AN ANALYSIS OF THE USE OF AUXILIARY VERBS BY DEAF CHILDREN USING COCHLEAR IMPLANTS

by

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Abstract: Spontaneous writing samples of deaf children with cochlear implants were analyzed for auxiliary verb errors. These results were compared to norms of typically developing children.

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Introduction

According to the Collins English Dictionary (2012), an auxiliary verb is defined as, 'a verb used to indicate the tense, voice, mood, etc, of another verb where this is not indicated by inflection, such as English *will* in *he will go, was* in *he was eating* and *he was eaten, do* in *I do like you*, etc.' In other words, an auxiliary verb modifies the main verb. It is commonly known as a 'helper verb.' While auxiliary verbs alone do not carry much meaning, their use in a sentence can change the context or meaning of a message.

The acquisition of auxiliary verbs is one of the more complex aspects of language development (Theakston & Lieven, 2005). Many studies have conflicting data in the development of auxiliary verbs in spoken language. Wexler (1994) attempted to describe auxiliary verb development in his work on children's grammar, creating the Optional Infinitive (OI) Hypothesis. The OI Hypothesis states that from the beginning of expressive language development, children have the ability to identify finite verb forms, including auxiliary verbs. The OI Hypothesis suggests that children can correctly identify the person marking of these forms for correct subject-verb agreement, but fail to mark the tense correctly in all contexts until later in development.

The purpose of the current study is to analyze the spelling and use of auxiliary verbs in spontaneous writing samples of children with cochlear implants. This data will be compared to information on the development of auxiliary verb use by normal hearing children to look for similarities and/or differences in development, sequence, and timing. In other words, do deaf children with cochlear implants develop auxiliary verb use in writing along the same pathway and at the same rate as that of their hearing peers? If the data shows that auxiliary verbs development is delayed or different than hearing peers, remediation strategies may be discussed.

Past studies have identified children with hearing impairment as being low in vocabulary and reading levels, consequently it is hypothesized that the sample analysis will show lower than average writing abilities, specifically in terms of the use of auxiliary verbs. This hypothesis is supported by multiple reasons. Auxiliary verbs carry little meaning on their own, do not have strong auditory signals, may sound similar to each other, and carry few lip-reading cues.

Discussion of Language and Auxiliary Verb Development

Language development is an extremely complex, yet naturally occurring process. The acquisition of language has been studied carefully in an attempt to determine how young children learn to understand and use language without explicit teaching. Some of the most well-known and cited researchers of language development include Bloom, Chomsky, and Brown. While their research is not current, much of the data reported still holds relevance today. One of these classic resources on language development is *A First Language* by Roger Brown (1973). Brown created stages of expressive language development based on longitudinal visits that were broken down by the age of the children. Brown used language samples to identify when children develop specific grammatical structures, and to document the progression of their average length of utterances in relation to their age. The average mean length utterance (MLU) is computed to explain one aspect of typical language development. Brown's stages are based on an approximate value of 50% of children at that age using a target structure. The stages are as follows:

- Early I, MLU: 1-1.5, age: 12-22 mo.
- Late I, MLU: 1.5-2.0, age: 22-27 mo.
- Early II, MLU: 2.0-2.25, age: 27-28 mo.
- Late II, MLU: 2.25-2.5, age: 28-30 mo.

- Early III, MLU: 2.5-2.75, age: 31-32 mo.
- Late III, MLU: 2.75-3.0, age: 33-34 mo.
- Early IV, MLU: 3.0-3.5, age: 35-37 mo.
- Late IV, MLU: 3.5-3.75, age: 38-40 mo.
- V, MLU: 3.75-4.5, age: 41-46 mo.
- Post- V, MLU: 4.5+, age: 47+ mo.

Children usually say their first words around one year of age, with the MLU for children 12-22 months typically between 1 and 1.5 words. These stages progress in reliable steps and in the Early Stage III, between the ages of 31-32 months, children typically demonstrate an MLU of 2.5-2.75 words. This is the point in time where auxiliary verbs normally begin emerging. At this level, the utterances containing auxiliary verbs are simple, such as 'John *can* run,' or 'Sue *will* throw [the ball].' These utterances become progressively more complex, and in Brown's final stage, Post-V, children at the age of 47+ months are typically demonstrating an MLU of 4.5+ words. At this stage children are using indirect objects in declarative statements with auxiliary verbs such as, 'Sally *can* read Bill a book,' Children are also using inverted auxiliary verbs, which is a verb that precedes the subject, in interrogative sentences such as, 'Where *did* Lisa go?' (Brown, 1973).

While the average MLU of typically developing children remains consistent in additional studies, there is significant variation in findings regarding the development of auxiliary verbs in spoken language. Theakston & Rowland (2009) have produced multiple studies on the development of auxiliary verbs in spoken language, finding that auxiliary verbs are fairly easy to track due to their small rate of incidence. There is some evidence indicating that children exhibit fewer errors when using high-frequency auxiliary verbs, structures that occur more often in our

language. Because these auxiliary verbs are better understood by children, they often substitute the less understood low-frequency auxiliary verbs with high-frequency ones, producing a grammatical error.

