## Drilling activities as means of bilingualism in children with DS


#### Abstract

There have been a lot of hypotheses at the time of talking about Bilingualism in children with DS. Those are basically divided into two groups: (1) The ones who support it; and (2) the ones who do not. According to surveys, the majority of experts do believe in Bilingualism among this population, in spite of that, there is little investigation on the field. Along this case study, different studies about bilingualism in children with SLI were analyzed. As being part of the educational field, we consider important to do research and develop strategies to guide this population when acquiring an L2. The main strategy supported on the paper are drilling activities, these were used as means of guiding the participant to expand his vocabulary in a foreign language. Also, a set of data collection instruments such as questionnaires, interviews, and pedagogical interventions were implemented. Results showed that the use of drilling tasks helped the participant to acquire the basic English vocabulary taught.


Keywords: Down Syndrome, drilling activities, learning strategies, bilingualism.

## Statement of the problem

## Introduction

Specific Language Impairments (SLI) such as Autism, Aphasia or Down Syndrome (DS) are cognitive conditions that affect the brain and its normal development. People with DS have cognitive disabilities due to a mistake in the division of the chromosomes of the body which are the ones that carry the hereditary information or genetic material (Neitzel,Trimborn, 2007). According to Stanford Children's Health (n.d), normally in reproduction, the mother's cell and the father's cell start out with the usual number of 46 chromosomes. Both cells then go through a cell division in which the 46 chromosomes are divided into two parts, so that both the egg and the sperm cells have 23 chromosomes each. When a sperm with 23 chromosomes fertilizes an egg with 23 chromosomes, the baby will have a complete set of 46 , half from the father and half from the mother. Nonetheless, sometimes an error occurs when the 46 chromosomes are being divided into halves, and an egg or sperm cell keeps both copies of the \#21 chromosome instead of just one copy. When this egg or sperm
is fertilized, the baby will have three copies of the \#21 chromosome, which is called trisomy 21 , or Down syndrome. The features of DS are caused by that extra copy of chromosome \#21 being in every cell in the body.

As reported by Stanford Children's Health (n.d), children with DS have different health complications such as heart defects, intestinal malformations, visual impairments, hearing loss and thyroid problems. The degree of intellectual disability that accompanies Down syndrome varies widely. It ranges from mild, to severe. Moreover, people with DS has language-learning difficulties, especially expressive language problems (Kay-Raining Bird, Trudeau, Thordardottir, Sutton, Thorpe, 2005). Due to those language-learning difficulties the development of their language can be very delayed and as a result of that, several children with DS are suggested to avoid the exposure to a second language.

Bilingualism in children with cognitive language disabilities or, as some experts name it, SLI, is an under-studied topic (Kay-Raining Bird, 2008). According to some clinicians and experts, being exposed to two languages is detrimental for cognitively disabled children (Kremer-Sadlik, n.d). Some professionals counsel families to restrict input to a single language for children with DS because there are delays even when one language is being learned (Feltmate, Bird, 2008). Clinicians attempt to ensure that the child is exposed to "simplified" linguistic input in order to facilitate language learning and use. For these professionals simplified input means exposure to one language only, i.e. English (Kremer-Sadlik, n.d). Nonetheless, there are studies which give a hope to the ones dealing with those impairments; evidence from individual cases and studies indicate that children with DS can become bilingual (Buckley, 2002).

## Justification

According to the National Down Syndrome Society (n.d.). DS is the most common genetic chromosomal condition. One in every 691 babies in the United States is born with this condition, about 6,000 each year. This syndrome occurs in people of all races and economic levels, it is vital to develop methodologies to help them to overcome issues that they face when growing up in their educational setting.

The purpose of the following paper is to describe an investigation conducted in the field of bilingualism and people with cognitive impairments such as DS. The aim of the research was to find out if by using different strategies, people with DS can develop functions in a second language such as introducing themselves, counting and talking about their personal lives.

The importance of addressing this topic resides in the possibility to expand research about strategies to develop bilingualism in people with the syndrome.

