Critical Review:
What are the language outcomes for children with SLI and bilingual development?

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This critical review examines the language outcomes for children with Specific Language Impairment (SLI) and bilingual development, compared to their typically developing bilingual peers. Study designs include case studies, mixed nonrandomized designs, parallel single subject designs and case-control studies. Results of the research provide suggestive evidence that bilingual children with SLI experience significant difficulties with bilingual language acquisition and proficiency, compared to their bilingual peers with normal language development. Recommendations for clinical practice and future research are provided.

Introduction

The linguistic diversity of Canada extends beyond the two official languages of French and English. Over six million Canadians reportedly speak a language other than French or English at home (Corbeil, 2015). There are two types of language acquisition for bilingual speakers. Simultaneous acquisition is when a child is raised with two or more languages from birth. Sequential acquisition is when a second language is learned after the first language is well established.

Research has shown that bilingual language environments do not negatively impact language learning in children with typical development. It is surprising that only a limited amount of research has been conducted on the impact that bilingual language environments have on children with language impairments (Gutiérrez-Clellen, Cereijido & Leone, 2009).

Specific Language Impairment (SLI) is defined as a neurodevelopmental disorder that is diagnosed when a child has a primary deficit in acquiring language at the usual rate despite apparent typical development in other areas (De Abreu, Cruz-Santos, & Puglisi, 2014). The prevalence of SLI in the United States is believed to be approximately 7% (Spoken Language Disorders, n.d.).

Previous research has focused on the language outcomes of monolingual children with SLI. The gap in knowledge regarding the language development of bilingual children with SLI warrants more research. A review of the current research can help summarize the reported language outcomes for these children. This type of research will help parents and professionals make informed decisions.

Objectives

The purpose of this study is to critically evaluate the current research in order to examine the language outcomes of bilingual children who have SLI.

Methods

Search Strategy

The computerized databases Scholars Portal, PubMed and PsychINFO were used to find peer reviewed articles using the search terms Specific Language Impairment OR SLI AND bilingualism AND language OR language development. The search was limited to articles written after the year 2000.

Selection Criteria

The studies chosen for this critical review paper evaluated the language development of bilingual children with SLI compared to their typically developing bilingual peers. No restrictions were set for participant demographics.

Data Collection

The search of the literature yielded seven studies that met the selection criteria. Study designs included: one systematic review, one case study, one mixed design study, one parallel single subject design and three case-control studies.

Results

Informational Review

An informational review is used to provide an overview of existing research pertaining to a specific topic. Informational reviews provide summaries of the results of each article, in order to make a general conclusion.

Paradis (2016) provided a review of research examining the typical and atypical development of

children with English as a Second Language (L2) backgrounds, and also provided assessment strategies for these children. One topic Paradis (2016) focused on in her review was comparing L2 English development in children with and without SLI.

Information regarding study selection and rating was not provided. Based on her review, Paradis (2016) found that simultaneous bilingual and monolingual children with SLI were able to acquire their language in the same way. Being a simultaneous bilingual does not appear to exacerbate SLI or interfere with the individual's potential for becoming bilingual. Nevertheless, sequential bilinguals, who learn their L2 later on, are able to acquire their L2, albeit more slowly than peers with normal language development (NL). More specifically, it was reported that the sequential bilingual children had more difficulties with their use of L2 morphology and non-word repetitions than other areas of language.

This review provided equivocal evidence that children with SLI are able to learn an L2, although their learning may be somewhat delayed.

Case Study

Case studies employ a qualitative design that examine either a single person or small group of people. The results drawn from case studies must be interpreted with caution because they are less generalizable due to their small sample sizes.

Restrepo and Kruth (2000) conducted a case study comparing the grammatical usage of two sequential bilingual children. One child had NL and the other had SLI. The participants were both 7-year-old girls who were Spanish-English bilingual speakers. In order to determine whether the participants had NL or SLI, interviews and language sample analyses were conducted.

