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University of Northern Colorado Greeley, Colorado

AN INQUIRY INTO THE LANGUAGE DEVELOPMENT OF TWINS: AN  
AUTOETHNOGRAPHIC STUDY

A Thesis

Submitted in Partial

Fulfillment for Graduation with Honors Distinction and  
the Degree of Bachelor of Science

Madison Grimm

College of Natural and Health Sciences

May 2022

AN INQUIRY INTO THE LANGUAGE DEVELOPMENT OF TWINS: AN  
AUTOETHNOGRAPHIC STUDY

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### **Abstract**

According to research, many twins have some form of a language delay. Despite the considerable research on twin language, the cause of these language delays is unknown. Several of the factors that have been proposed include genetics, prematurity, and low birth weight. I am a twin, and through this research, I reflect on my own language development from both memory and the records my family kept. The data from the records indicate that, unlike many other twins, I did not have a language delay. Despite the lack of a language delay, the data indicates the possibility that the environment and early interactions influence language development.

### **Keywords**

Twins, language development, autoethnography

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## Introduction

Approximately 38% of young twins have some form of language delay (Rice et al., 2014). While there are many theories on why the delay occurs, it is difficult, if not impossible, to tell what the cause may be. Many researchers have looked into the causes, trying to pinpoint the primary factor. For each study saying that one factor is the cause of the delay, it seems that there is another study saying that it is not. Most twins who have a language delay catch up with their peers by three or four years of age (Lewis & Thompson, 1992). However, the impact that twins have on the language of the other is rarely studied. It can be proven that they do have an impact on the language of the other, as 30–50% of twins, although sources differ on the exact percentages, develop their own language that only they can understand. While that phenomenon, sometimes known as cryptophasia, is often studied, the impact twins have on the language of the other excluding cases of cryptophasia, is rarely studied.

Through the lens of my own experience as a twin, I am analyzing my own circumstances regarding my own language development, as well as comparing myself to both the typical norms and the research I have read regarding twin language development. As a member of the population I am interested in, I have a unique perspective regarding the topic, and as such, I have to question how my own experiences match those of the typical singleton and other twins and what that means regarding typical language development.

## **Background**

### **Twins**

Twins occur when two children result from a single pregnancy. There are two types of twins, monozygotic and dizygotic. Monozygotic twins, or identical twins, come from a single zygote that split during the early stages of pregnancy. As a result the twins are genetically identical to one another and are always of the same biologic sex.

Dizygotic twins, or fraternal twins, come from two separate zygotes. As a result the twins are genetically different to one another and while they can be of the same biologic sex, they can also be different biologic sexes.

### **Language Development**

There are currently multiple theories regarding how humans acquire and develop language. Two of the main theories include the nativist theory, sometimes known as the linguistic theory, and the behavioral theory. The nativist theory was developed by Noah Chomsky. This theory focuses on the role of genetics and biology in the development of language, as he believed that language was innate due to similar grammatical structures across different languages and cultures throughout the world. The behaviorist theory was developed by B. F. Skinner. This theory places focus on the interactions between people, as he believed that language is a learned response, similar to behaviors (Wise & Sevcik, 2017).

### **Language Delays**

While there is a higher prevalence of a language delay in twins, it does occur in singletons. Language delays can be caused by any number of factors, although it is difficult to prove that any particular factor is the direct cause of a language delay. An

article written by Zubrick et al. (2007) looked at a variety of risk factors for language delays and found that “Personal–social levels, gross motor skills, gender, adaptive motor skills, fine motor skills, family history, number of children, proportion of optimal birth weight, prematurity, and age” were all predictors and risk factors (Zubrick et al., 2007, p.1586).

There is also the issue of twin studies when it relates to language delays and disorders. Many studies on language delays use twins to help reduce the variance that would be unavoidable in singletons to help test certain factors. Instead of using typical singletons to test different possible causes and factors regarding language, twins are used instead. However, there is an issue with that. Most twins are not typical, in fact, many twins have some sort of language delay, however in many of the studies I reviewed, twins are treated as if they are the norm. Most twin studies in the field of speech-language pathology are studies using twins to research speech and language, not studies about the speech and language of twins themselves.