## Objectives

This study is aimed at analyzing the English learning process of a Spanish -speaking 21-yearold man. Taking into account the different studies that have proved the ability that DS people have to acquire more than one language, and the hopes that those studies convey; the objectives of the investigation are:

1. To develop a methodology, by using drilling strategies, to teach a short English course to a participant with Down Syndrome.
1.1 To help the participant to improve his communicative English skills.
2. To gather more information about how DS people develop their linguistic and communicative skills in an L2.
3. To design more sources to support the investigation of the acquisition of communicative skills in people with DS.

## Research Question

With all the previously said, the research question for this project is: Is a person with Down Syndrome capable of learning basic communicative English functions through the use of drilling activities?

## Literature Review

The following is a compilation of all the documents selected for this literature review. It is subdivided in four groups: first, studies concerning special kids growing up in a bilingual context; second, works related to children growing in a monolingual context and the development of the their
communicative skills in two languages; third, works concerned with how bilingualism enriches language skills of SLI children; finally, documents explaining the right methodologies to use to teach people with DS.

## Children with SLI growing up in a bilingual context

The studies selected for this document showed that some of the authors stated at the beginning of the description of their papers that their participants were advised to avoid the use of two languages at any circumstances, Nonetheless, all of the documents rejected the idea and supported with investigations that children with SLI can acquire more than one language (Wilken, 2003).

That is the case of Al-Dubayan (2015) and Wire (2015) whose investigations demonstrated that there are no delays and negative impacts on the language development when Autistic children are exposed to more than one language and that being bilingual does not disturb the language development of children with SLI (Wire, 2015).

Along the investigation process, we could find a document that analyzed experiences of families with children with SLI that grew up a bilingual environment. Evidence demonstrated that there is a pattern in the development of language skills in those children. For instance, kids understand and speak the language that has prime significance in their first years; the second language is understood but not necessarily spoken. They start to use their L2 spontaneously at the age of five, and the basis of one language guides children to learn the second one (Wilken, 2003).

Other authors conducted investigations based on consequences of exposing children with SLI to only one language when growing up in a bilingual environment. Parks (2014), studied a Chinese family living in US that opted to avoid their L1 at home when talking to their son, but when talking among them Chinese language was used. The family and most of the cases in the study chose English as the language for their children to talk because of the
fear of damaging their children's language skills if they were exposed to two languages at the same time. If children are denied the possibility to develop their two languages, they will suffer social and psychological consequences because they will not feel part of either their family or their society (Parks, 2014). Another research of children with SLI in a bilingual environment but whose family avoided their L1 is the case of Kremer-Salik (n.d). Video recordings about family interactions were analyzed and findings demonstrated that the kids whose family members talked among them with their L1, and with the child only in the L2, showed frustration of not feeling part of their families.

On the other hand, Hyun, Roberti, (2014) studied a child whose family and context allowed him to use his two languages. Their qualitative case study intended to examine the external social, cultural factors and contexts that help to raise children with Autism Spectrum Disorder bilingually. Results showed that Autistic children acquire more than one language; and they choose the language depending on the context and the interlocutors just like any other bilingual children. External factors contribute to develop children bilingually; help them to maintain their culture, to feel part of their society and preserve their heritage and identity. Guiding a child into his two languages is essential for the child's overall development ( Hyun, Roberti, 2014).

Now, we will state some documents whose authors focused their studies on children with DS. These authors stated that children with DS can become bilingual, and they should not be excluded from a bilingual learning environment (Longard, 2009). As well Buckley (2002) establishes that there should be no doubts when allowing DS children to learn more than one language. She stated that an Italian woman with the syndrome could speak English, Italian and French with fluency and she proves that cognitive disabled people have the ability to acquire more than one language. There is a common delay in the production of speech and
grammar structures. However, enough exposure to both languages proves that it is possible to acquire them (Buckley, 2002).

Moreover, there are documents which supported that growing up in a bilingual context brings benefits for children with SLI. That is the case of Restrepo (2000) and Edgin, Kumar,Spanò \& Nadel (2011) who studied children with SLI exposed to two languages and children with the same conditions, but exposed to only one language. Their findings demonstrated that although with difficulty, children exposed to two languages have a better production of speech and better grammatical structures in their L1.

