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# The Acquisition of Morphosyntax by Children with Down Syndrome

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## **Abstract**

Down syndrome is one of the most common genetic disorders associated with intellectual disability and with cognitive delays that have clear implications for language learning, especially for the acquisition of morphosyntax. The weaknesses of Down Syndrome Children (DSC) in this area mean that they experience a time delay when compared to Typically Developing Children (TDC) and a great difficulty when acquiring multiple features of language. Some DSC do not experience a vocabulary explosion stage, most of them are not able to acquire all the morphemes of their language and their syntax tends to be always shorter and simpler than that of TDC as a consequence of their difficulties when learning complex rules. Nevertheless, the existence of an extra chromosome does not affect DSC's comprehension as it does their production.

The main aim of this paper is to present the main characteristics of the process of morphosyntactic acquisition by DSC. In order to do so, and after a brief introduction, I will first provide a brief review of the three main stages in that same process by TDC so that a comparison between the two can be established. This comparison will reveal which features DSC find more difficult and those that seem to be impossible to acquire. I will also consider the controversial issue of bilingualism among DSC and, based on recent research, show that DSC can become bilingual although the same morphosyntax difficulties that they experience when acquiring their first language can be observed. I will then present some tests used to assess morphosyntactic development, a useful tool for teachers, parents and caretakers when they need to identify the morphosyntactic problems found in DSC. Finally, I will describe some examples of helpful games to reinforce the morphosyntactic development of DSC, which will also be a useful guide for their teachers, parents and caretakers to help this population.

**Keywords:** Down syndrome, language acquisition, morphosyntax.

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## 1. INTRODUCTION

Down's syndrome (henceforth, DS) is a congenital disorder that received its name from the British physician John Langdon Haydon Down (1828-1896), who was the first to provide a description of its characteristics in 1866 (Mégarbané, Ravel, Mircher, Sturtz, Grattau, Rethoré, Delabar & Mobley, 2009). Children with DS have cognitive disabilities resulting from trisomy 21. At present, this syndrome is one of the most common congenital disorders as it occurs approximately in 1 out of 700 births (Andreou & Katsarou, 2013). The existence of an extra chromosome brings about many difficulties for people with DS –for example, they have a tendency to suffer from chronic health problems affecting their daily life. Moreover, their social abilities are also affected and, therefore, the process of language acquisition in this group has its own characteristics. Language-learning difficulties, especially expressive language problems, are an important problem for this population, as will be explained below.

As noted by Meisel (2011), it is during the second half of the second year of their life that typically developing children (henceforth, TDC) begin to use grammatical knowledge both in comprehension and production. In contrast, children with Down Syndrome (henceforth, DSC) experience a delay in the acquisition of linguistic features and morphosyntax is seriously affected (Maltese, Rappo, Scifo & Pepi, 2012). Due to their cognitive impairment, the acquisition of morphosyntax is considered a very complex process for DSC (Kay-Raining et al., 2005).

The main goal of this paper is to present the main characteristics of the process of morphosyntactic acquisition by DSC. In order to do so, I will first provide a brief review of the three main stages in that same process by TDC so that a comparison between the two can be established. This comparison will reveal which features DSC find more difficult and those that seem to be impossible to acquire. I will also consider the controversial issue of bilingualism among DSC and, based on recent research, show that DSC can become bilingual. I will finish the paper by presenting some tests used to assess the morphosyntactic development of DSC as well as some helpful games to reinforce such development.

## 2. ACQUISITION OF L1 MORPHOSYNTAX BY TYPICALLY DEVELOPING CHILDREN

Nativists and interactionist/developmental theories are two of the major approaches to the study of language acquisition. Nativist theories suggest that language is an innate faculty and humans are born having access to Universal Grammar (Chomsky, 1981). Universal Grammar is defined as “the system of categories, mechanisms and constraints shared by all human languages and considered to be innate” (Chomsky 1981: 3). As Minai (2013: 767) states “[...] syntactic categories are present in the child’s linguistic knowledge from birth and are universal”. Interactionist/developmental theories deny language innateness and focus on language development, which will be triggered by exposure to appropriate input. Constructivist thinking is rooted in several aspects of Vygotsky's (1978) cognitive theory, which basically claims that people create meaning through experience and, in the case of language learning, through social interaction with parents or caretakers.

In this section, we will briefly present the main characteristics of the stages in the acquisition of morphosyntax by TDC. According to Clark (2009), the process of language acquisition goes on for years as we are constantly learning new word-root-plus- affix combinations. Ingram (1989) proposed that this process could be divided into five different stages/periods:

- a. Prelinguistic development.
- b. Single-words utterances.
- c. First words combinations.
- d. Simple sentences.
- e. Complex sentences.

However, if we only focus on the development of morphosyntax, we could refer to the following three stages:

- (i) First stage: One-word or holophrastic stage
- (ii) Second stage: Grammatical expansion (two-word stage and morpheme acquisition)

- (iii) Third stage: Simpler and more complex structures (question, negation, relative clauses, coordination and subordination).

In what follows, I present the main characteristics of these three stages in TDC.

