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Language intervention on clitic phrases and passive structures in a sequential bilingual Italian-Bengali child with a suspected Learning Disability

A mixed explicit/implicit approach using TUF and syntactic priming

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Intoduction

The present research project is a case study which investigates production and comprehension abilities in the Italian language of a sequential bilingual Italian-Bengali 8-year-old child with a suspected Learning Disability. The participant presents evident language difficulties which mainly affect comprehension and communication, and issues related to memory and attention. On the other hand, performances in language production evidence difficulties with free-standing and inflectional morphology, lexical retrieval and complex structures. The case involves different variables as potential sources of the learning difficulties: suspected neuro-developmental issues related to attention, reduced input in the Italian language as an L2 due to the condition of sequential bilingualism and the disadvantaged socio-economic situation of the child's family. Therefore, it has been considered a complex case. Although the participant of this research study was involved in a neuropsychiatric evaluation, a final report providing support for our findings is not available. Nevertheless, it has been considered worth investigating the child's linguistic abilities in production and comprehension through standardized and non-standardized tests in order to collect enough data to identify a linguistic profile. One of our aims, indeed, was isolating language characteristics which may depend on later exposure to the Italian language, from those which may have a different, cognitive nature. In order to do this, a control child was involved in the research project. The child is an aged-matched Italian-Bengali sequential bilingual, who is exposed to the same quantity and type of exposure to Italian. Both children attend the same school and are spoken Bengali at home. The study lasted 8 months and was carried out in a primary school in the North of Italy twice a week. It was divided in three phases:

- an initial assessment of the children's linguistic abilities in production and comprehension;
- the administration of a linguistic intervention using the combination of explicit instruction and implicit instruction using syntactic priming paradigms focused on clitic structures and passive structures;

- a post-intervention assessment of comprehension and production. The language intervention and the post-intervention assessment only involved the participant since data on the control child were collected to provide an initial comparison and a possible discrimination between difficulties related to the L2 or to additional factors.

The final assessment aimed at verifying improvement in comprehension or production and to determine possible influences of each instruction method. The first chapter provides theorical remarks on different research areas of interest for this case study: TD acquisition in monolinguals, bilingualism and bilingual acquisition, SLI and related characteristics in production and comprehension, language impairments in comorbidity with ADHD and treatment practices using explicit instruction. The second chapter reviews findings on syntactic priming on different populations: monolinguals and bilinguals, and children with SLI and deals with priming as a potential form of implicit language learning. The third chapter discusses the case study itself. It presents the participant, it analyses data from the first assessment, it describes the implicit-explicit language intervention providing examples of the used materials and analyses the results which emerged by the post-intervention assessment. A final discussion provides reflections on improvement, instruction efficacy and potential research direction for further investigations.

1 Chapter 1: TD acquisition, AD acquisition, bilingualism and explicit treatment of language impairment.

1.1 Introduction

The first chapter of this thesis reviews significant findings from several research areas, which need to be considered to outline an accurate profile of the participant of the present case study. Firstly, it provides recent data concerning the emerged patterns of typical and atypical language acquisition in monolingual and bilingual contexts with particular attention to the differences between profiles of simultaneous bilinguals, sequential bilinguals (L2 learners) and monolingual children with Specific Language Impairment (SLI). Subsequently, it observes language acquisitional trajectories of the mentioned populations through cross-linguistic data collected on different domains of language. This introductory chapter also explores the cognitive implications of bilingualism in typically developing (TD) children and children with SLI. It also provides general remarks concerning the language characteristics, which seem to relate to ADHD. The analysis continues discussing the awareness, which families, educational and clinical environments need to develop on bilingualism and its implications on the assessment of SLI in bilingual contexts. It has been considered essential to draw attention on the mentioned topics of psycholinguistic research since each one of them provides a piece of awareness to account for what can be considered a complex case. Indeed, in the absence of an official diagnosis of the causes underlying the linguistic difficulties which the child presents in production and comprehension, the described aspects of (TD and AD) language acquisition must be considered interconnected realities, which potentially shape the emerged linguistic profile.

1.2 Developmental trajectories of L1 acquisition in Typically developing (TD) children. Data from cross-linguistic studies.

Psycholinguistic research on TD acquisition of the L1 has identified recurrent linguistic patterns in children's productions. Such similarities have been noticed in all language domains and across-languages, suggesting common global mechanisms of language learning and use during the first years of L1 acquisition

1.2.1 The acquisition of vocabulary

Concerning the domain of lexicon, research has demonstrated that there are similarities in the number of words which children learn at different ages across languages. Cross-linguistic differences within lexical acquisition, instead, emerged in the distribution of these words (verbs or nouns) and seemed to depend on structural characteristics of the language being acquired. For instance, high production rates of words belonging to one class may imply disadvantage of another class of lexical items; or, again, the small vocabulary may correspond to a more developed inflectional system (Bedore, Peña, 2008). Toddlers acquiring vocabulary do not seem to produce many naming errors, and their errors seem to be logical. For instance, being exposed to names of high-frequency items, they may display a general use of known, high-frequency terms to name lower frequency items. Children tend to do this because they use known words to make hypotheses on new ones also based on language-specific properties, which they already know (Bedore, Peña, 2008). Children's initial lexical knowledge seems to result from their contact with the world combined with the underlying identification of formal rules and generalization of them through practice and exposure. Therefore, experiencing the world is essential at the initial stages of language development. It is important to point out that experience depends on socio-cultural factors which determine the amount and the quality of the received input (Masrai, 2018).

1.2.2 The acquisition of morphosyntax

For the acquisition of morphosyntax, children's early productions across different languages start with single words and continue with multiword combinations and more complex forms. Other similarities are in the acquisition of structures like tense-marking or inflectional morphemes, which seem to be restricted to contexts, depending on the semantics of the verb. For instance, children speaking Italian, French, and English seem to use the past tense marking morphemes only with achievement verbs in early productions (Antinucci, 1976). On the other hand, there are cross-linguistic differences in the rate and order of acquisition of certain forms which depend on language-specific characteristics of those structures. The use of certain morphemes marking tense or inflection in English precedes the use of other morphemes: the morphemes "ing" and "s" (for plural forms) precede other morphemes (Bedore, Peña, 2008).

Research has shown that there are regular patterns in use and omission of grammatical morphemes in children's early production of multiword combinations. First, inflectional morphology seems to be mastered earlier than free-standing morphology. This phenomenon depends on the fact that bare stems without the inflectional morpheme marking person, number and gender (in cases of nouns) are not permitted either as nouns or as verbs. Verbs in the present indicative and imperatives (finite), as well as past participles (non-finite) are the first forms that Italian speaking children produce at early stages of acquisition (Caprin, Guasti, 2009). Despite the high complexity of the Italian verbal inflectional morphology, children's early productions seem to be accurate with the most frequent errors being overgeneralizations of the third person singular morpheme (sometimes used instead of the plural one) and regularizations of irregular forms (Caprin, Guasti, 2009), whereas substitutions with an infinite form is infrequent (Rizzi, 1993). Caprin, Guasti, 2009 suggest that children aged between 22 and 35 months use inflectional morphology even though singular verbal inflections, especially the third person singular inflection, is more used than the plural ones and is present from the very first productions. An additional prove for the fact that children master (at least partially) the verb inflectional system is that they omit

the subject, which is possible in Italian, but requires that the information on the subject (person and number) appears in the verbal suffix of the verb and the agreement. For instance, it is possible to say dormo, dormi, dorme (I sleep, you sleep, he/she sleeps), but it is not possible to say *dorm. Indeed, children's errors seem to mainly consist of substitutions rather than omissions of inflectional morphemes (Leonard, Caselli, Bortolini, McGregor, Sabbadini, 1992).

Copulas, auxiliaries, articles, and prepositions (free-standing morphology) seem to be more difficult and are subject to frequent omissions. The verb essere (to be) is acquired earlier as a copula than as an auxiliary since the latter appears in compound past tenses, which are acquired later. Indeed, auxiliaries appear together with the past participle in compound tenses, and only together they can express the tense, while copulas can be considered simple tenses and can express tense by themselves. Nonetheless, mastering the agreement appears more difficult in copular clauses than in clauses with lexical verbs (Caprin, Guasti, 2009). Articles in Italian are marked for definiteness, number, and gender and begin to appear between 18 and 22 months of age in combinations of words. Errors with articles seem to only consist of omissions and appear to depend on the position of the article. Children omit articles more when they appear in first clausal positions (in subject positions), or isolated NPs, then inside the clause, after verbs (Caprin, Guasti, 2009). The same happens with subjects, which are omitted from the specifier of the clausal root which hosts the omitted DPs.

The Italian pronominal system consists of tonic (high phonetic saliency) forms and clitics (atonic, low phonetic saliency). Pronouns are marked for person, number, gender and grammatical function which can be subject (tonic only), direct object (tonic and clitic) and indirect object (tonic and clitic). The reflexive pronouns can be both tonic and clitic. Tonic forms appear earlier than clitic forms which, instead, are acquired in parallel to verbal morphology. When children start to produce pronouns, they do not seem to completely master the differences in terms of case features, and they produce number and gender agreement errors, but clitics are always positioned correctly (Caselli, 1992; Guasti, 1993). Italian clitic pronouns are monosyllabic morphological items with low phonetic saliency which cannot appear in isolation. According to the

grammatical function that they have, they can be called accusative, dative, locative, and partitive (Renzi, Salvi, Cardinaletti, 2001). In the following section direct object clitic pronouns (accusative pronouns) and reflexive pronouns are observed in detail as they represent one of the structures which have been tested and trained in this research project through a combination of explicit and implicit instruction.

Influences on the acquisition of syntactic structures are not only the result of the combination of different factors like classes or morphosyntactic forms but also of other language-specific variables like phonetic saliency, frequency of occurrence and complexity of the structural rules themselves. High saliency of a particular form contributes to a greater probability for the child to create a representation of that form. For instance, English tense-marking morphology, which consists of low saliency forms (likes for the simple present tense and -ed for the simple past tense), seem to be spontaneously produced around 4 years of age; whereas in Spanish they consist of high saliency forms, which start appearing at 3 years of age (Bedore, Peña, 2008). The frequency of occurrence seems to influence the acquisition of articles which appear with the first words in Spanish, but only in around 3-word-utterances in English. The order of acquisition of specific syntactic structures is also influenced by the syntactic complexity of the structures themselves. For instance, it seems that negative and question forms are acquired earlier by Spanish speaking children than by English speaking children because the transformational operations to apply are less complex (Bedore, Peña, 2008).

1.2.3 The acquisition of narratives

Cross-linguistic similarities have also been noticed in the development of narratives. Children aged 3 seem to tell stories with fewer words, less complex structures and reduced length of utterances (LOU) compared to older children independently of language. In all younger children's productions, the sequence structure of the story is simpler, while in older children's productions (aged 5) it appears more detailed and marked by words expressing time. Productions of even older children (aged 9) contained further details or background information and more

clearly structured time sequences (Berman, Slobin, 1994; Bedore, Peña, 2008). Developmental differences, which emerge in narratives reflect structural differences among the languages themselves. Undoubtedly, there are common elements that belong to the pragmatic of storytelling, yet the use of such elements directly depends on their linguistic nature and complexity. Bedore and Peña (2008) claim that children speaking Romance languages would use one-word-verbs to express an action together with the correspondent direction or the kind of motion, while English speaking children would have to add a prepositional phrase to indicate direction and motion, which would mean adding complexity to the production. They make clear that, essentially, errors that children make while telling a story are closely related to morphological, syntactic, lexical and cultural characteristics of the languages they speak. In other words, errors that children make in storytelling mirror the complexity of morphosyntactic forms and they are not overt errors like adding irrelevant information. Therefore, it is of paramount importance that narrative productions are assessed considering language specificities and not merely based on mere scores. The researchers also claim that storytelling can reflect speakers' ability to arrange a whole structure of speech (composed of the domains mentioned above of language) while keeping the listener's perspective in mind. Language tests using storytelling, therefore, can reveal a lot not only of children's morphosyntactic representations at all ages, but also of processing and organization of complex speech in general, of their syntactic preferences, and pragmatic skills while providing valuable insights on cognition.

1.3 Specific Language Impairment (SLI)

Specific Language Impairment (SLI) is a neurodevelopmental disorder which specifically affects language since it appears in the absence of sensory-motor deficits like hearing issues, impairments in cognitive development like autism or mental retardation or other syndromes. Indeed, children with SLI display typical social-emotional, hearing and motor development and standard IQ rates. Moreover, it cannot be ascribed to insufficient language exposure, but it must be considered an impairment in the development of one single or more than one domain of language,

despite regular exposure which leads to linguistic performances below age expectations (Paradis, 2007; Bedore, Peña, 2008; Novogrodsky, 2015). SLI emerges as difficulties with either one modality or both production and comprehension of spoken and written language. Such difficulties can appear in all the domains of language (phonology, word finding, and lexicon, morphology, syntax, semantics, and pragmatics) either exclusively or in more than one domain combined (Novogrodsky, 2015). SLI is assessed by collecting language data from linguistic tests and naturalistic speech on production and comprehension and by comparing them with normative data from TD age-matched peers.

1.3.1 Developmental trajectories of L1 acquisition in children with Specific Language Impairments (SLI). Data from cross-linguistic studies.

Cross-linguistic studies of language impairment have found regular linguistic patterns in children with SLI which seem to appear across languages in the different linguistic domains.

Concerning the domain of lexicon different phenomena have been observed. The most frequent are: lower rates in word acquisition, word-retrieval difficulties, and errors in vocabulary use like verb omissions, lexical approximations, lexical mismatches (selection of a verb which is similar to the target, but not the most accurate one) or form exchanges (appropriate selection of the verb, but incorrect form for instance tense) (Bedore, Peña, 2008).

The domains of morphology and syntax are characterized by the reduction of both utterance length and utterance complexity in respect to productions of age-matched TD children. The structures which demand more difficult processing for children with SLI are language specific. For instance, English children seem to have more difficulties with tense marking morphology and morphology indicating plural forms, while children speaking romance languages seem to present more difficulties with articles and clitic forms (Bedore Peña, 2008).

There are linguistic items and morphosyntactic structures, which have been identified as particularly problematic for children with SLI. They are called linguistic

markers. Research has found linguistic markers for each domain of language. Children with SLI perform below average in tests assessing linguistic markers concerning the linguistic area in which they present the deficit. It is important to highlight that language markers are language-specific since they depend on the characteristics of the domains of the language that they refer to, like morphosyntactic rules or degree of complexity of structures (Vender, Guasti, Garraffa, Sorace, 2012). Research has found morphosyntactic items marking tense and agreement to be accurate markers for the English language, while object clitics, definite articles, and third person plural inflections can be considered markers for Romance languages (Novogrodsky, 2015). For the aims of his research, it is also important to consider that clitic pronouns production and non-word repetition are considered very accurate markers of SLI for Italian speaking children (Arosio, Branchini, Barbieri, Guasti, 2013; Vender, Guasti, Garraffa, Sorace, 2014). Moreover, SLI can appear as difficulties with the learning of new vocabulary, morphosyntactic errors which depend on specificities of the language and reduced discourse organization (Bedore, Peña, 2008).

Two principles need to be mentioned here and to be considered for accurate identification of the linguistic structures and items that can be considered linguistic markers, and, consequently, for an unbiased diagnosis.

- As already mentioned, linguistic markers change according to language. For instance, errors and omissions in tense-marking morphology are considered a marker of SLI in English, while omission of functional words like articles, prepositions, and direct object clitics and the overextension of the third person plural inflection (production of the third person singular instead of the plural one) are considered accurate SLI markers for Italian. Moreover, clinical markers often need to be tested in combination in order for their accuracy to increase. For instance, the mentioned clinical markers for Italian are often considered with non-word repetition (Arosio, Branchini, Barbieri, Guasti, 2013).

- Since children with SLI improve their language skills just like TD children, what was considered a marker of SLI at a certain age may not be a valid marker later

on. Therefore, it is important not only to identify clinical markers but also to test their persistence (Arosio, Brachini, Barbieri, Guasti, 2013).

Profiles of children affected by SLI can change according to the impaired language domain and can be characterized by dissociated deficits (affecting one single domain) or mixed deficits in comorbid situations. For instance, Friedmann and Novogrodsky (2006-2008) have investigated SLI children who had syntactic deficits but preserved lexical retrieval/word-finding and phonological skills, another group with lexical retrieval deficits but preserved syntactic abilities and another one with phonological deficits but no syntactic deficits.

Research has found that SLI can have a genetic nature. When caused by genetic reasons, SLI can depend on one single gene which compromises the functioning of different cognitive processes dealing with language processing and acquisition; yet in many other cases it has been found that the SLI implies more complex genetic disorders or a more complex nature of genetic and environmental factors combined (Bishop, 2006). Usually, SLI does not correspond to a single skill which is impaired but rather to a combination of them, and it can depend on deficits of different brain areas (meaning more than one cognitive process) which deal with language processing.

One of the most investigated kinds of SLI is the S-SLI which stands for Syntactic Specific Language Impairment. Individuals who are affected by this kind of impairment display difficulties with the processing of complex structures (either in comprehension or in production or both) like object relative clauses or passive clauses. Difficulties in the processing of these structures seem to derive from one syntactic characteristic that they share: the movement of one phrase, which transforms a simple structure into a more complex one with non-canonical order of arguments and creates an increase of complexity between the deep structure and the surface structure.

1.3.2 Accounts on the nature of SLI

The accounts, which have been proposed to describe the nature of the deficit underpinning SLI divide into two macro kinds: the linguistic-representational one (linguistically-based) and processing-based one.

- According to linguistically-based accounts, children are unable to represent specific grammatical aspects (Rice, Wexler 1996). This account would explain the difficulties, which English speakers with SLI have with tense-marking and inflectional morphology and, which French in Italian speakers have with definite articles and clitics (Bedore, Peña, 2008, Paradis, 2010).

- According to processing-based accounts, children with SLI have processing limitations and phonological and working memory deficits which affect their verbal and non-verbal abilities (Montgomery, Leonard, 1998). The Surface Hypothesis account (Leonard, 1998), for instance, suggests that morphological items with low phonetic salience are challenging to learn because of the reduced processing abilities of the speakers. Such items are language specific. Therefore, the "s" and "ed" markers (present and past tense) appear to be difficult because of their low phonetic salience. An interpretation based on the slowed hypothesis perspective would also account for delays in lexical retrieval and comprehension (Bedore, Peña, 2008). The study by Marinis and Sally (2013) on comprehension of passive structures compared data collected from three different populations: TD L1, TD children acquiring an L2, and SLI children. Children with SLI made many reversal errors and errors of interpretation of the passive structure as an adjectival structure. This finding would support the theory of language representation deficit, yet other results of the same study supported the processing limitation hypothesis. Firstly, children with SLI showed longer reaction times in the processing of both active and passive structures compared to L2 and L1 children; secondly, reversal errors were found in actives too. Therefore, results are more consistent with the slowed processing account than with the Surface Hypothesis, since children demonstrated to be sensitive to short unstressed morphological items like -ing for actives, and -ed, by for passives.

As already mentioned in the previous paragraph, the factor that seems to mainly affect processing of complex structures like clitic phrases (direct object clitics and reflexive clitics), object relative phrases, or passive phrases is the movement of the NP expressing the theme to an earlier position. With the syntactic movement, the theme occupies a non-canonical position, causing a change in the order of the

arguments and increasing the structural complexity of the sentence. S-SLI is a syntax processing deficit, and it significantly affects the ability to process complex structures which derive from syntactic movement (Friedmann, Novogrodsky, 2004). In a study on 10 Hebrew-speaking children, Friedmann and Novogrodsky (2004) tested comprehension of object relative clauses in school children with SLI aged between 7;3 and 11;0. Object relatives present a kind of syntactic movement in which the Theme moves from a post-verbal position to an earlier position in the sentence leaving a trace in the position from which it has moved and transfers its thematic role to the derived position. The investigated children had difficulties in understanding object relative clauses, yet their performance with simple sentences and subject relative clauses was better. They were compared to a group of TD children aged 6;0 who mastered all tested structures. This finding provides further evidence that non-canonical structures are very difficult for children with SLI and that the difficulty seems to depend on syntactic movement. A follow-up study by Friedmann and Novogrodsky (2006) aimed at discovering the specific mechanism related to syntactic movement, which causes difficulties in comprehending object relative structures. They investigated whether the deficit lies in the correct positioning of the trace (called t1) or in the assignment of the thematic role to the position to which the Theme has moved. Again, consistent difficulties in the production of object relative clauses emerged, and the production of subject relatives was better but still impaired. Nevertheless, children did not produce structural errors or ungrammatical sentences and demonstrated to possess the syntactic abilities to build the sentence frame. They made errors related to thematic roles, showing that the process of assigning thematic roles was impaired for school children with S-SLI, while the positioning of the trace was intact.

1.4 Neuro-developmental issues and Language Disorders. A closer look on ADHD

A considerable amount of literature claims that children with language deficits are often diagnosed with neuropsychiatric or neuro-developmental issues. ADHD (Attention Deficit Hyperactivity Disorder) or working memory deficits, for instance, are often found in comorbidity with SLI and learning disabilities (Novogrodsky, 2015) and

seem to mainly affect communication and comprehension (Bruce, Thernlund, Nettelbladt, 2006). It has been found that ADHD children who present language impairments display difficulties which appear to be more related to a language impairment than to speech disorders and that the former ones are the more likely to cause problems with the pragmatics of conversation, and social difficulties. Among the linguistic difficulties, which belong to the pragmatic domain, Tannock (2002) identified issues concerning communication, reading skills, and the use of language to regulate behaviour and plan, for instance:

"1) Excessive verbal output during spontaneous conversations, during task transitions and in play settings, 2) decreased verbal output and more disfluencies when confronted with tasks that require planning and organization of verbal responses, as in storytelling or when giving directions, and 3) timing problems in terms of initiating conversation, taking turns, and maintaining or changing topics during conversation".

Similar data have been observed by Westby and Robinson (2007), who registered the following characteristics in the participants of their studies:

"inability to maintain attention on the aim of the task and to notice details; dislike for activities which require planning, time, or mental effort; impulsivity in answering or taking the turn; difficulties to adjust languages to the listener; difficulties in organizing the discourse; difficulties in understanding main ideas while reading and making causal inferences".

It appears that what it more affected by attention deficits is normal functioning of communication rather than the language itself since the impulsiveness that characterizes ADHD appears in an inability to respect talking times, superficial attention in comprehension, and poor performances in elaborate production. A study by Bruce, Thernlund, and Nettelbladt (2006) on a group of children diagnosed with ADHD provides a detailed description of the ADHD-SLI comorbidity condition that the participants present. They administered a questionnaire divided into eight domains to parents of 76 children aged 11 years old on average. The questionnaire domains covered six factors, each of which represented one area of the neurocognitive development where children with ADHD presented problems: Cognitive skills,

Motor/Perception, Emotion/Socialization/Behaviour, Attention, Literacy Skills, Activity Control). The domains that the questionnaire investigated were Motor skills, Executive functions, Perception, Memory, Language, Learning, Social Skills, Emotional and behavioural problems; the subdomains of Language that the author describe are Comprehension, Expressive language skills, and Communication. What emerged is as follows.

1. The Language subdomains of Communication and Comprehension are much more impaired than Expressive language skills. Whether expressive problems were present, they depended on impaired comprehension or communication;

2. The factors analysis evidenced that language does not appear to be a distinct skill of the individual, but an area of their general cognitive skills. Therefore, many aspects of other domains influence the Language domain (and its sub-domains). Data show that the factor which mostly influences Language is the Cognitive Skills one since it contains memory, language comprehension, expressive language skills, communication, and learning. Moreover, from an analysis of the items that the domains contain, it emerges that there exist many more aspects of the subjects' cognition and behaviour which are strongly related to Language comprehension and pragmatics that the authors list and investigate, even if they belong to other domains. Specifically, this study showed that the most relevant domains are Executive functions, Learning, and Social skills.

