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Cambria Willis,* Anna Colpitts, and Lauren Denusik
cambria131@gmail.com

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Perceived Accentedness in Monolingual and Simultaneous Bilingual Children

Cambria Willis,* Anna Colpitts, Lauren Denusik

Previous research on accentedness in simultaneous bilinguals has produced inconsistent results and has focused on adult speakers. The current study explores the question of whether simultaneous bilingual children are perceived to have stronger accents in comparison to monolingual children. Adult participants were asked to rate the accentedness of English-Mandarin simultaneous bilingual children and English monolingual children. The difference in ratings between the two groups was not found to be statistically significant. It is concluded that simultaneous bilingual children seem not to differ in accentedness when compared to monolingual children, which has a number of social and theoretical implications.

1 Introduction

There is robust empirical evidence suggesting children prefer friends who share their first language (L1) and accent over children who speak with a second language (L2) accent (Paquette-Smith et al. 2019, Kinzler et al. 2009). These findings extend to children with various language backgrounds (Paquette-Smith et al. 2019, Dejesus et al. 2017) and suggest that children's peer preferences rely more heavily on accent than on race (Kinzler et al. 2009). Considering the substantial social implications for children, it is important to investigate which factors contribute to children's accent-driven peer preferences. Bilingualism may be one such contributing factor if children who acquire multiple languages simultaneously are perceived to have accents. However, previous research in this domain is limited. More children are growing up bilingual in areas that have traditionally been thought of as mostly monolingual, such as urban areas in Canada. Therefore, it is becoming more important to look at how bilingual children's peers and other people in their community, such as teachers and friends' parents, perceive them. The current study explores the question of whether simultaneous bilingual children are perceived to have stronger accents in comparison to monolingual children. Following Kupisch et al. (2014a), we are using the term "accent" to refer to a dialect that differs phonetically or phonologically from the dialect of monolingual speakers, as perceived by monolinguals. This broad definition was chosen in order to reflect that our participants may have interpreted "accent" as having a number of different meanings, such as an L2 accent, a regional L1 accent, or even the phonological variations that are associated with ongoing language development. The current study examines how monolingual English adult participants perceive English-Mandarin simultaneous bilingual children (speaking English) compared to monolingual English children. We hypothesized that participants would rate simultaneous bilingual children as sounding more accented than monolingual children; however, we found no significant difference between the two groups of child speakers. These results are discussed through a sociolinguistic lens, drawing on both social and acquisitional theories.

2 Background

2.1 Child Bilingualism

There are two different types of bilingualism in relation to the timing of acquisition of languages. Namely, simultaneous bilingualism, which is the topic of the current study, and sequential bilingualism. Simultaneous bilingualism occurs when a child has two native languages (Hoff 2014:264), while sequential bilingualism occurs when a child learns their second language after they are already somewhat proficient in their first language (Hoff 2014:274). Since the division between the two types of bilingualism can be unclear at times, and simultaneous bilingualism can be accomplished in a variety of ways, the language background of each child used for the stimuli of the current study will be detailed in the methods' section of this paper (Section 3).

One factor that may impact whether simultaneous bilinguals are perceived to have accents is the phonological differences between their two languages. The fact that language transfer, whereby the phonology of one language is mapped onto another, has been seen to occur in child bilingual acquisition supports this notion (Tessier 2015:324). One might expect a stronger accent in bilingual children whose two languages have very different phonology compared to bilingual children whose two languages have similar phonology. Relevant to the current study, English phonology and Mandarin phonology are quite different. Of the 22 consonant phonemes that Mandarin has, only 9 are shared with English (Lin and Johnson 2010). Additionally, aspiration is contrastive in Mandarin and voicing is not,

while the opposite is true in English (Lin and Johnson 2010). Finally, Mandarin has only 6 vowels, while English has upwards of 12 (Duanmu 2007, Ladefoged and Johnson 2015). The current study's hypothesis is motivated by the idea that language transfer may be more likely to lead to accentedness in simultaneous bilinguals when their two languages have very different phonologies, such as English and Mandarin. On the other hand, there is also evidence that simultaneous bilinguals learn and store the phonological systems of their two languages independently from each other (Tessier 2015:318), which suggests that differences between language phonologies may be irrelevant to accentedness in simultaneous bilinguals. Our results will speak to which of these two views is more relevant for the current sample of English-Mandarin simultaneous bilinguals.

