

## Critical Review:

### Does the presence of ‘twin language’ in preschool twins lead to increased rates of language impairment?

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This critical review appraises literature examining the effects of ‘twin language’ on the speech and language development of twin children. The six articles reviewed in this paper include two reviews and four mixed (between and within groups) studies. Results of this critical review reveal a general trend towards the use of twin language being associated with later language impairment above and beyond that which is already expected for multiple birth children. The limitations of these studies are in their inherent design—with correlational studies, one cannot determine the causal relationship between twin language and language impairment—ultimately whether twin language is a result of an underlying language impairment or whether it is a contributing factor. These findings also provide support for the notion that the phenomenon of twin language, particularly ones characterized by jargon, is nothing more than a shared phonological disorder by children at the same age and developmental level. Clinical treatment of twins presenting with twin language is discussed.

#### *Introduction*

On average, the language development of twins has been repeatedly found to lag behind that of singletons of the same age, sex and cognitive status (Mittler, 1970; Day, 1932; Bishop & Bishop, 1998). It is widely believed that a complex interaction between genetics and the environment play a role (Mogford-Bevan, 2000). Recent research has focused on the ‘twin situation’ and the social implications of such intimately shared experiences as a primary contributor for early language delay (Mogford-Bevan, 2000). One proposed explanation for this delay is the use of a “secret language” that is shared between twin pairs, taking precedence over the learning of the dominant language (Luria & Yudovich, 1971; Zazzo, 1960). Secret or twin language in this regard is shared language between twins or close in age siblings that makes use of novel sounds, words or syntax not found in the dominant language (Zazzo, 1960). This ‘secret language’ has been denoted in the literature using a variety of terms including ‘ideoglossia’, ‘cryptophasia’, ‘private language’, ‘autonomous language’ and ‘twin language’ making it difficult to compare outcomes across studies. For the purpose of this critical review, the term ‘twin language’ will be used to refer to this phenomenon.

To date, there have been various explanations brought forth about the presence, nature and impact of twin language on language development. Some reports have claimed that twin language is very sophisticated and common, impeding normal language acquisition by shutting out communication with others and refusing to use proper language forms (Mittler, 1970; Luria & Yudovich, 1971). However, alternative theories have suggested that what some may think is ‘twin language’ is nothing more than immature or poorly articulated speech that is difficult to understand for everyone but the

siblings. Rather than a secret communication system, it is merely practiced listening by those with similar oromotor skills. What researchers do agree on, is that speech and language modelling and mutual reinforcement of errors by twins does impact the trajectory of language acquisition (Bishop & Bishop, 1998). Whether twin language independently influences future language outcomes has yet to be determined.

#### *Objectives*

The primary objective of this paper is to critically analyze the available evidence for the presence of twin language and whether it has an effect on the language development of twin children. The secondary objective is to provide recommendations for future research and the clinical implications of our findings.

#### *Methods*

##### Search Strategy

The Western University library database was searched using the following terms: [twin language] OR [ideoglossia] OR [cryptophasia] OR [autonomous language] OR [secret language] AND [language development] OR [language delay] OR [language impairment] OR [language disorder] OR [speech disorder] OR [communication]. Relevant research was also sourced by examining reference lists of pertinent articles.

##### Selection Criteria

The following inclusion criteria was used to select articles for this review: peer-reviewed journal articles published in periodicals, a focus on the *phenomenon* of ‘twin language’ (as opposed to just language development of twins), speech-language outcomes of twins measured by standardized tests, a concentration on the pre-linguistic to linguistic phase of development and an explicit mention of twin language as it relates to

language impairment. Articles written in languages other than English that did not have a translated version available were excluded.

#### Data Collection

The results of the literature search yielded six studies that met the selection criteria: four mixed group studies and two literature reviews.