### **Genetics**

The factor that is one of the most studied in relation to the development and delay of the language of twins is genetics. In one study Bishop et al. (2003) tested the zygosity of same-sex twin pairs where at least one twin had an early language delay and their vocabulary, language, nonverbal skills, and if the parents sought out professional help for any language delay. The researchers came to the conclusion that while zygosity influenced the language delay common in most twins, the environmental influences shared by both twins have a more substantial effect on an early language delay. The study did not clarify what environmental influences they investigated beyond shared and

unshared environmental influences. While the study is quite informative, it only tested same-sex twin pairs. Not all twins are same-sex pairs, so this particular study leaves out dizygotic different sex twin pairs. As a portion of the typical twin population was not considered in this study, the research lacks a representative sample of the population. While different-sex twins may have different environmental influences, they also share some, leading to the question if the environmental influences the different-sex twins share would also affect early language delay or if the different environmental influences would make the early language delay worse for one or the other (Bishop et al., 2003).

In another study by Bishop and Hayiou-Thomas (2007) looked into heritability, the genetic similarities between the twin sets and its relation to specific language impairment. The study found that there were some genetic correlations between twins that had attracted clinical concern. This indicated the possibility that genetics play a role in determining the presence of a language delay (Bishop & Hayiou-Thomas, 2007).

### **Prematurity**

Another one of the more studied factors in the language delay of twins is prematurity. A baby is considered premature when they are born before 37 weeks gestation have passed (Centers for Disease Control and Prevention, 2021). A study performed by Culloty et al. (2019) compared twins and singletons at 3 and 5 years using a standardized vocabulary assessment, parent interviews, and teacher reports that prematurity is the cause of the language delay for many twins. However, premature, low birth weight twins are only ever tested against singletons. The singletons were only age-matched to the twins. The study did not compare the twin pairs to singletons who were also premature or had a low birth weight (Culloty et al., 2019). This brings into question

the veracity of the study, as prematurity and low birth weight are known risk factors of language delays (American Speech-Language-Hearing Association, n.d.). As there was no comparison to singletons who were also matched with gestation length and birth weight it is hard to determine if the conclusion the researchers came to was correct. If prematurity and low birth weight are responsible for the twin typical language delay or if it appears that way due to the fact that there is a higher incidence of prematurity and low birth weight among twins than there is among singletons.

An article by Stromswold (2006) goes over a multitude of factors affecting twin language development and delay, one of which was prematurity. They stated that “children who are born prematurely (before 37 weeks gestation) reach speech and language milestones later” as well as score lower on most speech and language tests, and thus are more likely to be diagnosed with a speech or language impairment than their same-age peers (Stromswold, 2006, p.341). This, combined with the fact that most twins are born premature may lead to a greater incidence of language impairments in twins (Stromswold, 2006). This article also doesn’t compare premature twin pairs to premature singletons, and while the statements may be true it still does not address if the twin typical language delay is seen even when compared to singletons who were also premature.

However, a study by Nan et al. (2013) does match premature twins and premature singletons. This study primarily focused on the overall development of twins including the development of motor and problem-solving skills alongside language development. It reported that twins scored lower on the communication portion of the tests when compared to singletons. Even in the cases where twins were born healthy and

prematurity was taken into account, twins still showed signs of communication and language delays. Unlike other studies indicated, this leaves the twins with an unexplained language delay. While prematurity is a risk factor, this study indicates that there is more to the twin language delay than just that factor.

### **Low Birth Weight**

Another factor commonly studied in regard to twin language development would be low birth weight. An infant is considered low birth weight when they are born weighing less than 2,500 grams, or about 5 pounds 8 ounces (Centers for Disease Control and Prevention, 2022). The Culloty et al. (2019) study looked at prematurity along with low birth weight. The study demonstrated that twins are more likely to be born under 2,500 grams than singletons. When comparing low birth weight to language development, they did not separate low birth weight and prematurity, which leads back to the criticisms presented in the previous paragraph. Mainly that they did not compare low birth weight twin pairs to low birth weight singletons, leaving out a factor that should have been accounted for to reduce variance. (Culloty et al., 2019).