Finally, in the section of children with SLI growing up in a bilingual context, there are some authors who claimed that the environment where these children grow up is a fundamental factor when learning another language. Rondal (2000) and Burgoyne (2016) claimed that it is essential that the pupil can get in touch with the language to learn it successfully, their studies showed that the exposure to the language helps to develop a better understanding of the L2 in spite of the cognitive conditions of children with SLI.

## SLI children growing up in a monolingual context

In the subdivision of monolingual contexts and the development of bilingualism by children with SLI, various researchers first measured the cognitive abilities of their participants with different cognitive tests; besides, they collected language samples, and used several standardized language tests and parents questionnaires to determine children's proficiency in each language. Here, those documents will be briefly discussed:

Talking about the proficiency in L1 of children with DS, Kay-Raining Bird, Cleave, Trudeau, Thordartottir, Sutton, and Torpe (2005), conducted an investigation in which they used tests to determine the language abilities of bilingual children growing up in a monolingual context. The findings showed that some children with DS may be more successful than others in becoming bilingual, and that the first language proficiency was not affected by the second one (Kay-Raining Bird, Cleave, Trudeau, Thordartottir, Sutton, Torpe, 2005).

On the other hand, some other articles talk about the difficulties that children suffering from autism and Down syndrome go through when acquiring their mother tongue. That is the case of Sue Buckley (1993), who explains how children with DS learn a language and which difficulties they have to face in order to achieve this goal. "Their vocabulary grows slower than a regular child, in addition, they face problems with word order and grammatical structures" (Buckley,1993). The conclusions set up by the researcher showed that children with this kind of cognitive disability are always going to be behind when acquiring a language.

Lastly, another author that studied children with SLI growing up in a monolingual context, is Kay- Raining Bird (2014), who conducted a research in Canada about the impact of bilingualism in children with DS developing in a monolingual environment. Four groups were analyzed to explore the bilingual learning skills in children with the disorder. Researchers used a computerized fast mapping task presenting familiar and novel actors and actions. The participants went through 14 trials which involved unfamiliar nouns and verbs. They used cues such as $a$ for the nouns and ing for the verbs. Results demonstrated two aspects; first, they showed that unfamiliar nouns were more accurately fast mapped than verbs;and second, children with DS growing up in a monolingual setting can become functionally bilingual in spite of their expected cognitive delay(Cleave, Kay-Raining Bird, Trudeau, Sutton, 2014).

## Works related to how bilingualism enriches language skills in children with SLI

Studies also revealed that being exposed to more than one language is an enriching experience. How and why bilingualism could benefit children with SLI is a document that states that learning an L2 helps to develop the mind of a child with SLI (Roeper, 2012). Roeper's hypothesis is that all people are bilingual because every language contains ingredients from other languages. Contrary of what some experts believe, richer modules in one grammar help trigger modules in another language (Roeper, 2012). Children with DS or Autism identify basic structures in one language and use them as cues to help to develop structures in the L2. The two languages work together and boost each other. Exposure to two languages helps to improve children's cognitive and communicative skills (Roeper, 2012).

There are specific ways to guide the bilingual teaching process towards SLI children (Martinez, 1997). Bilingualism has shown a cognitive enrichment in people with disabilities, but when their development is in a monolingual context, some aspects have to be taken into account in order to guide the learners to develop language skills in the two languages. First, it should be an individualized process with the learner; second, the tutor has to plan and adapt to the specific needs the student has; third, the instructor needs to be aware of the learning pace and understand that the results will be delayed for their condition; fourth, affective, behavioral, motivational and sociological factors have to be taken into account for they contribute to the learning. Finally, it is vital to teach DS children or Autistic children to discriminate the use of each language according to the context (Martinez, 1997).

## Works related to methodology to teach people with DS

This last subdivision of the literature review is concerned with documents regarding methodologies to teach people with DS. Here are some documents that guided the pedagogical intervention for this research project:

According to Down Syndrome Association of West Michigan and their Educator manual (n.d.), students with Down syndrome can learn at any age. It is important to address their strengths (i.e., social understanding and interactions, visual processing, visual memory, use of gestures to communicate) and weaknesses as well (i.e., motor skill delays, speech and language delays, auditory processing, and working memory difficulties). The book cites Martinez (2002) who states that it is important to note that many students who display difficulties are able to overcome or compensate them with proper instruction.