Theakston & Rowland (2009) conducted a two-part longitudinal study examining auxiliary verb acquisition. In one section they explored the acquisition of the verb *to be.* In the second section they investigated the acquisition of the verb *to do.* Twelve children participated in the study. When it began the average age of the participants was 2 years 10 months; when the study was completed the average age of the participants was 3 years 6 months. The children took part in games every six weeks to evaluate their level of progression with these auxiliary verbs. Their use of these items was evaluated in declarative statements as well as in yes/no and wh-question forms.

Theakston & Rowland's (2009) data showed some differing results when analyzing the acquisition of the verb *to be* in two forms: *is* and *are*. The data suggests the word *is*, which is a high-frequency verb form, has similar levels of use in declarative statements and in yes/no and wh- question forms. However, when comparing the use of the word *are* in the declarative statements to its use in yes/no and wh-question forms the error levels differ, with more errors of omission occurring in the declarative statements and more errors of agreement occurring in yes/no and wh- question forms. The data was not consistent with findings of other studies which have shown "that children understand the relation between different forms for tense, number, and person, even at age 3;5" (p.1464).

The second part of the study performed by Theakston & Rowland (2009) analyzed various forms of the verb *to do,* as well as the modals *can* and *will.* This portion once again looked at the use of these verb forms in declarative statements and yes/no question forms. In

terms of correct usage, *can* was produced correctly most often, followed by *will*, then *does*, however the differences among the three were not significant. The authors found that when making positive statements children tended to use the items appropriately. When making negative statements however, the children's errors dramatically increased. One significant finding noted was the substitution of *is* for *does*, for example, 'Is the piggy drives the car?' resulting in a subject-verb agreement error. The data in this study indicates that the forms of the verb *to be (is* and *are)* develop independently.

The findings by Theakston & Rowland (2009) confirm data found in other studies which concluded that modals of the verb *to do* have a high rate of error. Though these studies used a small sample size, it is valuable to review data from their longitudinal studies, as they allow individual progress to be tracked rather than looking at data that combines different age groups and average abilities. Studies such as this indicate that though Brown's stages of language development do have significance, it is beneficial to look at multiple areas of research as there may be greater variability in the development and mastery of auxiliary verbs than is suggested by Brown's stages. Further research may help clarify if children with hearing loss follow the same pattern of spoken language and auxiliary verb development as that of their hearing peers.

"Most children who are born profoundly deaf or who become deaf before the age of 3 fall significantly behind their normal-hearing peers in their mastery of the surrounding oral language in its written, read, spoken, and signed forms" (Svirsky, Robbins, Kirk, Pisoni, & Miyamoto, 2000, p. 153). This statement has been supported by many studies over the years, but with the advent of cochlear implants is it reasonable to wonder whether there will be a significant change? This is a question that continues to need further assessment. With cochlear implant technology that is constantly being improved, combined with the impact of early identification

and early intervention, children are being implanted at younger ages and are receiving improved access to sound. The following studies were published in 2000 and 2009, but this may not reflect the impact of recent changes in the field. The advances are happening quickly and it is difficult for research findings to keep up with the technological improvements.

Svirsky et al. (2000) conducted a study with 23 children with cochlear implants. The children were assessed at approximately 4 months pre-implantation and then again at intervals of 6, 12, 18, 20, and 24 months post-implantation to track their language development. The data from the subjects was compared to results from a past study completed by Svirsky that examined 113 deaf children who do not use cochlear implants. Using tests, such as the Reynell Developmental Language Scales (RDLS), which is normed on 1,319 children with normal hearing, and the Phonetically Balanced Kindergarten (PBK) test, the authors' findings suggest that cochlear implants have a significant benefit on language development. The mean rate of language development of children with cochlear implants exceeded that of deaf children who did not use cochlear implants, and was close to that of normal hearing children. There was an achievement gap based on the children's chronological age and their language age, which is when they began accessing their primary mode of communication. The achievement gap represents the difference found in language abilities based on a child's chronological age compared to their language age. These results indicate that children with cochlear implants have an improved rate of language development, and many get close to that of their hearing peers, though still not equal to it.

Inscoe, ODell, Archbold, & Nikolopoulos (2009) assessed 45 children, all of whom were implanted between 10 and 36 months of age. The study was conducted when the children were between the ages of 4 and 6 years. Instead of looking at the children's current age, this study

assessed their ‘hearing age,’ which begins at the time their implant was activated. The average ‘hearing age’ of this sample was three years; therefore the data gathered was compared to data from typical three year olds. The children were assessed using the South Tyneside Assessment of Syntactic Structures. On this measure 26 of the children scored at or above the expressive spoken language grammatical level of normal hearing three year olds, and 19 children scored below this level. These children appear to be developing language close to the expectations for their ‘hearing age,’ indicating the benefit of cochlear implants in accelerating language development. However, these children are still far behind their hearing age-mates. One would expect that scores will continue to move closer to scores of their hearing peers with improving cochlear implant technology and a decreased mean age of implantation.