Language Samples were elicited in both Spanish and English in a range of appropriate contexts, including story retells, games and informal conversations, and analysed using conventional measures for assessing linguistic skill. The English and Spanish language samples for the child with SLI were conducted at two points in time. The English sample was conducted when she was 6 years, 6 months old and then again at 7 years old. The Spanish sample was taken at 6 years, 6 months old and again at 7 years, 6 months old. Two samples were taken to ensure that there was an adequate amount of data for interpretation. The English and Spanish language samples for the child with NL were both conducted when she was 7 years old. In order to enhance reliability, a bilingual Speech-Language Pathologist segmented and transcribed the language samples in both languages.

This study used descriptive information to conclude that grammatical differences existed between the two children in both languages. The child with SLI demonstrated a more limited use of verb forms, tenses, pronouns, prepositions and limited syntactic complexity in both languages when compared to her NL counterpart. Furthermore, the child with SLI demonstrated significant first language loss, which is indicative of an impairment in the language learning process. Statistical analysis was not reported.

It may be inappropriate to draw conclusions based on only two children because of the small sample size and their differing family environments. The parents of the child with NL had received a higher level of education and interacted with families that spoke many languages, when compared to the child with SLI. Their distinct backgrounds could correlate with differences in the children's language development.

Overall, the information presented in the study provides limited suggestive evidence that sequential bilingual children with SLI struggle with various grammatical features of language.

Mixed Nonrandomized Design

A mixed nonrandomized design study can be used when it is not possible to assign participants to random groups. These groupings are imposed by the participants' diagnosis and cannot be randomly assigned. A study can have a mixed nonrandomized design when different groups of people are exposed to repeated measures.

Squires et al. (2014) conducted a study with a mixed nonrandomized design in an attempt to determine whether sequential Spanish-English bilingual children with SLI present the same gains from kindergarten to grade one in the macrostructure and microstructure of story retelling when compared to their typically developing bilingual peers. Cross-linguistic transfer is the ability of a bilingual individual to use elements from their stronger language to aid their understanding in their weaker language. This transfer of information is believed to occur for macrostructure and microstructure elements.

The participants consisted of 21 children who were Spanish-English bilingual speakers identified as having SLI by two Speech-Language Pathologists. The participants with SLI were matched to 21 other

participants that had NL based on age, sex, IQ and scoring on a gold standard nonverbal intelligence test. After receiving a model, the participants retold stories from wordless picture books in both languages when they were in kindergarten and again in grade one.

Appropriate measures were used during data analysis. There was a high inter-rater reliability for the transcription and scoring of the retold stories. The macrostructure and microstructure of each story retell was coded using rubrics where each element could be scored from 0 to 3, yielding a total macrostructure and microstructure score. This rubric was determined to have a high internal consistency. Appropriate statistical analyses were performed.

Results revealed that story retelling skills of the children with SLI and NL improved from kindergarten to grade one. However, the children with SLI had overall poorer scores in story retelling in both grades and languages, compared to age matched children with NL. This study provides highly suggestive evidence that bilingual children with SLI may experience more difficulty than their bilingual NL peers when transferring information of literate language forms from one language to another.

Parallel Single Subject Design

A single subject design is useful because it reflects changes within the individual participant since they act as both the control and treatment group.

Jordaan, Shaw-Ridley, Serfontein, Orelowitz and Monaghan (2001) conducted a parallel single subject study in order to investigate whether the specific type of language impairment will impact an individual's ability to become a bilingual speaker. The two participants were 7-year-old simultaneous Afrikaans-English bilingual children. One child had SLI and the other child had Semantic Pragmatic Disorder (SPD). The authors provided sufficient detail describing how each participant met the diagnostic criteria for their language impairment.

Speech-Language Pathologists conducted appropriate and extensive cognitive and language assessments in both Afrikaans and English. The cognitive assessment used in this study was the Cognitive Assessment System (CAS), which is only available in English and was translated into Afrikaans. The language assessment was conducted using fourteen different tests and assessments, along with a spontaneous language sample and a narrative discourse sample. The language assessment was conducted in both languages, meaning that many of the standardized assessments were translated into Afrikaans.

The two bilingual Speech-Language Pathologists used an appropriate inter-rater reliability process to analyse the language sample and narrative discourse sample. It was reported that the child with SPD was able to achieve bilingual language acquisition and the child with SLI experienced significant difficulties with their naturalistic bilingual language acquisition.