The following table shows the strengths of DS students and strategies for instructors to guide them in the learning process:

| STRENGTHS | STRATEGIES TO TEACH |
| :--- | :--- |
| Visual Processing |  |
| DS students solve problems better if are <br> presented with visual information. They are <br> visual learners. | Instructor could: <br> Draw a graph/chart/picture. <br> Act problems out. <br> Make a step-by-step video |


| Repetition helps <br> Practice leads to retention, and automatization. <br> It is vital to take students to the point where <br> they require less conscious effort. | Review and repetition are crucial to success. <br> Allow more time for them to think. <br> Build on prior knowledge. Review learned concepts <br> at the beginning of each lesson. <br> Practicing concepts improves memory retrieval and <br> amount of effort to complete task. Practice skills in <br> different contexts and with varied materials. <br> Practice should be fun, varied in content, and <br> relevant to real life |
| :--- | :--- |
| Cccommodations <br> Context in which students develop tasks plays <br> an important role. | Minimize noise and distractions. <br> Use the student's real word interests and experiences. <br> Utilize hands-on learning (e.g., manipulatives or <br> common classroom items). <br> Use classroom modeling (e.g., show student what the <br> completed project will look like; make deliberate <br> mistakes and then model problem solving strategies). |
| Implementation of different tools as means of <br> conveying meaning and helping students to <br> situate in real life situations | Teach about the real world, and independent living <br> skills (e.g., currency, banking and budgets, time, <br> shopping and cooking) <br> Students with Down syndrome can be taught when <br> and how to use technology (i.e., computers, <br> calculators <br> Aides can encourage students to learn. Examples of <br> manipulatives include games (e.g., Candyland, <br> Chutes and Ladders, Monopoly, dice, cards); felt <br> boards; personalized books; numicon plates and <br> materials and sorting containers (e.g., boxes, jars, <br> etc.). |
| Festures | This alerts a student to articulate better when <br> learning new words and the English phonemes. |
| It Pasic |  |
| It is used primarily to teach sound and word |  |
| sequencing. Through repetition, a student will |  |
| memorize correct sequences and gain confidence to |  |
| use in conversation. |  |

Table \#1. Summary of information taken from Down Syndrome Association of West Michigan Paper: Supporting the student with DS in your classroom.

Now, it is important to turn the weaknesses of the children into strengths. Individuals with DS may have some weaknesses; some students may present visual problems, hearing loss, difficulties processing communication and even communicating themselves. There will be some individuals needing glasses or with hearing problems, as teachers, we have to be aware of all this obstacles so that the student can have the medical care needed. Integrating this two skills together is very important at the time of training people with DS because they both help the students to connect and retain information, so it's mandatory to be conscious of the medical condition of the individuals.

According to the Canadian Down Syndrome Society (n.d), "they may also have difficulties processing information, doing more than one thing at a time, or responding quickly in some situations". These may cause frustration and students can have different reactions as overacting. Instructors need to be careful and patient when teaching and giving tasks to them; and provide them with safe and quiet environments in which they can concentrate and have a fruitful learning process.

Summarizing what the Canadian Down Syndrome Society states, educators need to stimulate learners to build up positive communication environments and help them to overcome any difficulty they have. Instructors have to encourage them, give simple and understandable instructions, use visual materials, keep eye contact, and create learning strategies that suit every individual. Teachers have to take their students' strengths to improve their weaknesses and the most important of all, to praise them and keep them motivated to learn.

The previous documents were analyzed due to their importance in the development of this research project. The documents presented in the above literature review are the ones that give the theoretical foundation to the methodology used in the pedagogical intervention designed for this case.

## Methodology Section

The table 2 shows the different stages that have been designed to develop this qualitative case study and they follow the next methodology:

| First Stage <br> Instruments: <br> (2) Interviews <br> (1) <br> Questionnaire | An interview is conducted to a psychiatrist in order to gather information about how people with this condition think, understand, and learn. <br> A relative of our participant answers an interview. The purpose is to collect deep information about him, what he likes, his preferences, his study strategies, and key details that can help us to improve the teaching methodology designed for the tutorial classes. <br> A questionnaire answered by the participant is the final tool to gather information. |
| :---: | :---: |
| Second Stage <br> Instruments: <br> Literature documents | The methodology to teach the participant is designed. To do so, literature papers are taken into account. <br> The results from the interviews and the questionnaire are analyzed. |
| Third Stage <br> Instruments: <br> Lesson Plans <br> designed <br> Observation <br> Diaries <br> Video <br> Recordings | Pedagogical interventions, in which the participant is expected to learn common basic functions using the language, take place. Visual aids to contextualize the vocabulary and the expressions are used. <br> Tools to keep a track of the process such as diaries and video recordings are also used by the investigators. |
| Fourth Stage | All the results from the tools are analyzed and conclusions are drawn. |