It is also important to consider the differences between language acquisition trajectories in monolinguals and simultaneous bilinguals, as this may be a confounding variable in the current study that is not found in the adult literature. Overall, simultaneous bilingual phonological acquisition mirrors monolingual acquisition, especially when considering suprasegmental features (Tessier 2015:323). However, there is evidence that simultaneous bilingual children tend to have smaller segmental inventories than what would be expected in monolinguals of the same age (Tessier 2015:330). It is also possible that the acquisition of some segments or patterns may be accelerated in bilinguals while the acquisition of others may be delayed, depending on which languages are being acquired (Tessier 2015:320–325, 330). Importantly, in the current study differences between monolingual and bilingual language acquisition may have impacted the adult participants' accentedness ratings of the child speech stimuli. Further research is required in order to investigate whether this could have influenced our finding that simultaneous bilingual children are not perceived to have stronger accents then their monolingual peers.

2.2 Previous Research on Accentedness in Simultaneous Bilinguals

Although the current study investigates perceived accentedness, the production literature is still important to consider, as some research has shown a correspondence between production and perception. Graham's (2015) research found that native-sounding bilinguals used autonomous pitch ranges in their two languages. However, other work finds that production differences do not always align with perception differences. For instance, Sundara et al. (2006) found production differences between bilingual and monolingual adults, but the bilinguals were perceived as having no L2 accent. It is important to note that there are two possible reasons for the current study's finding that bilinguals and monolinguals are perceived similarly: (1) there may be no production differences between bilinguals and monolinguals, or (2) there may be production differences that are not perceived or that are not taken into account by listeners judging accentedness. Therefore, findings from both production and perception studies will be discussed here.

Most research that investigates the accentedness of simultaneous bilingual speakers has focused on adults, and these studies have led to conflicting results. It is important to note that making direct comparisons across studies on bilingualism is difficult because there are many influencing factors to consider, such as speakers' language use and language environment across their lifespan. Some research has found evidence that adult simultaneous bilinguals have production differences compared to monolinguals of either language. For instance, Kupisch et al. (2014a) found differences in pronunciation, specifically in voice onset time (VOT), between French-German simultaneous bilinguals who grew up in Germany and French monolinguals. Interestingly, French-German simultaneous bilinguals who grew up in French-speaking countries were found to perform more native-like while speaking French compared to those who grew up in Germany. This suggests that accentedness in adult simultaneous bilinguals is influenced by the majority-language context within which they were raised. Sundara et al. (2006) found that English-French simultaneous bilinguals, who grew up in bilingual areas of Canada, produce coronal stops differently from monolinguals of either language. From this, the researchers conclude that simultaneous bilinguals' two languages influence each other phonologically. In contrast, other studies have found no production differences between adult simultaneous bilinguals and monolinguals. Lein et al. (2015) found that the VOT of German-French simultaneous bilinguals, whether they grew up in France or in Germany, fall within the range of monolinguals' VOT. The researchers take this to mean that adult simultaneous bilinguals have separate phonetic systems for their two languages. Similarly, Graham (2015) found no production differences for pitch ranges between Japanese-English simultaneous bilinguals, who lived in both Japan and the United States at some point in their lives, and monolinguals. A lack of production differences suggests that simultaneous bilinguals may have no L2 accent, at least in regard to these particular phonetic variables.

Research on perceived L2-influenced accentedness in adult simultaneous bilinguals has also generated inconsistent findings. Flege et al.'s (1995) research found that 78% of their Italian-English bilingual participants who started learning English before 4 years of age were perceived to have no L2 accent in English. It was found that as age of acquisition increased, so did the likelihood of speakers having an L2 accent. While the study did not specifically

look at simultaneous bilinguals, it suggests that those who acquire English at a very young age are likely to not have an accent as an adult. Kupisch et al. (2014b) compared the perceived accent of French-German and German-Italian simultaneous bilinguals to monolinguals. The study investigated whether simultaneous bilinguals were more likely to have an L2 accent in their minority language than in their majority language. The findings revealed that monolingual raters perceived the simultaneous bilingual speakers to have no L2 accent in their majority language, with less consistent results in their minority language. Interestingly, the simultaneous bilinguals' language environment as a child had a larger impact on L2 accentedness than did the speakers' current language context.

There is limited research on accentedness in child simultaneous bilinguals. One study found that Dutch-German simultaneous bilingual preschoolers use the same VOT range in their two languages for voiced plosives, but the range does not match monolingual preschoolers in either language (Stoehr et al. 2018). Some research has looked at accentedness in child sequential bilinguals and second language learners. For example, Uzal et al. (2015) compared heritage Finnish children to Finnish-born Turkish children and found that the two main factors that contributed to the children's perceived L2 accents were the age they started learning their second language and how much their first language was used at home.