The Stromswold (2006) article also investigated low birth weight as one of the factors that affect the language development of twins. The article states that even full-term low birth weight children are “more likely to suffer from language and learning disorders than normal birth weight full-term children” (Stromswold, 2006). Similar to the Culloty study, this article lacks a comparison of low birth weight twin pairs to low birth weight singletons. While many studies do not separate low birth weight and prematurity, as they often do go hand in hand, they are separate factors and the fact that they were clumped together makes it difficult to separate the influences they have on the language

development of twins. While this is understandable, it would likely be difficult to find singletons that only had one of the factors without introducing more unwanted variance, they still should be acknowledged as separate factors.

### **Other Prenatal and Perinatal Influences**

There are many factors that affect language development that can occur before and during birth. The Stromswold (2006) article also reviews a multitude of other prenatal and perinatal factors such as perinatal glucocorticosteroids, neonatal hyperbilirubinemia, intrapartum complications, and other similar factors. However, each of those factors shares similar issues with the results as they do with the low birth weight and premature conclusions. None of them compare the twin pair with that factor to same-age singletons who also have that factor.

### **Postnatal Influences**

Some researchers have studied the postnatal influences and factors of the language development of twins, primarily the impact of mother and child interactions. One study by Conway et al. (1980) looked into the influence of the mother's education and the amount of speech directed towards each twin and its impact on the language of the twin pair. Findings indicated that at young ages the influential factor was the amount of speech interaction between mother and each child (Conway et al., 1980).

Another study, by Rendle-Short et al. (2015) looked at a mother and her twin boys to see how they interacted with one another and the impact their interactions had on the language of the twins. This case study helped show the possibility that the twin typical language delay may not occur from lack of mother-child interaction. The case study also showed that twins may interact with one another differently than most same-age

singletons. However, because it is a case study rather than a study with an experimental design, it is difficult to determine if the results can be generalized to a larger population. (Rendle-Short et al., 2015).

### **Cryptophasia**

Cryptophasia is a phenomenon most commonly found in twins. It is usually considered a type of idioglossia, a language spoken by a very small group of people, sometimes only one. Cryptophasia is the name given to the language that a portion of twins or other children develop between one another that is incomprehensible to anyone but them (American Psychological Association, n.d.). Various studies refer to this phenomenon as “twin language”. A study by Bishop and Bishop (1998) saw cryptophasia occurring in about half of the twins who had some sort of speech or language impairment and in about 11% of twins who had normal language. The same study also showed that twins who had cryptophasia scored lower on mean language scores than typical children although they scored about the same as typical children when it came to nonverbal IQ (Bishop & Bishop, 1998).

## **Findings**

### **History and Risk Factors**

I am a dizygotic twin, born at 36 weeks gestation at a weight of 5 pounds 4 oz. This marks me as both premature and low birth weight. My family does not have a history of any speech or language impairments. My maternal grandparents helped babysit my twin and I while my parents were working full-time jobs. I grew up in an environment that placed an emphasis on learning new words and as I grew older, literacy. As a child I had low muscle tone and both fine and gross motor difficulties, leading me to

attend physical therapy and occupational therapy. I attended physical therapy from when I was ages 2 months to 5 years and occupational therapy from ages 3 years to 5 years.

### **Familial Records**

My mother and grandparents kept records of my development as a child, up until I was 32 months of age, as well as miscellaneous milestones over the next few years.

While these records also do include health information, I am reporting on the notes made about my own language development and environment.

**Table 1.** Familial Records

19 months	Started to sing along with television shows, and started using the phrase “where go?”
21 months	Started using the phrases “here goes”, “where’d go?”, and “there is”
23 months	Started putting three words together, and my twin and I have started taking things from one another
24 months	My mother made a record of the words in my vocabulary (Table 2), she stated that I had approximately 240 words in my vocabulary, although only 113 words, consisting primarily of nouns and adjectives, are listed.
25 months	Started using the phrases “so [name], what do you think” and “hey guys, what are you doing”
27 months	Started asking “why not”, started laughing at things on the television, made up my own song to the tune of “Mary had a little lamb” using her in reference to myself, and started talking to myself in the mirror.
28 months	Started using the phrase “I have an idea” and was noted to be able to interpret what my twin is saying when others are unable to understand them.
29 months	Started using the phrase “sorry [name], my fault”, consistently and correctly used the phrase “in the middle”
31 months	When my mother went on a trip I was noted as saying “Where’s