Since the individual with SPD was able to achieve bilingual language acquisition, this study concludes that bilingual language learning is possible with certain types of language impairments. However, this study also provides suggestive evidence that individuals with SLI may have more difficulty with bilingual language acquisition. A major limitation of this study design is the lack of generalizability of the results. Future studies should examine larger samples and should also explore the relationship between bilingual language acquisition and other language impairments. Furthermore, there was a great deal of English to Afrikaans translating for this study. When words are translated from one language to another, there may not be a one to one correspondence. This could affect the results of a test and potentially skew the overall findings.

Case-Control Studies

A case-control study is a type of nonrandomized clinical trial. In this case, participants who have a disease or impairment, such as a language impairment, are compared to participants who do not have that disease or impairment.

De Abreu, Cruz-Santos, and Puglisi (2014) conducted a case-control study in order to determine whether having SLI affects the executive functioning of bilingual children compared to monolingual and sequential bilingual children with NL. The participants included 15 Portuguese–Luxembourgish bilingual children with SLI, 33 NL Portuguese–Luxembourgish bilingual children and 33 NL Portuguese monolingual children. All the participants were eight years old and were matched for their first language, ethnicity, chronological age, and socioeconomic status. Verbal working memory (WM), visuospatial WM, selective attention, interference suppression and language skills were the areas tested. Language samples were appropriately obtained in both languages for the bilingual participants.

The results were analyzed using an appropriate one-way between-subject ANOVA and, due to the unequal sample size, the Tamhane's T2 post-hoc test. On all the

areas tested, the bilingual participants with SLI performed poorer on the verbal WM and inference suppression tasks. In both languages, bilingual participants with SLI performed significantly worse than the bilingual participants with NL on interference suppression tasks. There were also significant differences seen on the measures of grammatical understanding, with the bilingual participants with SLI performing significantly poorer than the bilingual participants with NL in both languages. Those results coincide with the belief that grammatical difficulties are a distinctive feature of SLI.

The bilingual participants with SLI did not demonstrate any superior skills in selective attention or interference suppression than their bilingual peers with NL did. However, the fact that executive functioning skills of the bilingual participants with SLI did not fall far behind the monolingual participants with NL, provides a fair amount of suggestive evidence that bilingualism may act as a protective factor against some of the cognitive disadvantages seen in monolinguals with SLI. De Abreu et al. (2014) drew on many parallels to monolingual speakers with SLI even though their study did not include a monolingual SLI control group. Such correlations must be interpreted with caution.

Girbau and Schwartz (2008) conducted a case-control study to examine the performance of Spanish-English sequential bilingual children with SLI on auditory non-word repetition tasks. Children with SLI reportedly have a poor phonological working memory, which would subsequently affect their non-word repetition abilities. The participants included 11 bilinguals with SLI and 11 age-matched bilingual children with NL. All participants were 8 to 10 year olds who were sequential bilinguals, with Spanish being their first language and English being their second language.

The participants' performance was tested using an appropriate Spanish non-word repetition task that the authors created. The participants heard 20 non-words through headphones and repeated the words into a microphone. The participants' productions were transcribed and scored based on their accuracy.

Statistical analysis involved the appropriate use of one-way and two-way ANOVAs. The bilingual participants with SLI had significantly lower productions of Spanish non-words, compared to the bilingual participants with NL. Both participant groups produced more errors with consonants than with vowels. However, the bilingual participants with SLI produced significantly more consonant substitutions and consonant omissions. Furthermore, for non-words with 3 to 5 syllables, an increase in syllables correlated with a decrease in accurate productions.

The authors described in detail their recruitment criteria for participants. Furthermore, they took great care to make sure that the non-word repetition task they created was highly sensitive and specific. Therefore, the results of this study are highly suggestive of poor non-word repetition being a clinical indicator of SLI, due to deficiencies in phonological working memory.

Gutiérrez-Clellen, Cereijido and Leone (2009) conducted a case-control study analyzing whether sequential bilingual children with SLI have different codeswitching (CS) patterns compared to their bilingual peers with NL. CS is when an individual alternates between two languages within their discourse. Grammatical competence is believed to be required in order to CS between two languages, however, most children with SLI display poor grammatical skills.

The participants were selected from another larger study. They were selected if their language sample included instances of CS. This resulted in a group of Spanish-English bilingual children, 18 children with SLI and 40 children with NL.