3 Methods

3.1 Participants

A total of 23 participants completed an accent rating survey, of which 19 participants self-identified as female, 3 as male, and 1 as non-binary. The average age of the participants was 39 years, but there was a wide range of ages: 13 of the participants were 20 to 23 years of age, 10 of which were 21 years old; the other 10 participants were between 48 to 85 years old, with the average being 63 years. All the participants were monolingual English speakers who had lived in Western Canada for the majority of their lives. Additionally, they had all spent at least 3 years living in Vancouver, British Columbia.

3.2 Materials

3.2.1 Speech Sample Stimuli

Speech samples from six different child speakers were rated using the accentedness scale. Half of the speech samples were from simultaneous bilingual children and the other half of the speech samples were from monolingual children. There was a total of 18 speech samples that were rated by each participant through the survey. All the speech sample stimuli were collected from two corpora on the CHILDES[1] database. The bilingual speech sample stimuli were collected from the Bilingual Child Heritage Chinese Corpus (BCHCC) (Mai and Yip 2017). The children in the BCHCC corpus were simultaneous bilinguals, having both Mandarin and English input since birth. All three lived in Seattle and had come to the University of Washington campus to record a session of play with their parents. The first subject will be referred to by her first initial "A". She was a 3;9[2] female, who was exposed to Mandarin from her mother and English from her father since birth. At the time of recording, A's language use was almost equally split between English and Mandarin, as she was attending bilingual daycare and speaking to her father in English and her mother in Mandarin. The second child from the BCHCC was a boy with "W" as his first initial. He was exposed to English, Cantonese, and Mandarin since birth. Both of his parents grew up in Southern China speaking Cantonese and Mandarin, and moved to the United States prior to W's birth. His parents spoke proficient English at work and Chinese at home. W was exposed to Mandarin from his father, Cantonese from his mother, and English in the community. At the time of the recording, W was 3;7. The third child from the BCHCC was a girl with "L" as her first initial. She was exposed to Mandarin at home since birth. Both of her parents immigrated from northern China to the United States in their childhood and spoke fluent English at the time of recording. L heard Mandarin at home and English at her nursery and later at preschool. At the time of recording, L was 3;10.

The second corpus we collected stimuli from was the EllisWeismer Corpus (Ellis Weismer et al. 2013). The EllisWeismer Corpus consists of data from a 5-year longitudinal study, which included a total of 112 monolingual children, half of whom had delayed speech production and the other half of whom had typical speech development. For the current study, we used speech samples from 3 control children with normal speech development. Speech

[1] CHILDES is a free online open-access database, accessed October 12 2019: https://childes.talkbank.org/.

[2] Years;months (e.g., 3;9 means 3 years and 9 months old).

samples were obtained through recordings of spontaneous speech between the child and parent, similarly to the BCHCC. All of the recordings were completed at the University of Wisconsin. All of the children were 3;6 at the time of recording and were monolingual English speakers. Mirroring the bilingual stimuli, 2 participants were female and 1 was male.

3.2.2 Baseline Test

The first component of the survey was a baseline test, in which participants categorized samples of children's speech into one of two groups on the dimensions of accentedness (accented vs. little to no accent) and intelligibility (intelligible vs. not very intelligible). The baseline test was included to familiarize the participants with high and low accented speech samples, in the hopes that they would then use these as examples of the extreme ends of the scales throughout the rest of the survey. Further, it provided insight into how participants were assessing accentedness and intelligibility. The baseline test included four speech samples from YouTube videos of children's speech that were not used in the main study (TheEllenShow 2015, ODG 2019, Steve TV Show 2018, Got Talent Global 2018). Two of the speech samples were of Chinese children with strong L2 accents and low intelligibility, and the other two speech samples were of Caucasian children who had little to no L2 (or other non-standard) accents and high intelligibility. The accentedness and intelligibility of the samples were determined using blind inter-rater reliability, where each of the three researchers listened to the speech samples independently and decided how they would categorize the speech. The researchers are all monolingual English speakers living in Vancouver, British Columbia, Canada. There was 100% agreement on the dimensions of accentedness and intelligibility. However, it is important to note that the researchers had access to the videos of the child speakers, while the participants only had access to the audio recordings. The appearance of the speakers may have influenced the researchers' judgements, as they may have subconsciously taken factors such as the race of the speakers into account.