The study evidenced a close connection between language and other neuro-developmental areas indicating that language development is the basis for the growth of other skills, especially learning and awareness of the self that lead the child to effective social construction. Such an overlap of cognitive, non-cognitive, behavioural and linguistic factors must not be undervalued in assessment contexts which should always be composed of experts from different fields collaborating. As the authors suggest, there is the risk of misinterpreting results of language tests since there are many factors co-influencing language performance in ADHD subjects.

Gathercole, Baddeley (1993) consider problems in the working memory as the cause of linguistic difficulties. Further studies on bilingual children referred for psychiatric services provide evidence that productive and receptive language issues in both the spoken languages are closely related to psychologic issues in the behavioural and emotional spheres and lead to social problems (Toppelberg, Medrano, Morgens, Nieto-Castañon, 2002 for a review). One possible interpretation of this finding is that psychopathology predicts language deficits in bilinguals because it interferes with the cognitive, social and linguistic strategies (which have been named in the previous section on bilingualism) that TD bi-lingual children use to learn two languages. On the other hand, there is another interpretative account according to which psychopathology and compromised bilingual language skills are caused by language deficits in general since reduced language abilities may cause a stressful acquisition process. In any case, what has emerged is that language difficulties were not influenced by immigration, age, or language. There seems to be a strong relationship between language and psychopathology (Toppelberg, Medrano, Morgens, Nieto-Castañon, 2002).

Kkaldonekand Crnjaković (2018) considers one aspect which is relevant for the sake of the present research, which is the effects that ADHD has on the acquisition of a second or additional language with a more in-depth focus on inattention and the functioning of working memory. ADHD is characterized by weak working memory, which is needed in incidental and intentional learning, and weak executive control processes like attention modulation. This not only causes difficulties to focus and maintain attention on a specific stimulus, but also Visual and verbal information memorization and processing results hindered. Consequently, the individual affected by ADHD has severe difficulties noticing a language form in the exposure in order to consciously reflect on it and learn it. This slows the process of acquisition of competence in the different linguistic domains and the development of strategies. Specifically, the tasks in which ADULTS affected by ADHD seem to struggle more are single word reading or writing (letter insertion, substitution or omission), writing planning, maintaining coherence at a sentence level, and reading comprehension in L1

and L2. The listening comprehension is also considered a challenging task as it requires sustained attention and selection of specific information (KkaldonekCrnja-ković, 2018). Other findings also show that one of the main difficulties for individuals with ADHD is to process visual-spatial information; therefore, morpho-syntactic structure ore lexicon should be mainly taught orally or through a multisensory approach.

1.5 Bilingualism

Bilingualism is the ability to comprehend and use two languages at the same time independently of the degree of proficiency in each one (Vender, Guasti, Garraffa, Sorace, 2012). For a more precise classification of the collected data on bilinguals, the literature distinguishes between simultaneous bilinguals and sequential bilinguals. Individuals who acquired/are acquiring two languages at the same time belong to the former category, while the latter describes individuals who acquire a language after having (entirely or not) acquired another belong to the latter (like immigrants or second language learners). Genesee, Paradis, Crago, (2004) distinguish two types of sequential bilinguals: those whose L1 is a minority language and learn the L2 in school or in the city context (like immigrant children or children whose parents are immigrants); and those whose L1 is the majority language and learn the L2 through systematic intensive programmes at school. In the last decades, bilingualism has become an ever-growing reality in Italian schools as a result of migratory flows across Italy. Italian classrooms are becoming multilingual and multicultural environments where more than one minority language is spoken as L2, and especially, where different background stories coexist. Children's past experiences involve different ages of the first contact with the second language, different reasons for migration, different amounts and quality of exposure to the migration language and different socio-cultural situations.

1.5.1 Bilingual acquisition in Typically Developing (TD) children

Cross-linguistic research on bilingual language acquisition has examined children's acquisitional trajectories and production behaviours in both languages and has identified similarities and differences across their profiles in all language domains.

1.5.2 The acquisition of vocabulary

Lexical acquisition in bilinguals appears similar to lexical acquisition in monolinguals. Indeed, studies have shown that children growing up in bilingual environments learn their first words at almost the same stage of development and the same rates as monolinguals (12-13 months), and the variable affecting vocabulary size is the amount of time spent in each language (Genesee, Nicoladis, 2005). The difference lies in the fact that bilingual children's vocabulary knowledge spreads through both language systems with words which overlap and words which only appear in one language. For instance, a strong relationship between word and context appeared to be one of the factors determining the number of words that children produce in each language (Bedore, Peña, 2008; Bedore, Peña, Giunta, 2002). The exposure variable needs to be taken into consideration since it influences children's word knowledge, yet this is not an essential condition. There is evidence, indeed, that children may know a number of words which would not be expected by the quantity of exposure in that language (Bedore, Peña, 2008).

1.5.3 The acquisition of morphosyntax

Similarities between simultaneous bilinguals and monolingual children can be found in the domain of morphosyntax as well. Nevertheless, there seems to be less overlap since properties and structures which children acquire are language-specific. For instance, French-English bilingual children use finite verb forms earlier In French than in English, and subject pronouns in English with both finite and non-finite verbs as they know that the subject pronouns must always be expressed (Genesee, Nicoladis, 2005 for a review). Another phenomenon of bilingual production which reflects

knowledge of language specificities is the code-mixing. When children mix their languages in the same utterance, they do it according to word classes (nouns in the place on nouns and verbs in the place of verbs), and they tend to switch language at specific boundaries separating two grammatical showing knowledge of grammar rules (Paradis et al., 2000). For an aware interpretation of the data collected on bilingual acquisition in TD and AD children, it is essential to consider other variables that can influence the order of acquisition within the two languages and differentiate the characteristics of production. They are the saliency and the frequency of use of language-specific morphosyntactic forms. For instance, morphosyntactic structures that are shared or similar between two languages are high saliency structures which have more probability to be acquired earlier. The same happens with high-frequency structures within the same language. It is no coincidence that bilingual children seem to know more grammatical rules and to produce sentences with a higher MLU in their dominant language (Paradis et al., 2003).

Morphosyntactic rules of the dominant language can have influences on the L2since bilingual children tend to incorporate structures of their dominant language in the weaker one. This phenomenon has been observed in cross-linguistic transfers of an L1 morphosyntactic rule to the L2 with the consequent production of a grammatically acceptable sentence, yet not entirely accurate from a pragmatic point of view. For instance, it has been found that bilingual English-German children tend to overextend the use of VO order in their German much more than monolingual children speaking German. Indeed, in German, a VO order must be used in main clauses and OV order in subordinate clauses (Genesee, Nicoladis, 2005 for a review). Bedore and Peña (2008) provide an additional example of that: a child who is dominant in Spanish could use the past progressive to tell a past action while speaking in English, while speakers who are dominant in English would use a more appropriate structure like the past tense. This reveals a productive language knowledge (Bedore, Peña, 2008) rather than a real error because it suggests that children know morphosyntactic rules of both languages and are sensitive to overlapping structures. Indeed, the example reflects the use of a

form which exists in both languages, but which generally would not appear in the used form.

1.5.4 The acquisition of narratives

Knowledge of both languages is also exploited in the domain of narratives, and it is visible in the morphosyntactic structures that children use to tell stories. On the one hand, children seem to use language-specific grammatical rules and story-telling styles. On the other hand, they also display crosslinguistic structural influences. Bedore and Peña, (2008) suggested that Spanish-English bilinguals use more nominal clauses in English and more adverbial clauses in Spanish as expected, yet they can also use complex structures in English which are influenced by Spanish.

1.5.5 Major findings on the cognitive implications of bilingualism in TD children.

Research has found that simultaneous and sequential bilinguals activate both languages when they are using one of them (be it in comprehension, planning or production of an utterance) and this evidence emerged in proficient bilinguals (like simultaneous bilinguals) as well as in L2 learners and L2 learners (Kroll, Bialystok, 2013). Research on code mixing and blending and on syntactic persistence/priming (see chapter 2 for a review) has confirmed that information of all language domains is accessible in both languages in bilinguals and interact in the processing and planning phases which precede selection of one of them. Language interferences are more frequent at lower levels of L2 proficiency since speakers rely on their L1 in the planning of utterances in the L2, yet they have been observed in proficient bilinguals as well demonstrated by research on syntactic priming (see chapter 2 for a review of the findings on bilinguals).

Further research has dealt with the cognitive benefits that develop in parallel with bilingualism. There is evidence that bilinguals outperform monolinguals in cognitive functions like attentional control, working memory and in factors which are even more closely related to language like abstract representations (See chapter 2 section 2.2 for a detailed review on bilingual syntactic representations) skills and metalinguis-

tic/metacognitive awareness. It seems that the constant process of inhibiting one language to successfully use the other allows bilinguals to develop abstract representations, to gain better awareness of their learning processes (Adesope, Lavin, Thompson, Ungerleider, 2010; Kalashnikova, Mattock, 2012) and to more efficiently distribute their attention resources (Adesope, Lavin, Thompson, Ungerleider, 2010; Kempert, Saalbach, Hardy, 2011; Kalashnikova, Mattock, 2012). Such cognitive benefits are independent of proficiency and are visible in simultaneous bilinguals (very proficient speakers), sequential bilinguals (who could have a lower level of proficiency), and later L2 learners. It is the process itself of managing two language systems which allows the named cognitive functions to develop. Nevertheless, it is well known that the earlier a second language is learned, the more stable advantages in learning contexts are.

Some of the data collected on sequential bilinguals who are children of immigrants seem to contrast with the findings mentioned above. Indeed, children from immigrant families or with a background story of immigration tend to perform worse than their native school peers in assessments such as the Program for International Student Assessment (PISA) or the Progress in International Reading Literacy Study (PIRLS) in the domains of reading, mathematics, and science. Specifically, immigrant children have difficulties with the language of instruction as a basic issue, which leads to incomplete comprehension of tasks and poor production performances. This difficulty seems to spread to other academic fields impeding native-like achievements (Kempert, Saalbach, Hardy, 2011). Therefore, despite data indicated the potentials that bilingualism could have on academic achievement, a necessity emerged to guarantee access to the instruction language to immigrant children.

Two findings from the study of Kalasnhikova and Mattock (2014) are particularly relevant for sequential bilingualism in the school context. The first one is that although cognitive benefits of learning a second language have been noticed in sequential bilinguals (who display unequal proficiency levels), a difference emerged between them and simultaneous bilinguals. Indeed, while simultaneous bilinguals showed improvement in all the tasks, sequential bilinguals only reached similar scores in tasks related to attentional control. This result could depend on the fact that they have been

exposed to both language systems for a shorter period and that they started processing a second language when their acquisition of the first language was not completed. Therefore, the management of a double language system improved their attentional control skills, yet the results suggest that metalinguistic awareness and linguistic representations may need more time and more language practice to become as robust as in simultaneous bilinguals. The second significant result is that both bilinguals and monolinguals improved the examined cognitive skills during school time.

This last result underlies the role of school for the child's cognitive development and connects to the previously mentioned finding that most immigrant children do not possess adequate L2 proficiency to cope with the language of instruction (Kempert, Saalbach, Hardy, 2011). School practices should aim at reducing the processing effort that immigrant children put on the second language by making it more accessible or by providing an extra systematic work on the L2 focused on the most used structures/lexicon and on strategies to develop metalinguistic awareness. The aim should be providing the immigrant child with initial equipment of linguistic tools that enables them to comprehend tasks, study material, and the teacher's subject-specific language firstly in order to minimize the linguistic issue that prevents sequential bilingual children from reaching the same results as native children in academic tasks.

The potential that school setting has in building immigrant children's linguistic competencies should be identified not only in primary school but also in preschool education which apparently can strongly enhance vocabulary acquisition in L1 and later learning of an L2 (Masrai, 2018). Therefore, guaranteeing the means through which the child can develop L1 vocabulary through a rich input exposure before traditional school should be a priority for families and schools not only for monolingual children but especially in the cases of sequential bilinguals.

To conclude, it is possible to claim that, despite bilingualism has often been considered detrimental to children cognitive and academic development, and sometimes it still is, there is enough evidence supporting the opposite view. A stronger awareness on the benefit of bilingualism is yet to be developed in education policymakers, school teachers and families of bilingual children, who often do not provide

adequate means for the development of both languages or focus on the development of either the familiar one or the instruction one.

1.6 Bilingualism and SLI

Although the research has evidenced the cognitive and social benefits of bilingualism, which are discussed in the previous paragraph, there are still open questions on bilingualism in cases of children with SLI, whose linguistic performances are below age in both languages. Performances of TD bilingual children can be inferior to performances of monolingual children in different domains of language during their first phases of acquisition. For instance, it has been observed that they have reduced receptive vocabulary knowledge, slower lexical retrieval and some difficulties with inflectional morphemes (Vender, Guasti, Garraffa, Sorace, 2012; Paradis, Crago, 2000). In other words, their performance in early productions can resemble that of children with SLI, and this has led to a debate about the accessibility of bilingualism for children with SLI.

It has been often considered inappropriate for children with SLI to be raised bilingual or learn a second language because of the general belief that learning a second language would mean overloading them, given their limited skills in their native one. For this reason, families of children with SLI are often suggested to only keep one language in family communication, which generally corresponds to the language of education or the one spoken in the country of immigration (in cases of sequential bilingual). Research investigating the nature of SLI has evidenced two different perspectives on the relationship between SLI and bilingualism (see also paragraph 1.3.2). One account implies cognitive, perceptual processing problems; and the other involves linguistic representational issues. Both accounts exclude the hypothesis that learning two languages at the same time could be detrimental to children with SLI (Paradis, 2007).

According to the first view children with SLI have deficits in some basic cognitive and perceptual processing mechanisms (Paradis, 2007). Their deficit consists in a processing-limitation, which causes a generalized deceleration of their ability to intake and retrieve linguistic knowledge, and also non-linguistic difficulties. Such a decelera-

tion involves both the languages the child learns and would cause delays in language learning compared to monolingual TD and monolingual SLI age peers (Miller, Kail, Leonard, Tomblin, 2001). According to the representation account, children with SLI have selective deficits in linguistic representations. In this case, the complexity of the representation is relative to one or more domains of language but does not belong to the extralinguistic spheres of cognition or perception. In other words, children with SLI are not wholly able to represent specific structures which are "disrupted" and are considered clinical markers (see paragraph 1.3). Therefore, SLI also show difficulties with structures that only belong to one language (Clahsen, Bartke, Göllner, 1997). Such a view implies that a child with SLI learning 2 languages at the same time would not relevantly differ from a child with SLI learning one language in terms of performance of clinical markers, since the impairment is in the linguistic representation system which is affected neither by reduced input in one language, nor by the overload of 2 languages.

The second account of the nature of SLI provides a better description of profiles of children with SLI, which seems to be uneven in terms of critic areas. English children with SLI, for instance, have more difficulties with tense marking morphology than with other kinds of morphology and such a gap seem to need much more time to be filled in SLI children than in TD children. The slowing processing account explains uneven profiles also through the surface hypothesis according to which SLI children find less phonetically salient morphemes more difficult to acquire because they also have perceptual impairments (Leonard et al. 1992).

Paradis, Crago, Genesee, Rice, (2003) compared production data of French and English tense marking and non-tense marking structures in productions of monolinguals and bilinguals with SLI in order to test the two discussed hypotheses. The processing account would predict that bilingual children with SLI perform worse than monolingual children with SLI in both languages and that any other result would be due to differences in perception. On the other hand, the representational account would predict that bilingual SLI and monolingual SLI perform worse in tens marking morphology than in non-tense morphology with no crucial difference between the two

groups. The first emerging result was that all children with SLI performed worse in tense marking morphology and no significant difference emerged between monolingual SLI and bilingual SLI.

A similar result has been found by Paradis et al., (2005/2006) who looked at the use of direct object clitics in bilingual English-French children, monolingual English children, and monolingual French children. Their result confirmed the expectations that the participants would show delays in the acquisition of direct object clitics. Moreover, bilingual participants produced more clitics in context in English than in French, meaning that the difficulty related to the semantic-pragmatic use is specific to French. Again, this study did not find any worse performance of clitic production in bilingual SLI in respect to monolingual SLI. Instead, they produced a higher rate of clitics, and both groups perform better with articles than with clitics, as expected for complexity reasons. These findings are more consistent with the representational theory and exclude the processing limitation perspective. Moreover, they invalidate the hypothesis that learning two languages at the same time could mean overloading a slowed processing system.

In conclusion, research demonstrated that there is no empirical evidence to claim that bilinguals with SLI would be hindered with respect to monolinguals because of the cognitive burden of processing a second language. Profiles of children with SLI show that their difficulties are specific to particular domains of language and that they depend on morphosyntactic complexity of the structure, which is specific to language and does not necessarily overlap in cases of bilinguals. This means that every child with SLI can be raised bilingual and that, being the SLI a representational deficit, it needs to be treated through a rehabilitation work on syntactic and morphological representations which can be language specific or generalizable to both languages. Systematic and aware exposure to both languages is needed, just like rehabilitation practices for monolingual SLI suggest.

1.7 How to identify SLI in bilinguals. Limits of diagnostic tools and risks of misdiagnosis.

Although research has gained more and more awareness of the linguistic profiles of sequential bilinguals and their difficulties in achieving academic goals, their situations are often underestimated, and, in many cases, they are misdiagnosed with a Learning Disability or SLI. On the other hand, it is not uncommon that sequential bilingual school children with SLI are not appropriately diagnosed and are not provided additional linguistic support because their difficulties are believed to be due to a limited or late exposure to the L2.

Various elements need to be considered by families, schools, and clinicians in order to avoid the risk of mis/under-diagnosis. First, awareness is needed on the different natures of linguistic difficulties (SLI and sequential bilingualism) and, consequently, on the deficits that they imply. Secondly, different approaches and instruments are required as far as the assessment of the deficits in concerned. Inadequate tests and limited data on the trajectory of L2 acquisition by sequential bilinguals often lead to under-identification or overidentification of linguistically impaired children. Indeed, when examined using academic tests, such tests aim at identifying starting levels and curriculum goals. Children may often perform below average because these tests cover a wide range of linguistic tasks, which aim at academic achievements and L2 children often do not have experience with this kind of language. Moreover, such tests cannot be considered appropriate for the diagnosis of linguistic deficits deriving from an SLI either, because they are not always built according to data on linguistic markers (Bedore, Peña, 2008).

Additionally, in early sequential bilinguals, the level of acquisition of the L2 is usually inferior to the level of monolingual speakers of that language. Therefore, quantity and content of exposure in both languages need to be taken into consideration since there are differences in the kinds of communication children are involved in between school contexts and family contexts (Bedore, Peña, 2008). This variable implies that early sequential bilinguals' acquisition of the L1/L2 is in constant adjustment and often does not maintain a defined path.

Diagnosing SLI becomes a more significant challenge when it comes to bilingual children, and this highlights the need for awareness on similarities and differences between the linguistic behaviours of both populations.

Parallels have been found in language behaviours of children with SLI and sequential bilinguals (L2 learners), for example in the use of inflectional morphology (like tense marking morphemes -ed and third singular -s), free-standing morphology (Chondrogianni, Marinis, 2012) and incomprehension of complex syntactic structures (Marinis, Saddy, 2013). Nonetheless, an accurate analysis of children's errors has evidenced differences between the two groups which derive from two principles. Firstly, the linguistic difficulties of the two groups (in terms of production and comprehension) are the consequences of different kinds of issues. Secondly, despite having difficulties in the same linguistic areas, the background knowledge seems to be different between the groups. This knowledge leads to a difference in the strategies, which L2 children and SLI children use to make up for the difficulties differs. Indeed, Bedore and Peña (2008) argued that TD bilingual children's typical errors related to tense-marking morphology are substitutions or generalizations of certain morphemes. L2 children seem to be aware of the need to express tense. This is the reason why they insert time information even if using incorrect morphemes. Sequential bilinguals tend to rely on their L1 knowledge which they transfer in the L2 system while following a normal language acquisition trajectory. Hence, their productions are the result of the competition of two kinds of representations (Armon-Lotem, 2014). Therefore, it can be claimed that their difficulty consists of an incomplete maturation of the L2 processing system caused by the fact that the L2 received less exposure. Children with SLI, instead, tend to make more omission errors and display impaired tense or agreement (Armon-Lotem, 2014).

Inflectional morphology and prepositions seem to be difficult for both groups. Armon-Lotem (2014) examines errors in these linguistic domains in these two populations through a sample composed of TD bilingual English–Hebrew and Russian–Hebrew preschool children (from 5 to 7) and age-peers monolingual Hebrew-speaking children with SLI. Even if inflection and preposition errors were found in both samples A clear

difference in quantity and type of error emerged between the two populations: children with SLI tended to omit inflectional morphemes or reduce the expressed features, while bilingual children would make substitution errors often due to interference from the first language. Children with SLI would reduce the features producing less complex infections, while L2 children would use incorrect but not reduced features. As far as prepositions are concerned monolingual children with SLI would omit them or use less complex prepositions, while L2 children would substitute them sometimes due to L1 interference or for semantic reasons.

The study by Marinis and Saddy (2013) investigated whether the two groups have a unique underlying grammatical system and whether they show the same difficulties. Through a comprehension task of passive structures, the study compared SLI children, L2 children, and L1 children and looked at how this structure is processed across the groups. Both the SLI and the L2 groups showed difficulties with passive structures. Thanks to RT measurements the researchers found out that participants of both groups are sensitive to the morphosyntactic cues for actives (-ing) and for passives (-ed and by). The difference that emerged is the following. L2 children can process the morphosyntactic cues and reanalyse the sentences in order to reassign the moved thematic roles but need more time to process the whole passive structure. SLI children process the morphosyntactic cues but need more time to do the re-analysis and assign the correct thematic roles. A comparison of the performances of short passives and full passives provides further insights on the two kinds of processing systems. L2 children showed difficulties in both long and short passives, but SLI children showed more difficulties with long than short passives. This is because long passives have the by-phrase, which consists of an additional thematic role to assign. The better performance with short passives is also compatible with the SLI children's low rates on grammatical and vocabulary knowledge and working memory.

Therefore, it cannot be claimed that the linguistic characteristics of children with SLI and L2 children follow the same trajectories because children with SLI present difficulties which are related to assigning thematic roles online. These difficulties are not limited to complex structures, but they interested in all kinds of structures. L2 chil-

dren, instead, showed difficulties only in passive structures and this result could be interpreted as the consequence of their reduced grammatical and vocabulary knowledge, which complicates the processing of a more complex structure than an active one.

1.7.1 Elements to take into consideration for greater accuracy in the diagnosis of SLI

As a concluding remark, it has been considered relevant for the aims of the rest of this work to mention the elements that need to be taken into consideration for the design of accurate diagnostic tools for language impairment in bilingual individuals.

- The developmental pattern, which monolingual and bilingual TD language acquisition follows. TD children of both groups tend to make productive errors in word production and morphosyntax, which reflect their grammar knowledge. In the case of bilinguals' word production and discourse may present influences between the languages so it is essential to consider how they can interact with one-another (Bedore, Peña, 2008).
- The developmental patterns of monolingual and bilingual AD language acquisition. In this respect, Bedore and Peña (2008) suggest that bilingual children with SLI can have distributed knowledge of both languages, hence, testing them in only one language may underestimate their skills.
- The limits that traditional language assessment for SLI can have with bilinguals. It is a common practice to use translation or adaptation of linguistic tests to identify SLI in bilinguals. Nevertheless, these practices present limits that must not be underestimated. Firstly, the two spoken languages do not necessarily follow the same developmental pattern, since specific structures or rules may present different grades of complexity. Secondly, tests are often translated only by content. As a consequence, the language behaviours that are considered markers of SLI in one language are targeted by the test which has been initially designed for that language, but not for the

translated one. Therefore, translated tests may fail in identifying critical linguistic elements in the different domains and modalities of language (Bedore, Peña, 2008).

- Linguistic tests should be designed based on data from appropriate normative groups, which means bilingual children, not monolinguals. Indeed, tests which get adapted to other languages (from English most of the times) or for bilinguals are often normed on monolinguals.

