

■ **Talk To Me: Parental Linguistic Practices May Hold the Key to Reducing Incidence of Language Impairment and Delay Among Multiple-Birth Children**

■ **Parle-moi : les pratiques linguistiques des parents pourraient être la clé pour réduire l'incidence des troubles et des retards de langage chez les jumeaux**

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Abstract

Researchers have long known that multiple-birth children are predisposed toward language impairment and delay. Proposed explanations include the frequent low birth weight of multiple-birth children, unspecified genetic factors, and differences in the linguistic environment that seem to correlate with language impairment. In the current study, the linguistic environment of a set of triplets was compared to that of their singleton cousin through analysis of videotapes of family interaction. The triplets' linguistic environment seemed to be very similar to that of the singleton (at 2;3.14, 2;4.25 and 2;7.25). Further, the triplets' MLUs had reached the normal range for their age by the time of the last taping (4;4.7). The results support contentions that linguistic environment is paramount in determining language development in multiple-birth children.

Abrégé

Les chercheurs savent depuis longtemps que les jumeaux sont prédisposés à souffrir de troubles et de retards du langage. Ils expliquent cette situation par le faible poids à la naissance des jumeaux, par des facteurs génétiques non spécifiés et par des différences de l'environnement linguistique qui auraient un rapport avec les troubles du langage. Dans la présente étude, l'environnement linguistique de triplets a été comparé à celui de leur cousin enfant unique par le biais d'enregistrements vidéo de leur interaction familiale. L'environnement des triplets paraissait très semblable à celui de l'enfant unique (à 2;3.14, 2;4.25 et 2;7.25). De plus, les longueurs moyennes des productions verbales avaient atteint l'étendue normale pour leur âge lors du dernier enregistrement (4;4.7). Les résultats corroborent les affirmations selon lesquelles l'environnement linguistique est primordial pour déterminer l'acquisition du langage chez les jumeaux.

Key Words: triplets, language development, parental interactions

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The language development of multiple-birth children is a topic that raises many questions, and often elicits conflicting answers. Three major questions that often surface in this area are: (a) do multiple-birth children have a tendency toward inventing secret (often referred to as autonomous) languages, (b) what is the extent of the predisposition toward language delay and/or impairment among multiple-birth children, and (c) if this predisposition does exist, what is its cause? These questions are arguably inextricable—each question depends largely on the answer to another. However, for the sake of simplicity, these questions will be dealt with separately here in order to get a clearer look at the big picture.

Most research that has been conducted in the area of language development in multiple-birth children has focused specifically on twins (e.g., Malmstrom & Silva, 1986; Savic, 1980; Stafford, 1987). Research that has involved triplet sets, however, has indicated similar problems as those experienced by twins, but with greater severity (see McMahon & Dodd, 1997). For this reason, the current study will build on studies conducted on language development in twins as well as on those conducted with triplets.

Autonomous Language

It is commonly assumed that twins develop secret or autonomous languages that cannot be understood by others, an assumption that has had only partial support from research. One piece of evidence supporting the existence of language that is particular to twins comes from Malmstrom and Silva (1986). These researchers conducted a case study of one set of twins and found idiosyncrasies in their speech that appeared to be specific to their twin status. For example, as toddlers, the twins referred to themselves by a single title, which was a combination of their two names. They also showed a tendency to use verbs in the singular when referring to themselves (e.g., "Is Krista and Kelda sleeping...?"), although they demonstrated knowledge of plural verbs when referring to other people. Also, until well past their fifth birthday, they showed a tendency to refer to **themselves, as a unit, using the pronoun *me***. Again, they showed knowledge of the proper plural pronoun when referring to others.

Another suggestion of a linguistic idiosyncrasy resulting from the twin situation involves the acquisition of the pronoun *I*. Savic (1980) reported that, while twins begin the process of learning the use of this pronoun later than do singletons, this process takes less time once it begins. This has been differentially interpreted in the literature over the years. Reznick (1997) cited Savic's research as showing that twins learn to use the pronoun *I* early, while Lytton, Singh, and Gallagher (1995) cited the same research as showing that twins experience a delay in saying the pronoun. Obviously, there is some need for further research in order to clarify points such as this one, as well as to determine a cause for such idiosyncrasies. However, with regard to the question of autonomous language, this could be considered a moot point. That is, it could be argued that this idiosyncratic speech does not constitute autonomous speech.