3.2.3 Accentedness Survey

To explore our research question, we designed an accent rating survey modelled off of methodology that has been used in previous research looking at the perception of accents (Uzal et al. 2015, Southwood and Flege 1999, Huang and Jun 2015). The survey was electronically distributed to participants using the platform Qualtrics (n.d.). The accent rating test has participants listen to a speech sample and then rate the perceived accentedness of the sample on a Likert scale. When designing our survey, we decided to use a 9-point scale (Southwood and Flege 1999). Our survey included a total of 18 speech samples.

To create the survey, we downloaded speech samples of monolingual and bilingual children from the CHILDES database and segmented them into short audio clips using Praat (Boersma and Weenink 2020). We used these segmented speech samples as the stimuli in the survey. The speech samples averaged 4.9 words (2 seconds) per sample. Each sample was deemed a sentence, with a complete subject verb and optional object by the researchers. For example, one bilingual speech sample was "but it is Spiderman", and one monolingual speech sample was "now where's his hat?". For a full list of the speech samples see Table 1 and Table 2.

3.2.4 Demographic Questionnaire

At the end of the survey, we included a demographic questionnaire. It consisted of questions about the participants' language background, including how many languages they speak, what percentage of the time they speak each language, and where they grew up. Information about the participants' language background was important to obtain because Huang and Jun's (2015) research found that raters' past linguistic experience influences their accent ratings. The demographic questionnaire also included questions about other factors that may have impacted their accent rating, such as how often they are exposed to children's speech each week, and how often, and in what contexts, they are exposed to accents. The participants' age and gender were also obtained.

3.3 Procedure

The Qualtrics survey was distributed by email to the researchers' friends and family. Upon receiving access to the survey, participants had 1 week to complete it. Before beginning the survey, all participants completed a consent form. The study has received approval from UBC's Behavioural Research Ethics Board as a course-based project.

After consent was obtained, the participants were presented with an instructions page. They were asked to be in a quiet space and to use headphones while completing the survey. They were also advised to allow themselves enough

time, roughly 20 minutes, to carefully complete the survey. Instructions on how to use the scales were included, and they were instructed to use the entire 9-point scale. There was no information given to the participants about the child speakers.

Next, the participants began the baseline test where they categorized samples of children's speech in regards to accentedness and intelligibility. After rating four speech samples for the baseline test, participants moved on to the main part of the survey, which consisted of questions about the stimuli (see Appendix A for an example). The first question directly addressed our research question of whether simultaneous bilingual children have a stronger accent than their monolingual counterparts. Specifically, it asked participants to rate the perceived accent of the speech sample on a scale of 1 to 9, where 1 was very accented and 9 was little to no accent. The next three questions were not directly related to the perception of accentedness, but instead were included to avoid participant bias by ensuring the participants did not know what the research question was. Additionally, the questions provided further insights into our findings. The second question asked participants to rate the perceived intelligibility of the speech sample, where 1 represented very intelligible speech and 9 represented speech that is not at all intelligible. The third question asked the participants to type out what they thought the child said, which functioned to check if the participants were engaging with the speech sample. Lastly, the fourth question had participants report how old they thought each child speaker was, as we were interested to see if one group of speakers, monolingual or bilingual, would be rated as sounding younger. The order of the questions was not randomized, so future work could examine how this may impact results. The last section of the survey was a brief demographic questionnaire including information about language background.

After 1 week, 39 people had begun the survey but only 23 of those survey forms were complete. The surveys that were not fully finished were excluded from the final analysis.

Table 1: Monolingual speech stimuli

	J	**S**	**M**
1st Speech sample	Do they come off	Could you help me	Did you forget your mama
2nd Speech sample	This is a boy	Now where's his hat	Let's play again
3rd Speech Sample	Oh he's got to put on these	What's he missing	Oh that's not a person

Table 2: Bilingual speech stimuli

	W	**A**	**L**
1st Speech sample	But it's Spiderman	Close to Dallas right now	Blocks on the ground
2nd Speech sample	He's too little he's big	Oh yeah that makes it easier	I have a baby in mommy's belly
3rd Speech sample	This is a fuel tank	Open the airplanes to drive in	She still can't find her shoes