### **Results**

#### Mixed (Between and Within Groups)

**Bishop and Bishop (1998)** used a mixed method approach to determine whether twin language was more common in children who go on to have persistent speech-language problems. They used two samples of twins – Sample G was a general population sample consisting of 94 pairs of same-sex twins with a mean age of 9.57, while Sample L consisted of 82 pairs of same-sex twins with a mean age of 8.33, but one or both twins had been previously diagnosed with a Specific Language Impairment (SLI). They used retrospective parental report to identify past twin language use and a battery of standardized psychological and linguistic assessments to measure current language status. They found that, of those twins where one or both were determined to have a language impairment, 50% had been reported to use a twin language, compared to only 11% of those with normal language development. Therefore, they found a significant association between parental report of twin language and current language competence regardless of the specificity of the language disorder (specific or broadly defined language impairment) or whether one or both twins were affected.

Although only one sample was representative of the general population, the researchers were diligent in ensuring their results were valid by conducting further analyses with and without the SLI group included. They found significant effects in both instances. The standardized assessments selected were both evidence-based and appropriate for determining general language ability. They took careful consideration in identifying potential confounding variables such as age, gender and zygosity. They also examined the effects of faulty interpretation, parental memory and response bias on outcomes to the best of their ability. The participant characteristics were clearly outlined, and inclusion/exclusion criteria were described and suitable for the present study giving confidence in the results obtained.

Overall, the results of this study were compelling. The large sample sizes, care taken with computing effect sizes and the elimination of potential confounding variables support the validity of these findings. Although, the presence of twin language was revealed through parental report, studies suggest that these narratives are largely

reliable (Bennetts et al., 2016). In addition, the nonrepresentative sample may have created issues for generalizing findings, but the researchers' additional analyses helped avoid these pitfalls. One drawback was the open-ended soliciting of information which created problems when categorizing the responses. Many parents did not know how to describe their children's speech, and this led to a disproportionate number of twin languages being classified as 'unspecified'. This made it difficult to discern which twin languages were considered more 'private' in nature (secret words/phrases alongside normal language use) versus 'jargon' (unintelligible words/sounds in the absence of normal language use) which may have impacted the results. However, overall, the study was well-conducted, and the results yielded important findings for practicing clinicians: twins who demonstrate a jargon-style twin language are at heightened risk for persistent speech-language disorder.

**Thorpe et al. (2001)** conducted a longitudinal mixed (between and within groups) study that examined the prevalence and developmental course of 'secret language' in 76 twin pairs and 80 singleton pairs (no more than 30 months apart in age) at 20 and 36 months old. They were recruited from a focused study on child language which excluded any children born before 33 weeks' gestation and those with known neurological deficits. The two forms of secret language examined in this study were shared understanding, which involved speech directed generally but only understood by the co-pair and private language, which involved speech directed at and understood only by the co-pair. Only the latter form of secret language was deemed relevant to the present critical review.

Participating families were visited at home when the children were 20 months old and again at 36 months old. During these visits, parents were interviewed about each child's language development and any communicative aspects between the pair that might indicate private language use. Prior to visiting children's homes, the researchers had created a working definition of private language and set out criteria to be used for determining whether communication between twins and matched singletons fit this description. In addition to obtaining information through interviews, communication was also directly observed during both visits. Observations were made in both unstructured and structured settings and were analyzed with respect to a coding framework developed for the purpose of this study. A follow up phone interview was completed at age six for the pairs that continued to display private language use at 36 months old.

Results from parent interviews showed that 7.1% of children used a private language at 20 months and only

3.8% at 36 months, implying little continuity. These findings were not exclusive to twin pairs, however did exist more frequently in twins than singleton pairs. When observing communication, it was noted that there was a tendency at both 20 and 36 months for children with a secret language to direct more vocalizations or speech to their co-twin, however these findings were not significant. It was also noted that at 20 months, reports were based on single-word expression whereas at 36 months, it was based on strings of words and/or full conversation. This made it difficult for observers to determine whether speech at the latter stage was focused primarily on the co-twin or not. In the groups that were reported to be using private language at 36 months, it was revealed that in some pairs, private language developed alongside normal language and coincided with normal functioning at six years old. However, when parental report indicated predominant language use at 36 months was private jargon, they were more likely to have impaired language development and an overly dependent relationship with their twin/sibling at six years old.