### **2.1. First stage in syntactic development**

During their first year of life, children show evidence that they are able to process language and that they have sensitivity for formal properties of human languages (Meisel, 2011). They interact and communicate with their parents or caretakers but their early verbal comprehension and production does not yet provide evidence for grammatical competence. It is not until the end of the first year and the beginning of the second when most TDC start producing their first content words. As expected, these first incorporations in their vocabulary are mainly related to their daily routine as they usually make reference to “people, food, body parts, clothing, animals, vehicles, toys, household objects, routines and activities or states” (Clark, 2009: 76). Nevertheless, the use of these words is quite general as they usually overextend the meaning to different elements. For example, when they want to say “cat”, “horse” or any four-leg animal, they produce “dog” (Clark, 2009). Nelson (1973) believes that children learn the names of things they can observe or act on, thus, “[...] the words the child learns reflect the child's mode of structuring the world” (1973: 33). The most common word classes to appear seem to be nouns (60%), verbs (20%), adverbs and adjectives (Crystal, 1997).

According to Clark (2009), children reach the fifty-word level when they are 1;5 - 1;8<sup>1</sup> years old. It is in this stage when they start showing a more rapid acquisition of words as well as a better pronunciation of their first utterances. It is estimated that by the age of 2;5 - 3;0 years old, they are capable of producing and understanding between 100 and 600 words. From 3 to 6 years old, children acquire around 9 to ten words per day. Afterwards, thanks to schooling, they are capable of adding new word-root-plus-affix combinations. When they are 17 “[...] it is estimated that they are exposed to up to

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<sup>1</sup>As is standard in the field, the first figure refers to the year and the second to the month. Example: 1; 5: 1 year and 5 months.

10,000 new word-root-plus-affix combinations just in school textbooks” (Clark, 2009: 75).

The increase of confidence in children’s own articulatory system is supposed to serve as a bridge for the transition from the one-word utterance stage to the two-word utterance stage, in which children start to combine sequences of words at 19.6 months (mean age) (Nelson, 1973). Let us consider this second stage in the next section.

## **2.2. Grammatical expansion**

During the two-word stage, children are able to express their intentions more clearly as they are able to make requests, explain the location of an object, negate, describe actions or events and express possession or characteristics. “Most early two word combinations were made up of two open class words or of a pivot plus an open class word” (Clark, 2009: 159) such as “no” (pivot) “play” (open word) or “more” (pivot) “eat” (open word).

During the two-word stage, children also try to incorporate inflections in their open class word production. They experiment with the addition of number (singular or plural) and case (nominative, accusative or genitive) in nouns and with the inflections of simple verb tenses as well as with person/number agreement. The simultaneous increase in vocabulary produces a better ability to recognize, learn and identify new patterns and structures. However, it is not until the child is able to recognize word classes and the meaning of the inflections that s/he will be able to use them appropriately. The amount of inflections is not the same in all languages, though. Thus, English, as an analytic language, has a poorer inflection system compared to synthetic languages such as French or Spanish (Clark, 2009). As we will see below, although this is clearly not a major problem for TDC, it will be for DSC.

In a pioneering longitudinal study with three English-speaking children (known under the aliases of Adam, Eve and Sarah), Brown (1973) reported that grammatical morphemes in early child utterances emerge in a specific order, which led him to suggest a fixed order of acquisition. Brown considered that a morpheme was acquired



when it was used in an adult-like fashion. Table 1 features the order of acquisition of 14 English grammatical morphemes:

<b>ORDER OF ACQUISITION OF 14 ENGLISH MORPHEMES</b>
1. Present progressive ( <i>-ing</i> )
Prepositions <div style="text-align: center;">           2. <i>in</i>            3. <i>on</i> </div>
4. Plural ( <i>-s</i> )
5. Past irregular ( <i>went</i> )
6. Possessive ( <i>'s</i> )
7. Uncontractible copula ( <i>be</i> )
8. Articles ( <i>a, the</i> )
9. Past regular ( <i>-ed</i> )
10. Third person regular ( <i>-s</i> )
11. Third person irregular ( <i>has</i> )
12. Uncontractible auxiliary ( <i>be</i> )
13. Contractible copula ( <i>be</i> )
14. Contractible auxiliary ( <i>be</i> )

Table 1. Mean order of acquisition of 14 morphemes across three children (adapted from Brown, 1973: 274)

De Villiers and de Villiers (1973) corroborated this order of acquisition in a cross-sectional study with 21 English-speaking children. They did report a difference with Brown's study, though: he found that contracted forms of the copula and of the auxiliary were acquired after the uncontracted ones, whereas De Villiers and de Villiers (1973) found the reverse order. They also reported variation across individual children. However, the commonalities between the two studies were clear and pointed to the generalization that acquisition of a number of grammatical features followed an order which was largely the same across individuals.

### **2.3. Later stages of morphosyntactic development**

The addition of new complex structures and clauses is the last phase of morphosyntactic development. At this level, children learn how to construct full sentences with different implications and meanings. This stage involves the acquisition of relative clauses, lexical substitutions, questions and negation structures as well as the ability to assign roles, choosing a perspective in order to talk and coordinate or subordinate sentences. Due to the amount of features and their complexity, this stage goes on until adolescence.

During this phase “[...] children make early use of what Du Bois called Preferred Argument Structure” (PAS) (Clark, 2009: 202). The PAS is highly related to the knowledge of the competences of a speaker together with the fluency of his performance. As cited in Clark (2009: 203) “[...] children’s acquisition of preferred argument structures appears to reflect a convergence of word-choice, referential form, and grammatical role”.

Fluency and experience in any language can be seen through different parameters during the speaker’s oral production. One of these resources is elision: in some languages, it is more likely to use different types of ellipsis, as is the case with nominal elision. One of the earliest features that a child learns in his language is the possibility of subject dropping, the so-called Null Subject Parameter in generative linguistics (Chomsky, 1981). Null-subject languages are those languages that can leave the subject of a sentence unexpressed, as is normally the case in Italian or Spanish. Even in non-null subject languages, such as English, children tend to omit subjects, as example (1) illustrates:

(1) “(I) eat an apple.”