4 Results

4.1 Baseline Test

There was little evidence of a consistent pattern in how the raters categorized the speech stimuli in the baseline test, with three of the four trials having raters divided on whether or not the child speaker "had an accent". While we assumed the stimuli for the baseline test were straightforward (due to the blind inter-rater reliability testing phase), the results showed that participants had difficulty deciding whether the stimuli were accented or not (see Appendix B). This issue may have impacted the results of the survey, since the interpretation of accentedness seems to not have been consistent across all participants. Future studies should include a clear definition of "accent" and provide examples to ensure participants interpret the term in the same way. Although we planned to use the baseline to ensure the raters were consistent in judging and interpreting accentedness, given the extreme variability, we did not exclude any participants from the final analysis based on their performance in the baseline test. There was more agreement amongst the participants for intelligibility, but of course our focus is on accent perception, not on perceptions of intelligibility. Of the four baseline trials, the second video had the most agreement with 96% of respondents selecting "Little to No Accent" and 100% selecting "Intelligible".

While we did not use the results of the baseline test to exclude participants, we did analyze the participants' use of the rating scale in the main part of the questionnaire to ensure the raters were using the scale in its entirety. First, we determined the lowest and highest number each participant used on the scale and excluded 1 participant who assigned 9 (i.e., no accent at all) for all 18 trials. We then calculated the mean rating and standard deviation of each participant's ratings. Based on this, we excluded 3 more raters since their standard deviation was less than 1. After these exclusions, we had a total of 19 raters that we used for the final analysis.

4.2 Accent Rating

4.2.1 Overall Accent Rating

The children's average accent scores were compiled to determine the overall average of the monolinguals and bilinguals. A two-sample t-test was conducted to compare the overall accent rating of the two groups, and no significant difference was found between the monolinguals and bilinguals (t (8) = 1.48, p = .16). While the monolinguals did have a slightly lower overall rating ($\underline{x}$ = 2.47), suggesting they were perceived as having less of an accent in comparison to the bilinguals ($\underline{x}$ = 3.05), the difference was not statistically significant (see Figure 1). The standard deviation was calculated by pooling the average response rating for each sample per child.

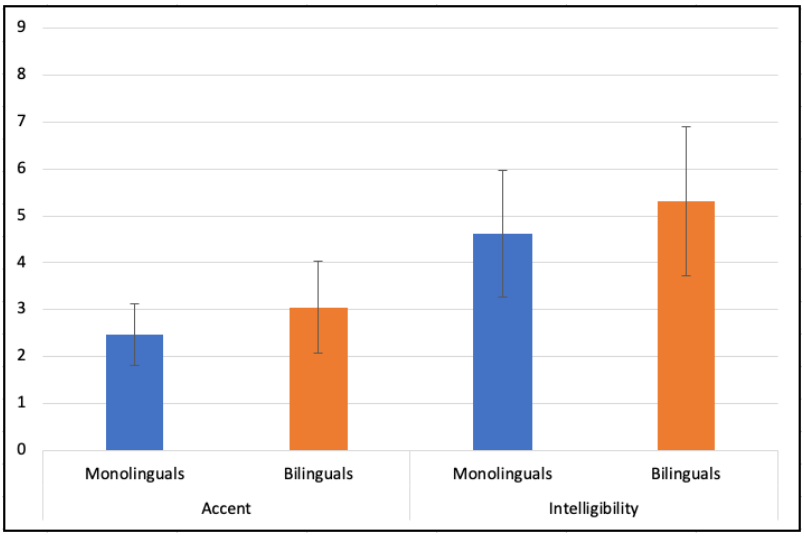

Figure 1: Accent and intelligibility ratings of the monolingual and bilingual children. 1 is very intelligible or not at all accented; 9 is very accented or not at all intelligible.

4.2.2 Monolingual Accent Rating

Interestingly, none of the monolinguals were perceived by the raters as having no accent at all (i.e., none of the raters gave a child a 1 on the scale). As shown in Table 3, S had the lowest overall average rating (1.93). J had the highest rating amongst the monolingual children and had an overall accent rating that was very close to what was reported for the bilinguals.

