skills. Recent studies have identified that bilingual autistic children have more advanced cognitive flexibility than monolingual autistic children (Peristeri et al., 2021a, 2021b), yet more research is needed to further understand how teachers and therapists can build on these strengths. Additionally, some researchers may consider integrating a translanguaging framework within academic contexts and research methodologies to promote an understanding of language as a singular dynamic system (O'Connor et al., 2019), although some scholars have identified translanguaging as a threat to sustaining minoritized languages (Cenoz & Gorter, 2017).

Research Practice Partnerships built on long-term collaboration between researchers and practitioners have proven effective in early childhood interventions, especially for children in low-income families or who have been historically marginalized (Bassok et al., 2021; Brotman et al., 2021). Future research must collaborate with regional centers and school districts designing and implementing interventions for autistic children growing up in multilingual families.

### *Practical implications*

As recent studies suggest, bilingual language practices may serve a range of interactive and relational functions. For example, bilingual practices have been shown to enhance autistic children's executive functioning skills (Peristeri et al., 2021a, 2021b) and they may buffer against axes of oppression such as immigration status, socioeconomic status, and educational opportunities (García Coll et al., 1996).

Capacity building interventions that promote early bilingual language development and balance opportunity gaps have been obscured by inequitable U.S. education policies that promote deficit oriented and subtractive language practices (e.g., reclassification policies for English Language learners with disabilities – Cabrera, 2013; Valenzuela, 1999; Walker & Carta, 2020). Our study shows that families use their multiple language systems purposefully to enact their daily routines and achieve their educational goals for their children. Strong evidence suggests that educators can mitigate inequities early by building upon family's heritage language in academic settings and empowering students to actively negotiate their linguistic repertoires in their environments, negotiating, interpreting, and responding to systems of power (García et al., 2011; Goodman & Tastanbek, 2021; Menken et al., 2012; Rogers et al., 2021; Spencer, 2017).

Therapists and educators are encouraged to build upon families' language choices and move beyond simplistic perspectives about language development (i.e., English only is best – Siyambalapitiya et al., 2021). Educators should build their own capacities by listening and learning about how students use language at home and elevate children's native language in school and other intervention settings. For example, young autistic children often have difficulty transitioning between routine activities or into new routines. Educators may incorporate words from the child's native language into their classroom with songs and rhymes to scaffold smooth transitions. Studies have shown the language learning benefits of using songs and rhymes for English language learners to improve vocabulary and pronunciation (Saricoban & Metin, 2000).

Given current study findings showing that interlocutors were influenced by their environments and by the language of print materials that mediated interactions,

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educators should intentionally include materials and experiences that build on home language resources. Educators who do not speak the students' home language may label materials in the child's classroom environment in multiple languages represented by the students to signal the value of children's home language; they may integrate home language formulaic phrases into daily routines, use extra-linguistic materials (e.g., video, pictures) to support meaning making in the new language, and layer new language vocabulary over the native language to reinforce vocabulary development (Lucas et al., 2008). Studies also call for educators to talk with students about the importance of valuing and honoring their home language, and empowering them to speak it (Young, 2014). It is devastating to see how children are placed in learning environments that strategically devalue their home language especially when families are engaging in purposeful, playful, language-rich bilingual interactions at home. These types of bilingual interactions have been shown to promote cognitive flexibility and long-term academic outcomes (Craig et al., 2009; McCabe et al., 2013; Peristeri et al., 2021b).

### *Study limitations*

There are several study limitations. First, these case study findings should not be generalized to broader populations of Mexican-heritage families. A strength of this case study design was to develop a more nuanced understanding of how one bilingual family engaged in language interactions with their autistic child. This in-depth analysis contributes to the scant research in this area but will not apply to all contexts. This study also did not utilize school documents or seek a separate autism diagnosis. The programs from which we recruited participants confirmed that children in our study were properly diagnosed. Authors also relied on parent reports of autism diagnosis, language use, intervention use, and school choice.

The video recording data collection was participant-led by design. Participants were responsible for filming instances of daily activities where language was present, the findings of this study are limited to what they captured on video. There may be language practices and language contexts or activity settings that researchers would have liked to capture (e.g., ABA intervention), but were not captured due to the study design. A strength of this design is how study participants felt empowered to capture what they felt was important to illustrate family language interactions. In an exit interview Beatriz confirmed having captured routine activities in which the target child engages daily, and in which he consistently behaves as he does when there is no video recording. Beatriz mentioned that Herman: "se portó como siempre se porta." (*he behaved how he typically behaves*). Future research might consider following up participant-led video recordings with more in-depth interviews asking caregivers to reflect upon their language use (including why they used code-switching).

## Conclusion

Drawing on language socialization theory, current study findings, and from interviews with Beatriz describing how she observed and learned from the English-speaking therapists engaging with her son during his early intervention program, the Fernandez family members were making purposeful and thoughtful language choices to support their autistic child's language learning. Much of the adult-led code-switching interactions were aimed at teaching new language or complex concepts to Herman and Rocio. Much of the

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child-led code-switching interactions were responding to those adult teaching strategies with routinized language, attention seeking language, or to test out new English vocabulary. Current study findings show that code-switching is an adaptive language competence that promotes rich language interactions. For families rearing bilingual autistic children, seeing these bilingual home language practices as linguistic assets and understanding how, when, and with whom code switching is used, can support families and therapists to develop focused learning goals and activities that capitalize on children's extra linguistic resources and address individual learning needs.

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