Discussion of Spelling and Writing Development

“The correlation between spelling and reading comprehension is high because both depend on a common denominator: proficiency with language” (Joshi, Treiman, Carreker, & Moats, 2008, p. 9). Because many deaf children struggle with language development, research suggests that they will consequently have difficulty with reading, spelling, and written language development. The following section will review spelling, reading, and written lanaguage development in both hearing and hearing-impaired children.

Spelling was once thought to be learned most efficiently through rote memorization. Recent studies have now suggested that visual memory may not be the best approach, as English is a sound based language. Sound and letter patterns are essential for the linguistic task of spelling. Good spellers have the ability to make sound-letter correspondences. Almost 50 percent of English words can be predicted from sound-letter correspondence (Joshi et al., 2008). This

research suggests that without the ability to detect the sounds, hearing-impaired students are at a disadvantage in becoming strong spellers.

Historically data has demonstrated that the average deaf adult reads at a 4th grade level, a potential result of the impact of a language deficit in a task based on a sound based language. However, with the advantage of cochlear implants, research is now showing that this may no longer be the norm. A study conducted by Geers & Hayes (2010) assessed the reading, writing, and phonological processing skills of 112 students ages 15.5 to 18.5 with cochlear implants. All students had ten or more years of experience using their cochlear implant. Assessments given were compared to a control group of hearing children. Two reading tests were administered to all the students in this study: the Peabody Individual Achievement Test- Revised (PIAT-R), which assesses reading recognition and reading comprehension and the Test of Reading Comprehension (TORC), which assesses reading comprehension. 47% of the students scored within or above the average range on the PIAT-R and 66% of the subjects in the study scored within the average range on the TORC.

On assessments of spelling and writing skills, the results were not as positive. The subjects were given a picture spelling test in which 100 familiar words were selected. The words varied in length and complexity and were represented in the form of a photograph, drawing, or cartoon. The participants were instructed to name the item and then spell it. On the picture spelling test, 67% of the items were spelled correctly by the deaf students. This is less than the 80% spelled correctly by the hearing control group. Writing was assessed with the National Technical Institute for the Deaf (NTID) Scoring. Each subject was asked to write a descriptive essay that was scored on organization, content, language use, and vocabulary use. The students with cochlear implants had a mean score of 53.5/100, while the hearing control group had a

mean score of 69.3/100. These scores indicate that less than half of the cochlear implant students fell within 1 standard deviation (SD) of the hearing control group in their assessed writing skills (Geers & Hayes, 2010).

Another long-term study by Archbold, Harris, O'Donoghue, Nikolopoulos, White, & Richmond (2008) analyzed the reading abilities of students with cochlear implants through assessments administered at 5 and 7 years post-implant. The Edinburgh reading test, which is normed on hearing children, assesses vocabulary, sequencing, and reading comprehension. The authors divided the students into two groups, those who were implanted before 48 months of age, and those implanted after. The results charted students' net reading ages. Those who were implanted before 48 months of age fell into the average range when compared to their age-matched peers at both 5 and 7 years after implantation. Conversely, those implanted after the age of 48 months demonstrated a significant delay in reading at both 5 and 7 years post-implant. For both groups, reading scores decreased from 5 years to 7 years, indicating difficulty with the transition from learning how to read to reading for a gain of information.

For both hearing and hearing-impaired children, very little research has been conducted on auxiliary verb development in written language. This makes analysis and comparison of data difficult. Therefore, it is useful to examine textbooks that teach written language development to generate an expected sequence of development based on age of presentation. This can give an indication of when specific auxiliary verb items were expected to be used in children's written language development. Using the Silver, Burdett, & Ginn *English* series auxiliary verb work was identified at various levels. At the second grade level, simple activities were presented to help classify the difference between *is* and *are*, *was* and *were*, *has* and *have*, and finally, *did*, *do*, and *does*. The textbook uses basic charts that sort the items into categories of time (now or in the

past) and number (one or more than one). This allows children to use a sentence's context to determine what word is appropriate (Ragno, Toth, & Gray, 1989).

The third grade level *English* textbook by Silver, Burdett, & Ginn is very different in its presentation of information. Instead of simple charts, there are definitions and examples of the rules for when to use certain forms of the verb *to be.* It also introduces the term 'helping verbs' and indicates that *have, has,* and *had* are 'helping verbs.' The text defines a helping verb as one that 'works with the main verb' (Ragno, Toth, & Gray, 1985, p.196). This differs from the second grade textbook as it provides more detailed descriptions as to why we use these verb forms in the way we do. Many examples are given to further promote understanding of the definitions. One may generalize from these textbooks that children are expected to know *how* to use auxiliary verbs correctly by second grade (7-8 years old) and understand *why* they are used by third grade (8-9 years old).