Table 3: Average accent ratings by each sample. "1st Sample, 2nd Sample, 3rd Sample" correspond to Tables 1 and 2

	Monolinguals			**Bilinguals**		
	J	**S**	**M**	**W**	**A**	**L**
1st Sample	2.74	2.42	3.21	1.11	2.95	3.95
2nd Sample	2.53	2.00	1.79	3.32	2.37	2.32
3rd Sample	3.42	1.37	2.74	4.26	3.53	3.68
Mean	*2.90*	*1.93*	*2.58*	*2.90*	*2.95*	*3.32*
Standard Deviation	*0.47*	*0.53*	*0.72*	*1.62*	*0.58*	*0.87*

4.2.3 Bilingual Accent Rating

Table 3 shows the overall accent ratings for both the monolingual and bilingual children. Interestingly, W had the lowest (1st sample) and highest (3rd sample) accent ratings, which resulted in the largest standard deviation of all the children. W's first speech sample was the phrase "but it's Spiderman". As part of the questionnaire, the raters were asked to type out what the child said. This particular speech sample was the only one where every participant correctly identified one word ("Spiderman"). It may be that W received the lowest score (i.e., was perceived as having the weakest accent) because people were able to understand what he said. Similarly, L's second sample, "I have a baby in mommy's belly", received a low accent score, and the raters were very accurate at restating what she had said. The relationship between intelligibility and accent ratings will be discussed in Section 4.4.

4.3 Intelligibility Rating

The intelligibility results suggest that neither the monolinguals' nor bilinguals' speech was easy to understand. The average intelligibility score for each child is shown in Appendix C (1 = very intelligible; 9 = not intelligible at all). Similar to the accent ratings, there is substantial variability within each child's three speech samples. Upon further analysis, we found that the ratings varied depending on what phrase the child produced. More specifically, if the speech sample contained a salient noun, such as Spiderman, the raters assigned it a lower rating for intelligibility (i.e., easier to understand). Furthermore, some of the phrases contained more challenging sounds that the child had not yet mastered (nor would we expect them to for their age). For example, the average age of acquisition for [b] and [d] is 3 years old, but for [ɹ] it is 5 years old (McLeod and Crowe 2018). This is similar to what was found for accentedness, and points to an important limitation of our study, namely that we could not control for the content of the speech stimuli.

Figure 2 shows the overall intelligibility rating for the monolinguals ($\underline{x}$ = 4.63) and the bilinguals ($\underline{x}$ = 5.31). Similar to the accent ratings, the slight difference between the two groups is not significant (t (8) = -0.99, p = .33). We calculated a Pearson's correlation between the intelligibility scores and the accent scores and found a moderately strong negative correlation (r *(16)* = -0.63, $p < 0.001$), meaning children perceived as having less of an accent were also perceived as more intelligible.

4.4 Age of Child Speaker

After participants had assigned a speech sample a score for accentedness and intelligibility, they were asked to guess the age of the child speaker. Overall, the monolinguals were thought to be slightly older ($\underline{x}$ = 4.10) than the bilinguals ($\underline{x}$ = 3.50), but it was not a significant difference (t (8) = 2.07, p = 0.06). We ran correlation tests to investigate the relationship between the perceived age of a child and the scale ratings. There was a moderately positive relationship between perceived speaker accentedness and perceived speaker age (r (16) = 0.46, $p < 0.05$), meaning if the rater thought the child was older, they also perceived them to have less of an accent. The correlation between age and intelligibility was strongly negative (r (16) = -0.77, $p < 0.001$), meaning that if the child was thought to be older, they were also perceived as more intelligible (i.e., they had a lower intelligibility score, as 1 = very intelligible).

4.5 Participant Demographics

There was no significant correlation between participant age as a continuous factor and accent rating ($r(16)$ = 0.26, p = 0.28), nor with participant age as a binary factor, i.e., two age groups, 20–23 years old versus 48–85 years old ($r(16)$ = 0.35, p = 0.14).

The majority of participants self-reported spending little time with children between the ages of 2 and 6 each week, with 5 reporting that they never spend time with children and 9 reporting that they spend less than an hour. Only 3 participants reported spending 1 to 5 hours a week with children aged 2 to 6, 1 reported spending 5 to 10 hours a week with them, and 1 reported spending over 10 hours a week with them. The correlation between time per week spent with children aged 2 to 6 and accent rating was not significant ($r(16)$ = -0.33, p = 0.17).

All participants reported hearing accents in their community, and 16 of 19 indicated they had friends and/or family members with an accent that differed from their own. Although we did not collect ethnicity information for the participants, all the participants were monolingual English speakers who lived in Canada (with 16 having lived in British Columbia at some point in their life) and who reported communicating in English at least 95% of the time. Despite the diverse exposure of the participants to children and accents, there was no significant correlation with the ratings they gave.