This study had well-outlined inclusion and exclusion criteria that considered important factors such as co-occurring disabilities that may have impacted findings. The methodology for this study was also well-described and could be replicated. Although the results obtained for participants at 20 months and 36 months were valid, the researchers did have some difficulties obtaining complete and detailed data for some pairs at the six-year follow-up due to factors outside of their control, potentially affecting the robustness of the final results. Therefore, this study provides compelling evidence that private language may exist between twins and some singleton pairs. Additionally, it suggests that only under certain circumstances (i.e. solely jargon speech communication) is there an association between secret language and language impairment.

**Dodd and McEvoy (1994)** conducted a mixed (between and within groups) study to determine whether atypical language acquisition in twins was associated with 'twin language' shared between the pair. Forty multiple-birth children (MBC), comprised of 17 twins and two triplets between the ages of two and four years old, were recruited through membership with the South Brisbane Multiple Birth Association. They were individually matched with 19 singleton controls on the basis of age, sex and socioeconomic status (SES). Inclusion and exclusion criteria indicated that no children had sensory, physical or intellectual disabilities and all spoke Australian English as their native language. The recruitment process for controls was not outlined in the study.

Each multiple-birth child attended two assessment sessions where data was obtained. The first session involved the collection of spontaneous speech samples from adult-child interactions and child-child interactions. The second session involved evaluating each twin's ability to understand their sibling's phonological error patterns through identification of mispronounced target words. Additionally, the MBC were asked to identify the same words spoken correctly by an adult. Spontaneous speech samples were also collected from the singleton controls and they were similarly asked to identify target words spoken accurately by adults versus incorrect productions by their matched twin.

The speech samples analyzed were those from the adult-child interactions as norms were available from another study that had collected similar samples. Analysis of these speech samples revealed that the number of phonemes present were age-appropriate for all but one of the MBC. Additionally, it revealed that 76% of MBC had one developmental process that persisted beyond the appropriate age while 71% displayed at least one unusual phonological process. A one-way ANOVA was conducted to compare the performance of MBC when interacting with an adult versus with their sibling. Analysis showed that there were more developmentally inappropriate phonological processes and unusual phonological processes present in their speech in the adult-child samples. Two-way ANOVA and Post-hoc tests were used to compare MBC and singletons' ability to understand phonological errors. These analyses revealed significant differences between the number of mispronounced words identified by MBC compared to their controls and demonstrated increased understanding of phonological error forms by siblings versus singleton controls. Furthermore, the results indicated that both siblings and controls were better able to identify the correct adult forms of the words over the mispronounced child versions.

The methods for this study were well-outlined and appropriate statistical analyses were conducted. Therefore, results from this study provide compelling evidence that MBC are at increased risk for phonological disorders compared to singleton children. Additionally, MBC's understanding of their sibling's faulty articulations is better than that of children matched for age, sex and SES suggesting they have learned to identify their sibling's productions through repeated practice. However, twin's ability to understand mispronunciations is largely related to how closely the word approximates the adult form of the intended word suggesting that understanding is dependent upon phonological rather than vocal characteristics of the stimuli. Therefore, the study provides evidence against the notion that MBC

share an autonomous language and are rather uniquely skilled at interpreting their twin's speech from extensive practice of shared communication.