The same occurs for the rest of weak forms such as pronouns, articles and prepositions. As they are usually unstressed, their omission makes the sentence easier for children’s production and still comprehensible for the receivers (Clark, 2009).

Consider the examples in (2):

(2) a. (The) Dog has (my) toy

b. (I) go (to) school

As the length of the sentences is constantly increasing in children's production, they are forced to consider the roles of every argument they produce. They are more likely to produce canonical over non-canonical linkings, in other words, they are more likely to produce sentences where the agent is also the subject (Clark, 2009). Doubts and curiosity are a characteristic in the process of child language acquisition. As children grow older, they have the need to ask and, hence, to learn how to form questions: "For both wh- and yes/no questions researchers have assumed that children acquiring English need to master auxiliary verbs" (Clark, 2009: 212). This process goes from simpler yes/no questions to wh-questions in which children tend to use first "what" and "where" and finally, the most complex formulations which are "why", "who", "when" (Clark, 2009: 208).

Negation is also an important feature in children's communication as negation is a way for them to express their feelings. Clark (2009) states that children develop two types of negations; *exclamatory negations*, like "no", to show disagreement with the previous utterance, and *predicate negations* such as "don't, later on, not" to negate the predicate of the sentence. In English, this second type of negation is much more difficult because knowledge of auxiliary and modal verbs is needed to construct it.

As utterances become longer, children start using coordinate and subordinate clauses. Bloom, Lahey, Hood, Lifter and Fiess (1980) observed the development of connectives in the production of four children (ages 2;2 to 3;0). Table 2 illustrates the order they found in their study:

Mean age of emergence	Connective and its meaning in context
2;2	And: additive, temporal, causal
2;7	And then: temporal
2;8	When: contingent (epistemic)
2;8	Because: causal
2;8	What: notice
2;9	So: causal
2;9	Then: temporal
2;10.15	If: contingent (epistemic)
2;11	But: adversative
3;0	That: referent specification

Table 2. Early connectives and semantic relations in child speech (adapted from Bloom, Lahey, Hood, Lifter & Fiess, 1980: 249)

Once the main stages in the development of morphosyntax in TDC have been summarized, we will present those same stages in the case of DSC.

### **3. LANGUAGE ACQUISITION BY CHILDREN WITH DOWN SYNDROME**

Language acquisition in DS is a complex process for children due to its close relation to their cognitive abilities. In general, the language acquisition process in DSC shows a delay in comparison with that of TDC, although the delay is more characteristic in their productive than in their comprehension abilities (Rondal, 1995).

According to Rondal (1995), it is useful to distinguish three phases in the language acquisition process in DSC: the pre-linguistic period, the first syntactic development period and the grammatical expansion period. As their speech is slower than the one of TDC, the pre-linguistic period for DS children is basically an interactive, visual and gestural phase in which the child communicates with their relatives through gestures, smiles or movements. DSC' first words appear at the age of 27.3 months in contrast with the 12-18 months in TDC (Oliver & Buckley, 1994). However, it is during

the two last periods when the child begins to experience more difficulties as his speech starts to develop morphologically and syntactically.

The acquisition of morphosyntax is probably the most difficult task for DSC (Kay-Raining et al., 2005). According to Arias and Barrón (2017), they tend to omit prepositions, conjunctions, and personal pronouns. It is also frequent to find errors related to gender, number or with the tense of the verbs in their speech. Their production tends to be weak and formed by shorter sentences. According to research, these characteristics are due to “[...] the cognitive delay itself, auditory problems, difficulties to articulate sounds, and even socioeconomic variables leading to poor access to education and efficient therapies or interventions” (Arias & Barrón, 2017: 3).

During the babbling stage or pre-linguistic period, no differences have been attested between DSC and TDC as the acoustic reaction and the production of the first phonemes seem similar. It is during the three different stages of the acquisition of morphosyntax when difficulties and differences in comparison to TDC can be found. These three stages are summarized in what follows.

### **3.1. First stage in syntactic development**

The first stage in the syntactic development in children’s language acquisition makes reference to the one-word utterance phase. It is in this stage where DSC begin to show a delay in the production of their initial words (Kay-Raining et al., 2005). As seen above, TDC start their production at the age of 12-18 months, however, DSC’s first words performance is attested at the age of 27.3 months showing a delay of at least 7 months. In addition to this time delay, the average of words is always more limited (Oliver & Buckley, 1994).

Once a TDC has acquired a larger amount of words, the combination of two words begins. TDC start combining two words at the same time DSC produce their first ones. That is, it is when TDC are able to produce more than fifty words that DSC start producing their first one-word utterances. This means a more serious delay for DSC as

they start their two-word-combinations when they are 30- 40 months (Oliver & Buckley, 1994).

In Oliver and Buckley’s (1994) research about how DSC acquired their first words, they worked with a group of 9 children, 4 males and 5 females, and recorded the first 10 words that each participant produced. Out of the total 90 words, 42 words did not coincide among the children. Their most common words were related to their routine such as “mummy”, “bye-bye” “hello” or “daddy” (Oliver & Buckley, 1994). After analyzing the first ten words produced by DSC, Oliver and Buckley (1994) concluded that both TDC and DSC used the same content words. The difference between both groups was that TDC used the words much earlier in time and that not all DSC experienced a “vocabulary explosion” stage.