## Table \#2. Description of the stages

## Sample

This research project is a case study whose sample consists of a 21 -year-old-male who has Down Syndrome (DS).The participant was chosen for this research study as he meets all the requirements and features that are to be observed and analyzed in this research project. He and his family were willing to take part of this investigation. They knew the objectives of the project, and the different tools that were going to be used as means of gathering information, such as questionnaires, interviews, video/tape recordings, and diaries.

He resides in Bucaramanga, Colombia and belongs to a middle class family. He has taken regular classes in a religious, public school at Piedecuesta. His course is called "Aceleración", in which only students with special needs relate among themselves. His family references him as responsible, organized, and with good behavior. He is also interested in learning English, he transcribes and is good at learning vocabulary. Regarding leisure activities, he likes swimming and has participated in sports' competitions in which has won around 10 medals up to now.

## Pedagogical intervention

With the participant's data collected and the analysis of the literature, we sought to create a unit in which by using drilling activities the participant acquired basic English functions and improved his communicative skills in the language.

For the pedagogical intervention, a serie of classes was designed and to each one of them it was assigned some vocabulary and a grammatical aspect. The activities to teach the learner were designed according to the topic and all of them followed a pattern of drilling activities. It was essential to create sessions according to the level of the participant, and generate a setting in which he felt comfortable, However, the sessions created at the beginning could not be implemented due to their difficulty. during the first session and the placement test it was observed that the learner only retained words. Therefore, a new serie of sessions was designed. Each class there were three or more than three words to learn, maximum six words per session. The topics selected were based on the participant's interests in order to give him a meaningful context. The following table summarizes the content of each session:

| Session | Content |
| :--- | :--- |
| Session 1 <br> Date: February 1st, 2017 | Placement test |
| Session 2 <br> Date:February 2th, 2017 | Greetings (hello, good morning, good night) |
| Session 3 <br> Date: February 3th, 2017 | Colors 1 (yellow, blue, red) |


| Session 4 <br> Date: February 4th, 2017 | Colors 2 (pink, green, orange) |
| :--- | :--- |
| Session 5 <br> Date: February 5th, 2017 | Review of the topics seen |
| Session 6 <br> Date: February 6th, 2017 | Swimming Vocabulary 1 (swimming pool, float, glasses) |
| Session 7 <br> Date: February 7th, 2017 | Swimming Vocabulary 2 (swim, water, ball) |
| Session 8 <br> Date: February 8th, 2017 | Numbers (1, 2, 3) |
| Session 9 <br> Date: February 9th, 2017 | Numbers 2 (4, 5, 6) |
| Session 10 <br> Date: February 10th, 2017 | Family members (father, mother, son) <br> *Members selected according to his family. |
| Session 11 <br> Date: February, 11th, 2017 | Family members 2 (sister, pet, nieve) <br> *Members selected according to his family. |
| Session 12 <br> Date: February 12th, 2017 | Review of vocabulary <br> Post test |

Table \#3. Description of the sessions

## Procedure

| Task time format |  |  |
| :--- | :--- | :--- |
| Task | Date | Observations |
| Methodologies' <br> research and collection <br> of data. | November 2016 <br> - January 2017 | -During this period, researchers started looking for <br> information regarding DS, DS learning/ teaching <br> strategies, and proper methodology to be used. |
| Questionnaire and <br> Interview | January 12th, <br> 2017 | -Questionnaire (answered by the participant and his sister <br> help). This one is emphasized on the participant's personal <br> likes and willingness to learn English. <br> -Interview (answered by the participant's sister). This is <br> focused on the people surrounding the participant and a <br> more detailed description of the participant's life and <br> condition. (data) |