Do multiple-birth children actually use truly autonomous speech then? McMahon and Dodd (1997) examined 37 twin and triplet sets and found almost no evidence of autonomous language within the sibling groups. Bakker (1987) has contended that what is perceived as autonomous speech is often evidence of language impairment. He argued that the idea of autonomous language has stemmed from the inability of other people to understand the speech of twins, and that this inability is actually due to the twins' impairment. In

a metastudy of varied twin research, he determined that phenomena often described as evidence of 'secret languages' among twin pairs are not restricted to twins and appear to be not invented languages or even to be intended as secret languages. Rather, they can often be directly related to the language of the parents and appear to be phonological distortions. This, Bakker stressed, is not unusual among children in general, but in the case of twins, it is reinforced by each member of the pair hearing it from the other as well as using it him or herself.

Bakker's (1987) suggestion that so-called autonomous languages are actually language impairments brings us to the second predominant question regarding language development among multiple-birth children: What is the extent of the predisposition towards language delay/impairment among these children?

Language Delay and Impairment

Researchers generally agree that multiple-birth children are predisposed to language delay and/or impairment. There is less agreement, however, on the nature and extent of the impairment or delay. Stafford (1987) tested 22 twin pairs as well as 22 singletons of similar ages who had older siblings. While there were no differences between the two groups in terms of general development, significant differences were found in expressive language and language comprehension. While significant differences do not necessarily indicate language impairment, or even delay, they do imply that twins lag at least somewhat behind their singleton peers in language development. Similarly, Hay, Prior, Collett, and Williams (1987) found differences between twins and singleton children. In this case, however, the differences went beyond language development. In addition to scoring worse than did singletons on language measures, the twins in this study also fell behind on measures of symbolic play and social behaviour, indicating a possible overall developmental lag. Thus, even researchers who agree that multiple-birth children are predisposed to having deficits do not necessarily agree as to their extent.

McMahon and Dodd (1997) provided evidence for a moderate view of multiple-birth children's predisposition towards language difficulties. In their study of triplets, they found that a slight majority of the children had normal or above-normal mean length utterance scores, and larger majorities (ranging from 69% to all but one child) scored in the normal range on most other measures of language development. The only measure on which most of the triplets showed difficulties was a measure of developmental phonological processes (i.e., phonological problems or idiosyncrasies that often appear early in language development) that persisted beyond the age at which they would have been expected to have disappeared from the child's speech—73% of the triplets studied showed at least one of these. Thus, while McMahon and Dodd's results do not contradict the idea that multiple-birth children are predisposed towards language

delay or impairment, they suggest that the impairment may be restricted to phonological development.

In sum, researchers generally agree that multiple-birth children are predisposed to language difficulties. There is disagreement, however, about whether these language difficulties are due to general cognitive deficits or specific aspects of language (such as phonology or expressive language). These facts, then, take us to the third predominant question in this research area: To the extent that the predisposition exists, why does it exist?

Possible Causes for the Delay/Impairment Predisposition

One possible source of the language problems observed in multiple-birth children may be low birth weight or short gestation period. These variables are not restricted to multiple-birth children, but are found more frequently among these children than among singletons. Alin-Åkerman (Alin-Åkerman, 1987; Alin-Åkerman & Thomassen, 1991) has found that differences between twins and singletons in language development disappear when birth weight is taken into account. This research suggests that language impairment is not so much a function of being a multiple-birth child as a function of low birth weight, a phenomenon that is common among multiple-birth children. Not unrelated, McMahon and Dodd (1997) also suggested that the shorter gestation period frequently found in multiple-birth children may be a contributor.

Some other explanations for multiple-birth children's tendency towards language difficulties revolve around the children's language-learning environment. Haden and Penn (1985) studied a set of twins in which one showed a language delay while the other had normal language development. They found that the twin who had normal development often attempted to dominate conversations, and her presence seemed to have an adverse effect on some of her brother's syntactic and interactive measures. This suggests that the constant presence of a dominant, same-aged peer may inhibit normal language development.

Other environmental explanations focus on parental treatment of the children. Multiple-birth children necessarily have to share parental attention and input (McMahon & Dodd, 1997). By the same token, parents sometimes treat multiple-birth children (especially if they are monozygotic) as a unit, rather than as individuals (McMahon & Dodd, 1997; Stafford, 1987). The amount of maternal speech that is directed at each individual child seems to suffer beyond the half-input that would be expected, however. In a comparison of maternal input to same- and different-aged siblings, Stafford (1987) found that mothers of singletons talked more to each child than did mothers of twins. Tomasello, Mannle, and Kruger (1986) found that twins engaged in 10 times fewer dyadic joint interactions with their mothers than did singleton children.