The following table illustrates the 90 words (10 words x 9 children) produced by the 9 DSC who participated in the study:

<b>Word</b>	<b>N<sup>2</sup></b>	<b>Word</b>	<b>N</b>	<b>Word</b>	<b>N</b>
Daddy	7	Up	3	Duck	1
Person’s name	5	Ball	2	Gone	1
Mummy	5	Shoe	2	Hat	1
Bye-bye	5	More	1	Lady	1
Dog	4	Arrow	1	Me	1
Car	4	Bag	1	Out	1
Yes	4	Bear	1	Roll	1
Baby	4	Bed	1	Teeth	1
Hello	4	Bib	1	Tried	1
No	3	Biscuit	1	Toilet word	1
Ta	3	Bowl	1	Window	1
Teddy	3	Brick	1	Dance	1
Wassat?	3	Chair	1	Doll	1
there	3	Cat	1	Dog	1

Table 3. Full range of words used in the first ten words produced by DSC (adapted from Oliver & Buckley, 1994: 73)

<sup>2</sup> N = number of children with this word in their first 10 words.

As for TDC, the two-word stage means the actual turning point regarding their language acquisition process. Oliver and Buckley (1994) described it as a “vocabulary explosion”. However not all DSC experience this explosion. The results from their study with 14 DSC, 4 males and 10 females, estimated the mean age for the consolidation of the two-word stage for this group. The average age was 42.5 months for males and 34.6 months for females. Considering these results, a delay of approximately 18 months for the two-word stage can be predicted between TDC (18-24 months) and DSC (34.6 months). Besides, Oliver and Buckley (1994) recorded the number of words produced by these 14 DSC showing that once the children had reached the two-word stage, they were able to produce a mean of 54.4 two-word combinations. The following table shows the mean age at which the 14 participants started and consolidated the two- word-stage.

		<b>Start of records</b>	<b>2-word phrases consolidate</b>
Females	Number of subjects	10	10
	Age range (years:months)	12 to 48	25 to 49
	Mean age (months)	25.9	34.6
Males	Number of subjects	4	4
	Age range (years:months)	12 to 41	36 to 52
	Men age (months)	25.1	42.5

Table 4. Mean age of the two-word stage in DSC (adapted from Oliver & Buckley, 1994:75)

### 3.2. Grammatical expansion

After the acquisition and combination of some words, children enter the so-called “grammatical expansion” stage. However, this stage is not an easy job for DSC (Kay-Raining et al., 2005) as children are supposed to learn word inflections, word categories and word order. According to Rondal (1995: 8) “[...] grammatical development is never complete in DS subjects”. As mentioned above, DSC’s speech tends to be shorter and it omit multiple function words such as articles, prepositions, auxiliaries, copulas, pronouns or conjunctions (Roberts, Price & Malkin, 2007). What’s more, these function words are acquired in a different order from the one in TDC.

As mentioned above, Brown (1973) research suggested the order in which 14 morphemes were acquired by English-speaking children. Thanks to his study, Rutter and Buckley (1994) could carry on comparative research in order to find the differences between the acquisition of those morphemes by TDC and DSC. After analyzing a group of 12DSC from the time they were 12 months and 38 months until they were 34 to 67 months, Rutter and Buckley (1994) obtained a different order of acquisition in which it was found that children acquired the morphemes in the following order:

- preposition “on”
- possessive /s/
- irregular past tense
- preposition “in”,
- present progressive,
- articles “a” and “the”
- plural /s/
- irregular third person singular present tense
- contractible auxiliary “be” form
- regular past tense
- contractible copula “be” form.



Figure 1. Features the mean age at which the morphemes were acquired by the 12 DSC in Rutter and Buckley's (1994) study.