Participants

The current study contains data previously gathered by Treiman & Hayes as a part of a larger study that researched the spelling skills of children with cochlear implants (Hayes, Kessler, & Treiman, 2011). The sample is comprised of students' spontaneous writing samples from six auditory-oral schools for deaf and hard of hearing children across the United States. Participating schools included: The Moog Center for Deaf Education (St. Louis, MO), Central Institute for the Deaf (St. Louis, MO), St. Joseph Institute for the Deaf (St. Louis, MO), Child's Voice (Chicago, IL), Desert Voices Oral Learning Center (Phoenix, AZ), and Sunshine Cottage School for Deaf Children (San Antonio, TX). 52 children, 26 males and 26 females, with cochlear implants submitted multiple writing samples. All students' primary mode of communication was oral language. The range of ages was 5 yr. 11 mo. to 11 yr. 8 mo. The age

range of implantation was 1 yr. 6 mo. to 7 yr. 6 mo., with the duration of use ranging from 11 mo. to 7 yr. The mean length of cochlear implant use was 5 years (Wolff, 2011).

Procedure

Participating schools were asked to submit children's spontaneous writing samples as a part of their typical classroom schedule twice a month. The topics, or lack thereof, depended on individual classroom routine; they were not prompted by the researchers. The teachers were instructed not to correct the work or assist the students in any way, including spelling and grammar. The students then read their samples aloud and the teachers made note of any pronunciation differences found between what a child wrote and how it was read. Further detail of the procedures can be found in the Appendix. The students' samples, as well as the differences in pronunciation noted by the teacher, were entered into a Microsoft Excel spreadsheet. (Wolff, 2011).

Scoring Procedure

The data collected by Treiman & Hayes was compiled into a Microsoft Excel spreadsheet that contained the child's writing sample (including grammar and spelling errors) as well as their pronunciation of the words (Hayes, et al., 2011). To analyze each sentence that contained an auxiliary verb, I began by coding groups of auxiliary verbs that appeared in the read-aloud samples. The color codes were as follows: red- have/has/had, blue- be/is/am/are/was/were, yellow- will/would, green- does/do/did, and orange- can/could/should. The sentences that had an auxiliary verb marked by the assigned color were then studied individually. Looking at each written sample, I determined whether the auxiliary verb was spelled correctly and/or used correctly within each sentence. This information was converted into tables and examined for amount of use within the sample and correct spelling and usage of the auxiliary verbs.

Results

The following results were gathered in an attempt to determine if students with cochlear implants are able to correctly spell and use auxiliary verbs. Results will be classified in the following manner: 0-50% accuracy- below average, 51-75% accuracy- average, 76-85% accuracy- above average, 86-100% accuracy- exceptional. The following data breaks the auxiliary verbs into categories for further analysis.

Have/Has/Had

The auxiliary verbs *have, has,* and *had* occurred more than 260 times throughout the sample. In terms of being spelled correctly, the verbs fell into the exceptional classification. These auxiliary verbs fell into the average range for correct usage. Table 1 shows this data, as well as for the individual words *have, has,* and *had.* These verbs are defined as, "to possess; own; hold for use; contain" (http://www.dictionary.com, 2012). *Have* is the plural, present tense form of the verb, *has* is the singular, present tense form of the word, and *had* is the past tense form used for both plural and singular tense.

Have appeared over 130 times throughout the sample. The results indicate that *have* fell into the exceptional category for spelling. A pattern occurred in the spelling errors of the item being spelled as 'hafe' or some other variation of the word using the letter 'f,' as well as omitting the 'e.' An example of a sentence with a spelling error is as follows, "Ater subway we will *hafe* for Halloween party" [After Subway we will have for Halloween party]. In terms of correct usage, *have* fell into the average range. A typical error included using the word when it should be its singular partner *has*. An example of it being used in place of *has* is demonstrated with this sample, "Mrs. Spevak *have* a big black paper" [Mrs. Spevak *have* a big, black spider]. A

sentence demonstrating correct usage and spelling is seen here, “In winter you can *have* a snow ball fint” [In winter you can *have* a snowball fight].

Has was used less than 50 times throughout the sentences. The auxiliary verb was spelled correctly in every occurrence, which qualifies *has* for the exceptional classification. This auxiliary verb had the highest spelling percentage from the category of *have, has,* and *had. Has* fell into the above average range for correct usage, nearly making it into the exceptional category. The following sentence demonstrates the verb being spelled and used correctly, “My dog Wrigley *has* a brathday tomoro” [My dog, Wrigley, *has* a birthday tomorrow]. The most common error in use included substituting the item with its plural counterpart of *have*. This error is shown in this sample, “Groundhogs *has* another name called woodchuck and they eat fruits vegtabes grass bugs and clovers” [Groundhogs *has* another name called woodchuck and they eat fruits, vegetables, grass, bugs, and clovers].

The auxiliary verb *had* was identified over 75 times throughout the sample. In terms of spelling, *had* fell into the exceptional category. One example of a spelling error is, “He canot do it Mom *hab* to help” [He cannot do it, Mom *had* to help]. *Had* fell into the exceptional range for correct usage, with the highest percentage correct in this grouping. An example of *had* being used incorrectly is as follows, “Do you *had* money for train tiket?” [Do you *had* money for train ticket?]. A sentence that was both spelled and used correctly is, “I *had* ice cream and I *had* cupcake” [I *had* ice cream and I *had* cupcake].