	mommy?”, “I miss her”, and “I want to go to my home with mommy”
32 months	I correctly counted from one to twenty, enjoyed singing, and held real conversations with my twin.
3 years	I could spell my own name without assistance.
3 years 9 months	A video is taken where I say and label various parts of human anatomy. This includes the lobes of the brain, the zygomatic arch, phalanges, metacarpals, carpals, the rib cage, the spine, the lungs, and the pelvis
6 years	Reading simple chapter books

**Table 2.** Vocabulary list at 24 months

Tree	Headband	I	Love	You
Miss	Purse	Coat	Hat	Move
Mess	Clown	Yellow	Mine	My
Turn	Puppy	Bugs	Ant	Boink
Vacuum	Sounds	Red	Shoes	Money
These	This	Pillow	Butterfly	Flower
Dragon	Dragonfly	Sheep	Beatle	Spider
Ladybug	Barney	Caillou	Big Bird	Cookie
Zoe	Elmo	And	Ernie	Baby
Cry	Elephant	Smile	Pumpkin	Snowman
Santa	Minnie Mouse	Bee	Bell	Corn
Clock	Bird	Egg	Drum	Earring
Bracelet	Makeup	Mitten	Flower	Hippo
Ice	Ice cream	Lion	Tiger	Bear
Lollipop	Nest	Owl	Monster	Pig
Parrot	Queen	Rainbow	Turtle	Horn
Spider	Xylophone	Yogurt	Yo-yo	Rabbit
Zebra	Snake	Knife	Cake	Pie
Peep	Hot	Tea	Bat	Upside down

Mole	Fire	Bye	Books	Later
Brush	Turn	Grapes	Papa	Got
Hand	Dirty	Open	Move	Color
Broke	Roll	Stop		

### **Discussion**

First, it is necessary to note that the data is far less complete than ideal. However, it is a good snapshot of not only my own language development, but what my family thought was important to include in the record. Families typically don't keep as detailed records as children get older, so even as incomplete and vague as it is, it is unusual to have access to this sort of data. Longitudinal studies are far less common than cross-sectional studies, so data over the span of time that my parents kept records for is unusual but beneficial.

The data indicates that my language development was not delayed. Typically individuals have a vocabulary of at least 50 words by the time they turn 2 years old. ASHA indicates that a child saying less than 50 words at 2 years old is a sign of a language disorder (American Speech-Language-Hearing Association, n.d.). In my case, I have a record of over double that in just nouns. Given how language typically develops and the fact that I was putting words together at that point, it can be assumed that I had a vocabulary that also included an assortment of verbs, some of which had been recorded earlier as seen in Table 1, leading to a larger vocabulary than the data recorded. While I do not have a language sample from the time period the data is from, based on the phrases written, the morphemes I used correctly were age-appropriate if slightly advanced. I was correctly using sentences associated with Brown's Stage 1 at the

appropriate age (Brown, 1973). These sentences are typically very simple but demonstrate communicative intent. As I grew older I started using morphemes of the appropriate stage for my age (Bowen, 2019).

While the phrases progress appropriately, some do fall outside the norms. The use of the contractible copula at 21 and 31 months is odd, typically that develops when a child is 3 or 4 years old in Brown's Stage V (Bowen, 2019). In other cases, particular phrases like the ones that were noted at 25 and 28 months, while advanced, are far more likely to have been part of rote phrases, rather than morphemes that I used consistently.

Despite all the risk factors, the data indicates that I did not have a language delay as a child. Instead, the data has led me to the idea that my environment may have played a major role in my language development. Children tend to pick up language through experiences and exposure, and unfortunately, twins often force caregivers to split their attention by virtue of there being two children to care for. Most parents work and while they may have family watch over them or hire a babysitter or a nanny to do so, typically there isn't one adult per kid for the vast majority of the day. As a result, children of multiple births receive less direct attention, a study conducted by Thorpe (2003) found that mothers were about half as likely to spend time one on one with their twins. I grew up in an advantageous circumstance, my grandparents took care of my twin and I, and my mother is a practicing speech-language pathologist. On top of the attention benefits of having an adult each, my mother ensured that my twin and I grew up in an environment that was very conducive for the development of language. She knows how language is supposed to develop and knows strategies and activities that help promote it.