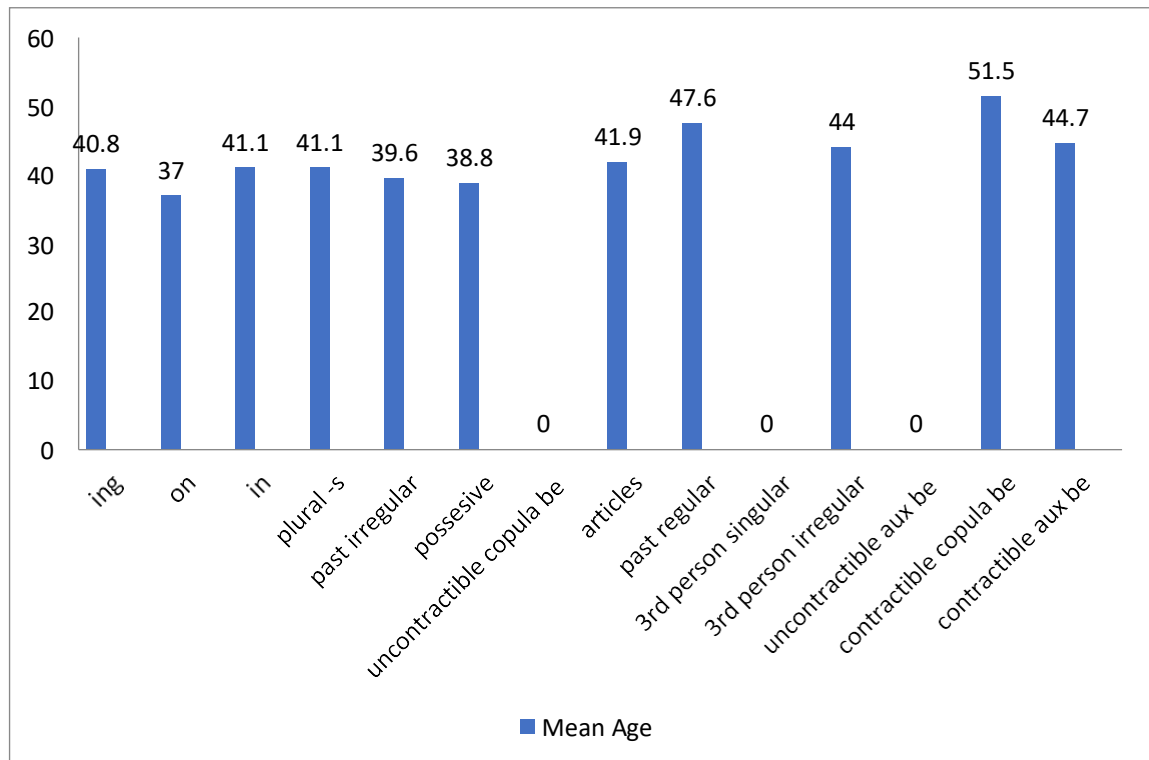


Figure 1. DSC's average age of acquisition of morphemes (adapted from Rutter and Buckley, 1994:78)

The individual analysis of the production of each participant in the study indicated that no child was able to acquire the fourteen morphemes. Table 5 shows how, out of the fourteen morphemes analyzed by Brown (1973), three of them, marked in blue in the table, uncontractible copula “be” form, third person singular and the uncontractible auxiliary “be” form, were not even produced by DSC (Rutter & Buckley, 1994). Furthermore, DSC acquired the other eleven morphemes 12 months later on average than TDC. Table 5 displays the comparison between TDC' and DSC' mean age of acquisition of the different morphemes:

	Mean age DSC	Mean age TDC
Morpheme		
Present progressive (-ing)	40.8	28.7
Preposition <i>in</i>	37.0	29.3
Preposition <i>on</i>	39.7	29.7
Plural (-s)	41.2	30.3
Past irregular (went)	39.6	32.7
Possessive (-'s)	38.8	33.3
Uncontractible copula ( <i>be</i> )	-	33.3
Articles ( <i>a, the</i> )	41.9	35.3
Past regular (-ed)	47.7	39.0
Third person regular (- <i>s</i> )	-	39.0
Third person irregular ( <i>has</i> )	44.0	40.0
Uncontractible auxiliary ( <i>be</i> )	-	41.7
Contractible copula ( <i>be</i> )	51.5	42.7
Contractible auxiliary ( <i>be</i> )	44.7	43.3

Table 5. Comparison of age of acquisition of morphemes by DSC and TDC (adapted from Rutter and Buckley, 1994:79)

As mentioned above, languages such as Spanish or French are more complex for DSC because of their richer inflectional system, and gender morphemes in articles, nouns and adjectives. Pineda and Bruzual (2001) carried out a study with 20 15-25 years

old men and women with DS to test their speaking abilities in Spanish, their native language.

The participants took part in several activities such as simple conversations, description of images, questions about the usefulness of different objects and simple story-tellings. One of the targets Pineda and Bruzual (2001) were interested in testing was the use of articles. The following excerpt features a dialogue between one of the researchers (I) and the different participants (J1, J2, J3):

(3) Excerpt of dialogue between research I and participants J1, J2 and J3

<p><b>I:</b> ¿Qué ves en el dibujo?</p> <p><b>J1:</b> ‘silla’, ‘e silla’, ‘e pato’ (el zapato)</p> <p><b>J2:</b> ‘Apato’ (zapato), ‘amisa’ (camisa), ‘a silla’ (la silla), ‘niño’, ‘e media’ (la media) ‘apato’ (zapato) ‘e media’ (la media)</p> <p><b>J3:</b> ‘Apato’ (zapato), pantalones, ‘amisa’ (camisa), ‘la media’</p>
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(Adapted from Pineda & Bruzual, 2001: 86)

The aim of this activity was to test the use of articles. In order to do so, the researcher showed a picture where different objects such as a chair, a shoe and different pieces of clothing could be seen. The feedback received by the participants showed the general misuse of the articles in all the words they uttered. Among the examples, we find words such as “silla” (chair), “zapato” (shoe), “camisa” (shirt), “media” (sock) or “pantalones” (trousers). Although, as seen in Rutter and Buckley’s (1994) study DSC acquire articles early, in fluent conversations they tend to avoid them so as to shorten their sentences and make them easier.

### 3.3. Later stages of morphosyntactic acquisition

As we have mentioned above, the production by DS children and adults is always shorter than that of TDC as a consequence of their poorer cognitive and memory skills. Due to this factor, the addition of multiple clauses or the structure of interrogative or negative sentences in their speech becomes difficult as they are forced to produce

longer combinations of words with multiple morphemes. Coordinate and subordinate sentences are hard for people with DS as they mean longer productions with more than one clause.

In order to assess the differences in complex grammar comprehension between TDC and DSC, Frizelle, Thompson, Duta and Bishop (2018) carried out a study in which 33 DSC (3;06 mental age) were compared with two other groups, one of 32 children with cognitive impairment of unknown aetiology and another group of 33 TDC. The three groups were tested with what they called “TECS-E complex syntax comprehension task”. In this task children were supposed to watch and hear an animation. Afterward, they were asked to touch a smiley face if the animation matched the audio or to touch a sad face if they did not match (Frizelle et al., 2018).