Be/Is/Am/Are/Was/Were

The grouping of *be, is, am, are, was,* and *were* contained the most amount of auxiliary verbs tracked, as well as being the largest occurrence within the sample. The verbs were used over 1000 times throughout the writing sample. As a group, the auxiliary verbs fell into the

exceptional classification for both spelling and usage. Table 2 shows this data, as well as for the individual words *be, is, am, are, was,* and *were. To be* can be defined as, 'to exist or live" (http://www.dictionary.com, 2012). The past tense singular counterpart is *was,* and the past tense plural version of the item is *were.* These past tense items fall under the definition of, "to take place; happen; occur" (http://www.dictionary.com, 2012). The present tense word *am* refers to one's self, *is* and *are* are the singular and plural forms of the word respectively and can be defined as, "occupying a place or position" (http://www.dictionary.com, 2012).

Be occurred over 50 times throughout the sample. The verb was misspelled one time, qualifying it for the exceptional range. The only spelling error was in the following sentence, "He thing that flowe pot will *bee* red" [He think that flower pot will *be* red]. In terms of usage *be* fell into the exceptional category. An example of *be* used both correctly and incorrectly can be seen in the following sentence, "DAD and boy *be* hutn becus They will *be* sad" [Dad and boy *be* hunting because they will *be* sad]. A correctly spelled and used occurrence is shown here, "I will *be* a prince in the parade" [I will *be* a prince in the parade].

The word *is* occurred more than 500 times throughout the sample, which was by far the highest occurrence of any auxiliary verb. A sentence that was both spelled and used correctly is as follows, "The Grondhog *is* slepn in the wintr" [The groundhog *is* sleeping in the winter]. Based on the results the verb fell into the exceptional classification for both spelling and usage. The majority of the usage errors were plural versus singular issues. This type of error can be demonstrated with this sentence, "Then all of the children *is* ready to go to there classrooms" [Then all of the children *is* ready to go to their classrooms].

Am was found in the sample less than 30 times, the smallest occurrence of this category. The verb was spelled correctly every time, giving it a classification of exceptional. *Am* also fell

into the exceptional range for correct usage. This makes *am* the most correct auxiliary verb, in terms of overall spelling and usage, of all the auxiliary verbs. An example of a sentence that was both spelled and used correctly is as follows, “I *am* ging to Roloy rroom” [I *am* going to Roloy’s room].

The auxiliary verb *are* was used over 100 times throughout the sentences. In terms of being spelled correctly, *are* fell into the exceptional range. A sentence that shows the item spelled incorrectly can be seen here, “Mom and breat and kate *ar* eitten at the pitnik wiyzill dad is bildding a tet” [Mom and Brett and Kate *are* eating at the picnic while dad is building a tent]. *Are* fell into the average range for correct usage. A common usage error was using *are* in place of *our*, which is demonstrated with this sentence, “We made a Glider and a Dart in *are* class room” [We made a glider and a dart in *our* classroom]. A sentence containing *are* that was spelled and used correctly is shown here, “Oh you *are* a sille cat” [Oh you *are* a silly cat].

Was occurred over 340 times throughout the sentences. The auxiliary verb fell into the exceptional classification for correct spelling. This sentence demonstrates *was* being spelled and used correctly, “The boy *was* so mad because He couldn’t throw the snowman” [The boy *was* so mad because he couldn’t throw the snowman]. An example of the verb being spelled incorrectly can be seen in this sample, “Then the dog *wus* happy” [Then the dog *was* happy]. In terms of correct usage, *was* fell into the exceptional category. A sentence that used *was* incorrectly can be seen here, “Jakie almost died so his friends *was* praying” [Jackie almost died so his friends *was* praying].

The auxiliary verb *were* was found less than 40 times in the writing sample. This verb fell into the above average range for correct spelling. This sentence demonstrates an incorrect spelling, “Then we *wer* wallkgeer farthr” [Then we *were* walking farther]. *Were* fell into the

above average range for correct usage, almost qualifying for the classification of exceptional. A usage error can be seen in this sentence, “The girl *were* rode on the horse” [The girl *were* rode on the horse]. This sentence shows the auxiliary verb being spelled and used incorrectly, “Ones thre *where* a monkey named crazy” [Once there *were* a monkey named Crazy]. This is an example of *were* being spelled and used correctly, “Ms. Spevak did not knon the lepurcun came to are room while we *were* at recess” [Ms. Spevak did not know the leprechaun came to our room while we *were* at recess].

Will/Would

Will and *would* occurred over 260 times throughout the sample. For both correct spelling and usage the auxiliary verbs fell into the exceptional category. Table 3 shows this data, as well as for the individual words *will* and *would. Will* is both the singular and plural form of the auxiliary verb *be* and *would* is the singular and plural past tense form of the word.

The word *will* was identified over 140 times throughout the sample. An example of a sentence that correctly used and spelled *will* is as follows, “I *will* need a cape and a crown” [I *will* need a cape and a crown]. In terms of correct spelling, *will* fell into the exceptional range; the verb was misspelled three times. An example of a spelling error in a sample is, “1 wekeie on noex FRiDay I *with* go on fiettiset” [One week on next Friday I *will* go on vacation]. *Will* fell into the exceptional category for correct usage. A usage error associated with tense is demonstrated with this sentence, “Miss Cristy said if we had a contest and was one of the juges she *will* pick me to be a wacky winner” [Miss Christy said if we had a contest and was one of the judges she *will* pick me to be a wacky winner].