In addition to differences in the quantity of child-directed speech, research has shown qualitative differences between parental speech directed at twins and that directed at singletons. Twin mothers have been shown to give their children more directives, to imitate their children's utterances more, and to elaborate on their children's utterances less (Tomasello et al., 1986). They also talk more to themselves, answer their own questions more, and use more stock expressions, spontaneous declaratives, and comments than do mothers of singletons (Stafford, 1987). Mothers of singletons, in contrast, used more conversation-eliciting devices, responsive behaviours, positive acknowledgments, and questions than did mothers of twins (Stafford, 1987). Multiple-birth children, then, are spoken to less and are given fewer opportunities to speak. When their parents talk to them (which is with lower frequency than for singletons), there is almost always another person, the co-twin, to share in the pressure to reply. They often live in an environment in which they are spoken to less than are other children, and less attention is paid to whether or not each individual child is giving responses. Thus, both opportunities and pressure to practice language skills are lower for multiple-birth children.

The Present Study

The studies conducted by Stafford (1987) and Tomasello and his colleagues (Tomasello et al., 1986) were groundbreaking in that they examined the behaviour of the parents rather than simply comparing the language development of multiple-birth children to that of singletons. Similarly, in the current study, child-directed parental speech is a focus. A triplet set and a singleton child were observed in a natural environment, interacting with one another and with both sets of parents. It is also notable that the videotapes were filmed by a member of the participants' family, in the home environment of one of the nuclear families (which one varied across tapes). Thus, the participants' natural context was replicated as closely as possible in a videotaped situation. For this reason, it seems likely that being videotaped was not an unfamiliar condition for the children or their parents. It is unlikely, under these circumstances, that the behaviour of either the parents or the children was altered for the sake of the researchers. Finally, unlike previous studies, the current study is a longitudinal analysis including three separate occasions of parental input measures and one follow-up in which the children's language development is assessed. The higher rate of sampling may allow for a clearer picture of parental input, and the follow-up observations will allow for inference of more long-term effects of the parents' behaviour on their children's language development.

The basis of the predictions for the current study is that children who are not spoken to frequently and/or not given frequent opportunities to speak will not learn to speak as quickly or as well as will children who are. Thus,

the children's language development at the end of the study is expected to reflect parental behaviour throughout. Research such as Malmstrom and Dodd (1997), Stafford (1987) and Tomasello and his colleagues (1986) would predict that the triplets would be spoken to less than would the singleton and would be frequently treated as a unit. Further, the triplets' parents would be expected to provide more directives and imitation, to answer their own questions more often, and to provide less elaboration of the children's utterances, fewer questions, fewer positive acknowledgements, and fewer responsive behaviours. The triplets' language development is expected to be lacking only if their parents conform to those language patterns.

Method

Participants. Participants were a set of preschool-aged triplets, a preschool-aged singleton (the triplets' cousin), and the children's parents. The triplets were two monozygotic boys (B1 and B2) and a fraternal sister (G). The boys' zygoty had been determined through DNA testing. The singleton (S) was a male who was being raised bilingually (English and French). All of the participants lived in cities in Canada. Both sets of parents had a minimum of a college degree.

Birth order and birth weight. The singleton was 5 months, 16 days older than the triplets and had a birth weight of 3,970 g. The birth order of the triplets was G, B1, and then B2. Their birth weights were 2,169 g, 2,113 g, and 2,162 g, respectively. All three of the triplets are considered low birth weight (LBW), which refers to children with birth weights of less than 2,500 g ("Impact of Multiple Births," 1999). However, they were well above the average birth weight for triplets, which Skrablin, Kuvacic, Pavicic, Kalafatic, and Goluza (2000) reported at below 1,600 g, and near the top of the range (800 - 2,642 g) that was reported by Vignal, Daures, Vergnes, Giacalone, and Boulot (1999). Therefore, the triplets were LBW in comparison to singleton children, but high birth weight in comparison to other triplets.

Child care arrangements. S spent four days per week in a French daycare and one day per week with his mother, who spoke only French to him. Evenings and weekends were spent with both parents. His father spoke English to him, and both parents spoke English to each other. The triplets spent five mornings and two afternoons per week either in preschool or under the care of a preschool teacher-in-training. Two afternoons per week were spent with their father and one with their mother. Evenings and weekends were spent with both parents. The triplets lived in a monolingual, English-speaking household.