1.8 The role of explicit language instruction in learning and treatment contexts

Psycholinguistic research has often identified spoken/written language deficits (like for instance SLI or developmental dyslexia) as being the underpinning cause of learning disabilities or a comorbid factor of other non-linguistic issues like ADHD in school children. Therefore, consistent work has been carried out on linguistic treatment by psychologists, linguists, and speech-language pathologists. Intervention projects are designed to test the development of language skills in one or more predetermined target domains which is/ are trained for a particular time They are normally designed as follows: pre-test, language intervention/treatment using one or more methodologies and post-test. The final post-test not only allows the researcher(s) to collect detail data about the individual's improvement but can also provide evidence for which instruction methodology has been more effective.

One of the most studied and used speech-language treatment technique is the explicit one. Explicit language treatment employs a kind of instruction which is based on language manipulation activities and which deliberately aims at developing metalinguistic awareness (Ravid, Hora, 2009). Children usually develop awareness about language functioning of their L1 throughout natural language acquisition and through parallel school instruction, yet the situations mentioned above of language disorders can make some linguistic functioning mechanisms difficult to access especially complex structures. Indeed, explicit intervention aims at encouraging a kind of development which would take place naturally on TD L1 situations. Explicit instruction can be used with the same function in the case of later L2 acquisition since it is a much more conscious and focused process of language learning. When not impaired, processing of an

L1 is an unconscious process. Metalinguistic awareness makes it conscious and allows the learner to focus on linguistic constructs and their properties shifting their attention from content to structure (Ravid, Hora, 2009). In this way, the learner becomes sensitive to the fact that language has its own rules and develops an ability to generalize them reaching a higher degree of autonomy in learning, comprehension, and production.

A potential weakness of explicit language intervention practices involving metalinguistic awareness is that children may sometimes present problems separating the processed linguistic structure from its meaning and treating syntax and meaning like to independent realities. Indeed, using metalinguistic awareness as a form of treatment requires that the child represents thought as something which can be expressed in different ways (Ravid, Hora, 2009). Karmiloff and Smith (1992) suggest that implicit knowledge become more explicit and flexible if its representations are re-described and this leads us to think about the relevant role which age and schooling have on the development of metalinguistic awareness.

There is evidence of the potentials that explicit instruction using language manipulation has had in restoring language knowledge and use in children with SLI who present difficulties in comprehension and production of movement-derived structures. A correct interpretation of a sentence with a moved argument implies several operations: the positioning of the original trace, the movement of a specific argument and the subsequent assignment of a thematic role and the establishment of a chain connecting the trace to the moved element. All these elements are the reasons for the complexity which makes syntactic-movement structures challenging to process for children with SLI (Grodzinsky, 1995; Friedmann, Novogrodsky, 2004-2006). There is also evidence that standard speakers are sensitive to syntactic movement and do possess the concepts of chain and trace (Thompson, Shapiro, 2005; Levy, Friedmann, 2009). Therefore, explicit instruction of movement-derived structures could be considered a technique to restore syntax knowledge starting from these impaired processes. Levy and Friedmann (2009) used explicit instruction of the syntactic movement in a case study of a 12-year-old child with syntactic SLI. Their treatment involved explicit

metalinguistic teaching of essential syntactic principles like argument structure, the concept of the trace and the chain and showed significant improvement in all trained structures. Ebbels and van der Lely (2001) used a visual encoding system for explicit treatment of connections between thematic roles and syntactic relations in the sentence. This intervention was based on the assumption that if children did not acquire syntactic rules spontaneously they could improve thanks to explicit treatment and it led to better performances in comprehension.

An additional explicit instruction technique, which can be used in cases of language impairment is the Treatment of Underlying Forms (TUF). It is a method that explicitly works on complex sentence processing, and it has been mostly employed with individuals affected by agrammatic aphasia (Thompson, Shapiro, 2005). It treats both argument structure and movement in parallel. The treatment involves a first phase which focuses on the verb and its syntactic properties. The participant is shown the argument structure of the verb, and every argument is assigned its thematic role through verbal and visual aids. This is done using the active, canonical form of the complex, non-canonical target structure. After that, the participant is shown the movement o various sentence constituent, and the surface form of the target sentence is derived. If the new obtained sentence requires additional morphological elements, they are inserted into the sentence-frame. Finally, an analysis of the correspondence between thematic roles and constituents of the phrase is done. Again, the TUF procedure involves metalinguistic knowledge of the verb (which means knowledge of the whole argument structure) and of the movement (which implies an awareness of the difference between thematic roles and grammatical functions). Positive results have been registered not only in the trained structures but also to similar structures in terms of semantic and syntactic properties, which implies generalization phenomena. In Thompson and Shapiro (2005) treated patients showed significant improvements in judging anomalous structures, and this finding shows that their processing if movement constructions improved. At this link, there is are different examples of a treatment session using TUF:

- https://www.youtube.com/watch?v=gU5khzjZkbo

- https://www.youtube.com/watch?v=vtoIMoT04j4

1.9 The trained syntactic structures. Formal properties and characteristics of TD/AD acquisition

This section discusses the properties of the linguistic structures and items which have been trained using explicit and implicit language instruction in the present research project: clitic pronouns and passive structures. They are described from a comparative perspective on Italian and Bengali with attention to cross-linguistic similarities and differences. The structures are analysed in terms of acquisition in monolingual and bilingual/L2 contexts and in TD and AD populations with the aim to provide a possible basis for the identification of the difficulties and an accurate interpretation of the emerged linguistic characteristics of the participant (see paragraph 1.2.2 and 1.5.3 for a review on the acquisition of other morphosyntactic structures). Additional linguistic elements which have been identified as problematic in the participant's spontaneous productions are considered as well.

1.10 Accusative Direct Object Clitic pronouns (DOC) and Reflexive Clitic pronouns (CR) in Italian

Italian direct object clitic pronouns DOCs are monosyllabic morphemes with low phonetic salience which are used to refer to an item which has been already mentioned in the sentence, which has the thematic role of the theme of the action and the grammatical function of the Object. Their morphological characteristic is that they are marked for person, gender and number and must be inflected as follows: lo (masculine singular), la (feminine singular), li (masculine plural), le (feminine plural). Additionally, when they appear in compound verbs, auxiliary + past participle), the participle must agree with the clitic pronoun for gender and number as in (4). Their syntactic property is that the positions in which they can appear depend on the finiteness of the verb. They are to be found in a pre-verbal position (proclitics) with finite verbs, as in (1), except for imperatives, and in a post-verbal position, attached to the preceding verb (en-

clitics) with non-finite verbs and imperatives as in (2). With modal verbs, they can be found in both positions as in (3). When it precedes a compound verb in the past (auxiliary + participle of the main verb) the main verb must agree with it as in (4).

(1) Il bambino **lo** lava (Arosio, Branchini, Barbieri, Guasti, 2013)
The child *it* (SING-MASC) washes

(2) Il bambino ha detto di lavar**lo**(Arosio, Branchini, Barbieri, Guasti, 2013)
The child said to wash *it*(SING-MASC)

(3) Maria vuole aprir**la**; Maria **la** vuole aprire (De Nichilo, 2017)
Maria wants to open *it(SING-FEM)*; Maria *it*(SING-FEM) wants to open

(4) Il bambino **la** ha lavata (Arosio, Branchini, Barbieri, Guasti, 2013
The child *it* (FEM-SING) has washed

The syntactic role of CODs (object) can also be played by tonic pronouns or whole NPs. This would guarantee the maintenance of the canonical position of the object in a SVO order, which would generate grammatical sentences, yet not appropriate from a pragmatic point of view as expressed by the examples (5), (6), (8), and (9) from Vender, Guasti, Garraffa, Sorace (2012)The only ungrammatical construction would be number (7) since the verb argument of the object is not expressed.

(5) Cosa fa il nonno alla bambina?
What does the grandpa do to the girl

(6) La bacia
her kisses

(7) *Bacia
Kisses

(8) ?Bacia lei
Kisses her

(9) ?Bacia la bambina

Kisses the girl

From an interpretative point of view, CODs are arguments of the verb expressing the object of the verb, yet they cannot appear in the same position. Indeed, the accepted form, as in examples (1) and (6), implies a syntactic movement from the canonical position of O in (SVO) to an earlier preverbal position. Therefore, what is important in terms of acquisition, production and comprehension is that the speaker identifies the argument of the verb expressing the function of object in order to correctly use/comprehend the COD (De Nichilo, 2017).

The Italian reflexive clitic CR *si* is a monosyllabic with low phonetic frequency item. While the CODs refer to an earlier mentioned NP, CRs refer to the subject of the sentence. From a morphological point of view, they are only marked for person and number and not for gender. In compound tenses they only appear when the auxiliary is *to be* (*essere*). It can appear in a pre-verbal position when the verb is finite as in (10) and in a post-verbal position when the verb is non-finite, as in (11).

(10) La mamma **si** lava (Arosio, Branchini, Barbieri, Guasti, 2013)

The mum *herself* washes

(11) La mamma ha detto di lavar**si** (Arosio, Branchini, Barbieri, Guasti, 2013)

The mum said to wash *herself*

From a pragmatic point of view both CODs and CRs are ungrammatical if they are used with a contrastive function and should be substituted by their tonic correspondents as in (12) and (13).

(12) Il bambino lo lava, *non il gatto (Arosio, Branchini, Barbieri, Guasti, 2013)

The child *it* (SING-MASC) washes, not the cat

(12) Il bambino lava lui, non il gatto

The child washes *it*(SING-MASC), not the cat

(13) Il bambino si è lavato* non il gatto (Arosio, Branchini, Barbieri, Guasti, 2013)

The child *him self* washed, the cat

(13) Il bambino ha lavato se stesso, non il gatto

The child washed *himself*, not the cat

As can be seen in (13) when used contrastively the CR is involved in a structure containing the auxiliary avere (*to have*) rather than *essere*, therefore the difference is not only pragmatic but also structural.

By the description provided above, it can be concluded that CODs and CRs are similar linguistic items, since they share the same prosodic and pragmatic features and their syntactic characteristics are similar. They only differ in their morphological characteristics.

1.11 Pronouns in Bengali (Thompson, 2012; David, 2015)

Pronouns in Bengali inflect for number and case, and they are distinguished for the level of formality in three kinds, honorific, familiar, intimate in the second person and in two kinds, honorific and non-honorific in the third. They distinguish 1st, 2dr and 3rd person, but, just like nouns, they do not distinguish for gender. Moreover, the third person is also distinguished between human and non-human categories. Pronouns distinguish for singular and plural, but the non-human ones do not have the plural form. The plural forms are expressed by adding numerals or classifiers in the root of the pronoun (/-gulo/, /-guli). They are demonstratives, more than personal pronouns, which implies that in the third person they contain special information. The following example from David (2015) shows the constituent order of a sentence which contains a pronoun.

(14) ami **sé-ta**kha-i-ni

1SG.NOM **3SG-CLF-OBJ**mangiare-PRS-A-NEG.PRF6

'Io non l'ho mangiato'

Reflexive pronouns are used in the same form to express first, second and third person without distinctions. They are also marked for case but do not have the locative one. They are used when two arguments of the verb have the same REFERENTE and inserted in the place of the second referent in the following order.

(15) aena-e bacca-ti **mije-ke**dekh-e hes-e

Specchio-LOC bambino-CLF.DIM **se stesso -OBJ**guardare-PRFP ridere-PRFP uth-l-o

scoppiare-PST-3-NHON

'Guardandosi allo specchio, il bambino scoppia a ridere'

1.12 Some correlated morphological characteristics of Bengali (Thompson, 2012; David, 2015; De Nichilo, 2017)

The nominal system in Bengali has four cases which are nominative, genitive, objective and locative. The morphology describing nouns distinguishes three categories, which influence the choice of case and plural markers: number, humanness and definiteness but nouns do not distinguish for gender. An additional distinction is made between honorific and non-honorific nouns, but this is expressed through agreement with pronouns. Nominal markers of case and number are considered clitics and, as such, they do not have high vowels. They mark the last noun of the NP string. As already mentioned, nouns and pronouns do not distinguish for gender, therefore no gender agreement is to be found in predicative adjectives. Only a handful of nouns and adjectives do have markers of natural gender which derive from Sanskrit. The characteristic of the feminine forms is that they end in *a*.

Bangla classifiers are bound morphemes, which are most of the times added to nouns' stems, before case markers. They are considered clitics, since they do not trigger vowel raising. They encode countability, therefore they are the kind of morphemes, which most resemble Italian articles in terms of role. For instance, /-ṭa/ indicates singular number, definiteness and countability. If it is used with a plural name, it refers to the group as a whole. The classifier /-gulo/ encodes plural number, countabil-

ity and definiteness. The singular classifier added to the numeral *ek* before the noun make the noun indefinite. Plural indefinites, instead, usually do not have a classifier.

In Bengali there are words which occur together with noun phrases to mark their grammatical function. In Italian such role is played by prepositions, while Bengali has a strong preponderance of postpositions. This means that these words are inserted after the NP. Most of them are nouns in the locative case or perfect participles, which means that speakers can create new prepositions according to the message they want to express. Each type of postposition implies a change of the case of the NP which precedes them. The way they change the preceding case, also depends on the human/non-human trait of the NP.

1.13 The acquisition of Italian DOCs and CRs TD children

Children begin to use direct object clitics around the age of 2;4-2;6 and seem to master them around 2;9 (Hamann, Belletti, 2006). Nevertheless, DOCs can be subject to omissions until the age of 4 (Arosio, Branchini, Barbieri, Guasti, 2013) and to inflectional mistakes until the age of 3-4 (Vender, Guasti, Garraffa, Sorace, 2012). It is uncommon that children produce errors related to morphology or positioning, and they seem never to substitute them with the correspondent tonic forms. They frequently substitute them with a full nominal phrase (Caprin Guasti, 2009; Arosio, Branchini, Barbieri, Guasti, 2013). The study of Caprin and Guasti (2009) has evidenced that clitic omission refers more to direct object clitics than to reflexive and dative clitics, meaning that DOCs seem to be the most difficult forms to acquire. Italian TD children appropriately use CR from the age of 2 in terms of positioning and do not present problems with the selection of the auxiliary essere (to be).

Research has found that the acquisition of DOCs is more difficult for bilingual children than for monolingual children. In Vender Guasti, Garraffa, Sorace (2012) preschool sequential bilingual children who are acquiring Italian as their L2 produced a significantly below rate of correct clitics in comparison to age-peers monolinguals. The researchers found a correspondence between low rate of DOCs production and quantity/quality of input in the L2. Those who showed less difficulties in DOCs production

and performances more similar to monolingual children were also the ones who were exposed to a more consistent input. Bi-lingual children produced a high rate of wrong clitics, but few constructions with the nominal phrase and few omissions, therefore, their performance would seem to resemble that of monolinguals (who rarely omit clitics as well). This means that they are aware that the clitic pronoun must be produced, yet they show flectional difficulties which cause agreement errors. This is what seems to differentiate them from children with SLI, whose most recurrent error with DOCs are omissions.

1.14 The acquisition of Italian DOCs in AD children

Direct object clitic pronouns are considered linguistic markers of SLI from the age of 5 in the sense that they usually emerge as one of the most difficult and damaged structures and are often omitted from contexts where they are obligatory(Arosio et al., 2010; Guasti, 2013; Del Puppo, Pivi, 2015) as in (16). Research has shown that preschool children with SLI show difficulties in producing third person DOCs, which mainly consist of omissions. Whereas, as children grow up, the rate of direct object clitics omissions diminishes, and the use of the SVO active structure increases. Productions like (17) become much more frequent, which consist of an utterance where a full DP substitutes the clitic pronoun. Again, as age increases, another phenomenon becomes frequent, which is the incorrect production of the clitic pronoun (Arosio et, al., 2010). In cases like this, the clitic pronoun is no longer omitted, yet it is incorrect as in (18). DOCs have been observed to be accurate markers of SLI for older children as well since they appear to be a persistent impaired structure. As already mentioned before, older children with SLI change their linguistic behaviour: they do not commit omissions of the internal argument of the verb any longer, and they tend to produce a full DP instead of the DOC expressing the internal argument of the verb, but still not with a clitic pronoun (Arosio, Banchini, Barbieri, Guasti, 2013).

(…) Cosa fa il bambino alla farfalla? (Arosio et, al., 2010)

What does the child do to the butterfly?

TARGET*: La prende*

It(SING-FEM) takes

(16)*Prende*

Takes

(17*) Prende la farfalla*

Takes the butterfly

(18) *Lo prende*

It(SING-MASC) takes

Data on French show that CRs are omitted at a lower rate than DOCs. There are not data confirming the same for Italian CRs. Yet, since DOCs and CRs in Italian and French are similar, it is reasonable to expect that also Italian speaking children would omit CRs at a lower rate than DOCs (Arosio, Branchini, Barbieri, Guasti, 2013).

Different theories have been proposed to account for the frequent omissions of DOCs in children with SLI.

- Bortolini, Arfè, Caselli, Degasperi, Deevy and Leonard (2006) suggest that omissions of DOCs depend on prosodic limitations which cause a slowed acquisition of low phonetically non-final syllables as in (18)
  (19) Gina lo vede (Arosio et al., 2013).
  (19) GIna lo VEde
  S w * S w
  This account is based on Leonard's (1998) surface hypothesis according to which children can grammaticalize morphemes if they are phonetically salient, which makes DOCs difficult to learn given their phonetic shortness and weakness (Arosio et al., 2013). This account has been discarded by other studies and has shown that the complexity of DOCs cannot depend on a purely prosodic reason.

- Jakubowitcz, Nash, Rigaut, Gérard (1998); Bedore and Leonard (2001); Pozzan (2006); and Bottari, Cipriani, Chilosi, and Pfanner, (1998) have observed a clear dissociation in rates between the production of clitic and determiners which still are monosyllabic phonetically weak short items in the different observed languages. The first study found a much higher rate of definite articles production than COS s (90% vs. 25.2%) in a group of French children with SLI aged between 5;7 and 13;0. Again in the second study, the authors found a similar dissociation in production rates (46,33% determiners and 38,93% clitics) in Spanish. The third evidenced a dissociation in children with SLI speaking Italian with a much more accurate production of determiners despite Italian definite determiners and DOCs are phonologically identical. The forth of the mentioned studies evidenced more omissions for determiners than for clitics (73% omissions of determiners, 41,1% for clitics) in Italian, but it is still inconsistent with the idea that the omission of DOCs is due to phonetic reasons. The results by Arosio, Branchini, Barbieri, and Guasti (2013) provide further evidence against this view since they found no difference in the production of CR between children with and without SLI.
- The study of Arosio, Branchini, Barbieri, and Guasti (2013) also rules out possible interpretations related to pragmatic deficits, which apparently can be considered potential explanations since children are often observed to produce full DPs instead of clitic pronouns. Most of the children's productions had a nulls subject, which means that they do have pragmatic competence on the use of pronouns. Moreover, they did not omit CRs which have the same pragmatic feature as DOCs.
- The findings mentioned above suggest that the reason underpinning difficulties in clitic pronouns is more related to syntactic and morphosyntactic complexity and that prosodic features could be an additional difficulty, yet not the only one. This morphosyntactic complexity derives from the fact that DOCs do express the object of the verb, which is canonically in a postverbal position but is realized in a preverbal uncanonical position in most cases (finite sentences).

The structure that clitics are involved in are structures which imply a movement of the DP, while the production of a full DP would allow children to interpret it locally. Thus, older children around seven years old seem to have the syntactic knowledge that the constituent of the verb must be expressed, yet they do not have access to the processing of the movement and produce the argument structure through a full DP.

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1.15 Passive structures in Italian

Italian passive structures are used in formal contexts and presents a non-canonical order of thematic roles and syntactic constituents: the patient has the syntactic function of the subject and the agent is expressed through an optional prepositional phrase introduced by the preposition *da* as in (19) and (20). The verb agrees in person and number with the patient and its auxiliary can be either *essere* or *venire*.

(19) Gianni è spinto da Maria

Gianni is pushed by Maria

(20) Gianni viene spinto da Maria

Gianni is pushed by Maria

In Italian active structures are much more frequent than passive structures. Active structures present a canonical relationship between thematic roles and grammatical functions: the agent is expressed by the subject and the patient is expressed by the object. In passive structures, the patient is expressed by the structural subject and the agent is expressed by the by-phrase (Marinis, Sally, 2013; Del Puppo, Pivi, 2015). For this very reason it is considered a complex structure, which, not only is acquired later than canonical structures, but it is also one of the most problematic structures for children and adults with SLI or other developmental issues which affect language.

1.16 Passive structures in Bengali (De Nichilo, 2017)

The passive structure in Bengali consists of a periphrastic construction composed of *-a* which is the affix of the past participle form and the auxiliar*ja*(“andare”). Therefore, it resembles the Italian structure which uses the auxiliary forms *essere/venire* and the past participle form of the main verb. As shown by the following examples (De Nichilo, 2017) there are different possible syntactic structures describing different semantic variables. The simple form -a indicates an impersonal passive.:

(20) dekh-a jay

vedere - PASSIVO andare - 3 P.SING.

(esso) è visto

(it) is seen

If the subject is expressed, it must be inflected in the dative case:

(21) ama-kedekhajay

o – DAT vedere - PASSIVO andare - 3 P.SING.

io sono visto (= a me è visto)

I am seen

If the agent of the action is expressed, it must be followed by the preposition *dara* (“da”)

(22) Jim dara bagh-Ta mar-a geche

Jim dalla tigre-CLASS uccidere- PASSIVO andare - 3 P.SING

La tigre è stata uccisa da Jim

The tiger has been killed by Jim

1.17 The acquisition of Italian passive structures in TD children

Recent studies showed that passive structures are comprehended (Volpato, Tagliaferro, Verin, Cardinaletti, 2013) and produced (Volpato, Verin, Cardinaletti, 2012) by pre-school children aged 3-4, yet only mastered later at 5-6 years of age (Volpato, Tagliaferro, Verin, Cardinaletti 2013 for comprehension; Volpato, Verin, Cardinaletti 2012 for production). One of the strategies that children, especially 4-5-year-olds, mostly use to avoid processing a passive structure is using an active structure with a clitic pronoun referring to the constituent which has the role of the patient. This is shown in example (23) from Volpato et.al (2012). Instead, the strategy described in (24) is mostly used by younger children, for instance aged, 3-4 and is a full active sentence with an SVO structure, which is still grammatical, yet pragmatically inappropriate.

(…) Cosa succede a Sara?

What happens to Sara?

TARGET*: (Sara) viene spinta (da Marco)*

(Sara) is pushed (by Marco)

(23) *Marco la spinge*

Marco herpushes

(24) *Marco spinge Sara*

Marco pushes Sara

Italian speaking children have been observed to acquire action verbs before non-action verbs with more accurate performances in comprehension and production (Volpato et al., 2012; Volpato et al., 2013) of passive structures. Moreover, research has shown that there does not seem to be a relevant difference in Italian children's performance in comprehension with sentences with or without the by-phrase (Volpato et al., 2015). Moreover, children aged between 3 and 6 seem to perform better with passive sentences containing the auxiliary *venire* than with sentences containing the

auxiliary *essere* because the former one guarantees an eventive interpretation of the sentence, while the latter can be interpreted as adjectival (Volpato et al., 2013).

1.18 The acquisition of passive structures in AD children

Misinterpretations of passive structures are persistent in children with SLI. Typical errors made by children with SLI are discussed below in relation to the different hypothesis on the nature of SLI (see paragraph 1.3.2).

- Van der Lely's (1996a) Representational Deficit for Dependent Relations (RDDR) hypothesis (which belongs to the representational set of accounts) proposes that children with SLI have difficulties comprehending passives because of a deficit in the computational system which creates difficulties in structures involving movements. Apparently, SLI children are sensitive to morphological clues indicating the passive, yet they cannot create a full representation of the structure and have difficulties assigning thematic roles. This leads to a high rate of reversal errors in long passives and adjectival interpretations in short passives.

- Leonard's (1998) Surface Hypothesis, which belongs to the processing limitation set of accounts, suggests that children with SLI have difficulties acquiring short unstressed grammatical morphemes due to their slow processing. In English, such a theory would explain children's difficulties with passive structures since they involve unstressed morphemes like the auxiliary be, the past participle to -ed and the preposition by. Marinis and Sally (2013) and Montgomery and Evans (2009) suggested that the difficulties in the comprehension of passives in children with SLI should be ascribed to processing limitations because passives are complex structures and require significant working memory resources that exceed the resources available to children with SLI.