Would was used less than 5 times within the over 3000 sentences. While it was used correctly every time, indicating a score in the exceptional range, the verb was spelled correctly

once, qualifying it for the below average classification. The one occurrence of the item spelled and used correctly is, “If they see us then we *would* have to go back to the platotn” [If they see us then we *would* have to go back to the plantation]. The misspellings included: whould, wold, and wob. An example of a sentence with the item *would* spelled incorrectly is, “They ring the bell and say *whould* you like to hear a joke?” [They ring the bell and say *would* you like to hear a joke?].

Does/Do/Did

The auxiliary verbs *does, do,* and *did* occurred over 75 times throughout the sample. This category contained the smallest occurrence in the sample. These auxiliary verbs fell into the exceptional classification in terms of correct spelling. The correct usage amount qualified the verbs for the above average range. Table 4 shows this data, as well as for the individual words *does, do,* and *did.* The verb *do* is defined as, “to perform (an act, duty, role, etc.)” (http://www.dictionary.com, 2012). *Do* and *does* are the present tense forms of the auxiliary verb, with *do* representing the first person, plural form and *does* representing the second person, singular version. The verb *did* is the both plural and singular past tense form of the auxiliary verb.

Does occurred less than 10 times in the sentences. The verb was spelled correctly 2 times, indicating a score in the below average category. A sentence that contained *does* spelled incorrectly can be seen here, “In the winter the amlle hebmat the bare and bat hebmat in the café the deer *dus* not hebmat” [In the winter the animals hibernate, the bear and bat hibernate in the cave, the deer *does* not hibernate]. In terms of correct usage, *does* fell into the above average range. The only sentence that demonstrated an incorrect use of the verb, a tense issue, was, “We ate snack and went to sleep and the owner came to her house and she *does* not feel like taking

slaves" [We ate snack and went to sleep and the owner came to her house and she *does* not feel like taking slaves]. An occurrence of the item spelled and used correctly is, "It does look very cool" [It does look very cool].

The auxiliary verb *do* was found less than 40 times within the writing samples. A sentence that contains the verb spelled and used correctly is, "Hi Ester Bunny I have some eggs for you and *do* you want to have a glass of water?" [Hi Easter Bunny, I have some eggs for you and *do* you want to have a glass of water?]. The auxiliary verb fell into the exceptional classification for correct spelling. The only spelling error is shown in this sentence, "How *bo* you make a shoe?"[How *do* you make a shoe?]. *Do* fell into the average range in terms of correct usage. Subject-verb agreement errors were the most common type of usage errors occurring with the verb *do.* An example of two subject-verb agreement errors in one sentence is, "Sadie kicking the water becase she *do* not like that and she *do* not went to get wet" [Sadie kicking the water because she *do* not like that and she *do* not want to get wet].

Did occurred in the sample less than 40 times. In terms of correct spelling, the auxiliary verb qualified for the above average category. This sentence demonstrates a spelling error, "I *di* not like the blooe pieele" [I *did* not like the bloody people]. A common error found was the letter reversal of 'd' to 'b,' for example, "*bib* the grille ent the fish?" [*Did* the girl eat the fish?]. The auxiliary verb fell into the exceptional range for correct usage. A sentence containing *did* correctly spelled and used is, "The boy lost his family so he looked for his family but he *did* not find his family" [The boy lost his family so he looked for his family but he *did* not find his family].

Can/Could/Should

The category of *can, could,* and *should* was the final grouping studied. These items occurred more than 90 times throughout the writings. For both correct spelling and usage, these auxiliary verbs qualified for the exceptional classification. Table 5 shows this data, as well as for the individual words *can, could,* and *should. Can* is defined as, "to be able to have; have the ability, power, or skill to" (http://www.dictionary.com, 2012). *Can* is a present tense verb that can be used in the singular or plural form. *Could* is the past tense form of the word *can.* The item *should* is defined as, "must; ought" (http://www.dictionary.com, 2012). It is used as both a singular and plural past tense version of the word.

Can was used more than 80 times throughout the sample, by far the most from this category. It was spelled incorrectly two times, qualifying it for the exceptional classification. A sentence with the auxiliary verb spelled incorrectly is seen here, "Lee and his mom side *cna* we go to grmog hous now?" [Lee and his mom said '*can* we go to grandma's house now?']. *Can* fell into the exceptional range for correct usage. An example of a usage error can be seen in this sentence, "He thought that he *can* climb on the tree" [He thought that he *can* climb on the tree]. A sentence that was both spelled and used correctly is as follows, "You *can* hunt turkeys with guns or bow and arrow" [You *can* hunt turkeys with guns or bow and arrow].