Data was appropriately collected from a narrative retell of a wordless picture book and a spontaneous narrative using a different wordless picture book. The participants were tested in both Spanish and English. A 2 by 2 ANOVA was appropriately used to determine the existence of significant main effects. It was discovered that there were no significant differences in the amount of utterances that contained CS across the age groups and contexts of elicitation. However, language dominance (either Spanish or English) and language of testing had significant effects. Participants who were English-dominant produced more CS when tested in Spanish, compared to the Spanish-dominant participants who were tested in English. It was noted that the participants with SLI used CS in a similar manner and as frequently as their NL peers.

Overall, this study provides suggestive evidence theorizing that bilingual children with SLI are proficient in their use of grammatical CS, regardless of the other language adversities they may experience.

Discussion

This critical review has examined the language outcomes for children with SLI and bilingual development. Overall, the articles examined in this study indicate that the bilingual children with SLI have

delayed language, compared to their bilingual peers with normal language development.

There were six studies that found significant differences, in some aspect of language use, between the bilingual participants with normal language development and the bilingual participants with SLI. Based on the articles reviewed, the bilingual children with SLI were reported to struggle with features of language in both of their languages. However, Paradis (2016) did not report how the first language of the sequential bilingual children with SLI was affected.

Five of the studies that found significant differences used sequential bilingual participants. Compared to sequential bilingual children with normal language development, sequential bilingual children with SLI were found to have below average skills in the following areas: non-word repetition (Paradis, 2016; Girbau & Schwartz, 2008), story retell (Squires et al., 2014), interference suppression (De Abreu, Cruz-Santos, & Puglisi, 2014), grammatical understanding (Paradis 2016; Restrepo & Kruth, 2000; De Abreu et al., 2014) and syntactic complexity (Restrepo & Kruth, 2000). Jordaan et al. 2001 compared two simultaneous bilingual children. In this study, both participants had language impairments, one had SLI and the other had SPD. However, it was the child with SLI that was found to have difficulties acquiring the surface features of both languages.

Two of the studies found no significant differences for the language outcomes for bilingual children with SLI. Gutiérrez-Clellen et al. (2009) found no significant differences with the code switching skills of sequential bilingual children with and without SLI, suggesting that both participant groups had sufficient grammatical skills. Paradis (2016) studied both sequential and simultaneous bilinguals. It was concluded that for the simultaneous bilingual children, having SLI did not interfere with their ability to become bilingual.

A general limitation of all of the studies were the small sample sizes. This is understandable because a specific population of bilingual children with SLI was required. Whenever there are small sample sizes, the results of the studies must be considered with caution since it is difficult to generalize the conclusions to a larger population.

Future Research Considerations

Future research should include larger sample sizes in order to produce results that can be generalized. In this way, more compelling evidence can be provided to address the current conflicting evidence.

Future research, involving sequential bilinguals, should examine the amount of their second language exposure. This is an important factor to consider because research has demonstrated that sequential bilingual children may require two to five years to become proficient in their second language (Cobo-Lewis, Pearson, Eilers & Umbel, 2002). If this information was taken into consideration and was equivalent across participant groups, perhaps the sequential bilingual children with SLI would perform more similarly to their sequential bilingual peers with normal language development.

Clinical Implications

Most of the studies showed that the bilingual children with SLI had delayed language, compared to their typically developing bilingual peers. However, some studies suggested that the bilingual children with SLI had a pattern of language development that is similar to their typically developing peers (Paradis, 2016; Squires et al., 2014; Girbau & Schwartz, 2008; Gutiérrez-Clellen et al., 2009). Although the evidence is still quiet weak, this implies that the delays seen in bilingual children with SLI are similar across languages, and their pattern of language development is similar to their peers with normal language development. Exposure rates to languages must be taken into consideration and these implications must be interpreted with caution.

The studies do not indicate that bilingual exposure creates an additional risk factor for the language outcomes of bilingual children with SLI. This knowledge can help inform the practice of Speech-Language Pathologists, who consult with parents and educators. The Speech-Language Pathologists can support parents who have children with SLI in bilingual environments and can advocate for early identification and services to support their children's language development. With this knowledge, parents should not hesitate to introduce a second language or enroll their child in French immersion if their child has SLI.

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