- Ferreira (2003) explains this processing difficulty. In active sentences when the speaker hears the first NP, they assume that it is the subject of the sentence and provisionally assign it the role of the agent. If the verb form is in line with this assumption the thematic role of the agent is definitively assigned to the subject. Later, the second NP is included in the structure and processed as the patient. In passive sentences like when the first NP is encountered, it is provisionally assigned the role of the

agent, but the verbal form indicated that it is passive. A second analysis must be done, and the first NP is reassigned a new role: that of the patient. After that, the thematic role of the agent must be transmitted in the by-phrase. Thus, processing of passives requires processing of morphosyntactic cues of the verb and a reanalysis of thematic roles.

2 Chapter : Syntactic Priming: state of the art and related considerations on the Language Production System and Language Learning

2.1 Introduction

Syntactic or structural priming refers to the facilitating effect that the exposure (be it listening, repeating, or more than one task combined) to a syntactic structure has on the processing of the same or a similar syntactic structure in comprehension or production. Such an effect is due to the activation of the syntactic representation of the constituent structure of a sentence, which reflects in a higher probability of reproducing that syntactic pattern in a subsequent utterance in speaking or writing or to comprehend it faster (Bock, 1986; Pickering, Branigan, 1998; Ferreira, Bock, 2006; Pickering, Ferreira, 2008). Syntactic priming has been widely studied in spontaneous dialogue and employed as an experimental paradigm in language research laboratories from the 80's on to investigate syntactic representations in L1 and L2, processing of syntax production and the nature of syntactic choices in L1/L2, processing of syntax comprehension, and the mechanisms which underpin L1/L2 learning (Ferreira & Bock, 2006; Pickering, Ferreira, 2008). Psycholinguistic research has considered syntactic priming paradigms effective instruments to look at the mentioned areas of cognition in different populations, for instance, TD monolingual/bilingual children and children with SLI (Shin, 2009 for a review). Syntactic priming experiments have been carried out using both oral and written tasks and investigated syntactic representations within each language modality (production/comprehension) and across modalities (Shin, 2009 for a review). In

experimental settings, syntactic priming tasks are carried out through batteries of trials each of which is composed of a prime stimulus and a target. The prime stimulus is an utterance (it can be presented with an image or without) expressed in the syntactic structure that the experiment aims at activating, the target is the sentence that the participant(s) is asked to say out loud after being exposed to the prime. It can be the description of a picture (picture description tasks) or a fragment to complete a sentence (sentence completion tasks). Filler trials are also inserted in the battery with different neutral sentences. There is empirical evidence that structural priming is an activation that occurs at a purely syntactic level which does not depend on closed-class- function words overlap, verbal overlap, the similarity of event roles, or semantics of single words between the prime and the target (Shin 2009 for a review). The section below reviews the main findings which psycholinguistic research on structural priming has collected so far and discussed the important accounts of language production processing and learning, which have been hypothesized from such findings. For the sake of the experimentation described in this thesis, the literature review is only going to focus on priming experiments which investigated production, and which took place in experimental settings. Most of the mentioned studies involved picture description tasks since that is the kind of priming paradigm that my experimentation employed. Firstly, data from priming studies on different populations are mentioned: TD monolingual and bilingual children, children with SLI and adults. Secondly, possible accounts concerning language production functioning and its nature are discussed taking the empirical data as a basis. Similar considerations are discussed in language learning as well.

2.2 Major findings on the linguistic nature of priming in monolinguals

The most used syntactic priming task to investigate structural representations and production processing is the picture description one which was first employed by Bock (1986). In this kind of paradigm priming trials are composed of a sentence as a prime stimulus and a picture to be described. The participant hears the sentence which is expressed in the syntactic structure which the task aims at activating and can either

repeat it or not. The target is the sentence, which the participants use to describe the picture. According to the linguistic modality, which a specific priming task aims at investigating, the participant(s) can either hear the prime sentence and describe the given picture straightforward, or they can be asked to hear the prime sentence, repeat it, and continue with the picture description. The two versions of the task measure priming effects from comprehension to production and from production to production respectively and have been used to look at the magnitude of priming effects within the same modality or across-modalities. The picture description priming task is based on the principle that the picture does not have a semantic or syntactic relationship with the processed prime sentence. Indeed, the participant(s) can describe the picture using two possible syntactic constructions without syntactic constraints. Indeed, what priming studies aim at finding and is whether syntactic persistence from the prime to the target, using Bock's (1986) definition, occurs independently of semantics and without syntactic constraints.

In Bock (1986) the participants were told that they were going to take part in a running recognition memory task, so they would be asked whether they had already heard the sentence or seen the picture before. Therefore, they were told that sentence repetition and picture description were mere memory aids. This was to guarantee that the participant's attention on the syntactic features of the sentence was reduced and to avoid possible connections which the participant(s) could make between images and their syntactic choices in production. To this end, filler trials containing different or more simple syntactic structures as primes were and still are usually inserted in priming batteries. This kind of priming paradigm has been widely used in the last 30 years of research to examine processing of syntactic production and provided consistent evidence that the syntactic input processed in the prime (either in the form of exposure or production) activates the employed syntactic construction and makes it more probable for that structure to be reused in the target utterance. Picture description tasks have been mainly used to explore production of transitive structures like actives or passives and dative structures like DOs (Double Objects) and PDs (Prepositional Datives). Such structures represent potential equivalent options to

express the same meanings. Therefore, they enable precise identification of a purely syntactic influence in expressive choices, all other conditions being equal. Below I analyze the variables which have been manipulated in research to provide more evidence for syntactic activation.

The first evidence which priming experimental paradigms (not only picture description) provided was that syntactic priming is an activation, which is sensitive to features of sentence form and independent of meaning (Levelt, Kelter 1982; Bock, 1986; Bock, Loebell, Morey, 1992). This suggests that processes dealing with semantics dissociate from mechanisms processing form in the production system and support the view that structural priming occurs at a representational level of the syntactic structure which strengthens or weakens according to its degree of activation. Activation can depend on recency or amount of exposure and influences subsequent syntactic processing by facilitating the production of that structure (Bock 1986).

The last 30 years of research has aimed to shed light on the nature of syntactic priming. Research confirmed that it is an activation, which spreads through a whole syntactic frame and can give insights on speakers' representations, which are structural. Various studies were carried out in order to identify the mechanism which triggers it the linguistic domains which it may be based on and the possible constraints. For instance, experiments were made to look at the role of morphosyntax (Levelt, Kelter, 1982; Bock, 1986), lexical items (Pickering, Branigan, 1989) and semantics (Bock, 1986; Bock, Loebell, Morey, 1992). Levelt and Kelter's (1982) syntactic priming study on prepositional phrases in dialogue evidenced a structure overlap between questions forms and answers where the primes were questions using the preposition at and the targets in which the speakers would unconsciously reuse the preposition at. This overlap indicated the activation of the structure containing a prepositional phrase and triggered by the preposition at. Bock (1986) tested whether structural activation could be based on morphosyntactic elements like closed-class words (a class of functional words to which prepositions belong) and she demonstrated that it did not. Firstly, the participants did not need to maintain the sentence structure in memory since they were focused on different goals. Secondly, the first of her three experiments

showed that a structural persistence between prime and target was evident also with other conditions: in DOs which did not have closed-class words, in trials containing the preposition to in the prime sentence and in the target, and in trials containing the proposition for in the trial and to in the target. The same result was confirmed by Pickering and Branigan (1998) who found priming effects in PD sentences containing the preposition to, but also in DO sentences which do not rely on prepositions. Such findings confirm that syntactic priming depends on activation which arises at a purely structural level without relying on lexical repetition of morphological elements or sound similarities.

Bock (1986) measured an additional variable which was thought to potentially boost or inhibit priming and concerns the message level: picture interpretation. It had been argued that the use of a passive structure in the prime could lead the participant to focus their attention on the patient of the action and maintain it throughout the following descriptions. Again, results showed that the number of priming effects produced in every condition was the same excluding this possibility. Another interesting variable that the researcher investigated as a potential influence at the message level (and consequently on the syntactic one) is animacy. In the first experiment (1986) she found that when the agent was human there was no priming effect and this would support the idea that choices of actives or passive could depend on conceptual features of the message. Therefore, the second experiment of the study investigated the relevance of such features of the message in syntactic processing. What emerged was that activation effect for passives persisted independently of meaning variation and that the structure, which the participants would use changed according to syntactic changes in the prime. Such a result has also been confirmed by Bock, Loebell and Morey (1992) who found that the animate or inanimate subject arguments in active primes would equally prime active targets and vice versa. These results are consistent with the view that surface structure of an utterance can be influenced by competing processes of syntax activation that end with the selection of the most activated one, meaning that the chosen syntactic structure can be

independent of semantics. This would imply that syntactic processing in production can be partially isolable from meaning.

Pickering, Branigan (1998) provided further precious data. Firstly, they excluded the semantic explanation since DOs and PDs can express semantically equivalent messages. Secondly, they observed that although syntactic structures persisted across semantically unrelated sentences, which had different verbs between primes and targets, the effect was stronger when the verb was repeated between the prime and the target (lexical boost). Moreover, they showed that the magnitude of the priming effect stays unchanged independently of changes in form, aspect, tense or number between the prime and the target, which suggests that verbs are represented at the lemma level without morphological features like inflection.

2.3 Major findings on the linguistic nature of priming in bilinguals.

In a sense, simultaneous bilinguals, sequential bilinguals, and advanced L2 learners can be compared being proficient users of a second language. Both in cases of bilingualism and of L2 learning, syntactic priming can be a valid instrument not only to look at the level of abstractness of specific syntactic structures but also to understand if and how the two languages interact with each other. Studies, which have been carried out so far have addressed whether the two spoken languages belong to the same system, to what extent and in which situations do they overlap, or whether the L1 can influence structural representations in the L2. Cross-linguistic syntactic priming paradigms in bilingual research allowed to discover whether syntactic representations in bilinguals are shared or separate providing precious insights on bilingual syntactic processing in language production.

Research evidenced that syntactic priming occurs between the two spoken languages and, just like in monolinguals, it confirmed that cross-linguistic syntactic priming depends on activation which spreads through a whole sentence structure without morphological, lexical, or semantic constraints. Recent studies on bilingual productions in analysing the combination of different languages evidenced that syntactic representations can be transferred from a language to another since

participants would use a target syntactic structure in one language after being exposed to the correspondent one in the other spoken language in the prime (Loebell, Bock, 2003; Mmejier, Fox Tree, 2003; Hartsuiker, Pickering, and Veltkamp, 2004; Salamoura and Williams 2007; Kantola, Van Gompel, 2011). This finding suggests that syntactic representations are shared in bilinguals. The shared syntax account argues that the activation of a syntactic structure in one language facilitates the activation of a syntactic structure in another language if they present the same grammatical configuration (Hartsuiker et al.,2004). It seems that L1 and L2 structures can overlap even at low levels of proficiency because the acquired representation of an L2 structure connects to the correspondent representation in the L1 (Kantola, Van Gompel, 2011). The shared-syntax account of bilingual syntactic representations would predict within L1/L2 priming to be as strong as between-language priming since, in both cases, the same combinatorial nodes between L1 and L2 lemmas are activated, and they are language unspecific nodes. Desmet and Declercq (2006), Schoonbaert, Hartsuikering and Pickering (2007) and Kantola and Van Gompel (2011) confirmed this expectation providing further evidence for the shared syntax view. Nevertheless, results have emerged which are also consistent with a separate syntax account (Loebell, Bock, 2003; Meijer, Fox Tree, 2003). According to this view syntactic representation of L1 and L2 in bilinguals are separate but connected and get more activated as much as the structural similarity between them increases. Such activation can be boosted through syntactic priming, yet the effects are assumed to be weaker.

What seems to characterize the productions analysed in the mentioned studies is that the primed syntactic structures entirely overlap with the target ones in terms of constituent order. Therefore, it has been hypothesized that word order is an essential condition for bilingual representations to be fully shared and that syntactic structures involving different word orders are represented separately (Hartsuiker, Pickering, Veltkamp, 2004; Hartsuiker, Pickering, 2007; Salamoura, Williams, 2007). Further evidence for that was provided by, Bernolet, Hartsuiker, and Pickering (2007) who did not find priming effects for relative clauses between English and Dutch since the first

one is verb medial, the latter verb-final, and, by Bock and Loebell (2003) who investigated English and German actives and passives.

Research in bilingual language processing using syntactic priming as an experimental paradigm has also dealt with research questions that have been addressed by studies on monolinguals (see paragraph 2.1.1). For instance, a condition which has been measured is the lexical boost, which is created by the repetition of translation equivalent verbs between the prime and the target. Schoonbaert, Hartsuiker, and Pickering (2007) noticed a translation equivalence boost in L1 □ L2 primings, yet not the reverse. Instead, Salamoura and Williams (2007) did not find changes in the magnitude of the priming from L1 to L2 in cases of translation equivalent verbs, meaning that priming did not exploit the transnational links between the lemmas, but, again, an overlapping structural frame.

An additional variable that has been considered by cross-linguistic syntactic priming research as well is animacy. Salamoura and Williams (2007) excluded the possibility of an influence of animacy by manipulating the prime sentences and turning them into shifted POs. They noticed that shifted POs did not prime DOs even if the animacy order was the same and confirmed that the lack of priming effects could only be ascribed to changes in the constituent order. It is also possible to exclude translation at the sentence level as a potential interpretation since the high proficiency of the participants guaranteed that they rely on language-specific knowledge and because intervening sentences in the L2 were inserted between the primes and the targets to avoid the use translation techniques in the language switch.

Processes behind L2 acquisition and the degree of abstractness of syntactic representations in bilinguals have also been investigated using cross-linguistic priming concerning proficiency. Flett, Branigan, and Pickering (2013) tested whether syntactic choices in L2 proficient speakers can be influenced by their L1 or if they are entirely based on their experience of the L2. They confirmed previous findings, but, additionally, they found that proficient speakers do not transfer syntactic preferences from the L1 to the L2. This finding suggests that at a high level of proficiency syntactic choices in the L2 do not depend on the existence of that structure in their L1. Bernolet,

Hartsuiker, and Pickering (2013) and Hartsuiker and Bernolet (2017) found stronger crosslinguistic priming effects in proficient L2 speakers, which is consistent with the view that initially, L2 learners may have separate representations of syntactic structures which become shared as proficiency increases at later stages of learning.

2.4 Syntactic priming in young children. Insights into syntactic representations and language learning

Syntactic priming paradigms have been used to investigate how abstract children's syntactic representations are and the linguistic elements on which syntactic processing in production relies at different ages. Many of these studies confirm findings, which have already been found on adults. Late syntactic development in speech and comprehension concerning received input has been examined by Huttenlocher, Vasilyeva, and Shimpi (2002, 2004) in two consecutive studies using priming. What emerged in the first one was a strong relationship between parents/teachers input and children performance with multiclauses speech and their nominal phrases rate. In particular, the researchers noticed a development of syntax after one school year with teachers who would use a more syntactically complex speech, highlighting the impact of home and school contexts on acquisition also in late stages of syntactic development. The second study aimed at measuring the influence that syntactic priming experimentation could have on the young participants' processing of syntax. Long lasting structural priming effects have been found for transitive (passives and actives) and dative constructions (DOs ad PDs) from production to production, and from comprehension to production in four and five-year-old kids as well. These results confirm that children do have abstract syntactic representations the activation of which leads to syntactic persistence. Additionally, a purely structural activation emerged with no reliance on lexical items, since verbs and other words were different between the prime sentences and the pictures. This supports the hypothesis that children have abstract structural representations of syntactic forms.

The data provided by Huttenlocher et al. (2004) found that syntactic activation in children is not only structural and abstract, but it can also occur when the syntactic representation of the structure is not entirely formed. It is not a coincidence that in their study children produced complex syntactic structures like passives even if they are infrequent in their spontaneous speech and hard to comprehend. This suggests that a syntactic form can be present at a general level and strengthened through practice and could justify teaching/treatment practices using priming. The study observed production of passive structures both after production and comprehension, providing further evidence that kids have a general representational level of syntax with no distinction of modality or language.

Savage, Lieven, Theakston, Tomasello (2003, 2006) add a different view to the debate on the abstractness of very young children's syntactic representation. They suggested that between 3-4 and 5 years of age representations are not as abstract and as accessible as in adults, but rather dependent on lexical items and certain morphemes. Indeed, they found that if children before the age of 3 learn a new verb, it is improbable that they use it in a different construction from the original one, meaning that they are not yet able to generalize the syntactic form until the age of 6 (Tomasello et al., 2006). Further results are provided by Huttenlocher, Vasilyeva, and Shimpi (2004) who administered syntactic priming to children ages from 4;5 to 5;8. They found a gradual increase in the abstractness going from lack of abstract representation to partial ones to more abstract syntactic representations as age increased.

The hypothesis that syntactic priming can be considered a form of implicit learning, which is supported by Bock and Griffin's results (2000) on adults found further evidence in data collected on children in the third experiment of Huttenlocher et al., (2004). Children were administered a priming session composed of a series of priming sentences to hear and a block of 10 pictures to describe. The priming effect lasted throughout the whole block of pictures showing that their use of the structure did not prime children and that the effect is long-lasting. Further evidence of long duration of priming effects in kids comes from the study of Savage, Lieven, Theakston,

and Tomasello (2006) who examined syntactic priming of passive sentences in 4-year-olds with a battery of identical prime sentences and another with varied prime sentences. Their findings show that children tend to show stronger priming effects with varied primes and that they could last over a month if reinforced. They also found an increasing number of produced passives within the same session. Both these findings indicate that syntactic priming can be a form of language learning which yet seems to need reinforcement to be long-lasting. In this last study, the condition of the variety of trials seems to be essential for the priming effect to be considered real implicit learning. At the beginning children's representation seems to depend on lexical items and verbs, but if exposed to more combinations of arguments in that structure a more considerable amount form-meaning association gets build making the structure more abstract and independent of lexical words. It is an interpretation which is consistent with usage-based theories of language learning according to which abstraction is enhanced through variation in the stimuli. Thanks to variation it is possible to recognize possible combinations filling the same structure and create an abstract one, without variation the participant would only be memorizing a chunk without grasping its structure.

Messenger, Braningan, and McLean as well, in a more recent study (2011) found that also very young children do have abstract syntactic representations. They observed that 4-year-olds produce more full passive structures after having been primed with short passives than after being primed with actives. Moreover, they seemed to repeat the structures without counting on lexical or verbal overlap and with primes and targets presenting different thematic roles meaning that their representations of short and full passives are shared and that the activation of the short passive structure is generalized to full passives with no need of the overt argument structure.

Bencini and Valian (2008) and Messenger et al. (2012) found syntactic priming effect for passive structures in 3year-olds. The young participants were more likely to produce a passive structure after being primed with a passive rather than after being primed with an active sentence in a task which involved comprehension and repetition

of the prime sentence. The finding suggested that very young children do have syntactic representations of the passive structure as well. The fact that there was no lexical boost between primes and targets confirms that the activation was purely structural. In the data on comprehension, it emerged that children do possess the concepts of "agent" and "patient" and that they clearly distinguish them from the grammatical roles concepts of "subject" and "object". Such findings discard the Lexical Specificity view which claims that children's syntactic representations depend on lexical items (Tomasello, 2000). The early abstraction one (Gertner et al., 2006) is supported by stronger evidence. Bencini and Valian (2008) also showed that in 3-year-olds comprehension only did not lead to the production of passives meaning that the production step was necessary for priming effect to occur. Moreover, they did not find improvement of comprehension after priming production leaving the debate open on priming across language modalities. Again, this study evidenced that syntactic priming involves implicit learning since children produced more target structures in the second half of the task. Moreover, the fact that they used a structure which is not generally mastered by very young children confirms that it is not merely about activation of pre-existing knowledge.

Considering all the findings that emerged from the most recent studies on syntactic priming, it is possible to claim that it can be considered both a form of implicit language learning and a valid experimental instrument to look at the level of abstractness of a particular syntactic representation in children.

2.4.1 Syntactic priming in children with SLI

All the mentioned potentials of syntactic priming in looking at syntactic representations and implicit learning can be transferred to children with SLI as well (Miller, Deevy, 2006). Syntactic priming can be employed with children with SLI to ascertain whether the conditions that generate priming are the same as in TD children, for instance, whether manipulation of the prime leads to adjustments in the response, or whether priming can occur without repetition of the prime independently of

modality. In other words, it can be a valuable tool to discover through which processes children with SLI build syntactic knowledge while experiencing language.

Leonard (2000) studied the use of the grammatical morpheme is in children diagnosed with SLI aged between 4 and 7. They were compared to younger TD children. Both TD and SLI children showed priming effect: after being primed with a sentence containing a present progressive with is or are, which, again reflects a structural activation which facilitated the insertion of the auxiliary is (children with SLI often omit it). Miller and Deevy's study (2006), instead, is the first one to use syntactic priming with children with SLI to test transitive and intransitive structures. Children with SLI showed stronger syntactic priming effects for transitive structures when primed with transitive sentences than with intransitive sentences. The researchers also found that children with SLI and TD age and language matched children are equally primed with no difference related to group membership.

An additional study on pre-school Italian speaking children with SLI by Garraffa, Coco, and Branigan (2015) tested the production of SR clauses. Children with SLI were observed to be primed immediately after hearing the experimenter use of the SRc to the same extent as TD children, yet they showed less cumulative effects of the acquisition of the learned structure. The existence of immediate syntactic priming suggests that children with SLI do have a syntactic representation of SR clauses, yet they struggle in accessing it without prior exposure. Most studies on TD children show that priming has a long-lasting effect, which means that the activated representation of the target structure is persistent. It seems that syntactic representations are more easily accessible when trained through experience (Kaschak, M., & Glenberg, A. (2004), for instance, in language acquisition they can move to a state in which they are accessed only if processed before, to a state in which they are available for spontaneous production without prior processing. Therefore, what seems to be impaired in children with SLI according to Garraffa, Coco and Branigan (2015) are learning mechanisms. They suggest that experience with individual sentences does not lead to an increase in spontaneous production in children with SLI since their implicit learning mechanisms may be impaired. This implies that children with SLI may

experience a short-term benefit from syntactic priming, but they could need extensive exposure for the benefit to be long-lasting.

In conclusion, there is evidence supporting the idea that priming tasks can enhance syntax learning, encouraging adjustments in syntactic representations in different populations. The debate is still open on the magnitude of this learning effect, especially in cases of language disorders.

2.5 Mechanisms underpinning syntactic processing and representations in language production. Insights from priming studies

In order to review the main accounts on syntax processing and representation, which the literature suggests, two rationales of syntactic priming need to be reminded.

1. Structural persistence seems to be boosted by the presence of lexical items overlap, especially verbs, but, words overlap between primes and target is not a necessary condition for priming to occur. In Levelt and Kelter (1982) the overlap seemed to boost priming but would decade after only one intervening trial. Pickering and Branigan (1998) found that the magnitude of the priming was significantly stronger with lexical boost yet, other findings (Bock, 1986-1989) showed that priming was equally strong in both conditions. Hartsuiker, Bernolet, Schoonbaert, Speybroeck, Vanderelst (2008) observed that syntactic priming is long-lasting, and the lexical boost exists, but decays more rapidly, while structural activation persists.

2. Order of arguments seems to be a necessary condition for priming to occur in monolingual and bilingual productions. Bock and Loebell (1990) found syntactic priming effects also when prime and targets shared the same phrase structure, but a different event-structure (e.g.; *The wealthy widow gave her Mercedes to the church,* and *The wealthy widow drove her Mercedes to the church*) showing that the activation is purely syntactic and is not based on meaning.

Two main accounts have been proposed to explain the mechanisms generating priming: one implies a lexical-syntactic integration (Pickering, Branigan, 1998; Branigan

et al., 2000) and the other hypothesizes abstract structural configurations as a basis of syntactic priming (Bock, Loebell, 1990).