While many of the biological effects and circumstances regarding birth have been

studied in regard to the twin typical language delay, factors like environment, split parental attention, and interactions with others are often overlooked in research. Most of the existing research instead focuses on data that is more easily measured, primarily prenatal factors, biology, and familial history. However, while those factors are far more easily studied, they heavily favor the nativist theory of language development. The nativist theory is in contrast with the behavioral theory, examples of which were previously mentioned include the studies conducted by Conway et al. (1980), Rendle-Short et al. (2015), and Bishop and Bishop (1998). All of those studies focused on postnatal factors. While the nativist theory has a large amount of research regarding the language development of twins, the behaviorist theory and the social-pragmatic theory lack research regarding this topic.

As a twin myself, I also found many issues with the data I came across in the various studies that I have read. While the data may not be misleading, nor incorrect, there was often something missing, factors left unidentified and unaddressed. Very little of the data addressed the primary questions I had when I originally started my research, ‘what is the effect that twins have on the development of each other’s language?’. As I read through papers I started to realize that too many assumptions were being made about twins, and the data and its presentation reflected that. This led me to wonder about the validity of the data in the studies I came across. If twins are treated as the norm, either cutting out any of the twins who didn’t match perfectly with the typical singleton traits or ignoring factors that are common in multiple births, are those norms valid? Twins usually experience many factors that aren’t typical for singletons, so why are norms meant for singletons based on data collected from twins? If the data involving twins treat the twins

as a single data point, what gets lost in the average? If monozygotic and dizygotic are categories in the data without any DNA or zygosity testing to back it up, can we be sure that the twins were sorted correctly?

My own experiences regarding language development indicate the importance of a language-rich environment and training parents on how to implement it. Early parent, or guardian, implemented language interventions are beneficial, even when the child in question does not have a language delay or anything indicating that one may develop. In my own case, I saw myself picking up words from new toys and new experiences. For example, at 3 years and 9 months I was familiar with portions of human anatomy. This interest stemmed from an anatomy coloring book my mother had purchased to help her with her human anatomy class in college which she kept. I found the book and thought it was a regular coloring book. My mother took the opportunity to teach me some basic anatomy which then became an interest, supported by various age-appropriate books I received from my family on the subject. Environment and play have a great impact on a child's vocabulary. Training parents to interact with their child, to follow their child's lead and interests, and how to change their child's environment to better provide language learning opportunities is beneficial. This is also supported by existing research regarding socioeconomic status and language development. In families with lower income there are often significantly less language learning opportunities as there is significantly less talking in lower income households. In a year "children from professional families would have heard 4 million utterances, and children from welfare families would have heard 250,000 utterances" (Roseberry-Mckibbin, 2001). This also compounds with the idea that families with disposable income can afford to take their children to new environments,

like the zoo or the aquarium, more often and would be able to afford more books and toys that would prompt more language development.

### **Conclusion**

This particular case study is a snapshot of my own language development, based on records that my family kept. More similar research needs to be done, preferably using tests alongside language samples and parental notes for full conclusions to be made about the role of the environment and interactions in the language development of twins. However, this study took a step to start filling in the holes of the research into twin typical language delays, as most of the current studies are more quantitative focused. This study also brought my attention to the need for different norms between twins and singletons. While singletons are a good benchmark for twins, it's also important to note that twins, and other children of multiple births, grow up in unique circumstances that are not accounted for in the norms of singletons. In the future it would be beneficial to have a set of norms for the language development of twins, instead of just the norms for singletons or to create a modified version of the singleton norms that better reflect the age ranges twins meet the standards, similar to the existing modifications made for those born premature.

I walked into this project with the intention to learn about my own circumstances and how they compared to others, and I am walking from this project more knowledgeable about myself and about other twins. I would like to conduct more research in the future in regard to the language development of twins, but for now this is the first of many steps.

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