Procedure. Participants were videotaped at four different points in their development. The first and fourth videotapes were filmed in the home of the singleton child, and the second and third tapes were filmed in the home of the triplets. The videotapes were recorded by the singleton's mother, with no outside observer present; Thus, all of the individuals present during taping were

Table 1

Utterance Codings

Functions Coded	Response to Last Utterance or Action Coded
Comment	Imitation
Directive	Recast
Information-giving	Acknowledgement
Question	Topic continuation
Response	Ignore; no response
Scaffolding	Request clarification
Fulfills none of the coded-for functions	Topic change
Unknown	Obey with no verbal comment
	Calling attention
	Return to previous topic
	Expansion
	Speaker answered own question; posed to addressee
	Unknown

familiar to all participants. Prior to taping, all participants were told that the researchers were interested in how triplets' language development proceeded. They were asked to act as they normally would, and videos were taken in the context of home videos. To this end, activities were not regulated during taping. At the first taping, the triplets were aged 2;3.14 and the singleton was aged 2;8.30. At the second taping, they were aged 2;4.25 and 2;10.10. At the third taping, they were aged 2;7.25 and 3;1.10. All of the children and parents were present during the first and third tapings; the singleton's father was absent during the second taping. The tapes ranged from 45 to 60 minutes in length. The speech on the videotapes was transcribed by a research assistant who did not know the children according to CHAT conventions (MacWhinney, 2001) and each utterance was coded for speaker, addressee, function of the utterance, and the speaker's response to the last utterance or action of the addressee (see Table 1 for a summary of these codings). These codings were

adapted from those recorded by Tomasello, Mannle, and Kruger (1986). The singleton's mother, who recorded the videos, checked the transcripts for accuracy and all her suggested changes were accepted.

The fourth taping was conducted later, when the triplets were aged 4;4.7 and the singleton was aged 4;9.22. All of the children and the singleton's mother were present during this taping. The last videotape was used to assess the children's level of language development.

Results

Linguistic Environment. Parental treatment of the triplets compared to the singleton in the first three videotapes was analyzed using a Chi Square. Specifically, the codings as listed in Table 1 were analyzed: How many times was each type of utterance directed at each child by one of his or her parents? As there were situational differences among the videotapes, utterances were collapsed across tapes to give a more representative sample. Note that a parental utterance was entered into analysis only if it was directed at the child in question alone (i.e., not if it was directed at the child as part of a group).

In some cases, there were not enough instances of an utterance type to conduct a reliable analysis. For this reason, no analyses are available for *ignore, no response* (there were no instances of a parent ignoring one of the children), *obey with no verbal comment* (no instances), *call attention* (7 instances), *return to previous topic* (11 instances), *expansion* (27 instances), or *answered own question, directed at addressee* (11 instances). Data for these codings are summarized in Table 2.

Table 2

Codings that could not be analyzed

Code	Number of Times Coding Type was Recorded			
	S	G	B1	B2
ignore, no response	0	0	0	0
calling attention	6	0	0	1
return to previous topic	3	5	2	1
expansions	5	11	7	4
answered own question	3	3	2	3
recast	4	2	0	2

Analyses were conducted for the remaining codings; however, several of them also contained low numbers, making interpretation difficult. Thus, results for *comments* and *information-giving*, both nonsignificant, should be interpreted with caution. The data for these codings are listed in Table 3.

There were significant differences among the children in the number of utterances directed at them by a parent. S was spoken to more than were any of the triplets. G spoke more than did the other children, and B1 less. There was a significant difference between S and the triplets in the number of directives received. S received significantly more directives than did any of the triplets. Significantly more questions were addressed at G than at any of the boys, but there were no differences in the number of responses addressed to them. G was imitated by a parent more often than were S, B1 or B2. She also received more requests for clarification. A topic was continued more often with S than with any of the triplets, but there were no differences in how often a topic was changed.