According to the first account, the production of specific syntactic structures depends on lexical constraints. The lemma level, which corresponds to the base form of a word with its grammatical category and morphological properties, also contains syntactic information since it presents combinatorial nodes indicating the ways the word can connect to other words or linguistic units. Pickering, Branigan (1998) provide an example for that. Three possible constituents with which the verb give can be combined are the man, the book and to the girl. They can be arranged in both PD structure (The man gives the book to the girl), and DO structure (The man gives the girl the book). With the verb send the same constructions are possible. The verbs send and give share the same syntactic information and the same argument structure. This is because what they share are the two possible combinatorial nodes (prepositional datives and double objects). These verbs are associated at the lemma level. The lexical integration view supports the study by Pickering and Branigan (1998). They observed that the priming magnitude stays unchanged even when verb tense, aspect or number are manipulated, corroborating the view that priming occurs at the lemma level and that syntactic representations can be shared at the same level between verbs with an overlap of combinatorial nodes. Such results, again, confirm the structural nature of syntactic priming but ascribe a consistent power to single lexical items (verbs) retrieval and activation as a constraint for syntactic representation to be generated. In other words, it is essential that the lexical items are activated since they contain structural information which gets activated and spreads influencing the syntactic choice of a subsequent utterance (Shin, 2008).

The second account, instead, involves the idea of purely structural constraints to explain priming effects and is the view that seems to be supported by more empirical evidence. It hypothesizes the presence of processes that build abstract sentence frames and that activation concerns the whole structure, without lexical isles. As already mentioned in the preceding paragraphs, evidence of this view comes from a series of studies which showed syntactic activation without lexical overlap and without

changes after conceptual information like animacy or thematic roles are manipulated (Bock 1986; Bock, Loebell, 1990; Bock, Loebell, Morey, 1992). Ferreira and Bock (2006) propose a multi-factorial account according to which syntactic priming occurs thanks to implicit long-term learning mechanisms but can be boosted by single word activations.

Cross-linguistic priming experimental paradigms have also been useful to investigate the mechanisms of bilingual language processing and bilingual syntactic representations. There is evidence that, just like in monolinguals, syntactic priming occurs in bilinguals without lexical overlap, or semantic constraints (Bock, Loebell, 2003; Desmet, Declerq, 2006). Moreover, crosslinguistic syntactic priming has been observed in bilingual production of in identical or similar structures, supporting the theory that syntactic representations in bilinguals are shared between the two spoken languages (Hartsuiker et al., 2004; Schoonbaert et al., 2007; Bernolet et al., 2008; Shin, 2008). Just like priming experiments within language, research has found that repetition of translation equivalent verbs (cross-linguistic lexical boost) increases the strength of the priming effect (Hartsuiker et al., 2004; Schoonbaert et al., 2007). Therefore, it is possible to argue that, although the activation stays structural in cross-linguistic productions as well, its nature could be described by the lexical-syntactic integration view, according to which structural activation occurs starting from the activation of shared lexical items.

In conclusion, data on bilingual syntactic priming contradict some of the significant findings on monolinguals and still leave open the debate of the lexical-syntactic view versus the pure abstract structural one. Additionally, there are variables which can affect priming magnitude in bilingual speakers: language dominance, which refers to 1) language proficiency and 2) asymmetries in the bilingual lexicon (see chapter 1, paragraph 1.5.1); and the direction of the syntactic activation.

2.6 Syntactic priming and L1/L2 implicit language learning. Insights into cognitive Functions

One of the aims for which syntactic priming has been mostly employed so far is to look at the degree of abstractness of syntactic representations in different populations and their nature. Investigating on what basis speakers create syntactic representations has led to a clearer view of the functioning processing of syntax comprehension and production as a result of syntactic representations themselves. Being syntactic priming an activation of a structural form, which does not rely on morphological, lexical, phonological or semantic constraints, and which persists in the speaker's representation, it can be considered a formed syntactic representation itself (which can be more or less spontaneous in speech). Being representations sentence frames expressing the syntactic constituent order which are unspecified for words, they are abstract knowledge. When a syntactic structure persists between utterances, it reflects memory of abstract syntax (Ferreira, Bock, Wilson, Cohen, 2008). Psycholinguistic research investigated to what cognitive function such abstract knowledge belongs for two main aims: firstly, to identify the nature of the memory system that underlies language processing (in comprehension and production); secondly, to discover the potential of that function in terms of language learning. In this sense, psycholinguistic research investigated whether syntactic priming only consists of better access to existing knowledge or can be employed an instrument of language instruction.

It could reasonably be hypothesized that abstract knowledge of syntax belongs to declarative memory which is concerned with abstract and relational memories (Ferreira, Bock, Wilson, Cohen, 2008). The fact that syntactic persistence occurs between structurally similar sentence and across languages indicates that it is independent of language and lexical content and proves its abstractness. On the other hand, syntactic knowledge could be considered to belong to implicit procedural memory which deals with memories that get fixed through experience and resist natural decline. Ferreira, Bock, Wilson, Cohen (2008) used an experimental priming

paradigm and a memory test of picture/sentence recognition to test syntactic persistence on patients with anterograde amnesia. They found that the primed syntactic form would persist with the same magnitude as in non-affected controls, while the affected participants would fail in remembering sentences and pictures. This result suggests that syntactic representations are probably based on implicit procedural memory rather than on the declarative one. Therefore, it could be assumed that syntactic procedures are carried out by stable procedural memory, while sentence contents belong to the declarative one, which is sensitive to decline.

Since implicit memory processes seem to be quite robust, they are often assumed to be the source of language learning. It seems, that the effect of syntactic priming can be found in a linguistic rearrangement in the long-term memory, suggesting that syntactic priming could be considered a form of implicit structure learning rather than a simple short-term activation of a memory representation (Bock, Griffin, 2000; Chang et al., 2000). Such a learning process can be considered implicit because specific structures get activated and acquired unconsciously and without explicating the rules that form them (Chomsky, 1986).

This claim finds support in all the studies mentioned so far because participants of priming experimentations did not need to retain syntactic forms in memory in order to carry out a picture description task. Bock and Griffin (2000, in adults) and Huttenlocher et al. (2004, in children) found that the syntactic priming effect would last across 10 intervening trials. Bock (1998), Bock and Loebell (1990), and Savage, Lieven, Teakston, and Tomasello (2006) found priming effects in children, which lasted over a month if reinforced. According to these results, syntactic priming seems to be more a stable cognitive readaptation of the linguistic production system rather than a simple transient activation of a structural form in short-term memory, which means that priming can create much more stable modifications in the language production system. Tulving and Schacter (1990) claimed that such adjustments could create implicit or procedural learning, adopting an idea that priming is much more related to long-term memory and learning.

Despite these results, explicit language instruction using conscious attention to morphosyntactic rules and metalinguistic awareness has been considered the most effective teaching practice in language interventions or teaching so far (Norris, Ortega, 2000). What has been noticed in learners, especially adults, is that they often have difficulties expressing themselves fluently, because of a lack of automatism of syntax or full knowledge of grammar (Shin, 2008). Filling these gaps could be the reason to use syntactic priming as a form of language practice in cases of unbalanced bilingualism or L2 learning (with children, young learners or adults). In this sense, syntactic priming can reasonably be employed as a reinforcement of an abstract knowledge acquired through explicit instruction with the aim of boosting automaticity (Phillips, Segalowitz, O'Brien, Yamasaki, 2004). The advantages of gaining automaticity in language production processing refer first of all to an enhancement of speed and accuracy of performance, which is applicable to all aspects of production (from word activation to structural activation to word positioning), and secondly, to the reduction of effort in processing (Phillips, Segalowitz, O'Brien, Yamasaki, 2004). Ellis (2005) has worked on the effects of implicit and explicit instruction on L2 acquisition and has examined if, and to what extent explicit learning enhances implicit learning. It emerged that explicit knowledge can be transformed into implicit knowledge. The impact of implicit instruction and the effect of the combination of implicit and explicit instruction on L2 learning have also been examined by Shin (2008) who observed a general enhancement of target structures production in picture description tasks and an increase of accuracy in grammaticality judgment tests after syntactic priming interventions. A relevant difference emerged between immediate implicit instruction and delayed implicit instruction. Immediate explicit instruction led to slower learning but stronger in the short-term memory, while delayed implicit instruction led to better acquisition in the long-term. In conclusion, these data allow to hypothesize that syntactic priming can be considered a valid form of implicit language learning, especially in a situation of scarce L2 input or non-spontaneous syntactic structures, yet it can be potentially more useful if used in parallel to explicit instruction.

3 Chapter: The case study

3.1 Introduction

This chapter describes the present research project. Firstly, it analyses data from the first administration of linguistic (standardized and non-standardised) tests which aimed at a pre-intervention analysis of the child's linguistic abilities in production and comprehension. Secondly, it presents the language intervention which was planned on the basis of the pre-test results and on my personal observations based on the child's spontaneous productions during the pre-intervention phase of the study. Thirdly, it provides the results of the post-intervention assessment. Finally, it discusses findings comparing them with the pre-intervention situation, the child's spontaneous productions, the supposed causes of language difficulties and the limits which this research encountered. Further research questions are considered as well.

3.2 Description of the study, research questions, and predictions.

The case study investigated comprehension and production skills of a bilingual Italian Bengali 8-year-old girl with consistent learning and linguistic difficulties. The research project lasted eight months and has been carried out in three phases.

- In the first phase, the participant's general linguistic skills in both modalities were assessed through linguistic tests. Some of the tests covered comprehension of different types of linguistic structures, while others were structure-focused. Production was assessed through tests eliciting one target structure, and through one narrative production test. The participant's spontaneous productions were analysed as well, with the aim of finding recurrent morphosyntactic and pragmatic patterns of use.
- The second phase is the linguistic intervention phase. It was carried out through an initial explicit instruction on simple SVO structures with particular attention on articles, prepositions, and article-noun-adjective agreement, using manipulation activities of item selection and sentence construction. After that, I carried out a more focused training of direct object clitic pronouns and passive structures. Treatment of direct object clitic pronouns was devised as follows. Firstly, I explicitly introduced the

syntactic movement involved in singular direct object clitic pronouns. The A movement was practiced through sentence construction activities and the TUF methodology. The structure was tested again after this first training session. Secondly, singular direct object clitic pronouns were trained using three syntactic priming paradigms. Clitic pronouns were tested one last time after the priming session in order to evaluate the effectiveness of the mixed implicit-explicit methodology. Given the syntactic complexity of passive sentences, they were initially trained implicitly using two syntactic priming paradigms. Explicit instruction of passive structures followed using the TUF methodology. The structure was tested for comprehension and production only at the end.

- In the third phase, the participant's linguistic skills in comprehension and elicited and free production were tested again. Both the instruction phase and the finalassessment phase did not only aim at evaluating improvements in both modalities, but it was also crucial to the research question which addressed the benefits of implicit and explicit language treatment.

The research project aimed at identifying the critical linguistic areas encouraging improvement in the trained syntactic structure by planning an aware intervention. Moreover, the employment of two modalities of language instruction (explicit and implicit) is a choice, which aimed at answering additional research questions.

1. How abstract are the participant's syntactic representations of the observed structure?
2. Does syntactic priming lead to implicit learning?

All these questions were considered relevant in the context of this research for two primary reasons. Given the complexity of the case, I considered those questions a good starting point to investigate

1. The possible nature(s) of the difficulties,
2. The practices which encourage learning.

Indeed, there were, and still are, different factors potentially influencing her representations like her sequential bilingualism and reduced input in Italian, or the

hypothesized fundamental cognitive issues. Such difficulties have been hypothesized to influence not only morphosyntactic knowledge, but also the participant's way to learn the language, and therefore, the intervention method to employ.

A consideration of all the variables of this case also shaped two main predictions at the beginning of the project.

- The implicit approach to language intervention using syntactic priming paradigm was expected to have stronger benefits with both the trained syntactic structures.
- Direct object clitics were expected to improve more considerably and rapidly than passive structure given the reduced syntactic complexity and the higher amount in input and output.

3.3 The participant

The following information on the participant has been collected during meetings with the participant's school teacher and a representative of the social service which is taking care of the child's family. For privacy reasons, it has not been possible to insert any other kind of documentary information or visual material in this work. For convenience, the participant is going to be referred to as "R.".

R. was born in Venice in December 2009. After a few months, her family moved to Bangladesh where both her parents come from. The child started living permanently in a city in the North of Italy at the age of three. Afterward, she started nursery school and at that point, her exposure to the Italian language begun, yet her attendance was not regular. Currently, she seems to attend primary school regularly from 8:30 to 16:30, but every year she has a one-month break from school because the whole family travels to Bangladesh. Both her parents are native speakers of Bengali and only speak Bengali to the child. They are also able to read Arabic and often use this language to read to the child. Although they have lived in Italy for ten years, the child's father is the only one who seems to speak a little Italian, while her mother only knows a few words.

The local social services started to take care of the child's family in 2012 after a request for cooperation which was made for the child's older brother by the middle school which he was attending. He seemed to manifest similar difficulties as well. A home-based educational treatment was provided for the girl by the social service in February 2017 mainly aiming at encouraging autonomy in learning, but also working on aspects related to behaviour and socialization. Moreover, the social service and the school encouraged a neuropsychiatric evaluation through the local social and medical service, which started in November 2017. The evaluation has prolonged due to her one-month stay in Bangladesh of last year, and because the family missed some appointments, which had been arranged with the neuropsychiatrist when they returned. Additionally, R.'s teacher arranged a neuropsychiatric evaluation through a private clinic when the child was still attending the first year of elementary school. The evaluation did not continue, but an initial report by the neuropsychiatrist is available. A translated extract is provided below.

"The child shows a considerable difficulty with the use of language as a means of reasoning and elaboration. She presents issues with the learning of reading and writing and deficits in the required morphosyntactic basic abilities. The Italian language appears sufficiently evolved in production despite problems related to social-cultural integration issues. Nevertheless, a follow-up evaluation is suggested (Wisc scale)".

The teachers made the first report of suspect Learning Disability (DSA for the Italian nomenclature) in 2017 when R. was attending the second year of primary school. In the report, it is said that the child, who comes from a situation of socio-economic disadvantage was not integrated with her classmates due to her linguistic difficulties. A translation of the original report is provided below indicating the following issues possibly related to the linguistic, cognitive, and social spheres:

- *"immature and unclear language;*
- *remarkable receptive and expressive difficulties with the Italian language, poor vocabulary knowledge;*

- *inability to discriminate phonemes and failure to develop awareness of the syllable (reads and writes one grapheme at a time). The child knows and reads the letters of the alphabet, yet is not able to associate them in syllable sounds;*
- *despite being stimulated, she does not properly pronounce verbal sounds;*
- *unclear handwriting;*
- *inability to elaborate logical and mathematical concepts;*
- *difficulties related to attention, short-term, and long-term memory;*
- *she has not developed the automatisms of learning yet. She employs automatic learning;*
- *she does not possess the basic prerequisites to master the learning processes of reading and writing and the concept of number;*
- *she is not autonomous during school activities, requiring exclusive attention of the teacher;*
- *she presents visuospatial issues and difficulties related to the time-space organization;*
- *cooperation with the family is difficult due to significant communicative difficulties in the Italian language;*
- *she completely and autonomously carries out the actions which are related to her needs (getting dressed, getting undressed, preparing her backpack, keeping her school materials in order, etc.)".*

3.3.1 General issues observed before the assessment session

The following observations are to be considered the result of a mere observation as we do not have a clinical diagnosis which corroborates them. By a qualitative observation on linguistic and non-linguistic aspects which was carried out before the quantitative analysis, the difficulties which the teachers had been observing strikingly emerged in our participant. Concerning the non-linguistic sphere of analysis, the most evident difficult was related to attention. R. appeared to struggle to focus on a given stimulus and to sustain attention. She would get very easily distracted by other stimuli inside or outside the room even when they were irrelevant. Concerning school activities, she would sustain attention only with very short activities in which the cognitive demand was significantly reduced (like true/false activities or single word insertion activities). She would simplify activities involving more complex cognitive operations, for instance, mixed abilities (like reading and answering to questions or reading and completing a sentence) using avoidance strategies or by providing very short, impulsive answers (most of the times one- or two-words answers). In particular, she would show evident difficulties in sustaining attention while reading or listening to a story and also with connecting and inferring information.Concerning the explicit activities which I designed, R. seemed to be slightly more able to sustain attention, because they were focused and not transversa. Moreover, I would:

- Use visual materials for manipulation activities like in the example below and some activities involving movement,
- I would plan a 5-10 minutes pause after some activities,
- I would reward the child with drawings and stickers which she would keep in her notebook.

Memory also appeared to be problematic. For R. it was challenging to elaborate and retain concepts learned during school classes (she would attend regular classes with her classmates). The same emerged during the activities which I planned. Sometimes R. would struggle to retrieve a piece of information even a few minutes

after I would say it. This would be even more evident with more complex retrieval operations like retelling a certain concept which I would explain, a story, an event or a piece of information which she had just read. By the initial observation, comprehension (of oral or written language), indeed seemed to be more problematic and the picture of the potential underpinning factors appeared more complex. In production, it seemed easier to hypothesize possible causes of difficulties (reduced L2 input, processing the complexity of structures). Despite the nature of R.'s difficulties was and still is unknown, issues related to comprehension and complex information retrieval, instead, could depend on comprehension itself (due to a language impairment or to reduce input in the L2), inattention which impedes elaboration of information or even memory, which might impede retrieval.

R. would also show behavioural difficulties, yet they did not represent the most evident issue. She would frequently interrupt, and she would not respect talking turns. She seemed to answer impulsively and not to control the contents of what she was saying. Sometimes indeed she would say socially inappropriate things. She did not show appositive behaviours but would almost always complain before starting the activities or she would ignore my instructions about activities. Anyway, she was always very sociable and talkative, and she would appreciate collaborating with her peers.

Concerning the Italian expressive and receptive language, many issues emerged from the very first encounters. They were persistent characteristics rather than occasional samples and showed a certain degree of regularity. Regular patterns could be identified in the kinds of errors in every domain and modality of language. The most recurrent errors observed in the initial encounters which preceded the test phase of the are reported in the table below. They are collected from the participant's spontaneous productions (table 1).

Table 1.

	Omission	Article selection	Article selection
ARTICLES		*La problema. Un chiave*	*Gli ragni, gli cigni, gli ventagli, gli biglietti*

	Omission	**Preposition selection**	**Semplification**
PREPOSITIONS	*Ma tu cosa vistirai? Da aluin? Tu fai aluin? la mia mamma aveva pensato che andiamo più mattina così… a fare haluin*	*Sai che io a Bangladesh ho un gattino?/ In settembre continui, un giorno puoi arrivare a mia casa./ Se vuoi un giorno vai con me in Milano. In agosto andiamo in mare.*	
	Omission	**Doubling**	**Clitic selection**
D.O. CLITICS	*Questo libro posso prendere in prestito? / Mi porti lo smalto, quando mi porti?/ A Rossella non conosci?*	*te lo faccio guardallo/ Le vorrei falle con rosa. / No, io lo vorrei colorallo*	
	Insertion when not needed	**Doubling**	**Clitic selection**
REF. CLITICS	*Anche tu ti credi?/ L'uccellino si cade/ Si ha caduto tutto/ non pensarti che non ti do i disegni / Voglio qualcosa per colorarmi. Io vorrei colorarmi*	*Non ti preoccupatti*	*La maestra è calma non si sgrida*
FULL OBJECT NP	*La mamma porta via / il bambino porta*		

OMISSIONS	*via / lui lancia (she was describing pictures, expressing the object DP was necessary)*		
	Gender agreement	**Number agreement**	**Gender change**
GENDER AND AGREEMENT	*Non le voglio taccare (i disegni), voglio lascialle qua / voglio disegnare un cosa / le sedie rossi / le mie zii / le mie amici sono*	*Ci sono i limone* *Oggi tanto regali*	*nell'ultima fila sono seduti i femmini / sono anche rabbiato oggi lo sai? / questi sono i canzoni, qui ci sono i canzoni /* *ate ti piace il canzone? / Posso dire una cosa, hai la CD?*
	Gender agreement	**Number and gender agreement**	
GENDER AGREEMENT + CLITIC	*non le voglio incollalli/ non le voglio taglialli / gli altri le tacco*	*la mamma li ha portata via (il bambino) / ti piace il salame? Le so ma non li ho mangiati mai / non li ho mangiati mai, formaggio non mi piacciono (uovo)*	
LEXICON		*Resti con me fino alla fine della suparia (superiori)*	

Some crystalized forms vere evident, for instance:*è' un po' ficilissimo; posso un po' guardare-provare?; sono diventata stanca, posso menticare?* Additionally, R. would often produce lexical substitution using general terms to indicate words which she did not know or which she could not retrieve. Most of the times they would take the form of periphrasis like *mi fai grande la voce? Puoi farla alta la voce?*(puoi alzare il volume?, can you raise the volume?); *sono diventati già* 8 (siamo arrivati alla numero 8, we got to number 8); *il mio fratello ha finito l'inverno, tu quanti anni hai?* (mio fratello ha compiuto gli anni, my broche had his birthday*); Io sono già diventata con te la vecchia?* (ho passato tanto tempo con te, I spent a lot of time with you*); mi piace tanto a me mi piace aluin è che io ho la moschea* (Sono mussulmana, quindi non posso fare Halloween, I am muslim so I can't celebrate Halloween).

As can be deduced by these data, errors in production seem to mainly concern morphology rather than syntactic structure. Omission and selection errors interest many aspects of inflectional and free-standing morphology which article-noun-adjective agreement are especially in sentences containing a compound verb with both auxiliaries (*essere* and *avere*), articles, prepositions and clitic pronouns. Errors on articles and prepositions seem to be of both kinds: omissions and substitutions. This data can describe profiles of both L2 learner and SLI since omissions are more frequent in SLI and substitutions are more frequent in L2 learners (See chapter 1). For both D.O. clitics and R. clitics the participant would omit but also double them. Again, omission errors would be consistent with SLI profiles while structures presenting two clitics are unusual. The first DOC in a structure like *te lo faccio guardallo* and the first RC in the structure *Non ti preoccupatti are placed in the correct position*, meaning that the child may have a representation of the clitic structure and may be able to process the theme movement since she seems aware of the argument structures of the verbs (*far*) *guardare* and *preoccuparsi*. Yet clitics are repeated at the end. This may depend on a double structural activation of two competitors among which the girl was not able to choose rather than on the inability to reproduce the syntactic movement. Nevertheless, in other productions the argument structure seems incomplete since the participant frequently omits the theme/object in both full NP and DOC forms, as in *La*

mamma porta via. It is important to add that in some cases structural errors are related to pragmatics. It emerged that the girl often omits the full object in simple SVO sentences, yet she seems to do it especially in tasks like picture descriptions and storytelling, where it is essential to explicit certain constituents from a pragmatic point of view. A correct use of clitic pronouns in both the preverbal and postverbal positions ha salso been noticed especially in compound past verbsas in the following examples: *Però lo stesso non* ***l'****ho fatta la matematica,* ***l'****ho fatta nel quaderno di segreti, però ho fatto anche le oprizioni*(operazioni) */ la maestra A.* ***li*** *ha capiti tutti che io lo so (ha capito che io so fare le operazioni) / e dopo le ho dato il quaderno e lei ha pensato di legger****lo****, aveva pensato di… due giorni dopo me* ***lo*** *da / te* ***l'****ho preparata Il mio diploma l'ho dato a te per leggere*.