The researchers prepared 114 animations and 114 audios. Some of them were based on subjects (transitive or intransitive) and objects (indirect or oblique). Others included sentences formed by verbs and different complements. The latter ones included different adverbial clauses (temporal, causal and conditional). Moreover, to reinforce the credibility, 10 sentences were included in order to detect a yes bias answer (Frizelle, et al., 2018). Table 6 represents some these sentences examples that were adapted to audio or animation for the test:

<b>Relative clause</b>	<b>Example sentence</b>
Subject intransitive	He found the girl that was hiding
Subject transitive	He pushed the girl that scored the goal
Object	The boy picked up the cup that she broke
Oblique	The man opened the gate she jumped over
Indirect object	She kissed the boy she poured the juice for
<b>Complement clause</b>	
Think	She thinks the boy's hair is dry
Know	He knows the girl broke the chair
Pretend	The boy is pretending he ate the chocolate
Wish	The man wishes he was on the bus
<b>Adverbial clause</b>	
Before	The boy played football before he watched TV
After	The box fell after the man opened it
Because	The girl cried because the boy pushed her
If	If the boy was taller he could get the teddy

Table 6. Example test sentences for each complex sentence (adapted from Frizelle et al., 2018:9)

Although the researchers' initial hypothesis was that DSC and those with a cognitive impairment with an unknown aetiology would behave in a similar way, and worse in both cases than TDC, the results revealed that the impaired group obtained 10.25 points less than DSC and 25.12 points less than TDC (Frizelle et al., 2018). The comprehension of complex grammar constructions was a hard task for DSC and, as a consequence, they tend to avoid this type of constructions in their oral production.

#### **4. BILINGUALISM IN CHILDREN WITH DOWN SYNDROME**

Bilingualism has been defined in many ways. Some authors describe it as “native- like control of two or more languages” (Skutnabb-Kangas, 1981: 82) and others as “the point where the speaker of one language can produce complete, meaningful utterances in other languages” (Skutnabb-Kangas, 1981:82).

Raising children into two simultaneous languages is usually a controversial topic (King & Mackey, 2007). Research shows that education in more than one language facilitates phonological awareness and reading fluency. However, in the short term, bilingual children are usually more limited in the vocabulary of each of the languages being learned (Feltmate & Kay-Raining, 2008).The acquisition of both languages occurs at the same time and the child receives two different types of input. Nevertheless, one of the languages usually becomes dominant because of a higher exposure (Blom, 2010).

Depending on the amount of input the child has been exposed to, the acquisition of each of the two languages might turn out differently. According to Blom (2010: 440), “the weaker language of young bilingual children is characterized by a lower mean length of utterance, suggesting a slower development”. Even so, children receiving a similar and high exposure to both languages are capable of performing successfully. Although at the beginning, children can seem to produce few words, in the long run, bilingual children acquire a complete vocabulary in both languages as well as the ability to transfer their knowledge from one language to the other (Feltmate & Kay-Raining, 2008).

Bilingualism in DS is even a more controversial topic. Due to the delay and difficulties associated with the acquisition of their L1, some professionals do not recommend exposing DSC to two different languages as they claim that it would be detrimental for L1 development (Feltmate & Kay-Raining, 2008). However, there is evidence of the possibility of bilingualism, and even multilingualism among people with DS (Kay-Raining et al., 2005).

As we have seen in previous sections, there are clear differences in the acquisition process of TDC and DSC regarding their L1. The same occurs when they are

exposed to another language. Feltmate and Kay-Raining (2008) carried out a study to test the ability of DSC when learning English and French. In order to do so, 4 DSC were compared with 4 bilingual TDC and 4 monolingual DSC. Table 7 shows a comparison between bilingual and monolingual DSC in triads as regards their knowledge of syntax, noun phrases, verbs, grammatical morphology and vocabulary (Feltmate & Kay-Raining, 2008):

<b>Measure</b>	<b>Triad 1</b>	<b>Triad 2</b>	<b>Triad 3</b>	<b>Triad 4</b>	<b>Difference</b>
<b>Receptive PLS-3</b>	B=M	B=M	B=M	B<M	=
<b>MLU</b>	B<M	B>M	B=M	B=M	Æ
<b>IPSyn</b>	B<M	B>M	B=M	B<M	Æ
<b>1 element NPs</b>	B=M	B>M	B<M	B=M	Æ
<b>Total verbs</b>	B<M	B>M	B=M	B<M	Æ
<b>% lexical verbs</b>	B>M	B=M	B>M	B=M	Æ
<b>Verb diversity</b>	B<M	B>M	B<M	B<M	B<M
<b>TW, 50 utterances</b>	B<M	B>M	B=M	B<M	Æ
<b>NDW, 50 utterances</b>	B<M	B>M	B=M	B=M	Æ

Table 7. Bilingual performance in DSC and TDC (Adapted from Feltmate & Kay-Raining, 2008:19)

*MLU = mean length of utterance; IPSyn = Index of productive syntax; NP = noun phrase; TW = total words; NDW = number of different words; B = bilingual; M = monolingual.; = indicates that 3 or 4 individual comparisons did not differ at the criterion level; Ø indicates that there was no consistent pattern*

The findings of the study reported no significant differences between bilingual and monolingual DSC, as both performances were very similar. However, as for the first language (L1), the same lack of abilities in relation to inflections, articles, and verbs is present in DSC (Chapman & Kay-Raining, 2012). Nevertheless, “[...] findings support that children with DS do become bilingual” without affecting the L1 development and contrary to what is thought, “[...] bilingual input does not disadvantage these children’s acquisition” (Feltmate & Kay-Raining, 2008: 19).