**Hay et al. (1987)** conducted a mixed method study to investigate whether cognitive development was delayed similar to language development in twins and whether increased social interaction would offset such language delays. Nine pairs of male twins and six pairs of female twins recruited from the La Trobe Twin Study were matched with 15 singletons on age, sex, SES, and performance on the Vineland Maturity Scale which is a measure of general intellectual and social functioning completed by a parent. All children were assessed using the Symbolic Play Test which is a measure of spontaneous nonverbal play activity and the Reynell Developmental Language Scales which is a measure of receptive and expressive language. Results were then averaged between the twin pairs and compared with their singleton counterparts. Results showed a significant twin x sex interaction such that twin boys scored significantly below age norms and matched controls on symbolic play and both language measures. They also differed from the female twins in that their parents reported significantly higher rates of "secret language" – 7/9 twin boys compared to only 1/6 twin girls. The second study, looking at the impact of increased social interaction on language development, showed consistent delays in twins with respect to language development upon entering preschool. They also noted that twins, as a group, had significantly more articulation problems than singletons, especially boys. When you compare the results of the two studies and note that significantly more boys were reported to have twin language and score lower on language measures *and* have higher rates of articulation problems than twin girls, one may wonder if the two are intrinsically connected—however, because the researchers failed to examine this notion further, one can only speculate.

The selection criteria for the twins was limited in that the original selection process used for the La Trobe Twin Study was never revealed; however, the selection of singletons through personal contacts and infant welfare programs was described, albeit nonrandom. The sample sizes were relatively small and therefore do not lend much statistical power to the effect sizes. This study did an excellent job matching the twins and singletons on a number of different confounding variables such as age, sex and SES to ensure results obtained were valid, however, the matching done for the intellectual/social measure was through a parent questionnaire which may be somewhat unreliable. Although they gave reasoning and reliability coefficients for the standardized tests used to measure general cognitive and language abilities, the use of only one test to measure each domain casts doubt

on the researchers' understanding of the complex constructs in question. Additionally, questions were raised about the use of symbolic play to discriminate between cognition and language. Many language theorists view symbolic play and representation as inextricably linked to language development and thus, it cannot be used as a distinguishing variable (Orr & Geva, 2015). The use of ANOVA and t-tests to quantify the associations between variables of interest were appropriate statistical methods for this type of analysis.

Given the small sample sizes, questionable approach to measuring and differentiating between the constructs in question and nonrandom sampling of singletons, the reliability of the findings is limited. However, the consideration taken in matching the participants on a number of important variables and additional analyses examining potential interactions between variables lend support to their notion that twin boys demonstrate significantly higher rates of twin language than twin girls and are uniquely disadvantaged when it comes to speech-language development. Therefore, the overall clinical importance is deemed to be suggestive.

#### Literature Reviews

**Thorpe (2006)** carried out a literature review on articles addressing twin language in relation to five key questions: (1) *What is the extent of language delay in twin children?* (2) *What are the causes of language delay in twin children?* (3) *Do twin children have a private language that inhibits normal development?* (4) *How might twin language development be supported?* and (5) *What are future directions for research in the language development of twin children?* Only two questions in this paper were considered relevant for the present review: *What are the causes of language delay in twins?* and *Do twins have a private language that inhibits normal development?*

The methods for this review were null and therefore preclude the ability to assign a validity rating. However, based on the information gathered in this review, it suggests that mild language delays evident in twins when compared to singletons is largely explained by experiences in the early social environment of twins. This review also summarizes three main findings related to the existence of twin language: a small group of twin children have unique and exclusive communication which is predictive of poorer language, many twin children by virtue of their shared social context and close relationship are better able to interpret each other's immature speech and therefore may appear to have 'twin language' and finally twin language is a phenomenon that is not exclusive to twins.

Although the findings of this literature review seem relevant to the present analysis, the lack of methodology impacts the validity of the results. Therefore, this review yields suggestive evidence towards the presence of twin language and cause of language delay in twins.

**Mogford-Bevan (2000)** conducted a literature review summarizing key studies on language development in multiple birth children (MBC), citing possible reasons for increased levels of language impairment in this population and the implications for assessment.