5 Discussion

Overall, our results suggest that, at least in this case, simultaneous bilingual children are perceived similarly to their monolingual peers in regard to accentedness, and thus our hypothesis was not supported. This main finding could have three possible explanations: (1) there are no production differences between the two groups of children, (2) there are production differences that are not perceived by adults or that are not indicative of an accent judgement, or (3) the participants all had different criteria for "accent" while completing the ratings because they were not given a definition of the term. A follow-up study would need to analyze characteristics of the children's speech samples to see what underlies the null result. In addition, future studies should provide raters with a definition of accentedness to ensure all raters are using the same criteria. Furthermore, while this study did not show any significant difference between monolinguals and bilinguals, all of the children were 3 years old and thus still developing their language. The monolingual child speakers were still perceived to have somewhat of an accent. This suggests that the phonological variations 3-year-old children produce as they are learning to articulate sounds may mirror what a monolingual speaker perceives as an accent. A future study may want to investigate how the age of a child impacts perceived accentedness. There is limited research on when accents emerge in language acquisition, and it may be that simultaneous bilingual children have stronger accents later in development.

There are a number of reasons why simultaneous bilingual children may not have accents in comparison to monolingual children. Research on sequential bilinguals has identified factors that influence perceived accentedness, including age of acquisition and the extent to which the languages are used at home (Uzal et al. 2015). As all of the child speakers in our study learned English from birth, our findings are consistent with the notion that an early age of acquisition contributes to reduced accentedness. It is important to note that even though all of the child speakers' parents were proficient in English, two of three of the bilingual children were exposed to more English in the community than at home. For simultaneous bilingual adults, research has found that the majority language of one's place of residence may have an influence on perceived accentedness. Specifically, it seems that simultaneous bilinguals have less of an accent in the majority language than in their minority language (Kupisch et al. 2014b). Our findings are consistent with this notion because all of the bilingual child speakers in our study were born and raised in the United States.

Another factor that may influence accentedness in simultaneous bilingual children is the phonologies of their two languages. Previous research on bilinguals has shown language transfer effects, whereby the phonology of one of their languages is mapped onto that of another (Tessier 2015:324). Our finding that simultaneous bilingual children are perceived similarly to their monolingual counterparts suggests that this transfer may not be observed in simultaneous bilinguals. Instead, the results of the current study are consistent with the Dual Language System Hypothesis that simultaneous bilinguals develop two different phonological systems that are stored separately (Genesee 1989).

It is important to note that while our results suggest that simultaneous bilingual children are not perceived as having accents, this study was done with adult raters. Therefore, the findings suggest that bilingual children may not be perceived as having an accent by adults, such as teachers and friends' parents. However, previous research has shown that children perceive accents differently than adults (e.g., Bent et al. 2014). Thus, it would be of value to conduct a study where monolingual children participate in a similar accent rating task to the one that was used in the current study. Such a study may reveal more direct implications for peer preferences. Future research should also focus on investigating the social implications of the current study's main finding, namely, that child simultaneous bilinguals seem to be perceived as native by adult listeners.

Interestingly, the accent ratings were not impacted by the age or experience of the raters. For example, the amount of time a rater spent with young children on a weekly basis did not influence their accent ratings. This suggests that in real life, bilingual children may be perceived similarly to their monolingual peers in terms of accentedness, regardless of certain demographic traits of adult listeners. It would be valuable to conduct further research on this topic, because it is plausible that other factors not considered in the participant sample, such as multilingualism, race, or ethnicity, may impact how adults perceive accents in simultaneous bilingual children versus monolingual children.

The correlations between the participants' accent ratings, intelligibility ratings, and estimates of the child speakers' ages revealed some interesting findings. Specifically, if the rater thought a child was older, they also perceived the child to have less of an accent and to be more intelligible. Further, if the rater perceived a child to have less of an accent, they also perceived the child to be more intelligible. These correlations make intuitive sense as it suggests that as children get older their speech becomes clearer and easier to understand. Similarly, the correlation between accentedness and intelligibility suggests that a stronger accent may negatively impact the intelligibility of the speech.