Kay-Raining Bird, Trudeau, Thordardottir, Sutton and Thorpe (2005) carried out a similar study with larger populations. They compared the language abilities of 8 children with DS being raised bilingually with those of three control groups matched on developmental level: monolingual children with DS (n = 14), monolingual TDC (n = 18), and bilingual TDC (n = 11). The bilingual children spoke English and one other language and were either balanced bilinguals or English-dominant. Several tests were used for all groups and bilingual children were also tested in the second language. The findings showed no detrimental effect of bilingualism. That is, the bilingual children with DS scored at least as well on all English tests as their monolingual DS counterparts, although the authors found variability among the DSC.

Research findings at Bangor University show that DSC can and do become bilingual  
<https://www.languagemagazine.com/2019/01/21/bilingualism-no-problem-forchildren-with-down-syndrome>



## **5. EVALUATION AND SPECIFIC TESTS TO ASSESS MORPHOSYNTACTIC EVOLUTION**

In order to determine the level of the common competencies in relation to morphosyntax, there are several types of tests designed to determine the linguistic stage DSC or TDC are at. Furthermore, these different programs have been also created in order to deal with the difficulties the children with other impairments would have, including DSC. Thus, parents or relatives are given a detailed study and an individualized program of their children's weaknesses and strengths so as to improve their competences. These tests are really efficient for DSC as one of their most important weaknesses is the acquisition of morphosyntax.

One of the most famous tests is a program called the Northwestern Syntax Screening Test (NSST), which was capable of analyzing production and receptive skills in children with impairment from 3 to 7 years old. The test was comprised by different tools related to different grammatical categories such as prepositions, personal pronouns, noun-verb agreements, possessives, tenses, voices and wh-questions (Paul, 2009).

For receptive analysis, children were stimulated through different images. As Paul (2009) exemplifies, if the focus of the study is on prepositions, the child would be shown two different images in which an object appears in different positions. Later, the child would be asked to select the correct image according to the required preposition. To assess production abilities, children are shown two images with opposite meaning. The instructor would describe the action of both pictures, after that, he would point at one and the child would be expected to associate one of the sentences with the image and say it aloud (Paul, 2009).

In addition to the NSST, Lee and Canter (1971) created the Developmental Sentence Scoring (DSS), a program which was designed in order to analyze children's generalizations and uses of complex grammatical structures and rules in conversations. Forty white, middle class, monolingual children (20 girls and 20 boys) of the same schools and community participated in the study. Every child was recorded in order to analyze their use of indefinite pronouns, personal pronouns, main verbs, secondary verbs, negatives; conjunctions, and wh-questions. After analyzing the records, children's

morphosyntax was scored from 1 to 8 points according to the DSS parameters. Thus, children's grammatical abilities were assessed (Lee & Canter, 1971).

More recently, the MacArthur-Bates Communicative Development Inventories (MB-DDI), a program created in 1993, was designed in order to provide information about children's comprehension and their progress in vocabulary and grammar acquisition. There are two different versions of the MacArthur-Bates inventories, the first one is for children from 8 to 15 months while the second one is for with children from 16 to 30 months. As the second version works with older children, this second category is focused on vocabulary and sentence structures resulting in a more complex task in which morphemes, complex verbs, strange words, sentences and complex morphosyntactic constructions are tested (Galeote, Soto, Serrano, Pulido, Rey & Martínez, 2006).

As reported in García, Navarro and Expósito (2010), a specific program called Battery-ECODI (Battery of Cognitive Evaluation for Persons with Mental Disability) was designed to assess exclusively the cognitive abilities of DSC. This program is based on 10 different tasks: laterality, memory, visual perception, attention, logico-mathematical reasoning, motility, language, reading, writing, and graph motor skills. The majority of these tasks include a specific training for the improvement of DSC's language such as activities based on verbal memory, phonetics, syntax, semantics, comprehension, reading and dictation. Galeote, Checa, Sánchez-Palacios, Sebastián and Soto (2016) have recently adapted this test for Spanish children with Down Syndrome.

## **6. GAMES AND ACTIVITIES APPROPRIATE FOR THE DEVELOPMENT OF LANGUAGE IN DSC**

There have been important and numerous developments in programs and activities designed to help DSC in their process of language acquisition. These programs reinforce automaticity and brain plasticity so that to be able to perform better in the future. Children are supposed to attend multiple sessions and devote a lot of time to the different tasks in order to improve.

Depending on the children's age, professionals recommend different types of activities so that they can acquire the basic competencies and overcome the most difficult features. However, it is important to keep reinforcing all the previous acquired knowledge during the complete process. According to Buckley and Bird (2012), it is important to start working at home with the children from the very beginning and, if possible, attend group activities. During the first year of life, Buckley and Bird (2012) encourage families to foster a communicative environment and to reinforce the use of gestures and signs. They propose playing "peek-a-boo", singing or using bright and noisy toys to call the baby's attention and imitation.

For the second year of life, communication, hearing and repetition are essential for the child. To obtain an early production of vocabulary, games can be introduced by using familiar objects or pictures in order to encourage imitation. A recommendation is the use of consonant and vowel sound cards so that the child imitates the sounds and plays with his/her phonetic apparatus (Buckley & Bird, 2012).

Once the child is 3 to 5 years old, the acquisition of more vocabulary and syntax can be taught through games with children's textbooks with simple and short sentences. Textbooks reinforce comprehension, audition, grammar and also the memory. According to Buckley and Bird (2012), it is very useful to create vocabulary checklists of words that the child is interested in. To test their efficacy, matching, selecting or naming are possible games.