For definite articles, it should be noted that R. much more frequently produces them before proper nouns, as in the sentence *la Giulia li piace bere il succo*, which could be a dialectal influence. In the first activities of sentence construction when R. was asked to insert a definite article in the correct position, she would sometimes insert it before proper names like *il – Paolo – mangia – gelato*. Moreover, when the correct masculine form of the article s produced, it is simplified in only one article for the singular form (*il*) and only on for the plural (*i*). Errors of gender in the singular form which emerged in elicited production and spontaneous production (see appendix) mainly consist of the change of the whole DP in the masculine form. With plural form there seem to be exceptions to this pattern. In a school activity where the child was asked to transform a series of DPs from the singular into the plural form, she produced many masculine plural DPs, but also a couple of feminine plural DPs: Lo stagno→*le stagne*; la tartaruga→ *i tartarughi*; il maiale→ *le maiale*; la bicicletta→ *i bicicletti*; la margherita → *i margheriti*; la torta→ *i torti*; la luna→ *i luni*; la pianta→ *i pianti*; la giacca→ *i giacchi*. The same phenomenon vas visible in the following spontaneous production, which was even preceded by a correct DP: *Ti piacciono I formaggi? No non mi piacciono le formagge.*

A remark needs to be done on pragmatics [1]. In the following and in other occasions in which the child was asked to give direction or tell an event her description seem very simple and repetitive and she does not appear to consider the listener's perspective using very vague expressions: *tu esci, quando c'è una macchina dopo va così, va così dopo c'è un storto noi aspettiamo per la Venezia… conosci dove c'è tabacchi? Dopo andiamo così, dopo andiamo così destra, andiamo così, dopo andiamo così, dopo andiamo così e vedi una fermata così che vedi l'autobus 4L? dopo c'è la nostra casa lì, vedi una casa rossa, lì c'è una moschea e c'è una casa rossa.*

To conclude it is interesting to notice that, despite the evident difficulties, the participant shows a creative use of the language. She seems to use periphrasis to convey meaning when she cannot access the right word. It is also evident in the expression *c'è un storto* to say "c'è una curva" (there is a bend).

3.3.2 What research suggests

Research has collected data from different studied involving children with similar linguistic, cognitive and behavioural profiles. The participants of such studies were diagnosed with ADHD, which is not the case of our participant. Yet, I considered useful to compare our data with results of studies investigating linguistic and non-linguistic areas of cognition in participants whose profiles resemble R.'s profile, in order to provide possible links between language and cognition in general on which to interpret our findings.

The first result of the study by Bruce, Thernlund and Nettelbladt (2006) is totally compatible with our participant's profile. By an analysis of her spontaneous production, it emerged that one of her most evident problems concerns long and complex productions in activities which required more complex processing and planning like telling a story, explaining a concept or giving directions, than when constrained to short answers. Dewitz P. and Dewitz P.K. (2003) classify the more problematic aspects related to the area of storytelling in three main areas: *failure to*

[1] Further useful samples like storytelling re provided in the following section and in the appendix.

link ideas across a passage—making relational Inferences, failure to make causal inferences, no response—did not answer. All of them are evident when the participant is asked questions related to a recently heard or repeated story.

Bruce, Thernlund and Nettelbladt (2006) provided a series of characteristics which the investigated participants presented. Those characteristics belong to different spheres: linguistic, cognitive and social and all of them were related to inattention, behavioural issues and learning disability. I provide the items which emerged in our participant. As far as the *Language* domain I found the following items: *Difficulty in carrying on a conversation, Difficulty understanding the meaning of what it is said, Difficulty understanding the explanations/instructions, Tends to misinterpret what is said, Difficulty with abstract concepts, Difficulty explaining what has happened, Difficulty following a story read out loud, Difficulty finding the right words, Tends to remember words incorrectly*. The participant also presents the following characteristics belonging to the *Executive Functions* domain: *Does not seem to listen when spoken to, Interrupts of intrudes on others, Difficulty following through on instructions, Blurts out answers*. Moreover, the following items are evident concerning the *Learning* domain: *Difficulty applying adult's explanations, Difficulty formulating in writing, Difficulty reading a text aloud, Difficulty acquiring reading skills, Difficulty with spelling, Guesses when reading, Difficulty understanding what he/she is reading, Difficulty understanding instructions, Difficulty understanding or using abstract terms*. Finally, as far as the *Social skill* domain is concerned the following aspects emerge: *Difficulty following rules, Says socially inappropriate things.*

Dewitz P. and Dewitz P.K. (2003) also mention a series of items belonging to pragmatics and comprehension, which are visible in our participant: *failure to adjust language to the listener, organizing discoursefailure to understand main ideas, difficulty with inferencing, include more extraneous information*.

4 Pre-intervention language assessment

4.1 Assessment of storytelling. The Bus Story (Renfrew, 1991)

4.1.1 Procedure

The Bus Story test assesses children's oral narrative competence in production. As discussed in chapter 2, storytelling is a valid instrument to analyse production since it allows to collect data across more domains of language and provides hints on the participant(s) cognition. Not only can it evidence lexical, morphosyntactic, phonological or structural difficulties, but it allows to observe the domain of pragmatics and semantics which are closely connected to narration (Bedore, Peña, 2008). Moreover, it is a way of looking at the child's way to represent and organize a sequence of events as a window into other cognitive processes. Telling events and stories in a coherent and aim-directed way means communicating, therefore it implies more complex variables to consider than mere language knowledge, the most important of which seems comprehension (Wagner, Sahlen, Nettelbladt, 1999).

The administration of the test is divided into three phases:

1. the experimenter reads the story aloud to the child
2. the child is asked to reorder 4 picture tables describing the story (1), (2), (3), (4)
3. The child is asked to retell the story using the ordered picture as a support.

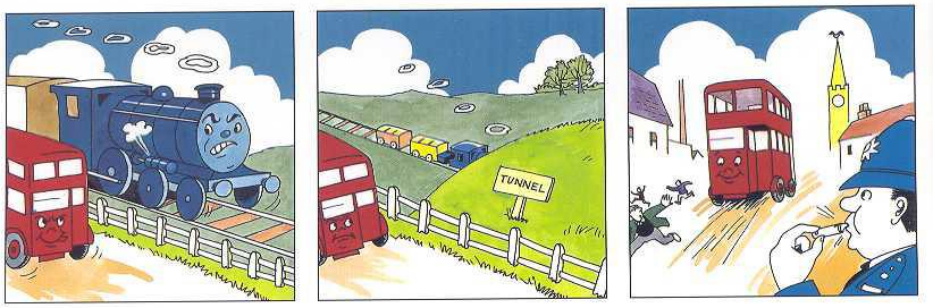
The story text and the table of pictures are provided below.

C'era una volta un autobus molto birichino. Mentre il guidatore cercava di ripararlo, l'autobus decise di scappare via. Corse sulla strada accanto al treno. Tutti e due si facevano le smorfie e facevano la gara a chi correva più veloce. Ma l'autobus dovette continuare la corsa da solo perché il treno entrò nel tunnel. Entrò in tutta fretta in città, dove incontrò un poliziotto, che soffiò nel suo fischietto e urlò: fermati autobus! Ma l'autobus birichino non l'ascoltò e corse verso la campagna.
Disse: sono stufo di andare per la strada, così saltò sopra lo steccato e incontrò una mucca che gli disse: "Muuuuuuh! Non credo ai miei occhi!" L'autobus andò a gran velocità giù per la collina. Quando vide che sotto c'era acqua provò a fermarsi ma non

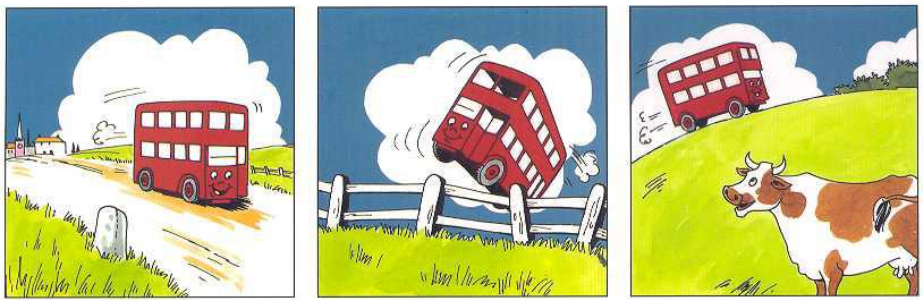
sapeva frenare. Così cadde nello stagno con un gran tonfo e si ficcò nel fango. Quando il guidatore trovò dov'era l'autobus, telefonò al carroattrezzi per tirarlo fuori e riportarlo di nuovo sulla strada.

1

2.



3.



4.

4.1.2 Results and analysis

The participant is able to reconstruct the story by correctly arranging the picture tables at the first attempt. The transcription of the first retelling is reported below.

L.	R.
Perfetto. Ora, cosa hai capito della storia?	*Ok! Te lo dico. Allora. Lui era in autobus. (she points at the policeman)*
Lui chi?	*Questo bambino.*
È un bambino?	*No.. non lo so. È un poliziotto.*
Lui è un vigile.	*Eh ok. Era qui dentro e la macchina gli ha fatto cadere. E dopo lui aveva telefonato a chi? A?*
Non lo so, non importa	*Vabè, a qualcuno. Dopo, lui non vede la sua macchina però il treno si arrampicò, dopo anche lui si arrampicò. Dopo, anche lui era andato più avanti.*
Chi il treno o l'autobus?	*Il treno. Dopo, era andato veloce e dopo era caduto sull'acqua. Dopo, lui stava vedendo che era caduto il suo autobus.*
Basta? Non ci sono altre parti?	*No, posso menticarlo?*

The child retells the story very concisely. The structure is very poor and only contains the major events which frame the whole story:
- the bus escapes from the driver,

- it runs away,

- it falls in the water and the driver finds it.

The beginning of the story is correct and corresponds to the first picture, yet the child seems to skip the following pictures until she describes the very last ones. Despite the

participant could use the picture tables, it is evident that she omits most of the told events:

- the bus meets a train

- the bus and the train compete in a race

- the train enters in a tunnel

- the bus enters in a city

- the police man wants to stop the bus

- the bus runs to the countryside

- the bus meets a cow - the bus runs down a hill and falls into the water

- the driver finds the bus

-the driver calls the tow truck to take the bus from water.

The child seems to also add extra information:
(…) "*e dopo lui aveva telefonato*"

"*and then he had phoned*".

From a linguistic point of view the following considerations can be done. The expression "*si arrampicò*" is used in two occasions, yet when she is asked to distinguish them the child replies that she is still referring to the same character, the train. Therefore R. my have used the expression to indicate the action of running away, which is performed by both the train and the bus because of vocabulary lacks. Among the expressive strategies which emerged, the child seems to use lexical exchanges and generalizations. She seems to select high frequency lexical items or paraphrased expressions to indicate words or expressions which are not available or more complex.

(…) "la macchina li ha fatto cadere" for "l'autobus lo ha fatto cadere"
"*the car made him fall*" for the bus made him fall

(…) "*era andato veloce*" for corse

"*it went fast*" for it run,

(…) "lui" for "the driver", "the bus", "the train"

"*it*" for "the driver", "the bus", "the train".

Almost every scene which the participant describes is introduced by the word "*dopo*" (*then*) which seems to divide the telling in short independent sentences giving the idea of a list. The child does not seem to be able to convey the links between events. The use of the adverb "*dopo*" and the tonic personal pronoun "*lui*" seem inappropriate from a pragmatic point of view. In the first case this strategy impedes cohesion between the story sequences and in the second case it complicates comprehension. By these data it is possible to hypothesize that the participant does not arrange the story while fully keeping in mind the listener's perspective. The transcription of the story retelling by the control child is reposted below.

L.	S.
	C'era un autobus che era molto birichino e non ascoltava nessuno. Faceva una gara chi andava velocemente e fass una corsa, ma lui fa da solo perché il tram è entrato nel tunnel e dopo corse subito e vide un polisiotto con un fischietto che soffiò e dice fermati. Però il autobus non ascoltò perché era birichino così corse e cadò in uno stagno di fango dove si va sotto.
Tutto puoi dire!	*E chiede aiuto e vie… un signore lo vede e chiamò al…carrotezzi che lo liberò. E dice che ascolterà tutti quanti.*

The control child is able to reconstruct the story correctly. She seems to not mention all events as well. She omits two described events:

- the bus enters in the city,

- the bus meets a cow.

She also adds a piece of information at the end of the story (…) "*E dice che ascolterà tutti quanti"*

"and says that it will listen to everyone".

This could be interpreted as an attempt to provide a sort of final moral and to respect a sort of script, which she became used to through schooling. From a syntactic point of view, the child does not present relevant issues except from two clitic omissions.

(…) "ma lui fa da solo" for *ma lui la fa da solo*

"but it does alone" for *but he does it alone*

(…) "però il autobus non ascoltò", for ma l'autobus non lo ascoltò

"but the bus did not listen to" for *but the bus did not listen to him*

However the story seems more coherent for the use of connectors like "*ma*" (but), "*però*" (but), and "*perche*" (because) and more comprehensible to the listener.

4.1.3 Discussion

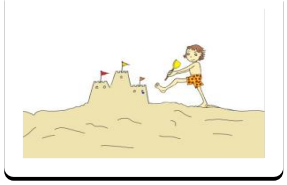
By the first administration of the bust story some of the characteristics emerged, which had been found in as language issues in comorbidity with ADHD (Bruce, Thernlund, & Nettelbladt, 2006). Difficulties which our participant showed, seemed to be mainly related to the ability to arrange a story structure creating cohesion and using strategies to facilitate comprehension to the listener, therefor to communication. What clearly emerges is the omission of most events despite the story had been told only few minutes before and the presence of the pictures. The addition of extra information is discussed by Bedore and Peña (2008) as a result the nature of which cannot only be ascribed to purely linguistic factors like SLI or reduced input in the L2 due to late exposure. An analysis of the other domains of language evidenced

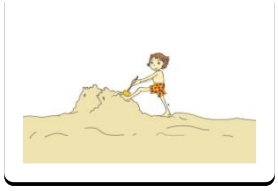
issues in lexical retrieval which triggered the use of lexical substitutions and periphrasis as expressive strategies. It is important to notice, thaw, that the words which the participant substitutes with more general forms are not low frequency words. This finding, could be ascribed to memory deficits which lead to difficulties in retrieving lexical items. Simple syntactic structures (SVO) seem preserved in constituent order thematic role assignment. Clear differences emerge between the two productions, but they seem to concern two areas: pragmatics and lexical retrieval. The control child is an Italian-Bengali sequential bilingual of the same age. She presents some of the characteristics of late exposure to the L2 especially in morphology. Yet lexical items seem more easily accessible.

4.2 The assessment of production of DO and R clitics (Arosio et al., 2014)

4.2.1 Procedure

The clitic elicitation test aims at assessing the production of 3rd person singular direct object clitics and reflexive clitics through a picture description task. It consists of 18 stimuli which elicit 6 DOCs "*lo*", 6 DOCs "*la*" and 6 RCs "*si*" in a random order. For each picture, which the child sees, a voice describes the situation as in example (1). After that another picture appears in which a character performing an action in the same context as the previous one as in picture (2) which is an example of DOC elicitation. (3) and (4) are examples of RC elicitation. Here the voice asks the child a question which aims at eliciting a description of the same situation containing a clitic. The test is preceded by 5 training stimuli which are used to let the child familiarize with the functioning of the test.

1. 	*In questa storia c'è un bambino che vuole distruggere un castello di sabbia.*

2. 	*Guarda, cosa sta facendo al castello?* *TARGET: Lo sta distruggendo*

3. 	*In questa storia c'è un gatto tutto sporco.*
4. 	*Guarda, cosa sta facendo?* *TARGET: si sta specchiando*

4.2.2 Scoring, results and analysis

Arosio et al. (2014) proposed a scoring based on 4 error types which have been considered to analyse the participant's production an example is provided for each of them.

1. Clitic omission (Omiss.). The clitic pronouns is simply omitted from the SOV structure.

   In questa storia c'è una signora che vuole dipingere una maschera. Guarda, cosa sta facendo alla maschera?

   TARGET*: la sta dipingendo*

   it (SEM-SING) is painting

   Omiss*.: sta dipingendo*

   is painting

2. Substitution of the clitic with a full DP (DP s). The clitic pronoun is substituted with a full DP as an object. The production results in an SVO structure.

In questa storia c'è una bambina che vuole prendere una farfalla col retino. Guarda, cosa sta facendo alla farfalla?

TARGET*: la sta prendendo*

it (SING-FEM) is taking

DP s.*: sta prendendo la farfalla*

she is taking the butterfly

3. Incorrect clitic. The clitic s produced and placed in th correct position, but it is incorrect.
   In questa storia c'è una mucca che vuole leccare una rana. Guarda, cosa sta facendo alla rana?

   TARGET: la sta leccando

   it (SING-FEM) is licking

   Incorrect clitic: lo sta leccando

   It (SING- MASC) is licking

4. Other. Different kinds of productions are classified in this group.

In the initial assessment of clitic production, neither the participant, nor the control produced any clitic.

Participant			
	Correct answers	0/18	0%
	Incorrect answers	18/18	100%
Control	Correct answers	0/18	0%
	Incorrect answers	18/18	100%

A more specific classification of the answer strategies which both participants adopted productions is provided below.

Participant						
Clitic pronoun	Omiss.		DPs		Other	
DOC *lo*	5/6	83,3%	1/6	16,7%	0/6	0%
DOC *la*	5/6	83,3%	1/6	16,7%	0/6	0%
RC *si*	5/6	83,3%	0/6	0%	1/6	16,7%
total	15/18	83,3%	2/18	11,11%	1/18	5,6%
Control						
Clitic pronoun	Omss.		DP s		Other	
DOC lo	4/6	66,7%	2/6	33,3%	0/6	0%
DOC la	4/6	66,7%	2/6	33,3%	0/6	0%
RC si	6/6	100%	0/6	0%	0/6	0%
total	14/18	77,8%	4/18	22,2	0/18	0%

Concerning the participant of this research, the most frequent error type is clearly clitic omission. The only DP s error for *la* clitics is "*sta prendendo la farfalla*", while the only DP s for *lo* clitics is "*sta rompendo il palloncino*". The only production which was classified as other is an ungrammatical expression. Yet it is remarkable the use of the postverbal dative clitic *gli*.

(…) In questa storia c'è un orsetto che ha fatto il bagno ed è tutto bagnato

Guarda, cosa sta facendo?

TARGET. *Si sta asciugando*

Other. *Sta facendo sporcargli.*

Production of clitic pronoun was below average also for the control participant, who did not produce any clitic as well. Her production slightly differed in terms of error kind as she produced one less omission and one more DP s for each DOC. All RCs were omitted.

4.2.3 Discussion

Concerning the production of clitic pronouns, performances do not differ significantly between the participant and the control child. No movement derived sentences with a clitic in the preverbal position were produced in both cases. Answer strategies differed slightly between the participant and the control, but in both cases, omission is the most frequent. Results of the participant and the control child are partially consistent with what emerged in the study by De Nichilo (2017) in which DO clitics were omitted, but half of them was substituted by full DPs. Results on R clitics are fully consistent with what emerged in the mentioned study as R clitics were omitted in almost all stimuli. Moreover, do not confirm what emerged in Vender Guasti, Garraffa, Sorace (2012), who observed production of clitics in preschool children sequential bilinguals. They found that clitic pronouns are more difficult for bilinguals than for monolinguals, yet sequential bilinguals differ from children with SLI in terms of error types. Bilinguals, indeed, produce more incorrect clitics, but few DP substitutions and few Omissions.

4.3 The comprehension of passive clauses. The picture selection task (Verin, 2010)

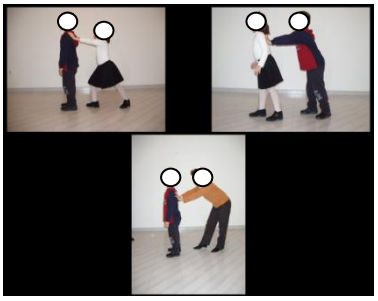
4.3.1 Procedure

The test is a picture selection task which assesses comprehension of passive structures. It is preceded by a training session in which participant can familiarize with the characters they will see in the pictures, and with the lexical items needed for a complete comprehension of the described event. For instance, in this part verbs describing the character's actions are presented, which are *prendere a calci* (to kick), *inseguire* (to chase), *spingere* (to push), *imboccare* (to feed), *baciare* (to kiss), *colpire* (to hit). The experimental session is made of 30 items in which 24 are experimental items with passive sentences and 6 fillers containing active sentences. 12 of the 24 passive structures have the auxiliary *essere*, 12 of them have the auxiliary *venire*. 12 sentences are full passives and 12 are truncated passives without *by*-phrase. The experimenter reads a question like "In quale foto…?" (In which picture?) and the

participant is asked to point at the picture in which the action which is described in the question is happening. An example of one trial is reported below.

(…) *In quale foto Marco è spinto da Sara?*

In which picture Marco is pushed by Sara?



TARGET: Picture 1

4.3.2 Coding, results and analysis

Participant				
	Experimental stimuli		Filler stimuli	
Correct answers	15/24	62,5%	5/6	83,3%
Incorrect answers	9/24	37,5%	1/6	16,7%
Control				
	Experimental stimuli		Filler stimuli	
Correct answers	23/24	95,8%	0/6	0%
Incorrect answers	1/24	4,2%	0/6	0%

The table shows that the performance of the control child is more accurate. There does not seem to be a relevant difference between full and truncated passives and between passives containing the auxiliary *essere* and *venire*. Error types for both the participant and the control are thematic role exchanges for full passives (RR errors). The participant makes thematic role transformation errors in processing truncated passives (CP errors). The only mentioned participant in this kind of sentences, which is

the patient, is transformed into the agent.The control participant only produced one thematic role exchange.

Participant					
	Auxiliary *essere*		Auxiliary *venire*		Error type
Full passives	2/12	16,7%	2/12	16,7%	RR
Truncated passives	2/12	16,7%	3/12	25%	CP
Total	4/12	33,4%	5/12	41,7%	
Control					
	Auxiliary *essere*		Auxiliary *venire*		
Full passives	1/12	8,3%	0/12	0%	
Truncated passives	0/12	0%	0/12	0%	

4.3.3 Discussion

Comprehension of passive structures in the participant evidenced difficulties related to thematic role assignment. Results seem to confirm that the difficulty underpinning processing of passive structures lies in the inability to reanalyse the syntactic structure after having encountered the first constituent, which leads to an incorrect assignment of the thematic role of the agent (Ferreira, 2003). The irrelevant difference between full passives and passives without by-phrase confirms the findings of Volpato, Verin and Cardinaletti (2016). The authors make clear that with items containing full passives two kind of errors were possible: either thematic role exchange RR error or the selection of a picture in which the agent changes CA error, which was expected to occur if children had problems processing the by-phrase and would lead to interpretation of long passives as short ones. For truncated passives, instead, one error could be the selection of a picture in which the characters are the same as the experimental item but the thematic role were exchanged, RR error, or the selection of a picture in which the patient changes, which would lead to a random selection of the

patient. CA errors were found in younger children as they seemed to not be able to process long passives and interpret them as short ones. For truncated passives young children produced more RR errors since the passive stimuli were comprehended. By a qualitative analysis of the error types, it emerged that the participant of this research makes 4 errors with question containing full passives and 5 errors with truncated passives. All errors with full passives were RR errors. All errors with short passives are CP errors which led to a random picture choice. This finding makes it possible to hypothesize that the participant did not correctly process the passive stimulus due to memory overload (Volpato et al., 2016). No difference was found between the comprehension of passives with the auxiliary *essere* and passives with the auxiliary *venire*, which in unexpected I considering the fndings of Volpato et al. (2016) and De Nichilo (2017). Despite the complexity of passive structures given by the discrepancy between thematic roles and grammatical functions, comprehension seems preserved in the control child.

4.4 Test for the production of passive structures (Verin 2010)

4.4.1 Procedure

The test is a picture description task which aims at eliciting passive structures. It is composed of 36 items. 12 of them aim at eliciting passive structures with transitive, reversible action verbs, which are *spingere* (to push), *imboccare* (to feed), *prendere a calci* (to kick), *colpire* (to hit), *baciare* (to kiss), *inseguire* (to chase). 12 stimuli aim at eliciting passive structures containing transitive, reversible, non-action verbs, which are *vedere* (to look at), *sentire* (to hear), *amare* (to love), *annusare* (to smell). 12 of the stimuli. 12 are filler stimuli which elicit active sentences. Each experimental trial contains 2 pictures. The experimenter reads two active sentences describing the two pictures. After the descriptions the experimental reads a question which elicits a passive structure. In some items it is essential to produce a full passive (with the by-phrase) because the character in the picture representing the agent changes, while the patient stays the same, like in example (…). In other items the agent stays the same, while the patient changes therefore the by-phrase is optional as in picture (…). Filler

items are composed of pictures depicting an event in which the subject is animate and the object is inanimate. And elicit an activesentence (…).