The auxiliary verb *could* was used less than 10 times in the sample. In terms of correct spelling, *could* qualified for the average classification. The spelling errors found were cunld, crul, and crnd. This sentence demonstrates one of the spelling errors, "She ran as fast as she cunld" [She ran as fast as she *could*]. *Could* was used correctly in every occurrence, resulting in a classification of exceptional. An example of a correctly spelled and used sentence can be seen here, "Then we both went to a small house to get two bags of corn and two bottles of milk so we

could feed the animals" [Then we both went to a small house to get two bags of corn and two bottles of milk so we *could* feed the animals].

Should was found one time in the sample, which was the smallest occurrence of all auxiliary verbs. The verb was spelled incorrectly, falling into the below average range, but was used correctly, qualifying it for the exceptional category. The sole sentence containing the item *should* can be seen here, "Emily A said we *shoud* put it outside" [Emily A said we *should* put it outside].

Total

The writing samples contained over 3000 sentences. On average, an auxiliary verb was used in more than one out of every two sentences. This average includes some examples of auxiliary verbs used more than once in a single sentence. In terms of both spelling and usage, the auxiliary verbs studied fell into the exceptional range. Table 6 shows this data.

Discussion

The purpose of this study was to determine whether deaf children with cochlear implants have writing skills, specifically auxiliary verb usage, on par with their hearing age-mates. The results of the study are surprisingly positive. Based on previous expectations in public schools, *English* textbooks have indicated that children should have a basic understanding of how to use auxiliary verbs by 8 to 9 years of age and an understanding of why they are used by 9 to 10 years of age. The participants in the sample studied ranged in age from 5 yr. 11 mo. to 11 yr. 8 mo. The high occurrence of auxiliary verbs in the sample, as well as an over 85% accuracy of use indicates that the development of auxiliary verb use in this group aligns with the expectations for use of these skills by typically hearing children. The percentages of spelling and usage accuracy

indicate that the children in the sample correctly spelled and used auxiliary verbs in the exceptional range.

These results did not support my hypothesis that children with cochlear implants would have lower than average abilities when using auxiliary verbs in their writing. This could be attributed to multiple factors. One factor is the fairly long average length of cochlear implant use of five years. The children in this study had been using their device for a long enough period of time to use auditory learning skills effectively. Another factor is the improved access to sound that cochlear implants now provide. Two reasons for the hypothesis was the lack of a strong auditory signal of auxiliary verbs, as well as the acoustic similarities some of these verbs have amongst themselves. It is possible that cochlear implants are now providing enough access to sound that the acoustic signal of auxiliary verbs is no longer a concern.

I would expect that studies similar to this in the future would result in even higher correct spelling and usage percentages. This assumption is due to the time period the data was collected as well as the age of implantation in the subjects (1 yr. 6 mo. to 7 yr. 6 mo.). Cochlear implant technology is quickly progressing and advancing. It is vital to continue research with updated information that represents the most recent use of technology. In the past, children were undergoing cochlear implant surgery at a later average age than today. Current FDA regulations allow for children 12 mo. of age to undergo implantation, however there are times when earlier implantation is possible. The combination of better cochlear implant technology, earlier average age of implantation, and early intervention services will likely result in better language, reading, and writing skills of children with cochlear implants. Future research is also needed on typically hearing children’s development of auxiliary verbs in written language. This data would provide

stronger information to compare with hearing-impaired children as opposed to looking at structures in *English* textbooks.

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Tables

Table 1

The Occurrence and Frequency of Correct Spelling and Usage of the Auxiliary Verbs: Have, Has, Had.

	Total Occurrence	Spelled Correctly	Used Correctly
Have/Has/Had	263/3030 = 8.7%	250/263 = 95.1%	208/263 = 79.1%
Have	138/3030 = 4.6%	127/138 = 92.0%	93/138 = 67.4%
Has	48/3030 = 1.6%	48/48 = 100.0%	41/48 = 85.4%
Had	77/3030 = 2.5%	75/77 = 97.4%	74/77 = 96.1%

Table 2

The Occurrence and Frequency of Correct Spelling and Usage of the Auxiliary Verbs: Be, Is, Am, Are, Was, Were.

	Total Occurrence	Spelled Correctly	Used Correctly
Be/Is/Am/Are/Was/Were	1080/3030 = 35.6%	1046/1080 = 96.9%	942/1080 = 87.2%
Be	53/3030 = 1.7%	52/53 = 98.1%	50/53 = 94.3%
Is	508/3030 = 16.8%	501/508 = 98.6%	440/508 = 86.6%
Am	29/3030 = 1.0%	29/29 = 100.0%	28/29 = 96.6%
Are	113/3030 = 3.7%	105/113 = 92.9%	83/113 = 73.5%
Was	342/3030 = 11.3%	330/342 = 96.5%	311/342 = 90.9%
Were	35/3030 = 1.2%	29/35 = 82.9%	30/35 = 85.7%

Table 3

The Occurrence and Frequency of Correct Spelling and Usage of the Auxiliary Verbs: Will, Would.

	Total Occurrence	Spelled Correctly	Used Correctly
Will/Would	151/3030 = 4.98%	145/151= 96.0%	134/151= 88.7%
Will	147/3030 = 4.9%	144/147= 98.0%	134/151= 88.7%
Would	4/3030 = 0.1%	1/4= 25.0%	4/4= 100.0%

Table 4

The Occurrence and Frequency of Correct Spelling and Usage of the Auxiliary Verbs: Does, Do, Did.