Throughout the primary school years, DSC are exposed to different areas of work in which the addition of questions, negatives, plurals, possessives, prepositions, articles and tenses are necessary. For their progression, literacy activities are essential. Some of these fields mentioned above are more difficult than others as some of them add very little to the meaning of the sentence and DSC tend to avoid them and simplify sentences. However, there are also some activities and games to reinforce their use.

In order to reinforce the use of questions a good activity would be to produce questions aloud about simple activities so as to be heard "Why are we putting our coats on?... Because it is raining" (Buckley & Bird, 2012: 45). Together with the questions, negatives can be introduced with cards such as in "Is it chocolate?. No, it's not chocolate it's a key" (Buckley & Bird, 2012: 46). Besides, matching cards are useful for

the acquisition of the plural marker where the child has to say if there is one or more than one element, moreover, asking to put something in/on/under something would be an example for learning the prepositions (Buckley & Bird, 2012).As mentioned above, some elements add very little information to the sentence such as articles, which are usually unstressed. Reading is a method to get used to them. Furthermore, because of their semantic complexity, the acquisition of tenses is a very hard task for DSC. Attention and conversations focused only on one tense are the tips for acquisition (Buckley & Bird, 2012).

An interesting study was carried out by Venuti, De Falco, Esposito and Bornstein's (2009). Its purpose was to compare the differences between solitary child play and mother-child collaborative play in DSC and TDC. The study revealed that DSC are generally less explorative in solitary play than TDC. However, a familiar-child collaborative play motivates them to explore and play. A familiar presence provides different types of behaviors that are very useful for the child such as widening, control of attention and action, restrictions and propositions. Figure 1 summarizes the findings of the study:

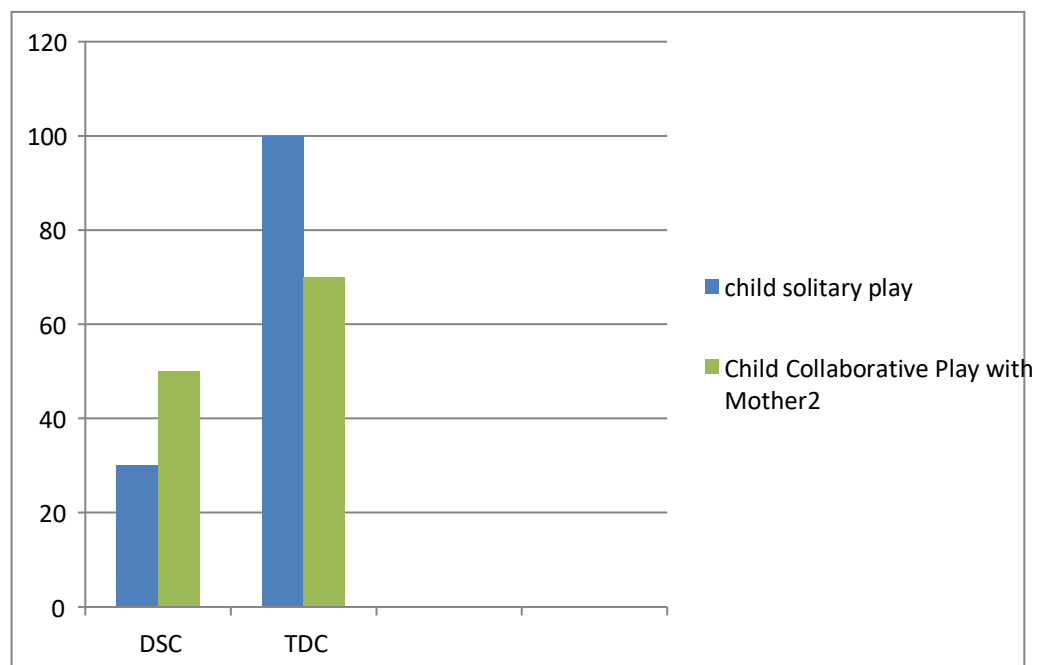


Figure 2. Comparison between child solitary play and child collaborative play with their mothers (adapted from Venuti, De Falco, Esposito and Bornstein, 2009: 8)

In summary, activities and games reinforce DSC's acquisition and language development. Moreover, the presence and guidance of their families encourage and help them in their language acquisition process.

## **7. CONCLUSION**

The main goal of this paper was to provide an overview of the main differences between the acquisition of morphosyntax by TDC and DSC. In order to understand the differences in their acquisition and so as to deal with the difficulties that the second group experiences, I first provided a brief overview of the morphosyntactic development in TDC in order to provide the same information for DSC. Once I established the differences between the two groups, I brought up the controversial issue of raising DSC bilingual and showed that some studies have concluded that exposure to another language is not detrimental for them. The paper has also reviewed some evaluation tests used to assess the morphosyntactic evolution in DSC and to identify the weaknesses in language development among this population. Moreover, some games and activities to help DSC with certain difficult structures were also reviewed.

After writing this paper I have realized that even though a cognitive disorder such as DS does not mean any problem for the comprehension of language, it does pose several difficulties for its production. Communication is essential for humans and it must be very difficult not to be able to produce complex sentences or omit different parts of speech, in summary, not being able to communicate as TDC do. The one-year delay observed in some of the typical stages in the acquisition of morphosyntax by DSC needs to be taken into account when teaching this population. Reading about this topic has made me realize that there should be more research on the acquisition of morphosyntactic features by DSC in comparison to TDC as that information could have an important impact on educational approaches for this group of learners.

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