6 Conclusion

There is minimal existing research on accents in simultaneous bilingual children, but the current study sought to answer the question of whether simultaneous bilingual children are perceived to have stronger accents in comparison to age-equivalent monolingual children. Accent ratings were assigned by 19 English monolingual adults to English monolingual and Mandarin-English simultaneous bilingual 3-year-old children. The results found no statistically significant difference between the two groups of child speakers, suggesting that the adults perceived the simultaneous bilingual and monolingual children similarly in terms of accentedness. This has important social implications. Previous research has shown that accent is an important factor for child peer preferences. Our study suggests that children who acquire two languages simultaneously do not develop accents that differ from their monolingual peers and thus may not be excluded from their peer group on this account. Future research should be done with an older population of child speakers to determine if the results still hold once language development is complete. It would also be valuable to do a similar study with child raters, as younger listeners may perceive accents differently. Finally, future studies on accentedness must clearly define the term "accent" to ensure all raters use a similar definition when completing the ratings.

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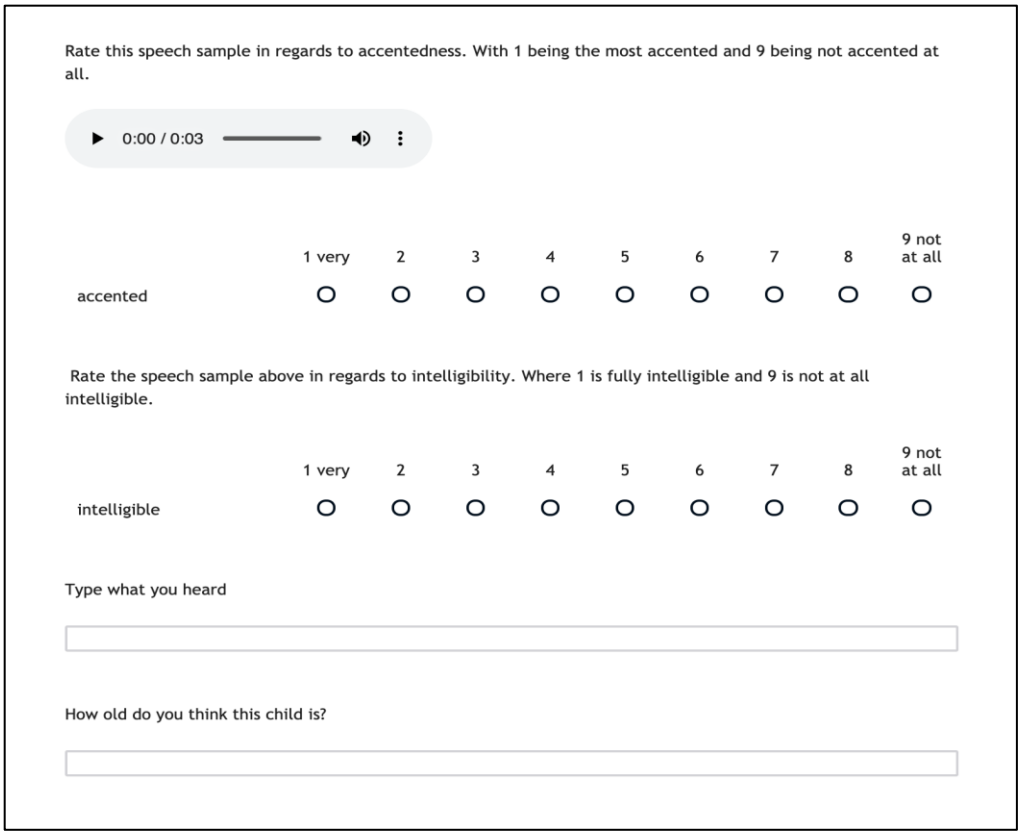
cambria131@gmail.com

Appendix A

Example of Questionnaire



Appendix B

Results of Baseline Test

N = 23	**Little to No Accent**	**Accented**	**Not Very Intelligible**	**Intelligible**
Baseline 1*	8	16	0	22
Baseline 2	23	1	0	22
Baseline 3*	13	11	6	16
Baseline 4	15	9	18	4

Note 1: "*" indicates the two baseline speech samples where the researchers thought the children had an accent.
Note 2: There was 1 participant that did not provide a response for any of the intelligibility questions during baseline.

Appendix C

Intelligibility ratings for monolingual children by each sample and overall ratings

	Intelligibility Ratings					
	Monolinguals			**Bilinguals**		
	J.	***S.***	***M.***	***W.***	***A.***	***L.***
1st Sample	3.74	4.74	6.42	3.47	7.42	7.26
2nd Sample	3.11	5.89	4	4.26	3.68	4.16
3rd Sample	5.05	2.63	6.05	6.26	6.68	4.63
Mean	3.97	4.42	5.49	4.66	5.93	5.35
Standard Deviation	0.99	1.65	1.30	1.44	1.98	1.67