$\left.\left.\begin{array}{|l|l|l|}\hline \text { Placement test } & \begin{array}{l}\text { February 1st, } \\ 2017\end{array} & \begin{array}{l}\text {-Short exercise to define the participant's English level } \\ \text { and motivation. }\end{array} \\ \text {-Methodology decision making (based on the participant's } \\ \text { data and the methodology research). }\end{array}\right\} \begin{array}{lll|}\hline \text { Fessons } & \begin{array}{l}\text { February 2nd - } \\ 2017\end{array} & \begin{array}{l}\text {-Eleven (11) hour-and-a-half lessons, in which by using } \\ \text { drilling activities and different strategies, the teachers will } \\ \text { help the participant to communicate in English as a } \\ \text { foreign language. }\end{array} \\ \hline \text { Post-test } & 2017 & \begin{array}{l}\text { February 12th, } \\ \text { and the learning strategies proposed by the researchers } \\ \text { worked on the participant or not. }\end{array} \\ \hline \text {-This exercise will also help the researchers to know how } \\ \text { much the participant will have improved. }\end{array}\right\}$

Table \#4. Description of the procedure

## Findings

Along this paper, a complete process of the research project has been presented, starting from the necessity of doing this investigation, the objectives proposed for it, and the data collected for the literature of the research; after that, the participant was chosen and the specific methodology to be implemented was defined too; finally, the pedagogical intervention took place. Now, it is time to show the findings of this case study.

When doing the pedagogical intervention, many factors were noticed on the participant; since the beginning, in spite of showing some signs of shyness towards the teachers, the student demonstrated high motivation to learn English. Teachers were able to provide enough input, taking into account the participant's English level, and to connect his likes to the lessons so that he felt
comfortable while learning. As time passed by, the learner's shyness was notoriously decreasing, and his willingness to continue on the process increased even more.

Talking about his production, teachers noticed that the student was not able to produce complete English functions, as it was proposed, but he could easily learn basic vocabulary of real words that he uses on his daily life as: Greetings, farewells, colors, numbers, family members, and vocabulary related to swimming. During the 10 lessons, the participant learned a total of 26 words.


Figure \#1. Summary of the basic vocabulary learned by the participant.

In spite of the fact that the research question results, according to this particular case study, showed that the participant could not learn entire basic English functions, it has to be said that the objectives of the case study were successfully accomplished. There was a short methodology created to teach a short English course to a child with DS, and the participant showed a high improvement on his English level. Also, there was knowledge expanded on how children with DS develop their linguistic and communicative skills. Finally, this research project is another source that may help to support the little investigation on the field of communicative skills' acquisition in people with DS.


Figure \#2. Summary of the objectives achieved by the researchers.
By doing an analysis of the findings, we confirm that regardless his physical and mental condition, the child studied along this case study is capable of understanding and producing basic English vocabulary. This spreads hope on people with DS, their families, and some skeptical doctors that do not consider the possibility of bilingualism in this specific population.

## Conclusion

In this paper we have attempted to find out if by the use of drilling activities, children with DS can become bilingual or at least improve their communicative skills in a second language. From the data we conclude that although limited, there are signs of communication by the participant. Evidence demonstrated that the learner uses different strategies to manifest understanding and to produce in the language that is being taught. Those strategies are facial expressions, physical movements or demonstrations, and the production of sounds in the language. As stated by some experts, there was a common delay in the understanding and production of language; nonetheless, through the use of drilling activities, the learner could overcome barriers and demonstrate that the common advice given to families with children with the disorder of not to expose them to more than one language should not be followed, because as the participant proved along the investigation, having DS does not deprive them from developing skills in more than one language.

It would be wrong to state that the participant acquired complete grammatical structures or that he achieved a high level of proficiency in the language; however, evidence from the research
exhibited that the participant could understand patterns, learn vocabulary related to his daily life, retain it and produce it using his foreign language communicative skills.

The language is an inherent capacity of human beings, and people with DS are not excluded. Therefore, although they have language-learning delays, they have the capacity to communicate with others, and by using the proper strategies, they can develop their language capacity and take it to an understable level. Moreover, as any person with a delay, people with the syndrome just need a lot of motivation and support to overcome the learning difficulties they might have.

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