Mean Length of Utterance. All the transcripts were analyzed for the children's mean lengths of utterance (MLU). MLU was determined as in Miller and Chapman (1981), to allow for comparisons with their reported norms, with three exceptions. At all ages, all of the children's utterances were used. Also, it was assumed that all the children were capable of separating the morphemes in contractions such as "don't"; therefore, the "n't" was always counted as a separate morpheme. Finally, some of S's utterances contained French words. These were always counted as single morphemes unless he attached English morphology to the French roots (e.g., adding the English morpheme 's' to the French word *citrouille* 'pumpkin' to form a plural). S's MLU in the fourth videotape was 5.67. This falls well within the normal range, and above the average MLU, that Miller and Chapman (1981) reported for children aged 57 months, one month younger than S at the time of taping. S's MLU also fell above Miller and Chapman's reported average for children aged 60 months. G, B1, and B2 had MLUs of 4.00, 3.98, and 4.70, respectively. No norms were available for children of the triplets' age (approximately 52 months), so they were compared to Miller and Chapman's norms for children aged 54 months. All of the children fell within the normal range, 3.64 - 5.76. The children's MLUs at each taping are available in Table 4. Unfortunately, Miller and Chapman (1981) did not provide norms for children of all ages. Therefore, at each taping, the children are compared to the closest age groups for which norms were available (see Figure 1). In two cases, this involved using the same norms for two consecutive tapings.

Table 3

Summary of analyses of the children's linguistic environment (parental language use).

Category	S	G	B1	B2	χ^2	significance
No. utterances addressed to:	317	284	244	221	20.39	.01
comments	18	25	15	12	5.31	ns
directives	62	15	23	18	48.86	.01
information-giving	7	9	3	8	3.07	ns
questions	62	89	58	82	9.38	.05
responses	20	24	31	21	3.08	ns
scaffolding events	10	9	14	5	4.32	ns
imitations	3	12	1	5	13.10	.01
acknowledgements	10	3	3	1	11.00	.05
topic continuation	190	168	150	133	11.19	.05
request clarification	8	28	17	19	11.22	.05
topic change	14	9	11	17	2.88	ns

Table 4

The children's MLU at each taping, shown with age (in brackets).

Tape	S(age)	Norm (age)	G(age)	B1	B2	Norm (age)
1	2.95(32)	2.07-3.27(33)	1.85(27)	1.72	1.66	2.28-3.22(30)
2	3.41(34)	2.72-4.60(36)	2.45(29)	1.90	1.55	2.28-3.22(30)
3	3.37(37)	2.72-4.60(36)	2.71(32)	2.33	2.89	2.07-3.27(33)
4	5.67(58)	4.00-6.34(57)	4.00(52)	3.98	4.70	3.64-5.76(54)

Discussion

While there were some significant differences among the children in the parental behaviour measures, there were almost no cases (of those that could be analyzed) in which S differed significantly from all of the triplets in the direction that would be predicted from Stafford's (1987) and Tomasello's (Tomasello et al., 1986) work. Significantly more utterances were directed at S than at any of the triplets; however, this can be accounted for, in large part, by the significantly higher number of directives he received (counter to predictions). Overall, there were few significant differences between the parental treatment received by the triplets as compared to that received by S.

In fact, there were several examples of parental behaviour that ran quite counter to predictions from the literature. There was one instance in the first videotape in which the triplets' father was changing B1's diaper and both G and B2 approached him to show him toys at the same time. Their father answered both children's pleas for attention individually, asking each a question about the proffered toy, and even expanded on the information G was giving him about hers.

All four of the children studied fell within the normal MLU range for children several months older than they were at the time of the fourth taping. Thus, predictions

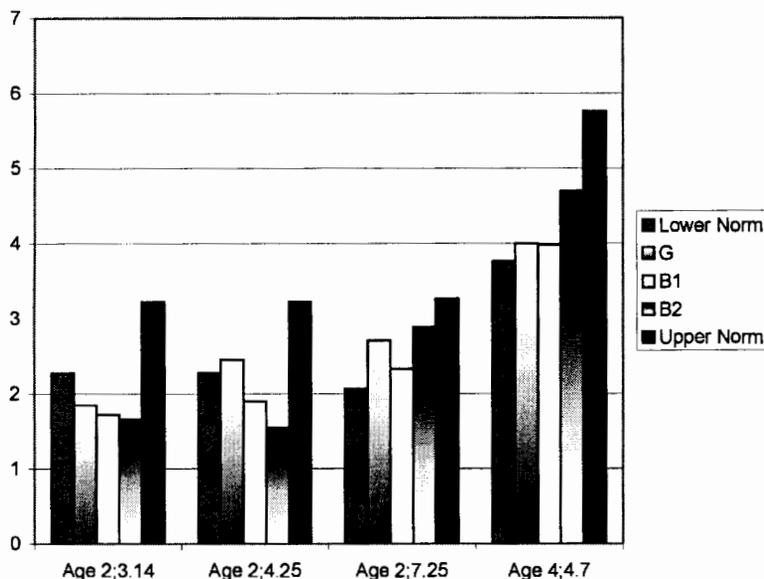


Figure 1

that the triplets' language development would suffer only if the parents conformed to the behaviour reported by Stafford (1987) and Tomasello and his colleagues (1986) were borne out. The children's linguistic environment did not appear to be lacking in the expected ways, and their language development was comparable to that of singleton children. It is also notable that the children studied by Miller and Chapman (1981) were recorded in dyadic conversations with their mothers, while the children in the current study were recorded in the presence of three other children and one to three adults. Thus, it seems likely that the MLUs reported here are an underestimate of the results that would be obtained in a setting such as the one used by Miller and Chapman.