	Total Occurrence	Spelled Correctly	Used Correctly
Does/Do/Did	76/3030 = 2.5%	66/76 = 86.8%	59/76 = 77.6%
Does	5/3030 = 0.2%	2/5 = 40.0%	4/5 = 80.0%
Do	35/3030 = 1.2%	34/35 = 97.1%	22/35 = 62.9%
Did	36/3030 = 1.2%	30/36 = 83.3%	33/36 = 91.7%

Table 5

The Occurrence and Frequency of Correct Spelling and Usage of the Auxiliary Verbs: Can, Could, Should.

	Total Occurrence	Spelled Correctly	Used Correctly
Can/Could/Should	92/3030 = 3.0%	86/92 = 93.5%	87/92 = 94.6%
Can	82/3030 = 2.7%	80/82 = 97.6%	77/82 = 93.9%
Could	9/3030 = 0.3%	6/9 = 66.7%	9/9 = 100.0%
Should	1/3030 = 0.0%	0/1 = 0.0%	1/1 = 100.0%

Table 6

The Occurrence and Frequency of Correct Spelling and Usage of All Auxiliary Verbs.

	Total Occurrence	Spelled Correctly	Used Correctly
All Auxiliary Verbs	1662/3030 = 54.9%	1599/1662 = 96.2%	1430/1662 = 86.0%

Appendix

How to Collect Written Language Samples

1. Twice a month, the teacher will provide a short opportunity for the children to create spontaneous written language samples. This should take approximately 10-15 minutes and should be conducted as consistently as possible and at the same time of the day (i.e. every other Friday afternoon or every other Monday morning). *The administration of these written language samples should not interfere with the regular school day or with the typical written language or spelling curriculum already in place in the classroom.*
2. The teacher will ask the children to write a story without any help, "just for fun." The teacher may provide them with a variety of prompts to keep the activity interesting. For example, the teacher may use a picture, a sequence story, a conversational topic, or any other type of story starter that is of high interest to the children.
3. The teacher then allows the children to write stories without help in spelling or syntax. If a child asks how to spell a word, the teacher may encourage the child to give it his or her best attempt and not to worry about making mistakes. It is very important for the teacher to make the activity as stress-free as possible so that the children actually enjoy expressing their ideas without worrying that they will be corrected.
4. After the children are finished, the teacher asks each child to read or sign their story. The teacher should note any words that are misspelled by writing the correct spelling above the misspelled word. This can be done as the child is reading the story and used as a teaching moment. Also, if the child says or signs a sound or word that he didn't write, especially word endings such as *s, ed, ing, es*, etc., the teacher should write what the child said or signed. For example, if the child wrote the word **plaey** and said **played**, the teacher should make the following notes:

   plaey
   play (said "played")

   She may also want to note any unusual pronunciations in parentheses. For example, if the child wrote **fireplast** and said **fireplate**, the teacher should make the following notes:

   fireplast
   fireplace (said "fireplate")

   The teacher should also note any words that would be difficult for an outside reader to understand without explanation (i.e. names of family members, pets, friends, places, etc.). Additionally, the teacher should note if any of the words the child has spelled are displayed somewhere in their immediate environment. For example, if a child has written a story about Halloween, the teacher should note if there is a large sign above the board that reads, "Happy Halloween," so the researcher knows that the child had access to the correct spelling of those words.
5. After the samples have been written, the teacher completes the "Collection Form" and follows the guidelines listed. The teacher will fill out a Collection Form each time she or he collects samples. The teacher will also please note any changes to the child's information throughout the course of the school year (i.e. audiology or educational issues).
6. The teacher copies the samples, keeping the original for his/her files, and puts the Collection Forms and samples in a postage-paid envelope. These should be mailed after each collection, approximately every two weeks.

Written Language Samples Collection Form

Please fill out this form each time you collect samples. You may use one form for each group of students.

Teacher:_____ Date of Samples: _____

Children (first names only): _____

- ☐ Ask the children to write a story "just for fun" with no teacher corrections. What prompt did you use? (e.g. sequence story, conversational topic, etc.)

  _____

- ☐ Ask each child to read/sign his or her story to you.
- ☐ Note on each child's sample any misspelled words or words that the child said or signed differently than he/she wrote. Also, note words that may be difficult for a new reader to figure out, such as names of family members, pets, place, etc.
- ☐ Were there any words in the sample that the child may have been able to copy from displays in the room? (e.g. *Happy Halloween, September, Welcome*, etc.)

  _____

- ☐ Write the child's first name on each sample.
- ☐ Write the date on each sample.
- ☐ Make a copy of each sample. Please keep the original for your files.
- ☐ Attach this page to the group of samples and put in the postage paid envelope to be mailed every two weeks, if possible.
- ☐ If applicable, did any child have any audiological issues since the last sample? (e.g. device malfunction, missing equipment, etc.) If so, please note here:

  _____

  _____

  _____

- ☐ Note any additional comments here:

  _____

  _____

  _____