There was no explicit methodology stated regarding the sourcing of papers for this review and therefore make it difficult, if not impossible, to determine its reliability. However, the evidence gathered supports the notion that researchers and theorists alike are moving away from the idea of ‘autonomous languages’—described as unique, purposeful communications between twins that involve shared understanding and meanings comprehensible only to them—instead favouring the more recent conception that twin languages are nothing more than a shared phonological impairment between two children at the same age and developmental level. The children appear to understand their co-twin’s speech approximations, and in some cases really do comprehend better than a neutral comparator, leading to mutual reinforcement of errors that perpetuates the learning of faulty motor patterns.

Although the review appears to cite relevant and informative research regarding this topic, it is difficult to apply this information to clinical practice without confidence in its methodology and as such, the clinical importance is henceforth suggestive at best. If clinicians wish to implement this information, it is prudent that they pursue additional confirmatory evidence prior to application.

### *Discussion*

Taken together, these studies reveal a trend in the literature that largely refutes the idea of ‘twin languages’ in favour of the more widely accepted notion of shared phonological impairment. Additionally, the researchers make the important distinction between ‘private language’ – one that involves secret words and phrases used alongside proper form of the dominant language and ‘jargon’-style twin language – one that is made up of immature, distorted and improper speech forms in place of the dominant language. The former is not associated with any risk of impairment while the latter has been shown to correlate highly with persistent language disorder as revealed by several studies in this review. Additionally, some studies have discovered this phenomenon in other close-in-age siblings and multiple birth children, suggesting that it is not only a twin occurrence.

The various, and in some cases absent, definitions of twin language used by respective researchers made it difficult to compare and consolidate evidence across studies; without definitive explanations of the construct being explored, it is difficult to generalize confidently about the findings. Furthermore, most of the studies relied on parental report of past behaviour to establish presence of twin language. Only two of the studies had direct observations of twins’ communication by qualified professionals. Additionally, the nature of twin studies themselves precludes the use of fully randomized sampling and scientific experimentation, so one must resort to using correlational designs to determine associations between variables. Several studies used a mixed method design with relatively sound methodology to reveal significant effect sizes between twin language and language disorder. The degree of correspondence between outcomes of the studies presented in this review lends itself to the impact of the findings. Overall, the results are compelling and should inform the practice of clinicians. If twins, especially boys, present with a twin language characterized by distorted and immature speech sounds (i.e. jargon), they are at increased risk of persistent language disorder. This is, in part, due to the continuous poor modelling and mutual reinforcement of speech errors by their co-twin which ultimately impedes timely language progression above and beyond that which is found separately for twins and boys from previous studies (Day, 1932; Hay et al., 1987). However, large-scale twin population studies with age, sex, SES and phonological inventory-matched singleton controls would further solidify this finding to reveal definitively if twin language impedes the speech-language development of twin pairs.

Lastly, one must not forget the nature of the relationship—correlation does not equal causation. Twin language may be a consequence rather than a cause of language disorder. It is just as likely that twin language arises as a result of language deficiencies within twin pairs, as a way to cope with their difficulties. After all, it is better to communicate with whatever tools one has available to them than to not communicate at all. This way, they are still learning social communication and conversational behaviours even if the exchange is rather meaningless to observers.

### *Clinical Implications*

Some researchers argue that, in order to redirect twins’ course of language development, that they should be separated in classrooms and daycare (Hay et al., 1987). Existing evidence shows that limiting communication between co-twins for a period of time creates an “objective necessity for speech communication” with others. This situation forces each individual twin to conform to typical conversational norms and proper

speech forms if they are to interact successfully with others. Therefore, it may be appropriate to separate twins for a portion of the school year in order to facilitate speech and language growth. With the informed consent, support and understanding of parents and teachers, twins presenting with twin language, and other risk factors for language disorder, can be properly guided and treated using evidence-based methods so they are able to succeed in accomplishing all curriculum goals.

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