Importantly for the question of causation, the triplets did *not* fall into the normal MLU range for their age group at the time of the first taping, and only G fell into the normal range at the time of the second taping. The implications of this finding are twofold. First, this suggests there may be some factor other than linguistic environment, such as birth weight, that predisposes multiple-birth children towards language impairment or delay. Second, this finding suggests that the linguistic environment commonly observed in multiple-birth families is *not* a result of the children's language ability, but is rather a cause or an exacerbation. Were the parental behaviours caused by the children's language delay, it could be expected that the parents in this study would have exhibited similar behaviours. Instead, they treated their children much the same as the parents of the singleton treated their child, and the triplets gradually improved to perform within the normal range.

Unfortunately, one weakness of case studies is that it can be difficult to draw clear conclusions and nearly impossible to generalize those conclusions. Further, this

study does contain some possible confounding variables; namely, the singleton child was older than were the triplets, and the singleton was being raised in a bilingual home (see Nicoladis & Genesee, 1997 for a discussion about the implications of bilingualism for language development) while the triplets were being raised in a monolingual home. However, case studies carry the advantage of giving an in-depth look at phenomena and providing the opportunity for greater insight. Combined with the coinciding results reported by other researchers (e.g., Stafford, 1987; Tomasello et al., 1986) this study supports the idea that the linguistic environment provided by the parents may be related to the language delays and impairments often found in multiple-birth children. Further, by measuring the parental behaviour at a time prior to the measure of language development, the current study offers the first evidence of a cause-and-effect relationship. That is, establishing that linguistic environment between the ages of 2 and 3 years may be related to language development at 4 years suggests that it is the parental behaviour that affects children's language development, and not vice versa.

The major implication of such a suggestion is that the language delay often found in multiple-birth children may be preventable through education of expectant parents. Parents who are educated about the linguistic tendencies of the parents of multiple-birth children and are trained in effective communication with their children will be arguably less likely to engage in the practices that have been discussed. If the results of the current study prove generalizable, the implication is that, with an increase in parental behaviours such as individual treatment of the children, elaboration of the children's utterances, questions, positive acknowledgements, and responsive behaviours, and a decrease in directives, imitations, and the tendency for parents to answer their own questions, will come a decrease in the numbers of multiple-birth children with language delay.

There are several aspects of this study that could lend themselves to future research efforts. Firstly, a replication of this study could be attempted on a larger scale, to determine whether or not the results generalize to other multiple-birth families. If they do, directions concerning the education of parents-to-be of multiple-birth children should be clear: Treating multiple-birth children as individuals can reduce language delay over the long run.

A second finding of this study that deserves further investigation is possible gender differences. Throughout this study, the one girl triplet stood out as being different from her brothers in terms of how much she spoke and how much her parents spoke to her. It is entirely possible that this is a mere case of personality factors affecting the linguistic environment—G is more talkative, and so G is spoken to more often. However, it is also possible that

gender has affected G's linguistic environment relative to B1 and B2. It may be interesting to discover if differences such as this one are common in multiple-birth (or even simply multiple child) families that include children of both genders.

Third, this study worked within the parameters of maintaining a naturalistic environment. While this is important, it necessarily affects any attempt to standardize situations across videotapes. Comparisons should be done with more standardized, if less naturalistic, environments. Agreements between studies would only strengthen the results presented here, and disagreements between studies would indicate the necessity for further, careful, research.

While the purpose of this study was to provide further insight into the relations between multiple-birth children's linguistic environments and their later language development, it is an area that can extend far beyond multiple-birth issues. It has long been known that complete isolation from language can severely and permanently impair language development even once an individual is removed from the deprived environment (for discussions, see Bjorklund, 1995 or Gardner, 1982). However, the effect of environment on language development when environments fall within a normal range is rarely discussed (but see Vasta, Haith, & Miller, 1992). The literature presented in this study, as well as the results, may suggest that it is time for research that does.

Author's Note

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