(…) Nella prima foto Sara spinge Marco. Nella seconda la mamma spinge Marco. Cosa succede a Marco nella prima foto?

TARGET: Marco è/viene spinto da Sara


(…) Nella prima foto Sara imbocca la mamma. Nella seconda foto Sara imbocca Marco. Cosa succede a Marco?

TARGET: Marco è/viene imboccato


(…) Cosa succede nella seconda foto?

TARGET: Marco spinge la sedia



4.4.2 Coding, results and analysis

Neither the participant nor the control produced any passive structure. Therefore, the production of passive structure is evidently impaired with no difference between action and non-action verbs. By an analysis of the given answers a variety of alternative answer strategies emerged (A- F), which are proposed below.

Participant							
	Strategy	Action verbs		Non-action verbs		Tot	
A	Active structure with full phrases (SVO)	3/12	25%	8/12	66,7%	11/24	45,8 %
B	Active structure with full phrases (SOV)	1/12	8,3%	0/12	0%	1/24	4,2%
C	Active structure with clitic (SOV)	7/12	58,3%	1/12	8,3%	8/24	33,3 %
D	Active structure with resumptive clitic	0/12	0%	1/12	8,3%	1/24	4,2%
E	Active structure DP omission	1/12	8,3%	2/12	16,7%	3/24	12,5 %
Control							
A	Active structure with full phrases (SVO)	10/12	83,3%	10/12	83,3%	20/24	83,3 %
B	Active structure with full phrases (SOV)	0/12	0%	0/12	0%	0/24	0%
C	Active structure	1/12	8,3%	2/12	16,7%	3/24	12,5

	with clitic (SOV)							%
D	Active structure with resumptive clitic	0/12	0%	0/12		0%	0/24	0%
E	Active structure with clitic (SOV)	1/12	8,3%	0/12		0%	1/24	4,2%

The strategies which the participant seems to use most are strategy A. for non-action verbs and strategy C for non-action verbs. Among the sentences containing non-actional verbs only one results in a verb change: the verb *amare* is changed into *abbracciare.* Although the amount of verb transformation is not relevant, this kind of production have already been found in children (Volpato et al., 2016). The control child uses almost only strategy A with no difference between action and non-action verbs, meaning that her syntactic choices do not depend on the kind of verb. She does not transform non-action verbs into action verbs.In some responses the participant uses a verb which is different from the one which she heard in the stimulus, but equivalent in meaning. It can be hypothesized that this is not due to comprehension because they are all high frequency verbs and because the training session assessed comprehension. The child seems to not remember the original verbal form and to substitute them with more general forms or to words which she uses more frequently, as shown in the examples below:

(…) imbocca -> *li fa mangiare*

(…) vede -> *guarda*

(…) prende a calci -> *li dà i calci*

(…) colpisce -> *li fa male*

(…) filler -> *fa bum alla sedia*

(…) parla -> *fa buuu*

(…) (Filler stimulus) prendere a calci -> *sta giocando con il pallone*

In one verbs are completely changed even if the child can look at the picture

(…) imbocca -> *li bacia in bocca*

he feeds -> *he kisses on her mouth*

The same verifies for nouns

(..) "Il papa parla nell'orecchio di" for "*li urla nel naso*"

"the dad talks in his hear" for *"the dad shouts in his nose"*

(…) "Sara abbraccia la sua bambola" for "Sara abbraccia il cagnolino"

"Sara hugs her doll" for "Sara hugs the doggie"

4.4.3 Discussion

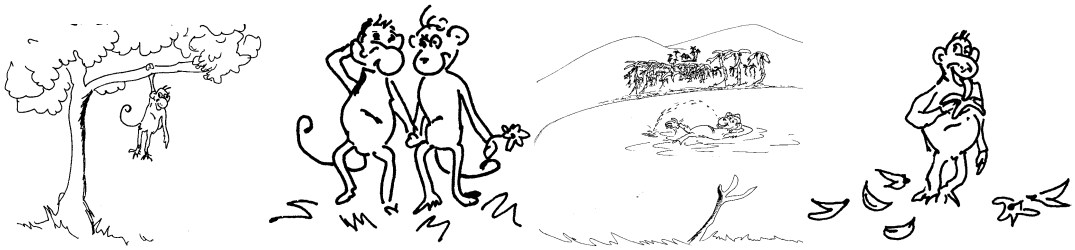
The fact that neither the participant not the control child produced passive structure is not consistent with findings of the study by Volpato, Verin and Cardinaletti (2016) who found production of passive structure with both *essere* and *venire* auxiliaries in 3 groups of children who were younger than both our participants. The most used strategy is simple SVO structure for non-action verbs and SOV structure with a clitic pronoun for action verbs, which differs from what has been found in De Nichilo (2017). This result shows that the lack of a representation of the passive structure in both our participants does not depend on the auxiliary. Probably, it can be ascribed to both syntactic complexity and the low saliency in input.

4.5 The comprehension of relative clauses. The agent selection task (Volpato, 2010)

4.5.1 Procedure

The test assesses comprehension of subject and object relative clauses through a picture selection task. It is preceded by a training session which aims at attesting and integrating comprehension of the verbs which the participant is going to encounter.

Here, the experimenter says the verb and the participant indicates the pictured action. In the test itself, the participant sees two pictures each one with two participants. In the first one they do an action and in the second they do the same action but they are exchanged, which means that the thematic roles are exchanged. The experimenter reads a sentence like “Indica…” and names one of the participants who is doing something. He participant has to point the correct participant doing the action. Therefore, the choice is among 4 items (2 participant for each performed action). The test is composed of 80 stimuli. 20 items are subject relatives with only one animate referent, for instance *Il cane che ha l'osso in bocca* (The dog that has the bone), which are easier to comprehend.



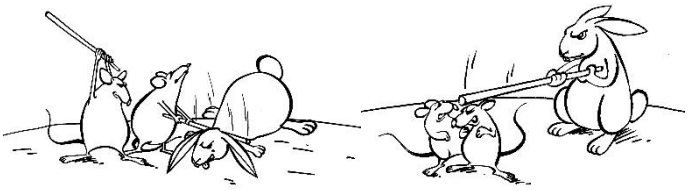
The other 60 stimuli are reversible sentences and contain actions which could be performed in a specular direction between the referents. Five groups of sentences are tested:

- Subject relatives with match conditions of number features between subject and object

  La pecora che leva il cavallo

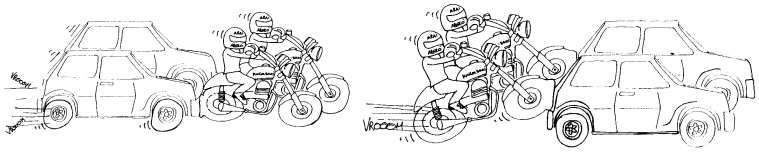
- Subject relatives with mismatch conditions of number features between subject and object

  Il coniglio che colpisce I topi



- Object relatives with match conditions of number features between subject and object

  Le moto che le machine spingono



- Object relatives with mismatch conditions of number features between subject and object

  La giraffa che le zebre tirano

- Object relatives with subject in the post verbal position with mismatch conditions of number features between subject

  I nonni che la tartaruga tocca

The condition which has been manipulated in this test for both subject and object relative clauses is the number feature. Match and mismatch conditions of the number feature between subject and object was measured in SVO, OSV and OVS sentences. This aimed at verifying whether children are sensitive to this condition in comprehension (Volpato 2010).

4.5.2 Coding, results and analysis

Comprehension of the filler items was preserved. The child answer correctly in half of the experimental items (60) with a percentage of accuracy of 55%. Yet her difficulties with relative sentences is still relevant for her age. On the other hand, the performance of the control participant is not significantly different, with only 5 more correct items.

Participant				
	Experimental		Filler	
Correct answers	34/60	56,6%	19/20	95%
Incorrect answers	26/60	43,3%	1/20	5%
Control				
Correct answers	39/60	65%	19/20	95%

Incorrect answers	21/60	35%	1/20	5%

An analysis of error types has been made according to the kinds of tested sentences.

- RS m: subject relatives with match conditions between subject and object
- RS mis: subject relatives with mismatch conditions between subject and object
- OR m: Object relatives with match conditions between subject and object
- OR mis: Object relatives with mismatch conditions between subject and object
- ORp mis: Object relatives with subject in the post verbal position with mismatch conditions between subject

	Participant		Control	
Sentence type	Incorrect answers		Incorrect answer	
SR M	4/12	33,3%	0/12	0%
SR mis	2/12	16,6%	1/12	8,3%
OR M	6/12	50%	8/12	66,6%
OR mis	7/12	58,3%	4/12	33,3%
ORpmis	7/12	58,3%	8/12	66,6%
F	1/20	5%	1/20	5%

4.5.3 Discussion

It clearly emerges that object relatives are more difficult to comprehend than subject relatives for both participants. This finding is consistent with Adani et al., Volpato (2010) and De Nichilo (2017). For object relatives no difference emerged between sentences with match condition of number feature, sentences with mismatch condition and sentences with mismatch condition with the subject in the post verbal position. Although object relatives with mismatch condition and the post verbal subject are clearly difficult, they do not seem to be more difficult than object relatives

with mismatch condition and subjects in the preverbal position for the participant, which is not consistent with Volpato (2012) and De Nichilo (2017). For object relatives the mismatch condition of the number feature does not seem to simplify comprehension, which could indicate that the complexity of the structure itself is what underpins the difficulty. This result is not consistent with Adani et al. (2014) and Volpato (2012 normal hearning children group) ORp sentences with mismatch condition seem to be difficult for the control participant as well, yet to the same extents as object relatives with match condition. The difference of the number condition between object relatives seems to influence comprehension for the control participant, yet only with object relatives with subject in the preverbal position suggesting that her behaviour is more similar to that of TD children. For subject relatives instead, it seems that the mismatch condition of number feature does not simplify the processing of the structure. A detailed analysis of error types in the mentioned sentence types is provided below for both participants following the coding proposed by Volpato (2010).

- Error R (reversible character): the participant chooses the correct referent, which, performs the opposite action. This means that the thematic roles are exchanged.
- Error AG (agent character): the participant selects the picture in which the thematic roles are respected and the action is interpreted in the correct direction, yet they indicate the wrong referent.
- Error O (other character) the participant chooses the wrong character performing the wrong action.

Participant	SR M (12)		SR mis (12)		OR M (12)		OR mis (12)		ORp mis (12)	
Error R	4	33,3%	2	16,6%	4	33,3%	1	8,3%	6	50%
Error AG	0	0%	0	0%	2	16,6%	2	16,6%	1	8,3%
Error O	0	0%	0	0%	0	0%	4	33,3%	0	0%

Control										
Error R	0	0%	0	0%	6	50%	2	16,6%	8	66,6%
Error AG	0	0%	0	0%	2	16,6%	2	16,6%	0	0%
Error O	0	0%	1	8,3%	0	0%	0	0%	0	0%

In general, the most frequent type of error for both participants seems to be R, which means that they are able to identify the correct referent but they chooses the wrong picture. In other words she chooses the image which represents the same action, but performed in an opposite direction between the two referents. The reason underpinning this result could be a difficulty in assigning thematic roles.

4.6 The production of subject and object relative clauses (Volpato, 2010)

4.6.1 Procedure

The test aims at assessing the production of SR and OR clauses through a picture description task. It is composed of 36 items. Each item is composed of 2 pictures which the experimenter describes. One or more kids are always present in the pictures as one of the action referents. After having described what happens in the 2 pictures the experimenter asks a question in which the child is asked to express a preference for one or more kids which are depicted in both pictures using a whole sentence. Therefore, the participant would be encouraged to use a relative clause. 12 items elicit SR clauses as in example (…), 12 items elicit OR clauses, as in example (…) and 12 are filler stimuli (…).

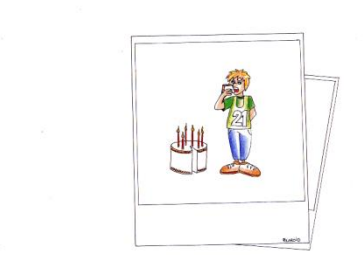
(…) Ci sono 2 disegni. Nel primo un bambino pettina la mamma e nel secondo un bambino

pettina il cane. Quale bambino ti piace di più? Inizia con "(Mi piace) il bambino …"

- Target: (Mi piace) il bambino che pettina la mamma/il cane

(…) Ci sono 2 disegni. Nel primo i cani baciano i bambini. Nel secondo, i nonni baciano i bambini. Quali bambini ti piacciono di più? (Mi piacciono) i bambini…
Target: (Mi piacciono) i bambini che i cani/i nonni baciano.

(…) Cosa fa il bambino in questa foto? Il bambino…
Target: Il bambino/Lui mangia la torta.



4.6.2 Coding, results and analysis

All filler stimuli were correct for both participants. A relevant difference emerges between the participant and the control in the production of relative clauses since the former produced all elicited SR and no OR and the latter produced all SR and 10 OR. Both these results confirm the emerged finding that ORs are more difficult that

SRs (Volpato, 2010) but partially replicate findings of De Nichilo (2017) since the participant did not produce object relatives, but the control did.

Participant				
	SR		OR	
Target answers	12/12	100%	0/12	0%
Different answers	0/12	0%	12/12	100%
Control				
Target answers	12/12	100%	10/12	83,3%
Different answers	0/12	0%	2/12	16,7%

A more detailed analysis provides the answer strategies which have been used by both participants to replace ORs according to the coding below:

- A. SR with thematic role exchange. The sentence is transformed into a subject relative clause and the thematic roles are exchanged.

  Ci sono due disegni, nel primo i cani baciano i bambini, nel secondo i nonni baciano i bambini. Quali bambini ti piacciono?

  TARGET: (mi piacciono) I bambini/quelli che i nonni baciano

  Given answer: quelli che baciano i nonni

- B. SR without DP expressing the object. The object relative is transformed into a subject relative, but there is no change if thematic roles.

  Ci sono due disegni, nel primo un orso morde un bambino, nel secondo l'orso accarezza un bambino. Quale bambino ti piace?

  TARGET: (Mi piace) il bambino/ quello che l'orso accarezza

  Given answer: l'orso che accarezza

- C. Active sentence with SVO order. The sentence is transformed into a simple active SVO, but there is no change of thematic roles.

  Ci sono due disegni, nel primo i cani baciano i bambini, nel secondo i nonni baciano i bambini. Quali bambini ti piacciono?

  TARGET: (mi piacciono) I bambini/quelli che i nonni baciano

  Given answer: I cani baciano I bambini

- D. Active sentence with SVO order object DP omission. The complex sentence is transformed into a simple sentence but the DP expressing he object is omitted.

  Ci sono due disegni, nel primo un orso morde un bambino, nel secondo l'orso accarezza un bambino. Quale bambino ti piace?

  TARGET: (Mi piace) il bambino/ quello che l'orso accarezza

  Given answer: l'orso accarezza

- E. Other: Other kinds of productions are classified under this category

Participant				Control	
Strategy					
A	SR with thematic role exchange	7/12	58,3%	1/12	8,3%
B	SR without object DP	2/12	16,6%	0/12	0%
C	C. Active sentence SVO	0/12	0%	1/12	8,3%
D	Active sentence object DP omission	0/12	0%	0/12	0%
E	Other	3/12	25%	0/12	0%

The participant seems to prefer strategy A, which does not replicate findings of De Nichilo (2017). In this case the participant chooses a less complex syntactic structure, but she also exchanges thematic roles.

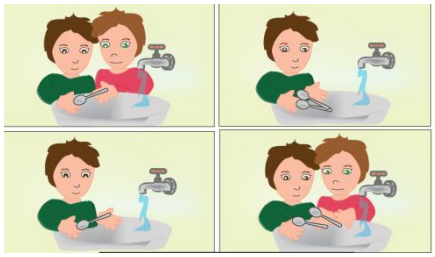
4.6.3. Discussion

Data which emerged from SR and OR production task is partially consistent with what emerged from the assessment of comprehension of relative clauses. The discrepancy between SR and OR in terms of complexity seems to influence production more than comprehension. Therefore, just like passive sentences, there seems to be a discrepancy between comprehension and production modality. It is interesting that the most evident difficulty underpinning both comprehension and production of SR and OR clauses is thematic role assignment. From the analysis of comprehension, it emerged that the most frequent error for both participants is error R, which implies the selection of the correct referent, performing the opposite action. The production test evidenced the same kind of difficulty in the strategies used when processing OR sentences.

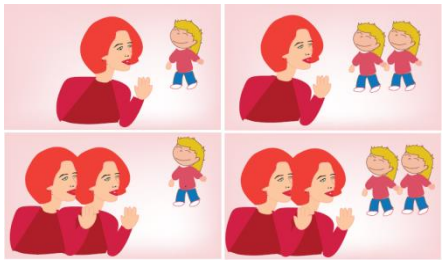
4.7 Test (Frugarello, 2013), an adaptation by Lantschner (2017)

4.7.1 Procedure

The test is a picture selection task, which aims at evaluating the influence of number features in object relatives with embedded subjects in pre-verbal position. It consists of 96 stimuli. 72 of them experimental trials, and 24 are filler items, which are subject relatives. The experimenter shows a group of 4 pictures to the participant an says a sentence. The participant has to point at the picture describing that sentence. Half of the stimuli (36 items) tests irreversible sentences in which one of the referents is animate and the other is inanimate as in example (…), the other half (36 items) tests reversible sentences in which both referents are animate as in example (…). Each picture represents a different condition of the number features, therefore, number features are the elements which the participant has to process in order to select the correct picture.

(…) 

Tocca il cucchiaio che l'uomo lava

(…) 

Tocca le bambine che le donne salutano

4.7.2 Scoring, results and analysis

Participant	Rev.	Fillers	total	Irrev.	Fillers	total
Incorrect	20/36	8/24	28/48	21/36	9/24	30/48
answers	55,6%	66,7%	58,3%	58,3%	75%	75%
Correct	16/36	4/12	20/48	15/36	3/12	18/48
answers	44,4%	33,3%	41,7%	41,7%	25%	25%
Control	Rev.	Fillers	total	Irrev.	Fillers	total
Incorrect	0/36	1/12	1/48	1/36	0/12	1/48
answers	100%	8,3%	2,1%	2,8%	0%	2,1%
Correct	36/36	1/12	37/48	35/36	12/12	47/48
answers	100%	8,3%	77,1%	97,2%	100%	97,9%

The results show a significant difference between the participant and the control's performance. Concerning the participant, no relevant difference emerged between reversible and irreversible sentences. The interesting result is that the participant produced errors also in the processing of filler items, which are subject relatives. This finding is consistent with the SR and OR clauses comprehension test, which showed that subject relatives are easier than object relatives, but still they represent a

challenge for our participant. The control child only produced one error in one irreversible sentence and in one filler stimulus. Errors are analysed in relation to each sentence type according to the scoring below:

- SS: both DPs are singular
- SP: the first DP is singular, the second DP is plural
- PS: the first DP is plural, the second DP is singular
- PP: both DPs are plural

	Incorrect Rev. **20/36**	Incorrect Irrev. 21**/36**	Total	Correct Rev.	Correct Irrev.	Total
SS (Sing. Sing.)	1/9 11,1%	4/9 44,4%	5/18 27,8%	8/9 88,9%	5/9 55,5%	13/18 72,2%
SP (Sing. Plur.)	6/9 66,7%	7/9 77,8%	13/18 72,2%	3/9 33,3%	2/9 22,2%	5/18 27,7%
PS (Plur. Sing.)	5/9 55,6%	4/9 44,4%	9/18 50%	4/9 44,4%	5/9 55,6%	9/18 50%
PP (Plur. Plur.)	8/9 88,9%	6/9 66,7%	14/18 77,7%	1/9 11,1%	3/9 33,3%	4/18 22,2%

Neither for reversible sentences nor for reversible sentences, the participant does not seem to benefit from the difference of number features between subject and object which confirms data which emerged in the task assessing comprehension of OR clauses.

5 The language intervention

5.1 Introduction

The language intervention planned for the participant of the present research project is an Italian language treatment/teaching programme combining explicit

instruction and implicit instruction. The explicit instruction was carried out using activities aiming at developing metalinguistic awareness and the TUF (Treatment of Underlying Forms) methodology, while the implicit instruction phase employed syntactic priming paradigms. It lasted eight months from March 2018 to December 2018 (except from June, July, and August) and was carried out twice a week. As discussed in the preceding chapters, both the implicit and the explicit approaches are supported by empirical evidence of their validity as language treatment methods in cases of SLI or language difficulties of other kinds. Moreover, the consistent difficulties which the participant displayed with attention and memory, the employment of syntactic priming paradigms has been considered a valid instrument for two reasons. Firstly, I was conceived as a valid instrument to assess the abstractness, and therefore the solidity of the child syntactic representations, since it does not consist in a mere elicitation but in a "multi-level processing" task composed of comprehension (sometimes) repetition and production of the target structure. The cross-modal level on which it works allows the syntactic representation to be assessed from different perspectives, and to be activated more than a modality-focused activity. Secondly, being syntactic priming an activation of a whole structural frame it speeds processing of that sentence structure itself. It provides a model on which to construct subsequent utterances avoiding structure selection grammatical encoding level of the language production system. Therefore, it seemed a valid instrument to build syntactic habits avoiding the cognitive effort to process structures consciously and to encourage production of structure which may exist but is not spontaneously used. I designed the priming paradigms for direct object clitics and passive structures using the picture description model (Bock, 1986). In the priming task which I designed the participant is asked to listen to and repeat the prime sentence expressed the target syntactic structure. After that, the participant and the experimenter take turns in describing the picture.

I considered, an explicit language instructionapproach necessary for the intervention to be more complete. Based on metalinguistic awareness, it involves conscious attention on the target structures, their properties, constituents, thematic

roles and use. This means that the comparison between the simple canonical sentence to the more complex structure involving movement is actively analysed and does not remain unspecified. Activities involving metalinguistic awareness like the TUF have focused attention and reflection as their basis, which made them a consistent challenge for the participant, given her low attention span. The explicit instruction approach involves principles which are opposite to syntactic priming, yet it has been considered necessary because the activities involved more active participation and allowed access to awareness of the possibility to manipulate language. Indeed, the explicit analysis of the simple and the more complex version of a sentence aimed at correcting and enriching the participant's syntactic repertoire while developing a "linguistic logic" which would lead the child to more autonomous language use. In this sense the programme aimed at making the child aware the fact that words and word strings (constituents) have roles (thematic roles) which cannot change, yet their superficial form or order sometimes can.

5.2 General instruction phase on simple sentences. Focus on articles and prepositions.

Given the morphosyntactic difficulties which emerged in tests and spontaneous productions, I considered necessary to start the intervention with activities training simple sentences. The activities aimed at training simple SVO structures and focused attention on definite and indefinite articles and prepositions (simple and complex). All the mentioned activities were done orally.

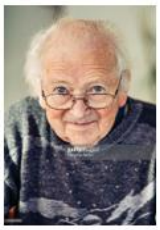
Through a power point presentation and a table with pictures, the child familiarized with all article forms (masculine, feminine, singular, and plural). Articles would be presented in DPs to allow the child to possibly create generalizations on the basis of genre. After this first contact with articles, I proposed a series of activities to train article selection, position in use and agreement with nouns. The first proposed activity involved movement and aimed at training article-noun combinations. After hearing a noun, the child would jump on a sticker on the floor with the correct article written on it and say the plural form of the whole DP. An oral article selection activity

followed. The participant would listen to a whole simple sentence and select the correct article (definite or indefinite) between two options. The sentences which I used follow the model of the example below.

(1) Lui è IL/LO fidanzato di Sara

(2) La mamma ha comprato UNO/UN specchio nuovo

The aim was to raise awareness of articles in use and the positions they occupy, in the subject DP and in the object DP.The subsequent activity focused on oral production. The child would look at two pictures representing the two DPs and read a bivalent verb written between them. She would have to build an SVO sentence with those elements selecting two articles one for the first DP (subject), and the other one for the second DP (object). All sentences contained DPs which were different for gender or number or both, which aimed at developing awareness on morphological changes and at encouraging a variety of the stimuli by training as many combinations as possible as it is evident by the pictures below (1), (2).

1.  LAVARE 

2.  BERE 

I used a series of manipulation activities focusing on SVO structure and articles. It was a sentence construction activity with word puzzles. The participant would be given

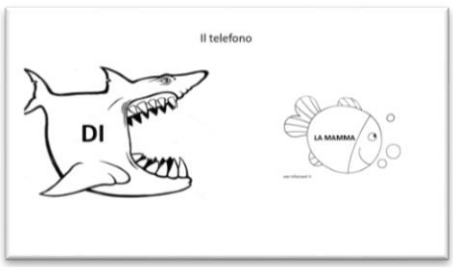
pieces of paper, every piece corresponding to one word, and she would be asked to build an SVO sentence with those pieces of the puzzle. In this activity, the child only had to select between two articles, but the SVO construction could be trained as she was asked to build the sentence from the beginning without visual or oral aids. A picture of the activity is provided below (picture 3).

3. 

After that, I proposed Two additional metalinguistic activities involving articles. They aimed at developing awareness of the difference of word class between articles and other words and were used to introduce prepositions. Therefore, they did not focus on article selection or use, but they showed articles in comparison to other classes of words. In the first one, using two tables of words, the child was asked to distinguish between articles and other word classes and to try to guess which kind of words they were. One of the tables contained definite and indefinite articles and prepositions, the other contained articles and nouns. The second metalinguistic activity was designed on the basis of materials proposed by Caon (2004). The child was given strings of words containing words belonging to different word classes, for instance, a string of five words could contain two articles and three nouns or three articles and two prepositions. The child was asked to distinguish them through elimination. She would start by eliminating the first word on the basis of specific criteria (for instance for being the only masculine article), and she would continue eliminating more word motivating the criteria behind the choice. Reflecting on the criteria which motivated elimination encouraged reflection on the traits like gender and number and the word classes themselves.

After the described training on simple sentences I considered appropriate to start an explicit instruction on prepositions. For a first familiarization with simple prepositions. I provided the child was provided a list of simple prepositions with sentences giving examples of simple prepositions in use. A sentence construction activity through word puzzles followed. Just like in the case of articles, word puzzles aimed at training correct positioning of the preposition and use. The task of actively having to arrange a sentence frame filling wholes and finding a correct position for each word was considered an effective teaching technique which could allow the child to develop awareness on word order more than other oral or written activity. After that, instruction was extended to complex prepositions. They were first explicitly presented to the child using a power point presentation which distinguished simple prepositions from complex prepositions. The presentation aimed at showing the difference between the two kinds of prepositions by presenting them in PPs and not in isolation in order to make contexts of use more visible. The presentation was based on the idea that most simple prepositions could "eat" articles and incorporate them becoming single words (complex prepositions), but this would happen in specific contexts. The slides showed that prepositions were like sharks which would eat smaller fishes, but not greater ones. The fishes which they could eat (small fishes) were represented by common names like in picture (5 and 6), while the fishes which they could not eat (whales) were proper names like in pictures (7 and 8). Therefore, a contact between a shark representing the preposition *di* and a small fish representing a common name would produce a complex preposition like *del*, *della*, *dello*, while a contact between the shark *di* and a whale like, for instance, Maria would result in two separated words.

5.



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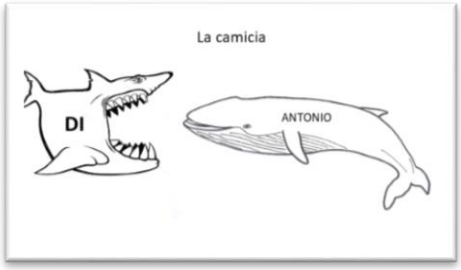
7. 

8. 

The use of complex prepositions was trained through two activities. The first was a sentence completion activity aiming at training the distinction between simple and complex prepositions. In a power point presentation, the child would see the beginning of a sentence (for instance a subject and a verb) and some NPs as possible endings. The child was asked to form sentences combining the first part of the sentence with the others by building correct PPs. She had to select between simple and complex prepositions according to the different NPs. An example is reported below (picture 9).

9. 

The second activity was a sentence construction activity, which used pictures to represent verb arguments like in the examples below. The activity trained the use of articles and complex prepositions in parallel to SVO sentence structure. In some samples the child was asked to insert one PP (picture 10), while in other samples she was presented with more complex sentences in which she had to insert two PPS (picture 11).

10. 

11. 

5.3 The explicit instruction phase training complex structures

5.3.1 Language intervention on Direct Object Clitic pronouns and Reflexive Clitic Pronouns

After simple SVO structures had been trained, I introduced the first movement-derived structures: DOCs and RCs. The language intervention on singular direct object and reflexive clitic pronouns was carried out through the explicit approach first, and through the implicit approach after. The reason behind this choice is that, given the reduced complexity of clitic phrases compared to passive structures and the greater saliency in input, it has been considered a valid strategy to let the child familiarize with the idea of syntactic movement and to consolidate it with implicit training after. The explicit instruction phase aimed at developing awareness of the syntactic movement of the verbal argument carrying the thematic role of the theme and the grammatical function of the object (in an SVO sentence structure) to the preverbal position as the examples below (3), (4).

(3) Carlo (S) mangia (V) il gelato (O)

Carlo (S) eats (V) the ice-cream (O)

Carlo (S) **lo** (O) mangia (V) ___t___

Carlo (S) it (O) (SING-MASC) eats (V)

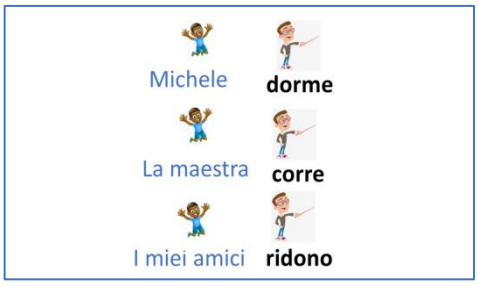
(4) Carlo (S) lava (V) se stesso (O)

Carlo (S) washes (V) himself (O)

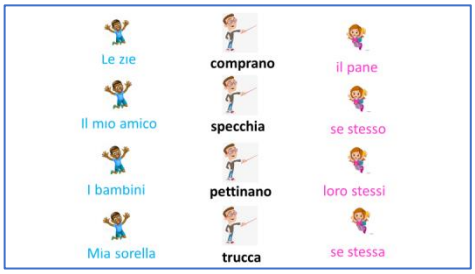
Carlo (S) **si** (O) lava (V) ___t___

Carlo (S) himself (O) washes(V)

Firstly, he child was explained the argument structure of a simple sentence using the metaphor of a classroom. She was told to imagine that the verb is like a teacher who gives tasks to the pupils who represent the verb arguments. In order to properly build a sentence, the teacher gives a role to each pupil (block of words). According to the sentence which has to be built, the teacher may need one or more pupils, but each one of them always keeps the same role. Therefore, independently of the pupil's position, they always correspond to the same roles. Starting from this metaphor the movement of the grammatical function of the object to the preverbal position and its transformation into a clitic pronoun were made evident through a power point presentation. The presentation started with a comparison of different sentences containing monovalent, bivalent and trivalent verbs where verbs and constituents were indicated by the visual reference of the teacher-pupils as in pictures (13), (14), (15) and (16). This phase aimed at making clear that verbs do not always need the same amount of arguments, but if not all the necessary arguments are specified, the sentence does not make sense. The overlap between shared arguments was made evident by the presence of the same image of the child. It pointed out that even though lexical items change, the roles in the sentence always stay the same. As shown by the picture below, a specular activity was also carried out using printed pictures of the teacher and the pupils and word puzzles. The child was asked to build SVO sentences putting the correspondent character above each verb argument and maintaining the same character for the same argument across the sentences. In this phase she was also taught the meaning of the words "subject" and "object". Pictures(17) and (17.1) provide an example.

13. 

14. 

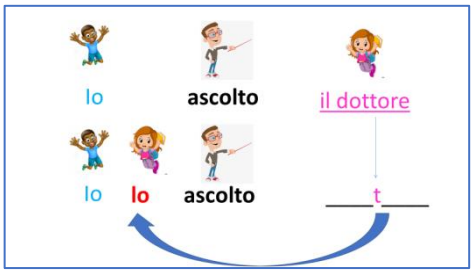
15. 

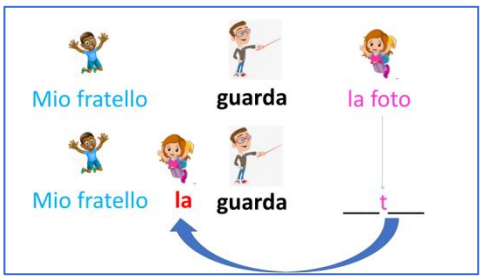
16. 

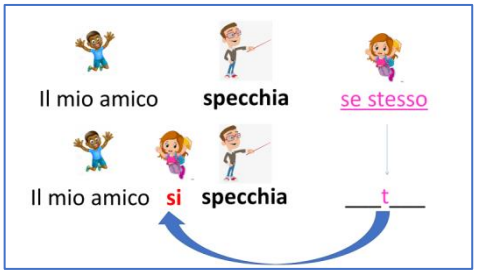
17. 

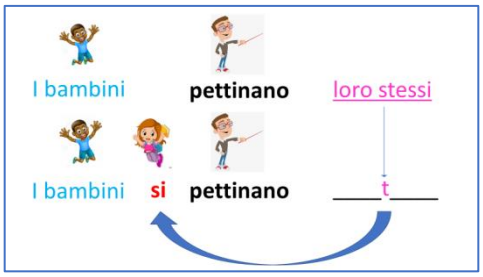
17.1 

Only after this phase, the movement of the object argument was shown for singular DOCs as in pictures (18) and (19) and for RCs as in pictures (20) and (21) exploiting the movement of the figure of the child representing the object from the canonical position to the preverbal one.

18. 

19. 

20. 

21. 

After having been shown the syntactic movement, the child practiced it through manipulation activities of sentence construction where she would build the canonical (SVO) structure and the non-canonical structure by moving the theme herself. The activity trained CODs in sentences with bivalent verbs as shown in examples (22) and (24) with trivalent verbs (23). This kind of activity aim at automatizing the representation of the sentence structure by actively building it, which implied conscious awareness of the correspondence between constituents and thematic roles.

(22)

IO		**SALUTO**	LA MAESTRA
IO	LA	**SALUTO**	

(23)

MARCO		**DÀ**	IL PIATTO	ALLA MAMMA
MARCO	LO	**DÀ**		ALLA MAMMA

(24)

MARCO		**LAVA**	SE STESSO
MARCO	SI	**LAVA**	

I proposed the same kind of activity also for sentences involving longer strings of verb arguments both as subjects and as objects. Some of the proposed sentences with CODs presented objects (25 and 26) or subjects (27 and 28) involving two nouns of the same gender, and others two nouns of different genders as in. This aimed at increasing the complexity of the object and at encouraging a deeper analysis within constituents.

(25)

SOFIA		**HA MANGIATO**	LA TORTA PER LA PANNA
SOFIA	LA	**HA MANGIATA**	

(26)

LA MAMMA		**ABBRACCIA**	IL FIGLIO DELLA SUA AMICA
LA MAMMA	LO	**ABBRACCIA**	

(27)

IL BAMBINO DELLA MIA AMICA		**LAVA**	SE STESSO
IL BAMNINO DELLA MIA AMICA	SI	**LAVA**	

(28)

LA SORELLA DELLA ZIA		**PETTINA**	SE STESSA
LA SORELLA DELLA ZIA	SI	**PETTINA**	

The successive step of the explicit instruction phase involved practice of CODs and CRs in contextualized use. The proposed activities aimed at training the pragmatics of the use of clitic pronouns by eliciting them in semi-spontaneous productions. In the first

activity the child was shown two pictures in a row, she was told that the protagonist is doing something to another participant (object or animal), and she is asked what the protagonist is doing with the that participant. The activity aims at eliciting sentence like in the example (29 and 29.1).

(29) 

(29.1) La signora sta facendo qualcosa con la finestra

The lady is doing something to the window

*Nella prima imagine **la** sta chiudendo*

In the first picture (she) it (SING-FEM) is closing

E nella seconda?

In the second?

*TARGET: (La signora) **la** sta aprendo*

The subsequent activity was an oral sentence completion. I would read a sentence without the DOC pronoun and she was asked to add the missing DOC in the right place as in examples (30) and (31). This activity aimed at developing sensitivity towards different contexts of use of the DOC pronouns and at training morphosyntactic properties like position and gender agreement.

(30) *Chi compra la pizza? ___ compra Michele*

Who is going to buy the pizza? ___ (SING-FEM) buys Michele

(31) *Sara compra un vestito e poi ___ mette*

Sara buys a dress and then ___ (SING-MASC) wears

After the child had been familiarising with the form and the use of singular DOC pronouns, I considered appropriate to propose an activity which involved metalinguistic awareness. She was asked to distinguish between singular DOC pronouns and definite articles inside the following sentences (32) and circle them with different colours. Through this activity the child could reflect on the role that the two kind of item have in the sentence (verbal arguments or morphological items only) by individuating the noun they refer to. Being DOC pronouns and two definite articles homophone morphological items (apart from the articles IL and L' and the plural ones) she was stimulated to base her choice on semantics and syntactic functions.

(32)

LA PENNA E' NELL'ASTUCCIO	MANGIO IL GELATO	TE LO PRESTO IO
LA SCRIVIAMO IN CLASSE	IL BAMBINO PRENDE LO ZAINO	LA METTO QUANDO FA FREDDO
LA MAESTRA APRE LA PORTA E POI LA CHIUDE	LO REGALI AL NONNO	HO TROVATO LO ZAINO DI SARA
NON MANGIARE IL DOLCE! LO MANGIO IO	LA PORTI ALLA MAESTRA?	COMPRIAMO UN LIBRO E POI LO LEGGIAMO

One final activity based on the TUF method was proposed for both DOCs and RCs before the intermediate test. The activity was designed on the basis of the example provided in paragraph 1.5. As already mentioned, the TUF methodology allows to treat both canonical structures and structures derived from movement. It makes the syntactic movement evident through the comparison of the canonical and the non-canonical sentence, it develops structural knowledge because the participant actively constructs sentences and supports reflection on thematic roles through pictures representing an event. Therefore, it functions on more than one level since it trains morphosyntactic properties of the structure but encourages metalinguistic and pragmatic awareness. The activity proposed based on the TUF methodology followed this sequence.

1. The child was given a picture to observe and she was asked to put the sentence puzzle into the correct order so as to form a sentence which could describe the picture as in (33) and. The pieces of the puzzle contained whole NPs, therefore the aim is to form an SVO canonical sentence structure.

2. When the sentence was built the child was asked questions related to the thematic roles. For instance, if the built sentence was *"The mermaid kisses the crab"* the child was asked three questions:a) *What is the action?* b) *Who is the one who kisses?,*c) *Who is the one who gets kissed?.* The child had to answer by pointing the NPs from the built sentences, not the characters of the picture. This part is necessary to ensure that the participant can assign thematic roles and does not have impairments at the message level.

3. After that I would build another sentence just below the already built one. This time it was the movement derived sentence containing a DOC/CR pronoun as in (33.1)

4. After that the child was asked the same questions in order to verify whether she was able to assign the right thematic role to the moved element.

5. Lastly, she was told to noticed that, even though the participant who gets kissed has changed its position in the sentence and has transformed into a different word, it is still the one that gets kissed.

Just like in the previous mentioned activity of sentence construction through puzzles, the same task was proposed again with sentences containing longer NPs as in (34) and (34.1).

After the first model was constructed the child would build the non-canonical sentence by herself in step 3.

(33)

(33.1)

La sirena		Ha baciato	Il granchio
La sirena	**Io**	Ha baciato	

(34)

(34.1)

La giraffa con gli occhiali	legge	Il libro verde
La giraffa con gli occhiali	**Io**	legge

5.3.2 Passive structures

As observed in chapter 1 paragraph 2.9, passive structures involve much more complex syntactic operations than DOC and RC pronouns since are not only movement derived structures, but they also imply a change in thematic roles. In the preceding explicit phase which focused on clitics, the child familiarized with the grammatical concepts of subject and object and she was made aware that, for pragmatic reasons, the object can change its position without changing its role. Given the discrepancy between thematic roles and grammatical functions in passive structures (the subject of the SVO is the agent, while the subject of the passive structure is he patient) it has been considered a smoother solution to treat passive structures with the TUF methodology only throughout three sessions. Moreover, the scarce metalinguistic knowledge of the child, her relatively still short time spent training an easier kind of movement and her consistent vocabulary lacks were to be considered. For instance, the child showed difficulties in understanding words belonging to the metalinguistic context like fare l'azione" (doing an action) or "riceverel'azione" (receiving an action), which had been previously used to explain what happens to the object in the SVO structure, and sometimes she seemed to forget their meaning after being explained it. The TUF activity, instead, allowed to reflect on the thematic roles in a contrastive way thanks to the support of the pictures and the questions. The activity followed the above-mentioned five steps after which the child was asked to repeat again which are the two ways to express the event described by the picture without looking at the built sentences. One of the activity sentences is provided in examples (35) and (35.1).

(35)

(35.1)

La bambina	spinge	il bambino
Il bambino	viene spinto	dalla bambina

5.4 The implicit instruction phase of the language intervention. Design and aims of the syntactic priming tasks

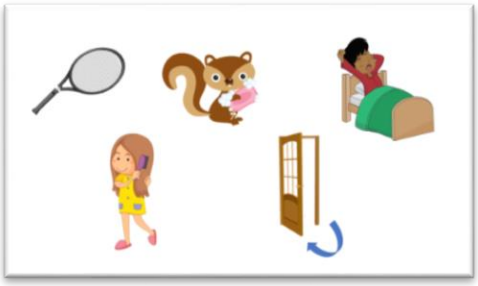
The implicit treatment phase of DOC and RC pronouns was carried out using syntactic priming paradigms. Based on the research findings discussed in chapter 2, the use of syntactic priming tasks had three main aims. First assessing the level of abstractness of both syntactic structures though a multimodal activation (using comprehension and production). Secondly, it aimed at investigating the magnitude of within language syntactic priming effects for two different structures in terms of syntactic complexity and in a situation, which includes different variables: learning difficulties supposedly deriving from a memory/attention deficit, reduced input in Italian as an L2. Thirdly, it was designed to strengthen structural representations and speed up processing of the observed structures in production on order to improve productive oral performance and comprehension and encourage learning. The implicit instruction phase was conceived as a potentially effective practice to automatized syntactic structures representations and facilitate access to them. Given the hypothesized difficulties related to memory and attention, it could be reasonably expected the child to have working memory (related to linguistic processing of movement) or structure retrieval difficulties, therefore the automatization of the priming task was conceived as a way of lightening the processing burden of non-spontaneous structures by providing an external source of activation. Moreover, the priming tasks have been considered a potential language learning instrument from the beginning independently of the obtained results, since it is a focused exposure of structures which are complex (both of them), and not frequent in the L2 exposure (passives). In the case of DOCs and RCs the priming phase the explicit phase preceded the priming phase, because the participant was considered able to familiarise with the

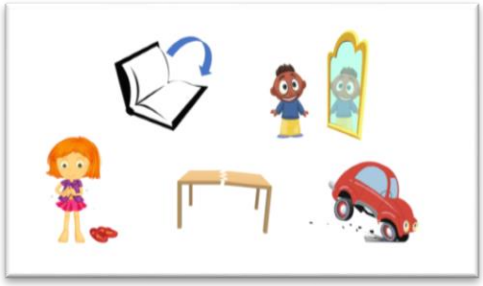
morphosyntactic, pragmatic and semantic properties of the pronouns from a more conscious and active perspective. Therefore, the priming session aimed at strengthening clitic structures and activating passives. Additionally, the priming task alone would not have been enough to completely train all aspects of pragmatics. In the case of passive structures, the implicit phased was proposed first. The logic behind this choice was that, given the complexity of passive sentences, it was important to assess how strong were syntactic representations in the participant before starting with an aware analysis of the morphosyntactic properties. Representations of passive structures were expected to be even weaker since they were neither spontaneously used structures, nor frequent in everyday exposure. Therefore, the aim was to activate them enough to be more consciously analysed through the TUF.

5.4.1 Direct Object Clitics and Reflexive clitics

The first priming task which I proposed trained RCs. It is a 10-trials priming task composed of 29 items: 20 experimental items each (10 prime stimuli containing a picture and a sentence, 10 target pictures) and 9 filler stimuli. It was preceded by a training session (pictures 36 and 37) in which the child had to point the correct action. For instance, she would be asked "*dove vedi il verbo lavare?*" (*where can you see the verb to wash?*), or "*dove vedi il verbo specchiare*" ("*where can you see the verb to look oneself in the mirror"*). The verbs were all expressed in the infinitive non-reflexive form so as not to facilitate the activation of reflexive clitics before the task started. This phase aimed at assessing or possibly integrating her knowledge of verbal lexical items to guarantee comprehension in the following items. All the subsequent items (sentences and pictures) were designed so that the child would only encounter known words. In order to guarantee that the participant did not focus her attention on syntax, the task was presented as a game, which she would play with a character. This character (Marco) would introduce himself and explain the game as a vocabulary game aiming at discovering unknown words and learn them (images 38, 39, 40). Each trial is composed of a prime stimulus with an image and a voice saying something (describing the picture) using the target structure and a target picture which the participant has to

describe. In this way the voice (Marco) and the participant take turns describing the picture. After every complete trial there is a filler item containing semantically and syntactically unrelated sentences. Fillers alternate between items in which the experimenter describes what happens in the picture and items in which the participant does it. The experimental trials were designed as follows. In the prime (image 41) the child would hear Marco's voice describing the picture using a sentence contextualising the event without expressing the clitic pronoun, in some cases it is a canonical SVO sentence like "*lo scoiattolo lava il suo pelo*" ("*the squirrel washes its fur*") in picture 41, or it could be a sentence like "*la racchetta è spezzata*" ("*raquet is broken*"). After this sentence, the child would hear Marco's voice asking a question eliciting the singular direct object clitic pronoun like "*Cosa fa lo scoiattolo?*" ("*What does the squirrel do?*"), or *"Cosa succede alla racchetta?"* (What happens to the racket?). Lastly, the child would hear the movement-derived sentence containing the clitic form, for instance "*Lo scoiattolo si lava*" ("*the squirrel washes itself"*), or *"la racchetta si spezza"* (The raquet breaks it self). The target item (picture 42) involved a picture to describe. Marco would ask "*Cosa fa la bambina?*" ("*what does the child do?*"). Here the target answer would be "*si veste*". The filler item (picture 43) would represent verbs which are semantically unrelated to the experimental sentences and which are involved in totally different syntactic structures. Indeed, some of them were monovalent verbs like picture (43) or sometimes they the verb to be like "*la torta è sul tavolo*" ("*the cake is in the table*"). Trials alternate between one with animate participants and the other with inanimate participants. There were no changes of animacy within the trials, therefore two of the trained conditions are P. animate - T. animate, P. inanimate - T. inanimate. Half of the trials primed full clitic phrases, for instance "*Cosa fa lo scoiattolo? Lo scoiattolo si lava*". Half of them primed short sentences containing the clitic and the verb, for instance "*Cosa fa la bambina? Si pettina*". The participant was not requested to repeat the clitic prime sentence and there was no verbal repetition between the prime and the target, therefore two additional conditions were no lexical boost and no repetition.

36. 

37. 

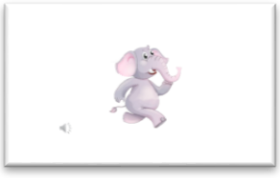
38. 

39. 

40. 

41. 

42. 

43. 

Of the 10 items in which the participant was asked to describe he picture she produced 5 correct RC (table 2) Moreover, she produced one clitic (*si lava I denti*) when describing the picture "*la bambina sorride*", which has not been considered as the picture belonged to the filler trials. However, the priming had a 50% magnitude, which is a relevant result considering that it was the child's first exposure to a priming task.The priming effect seemed to be slightly stronger with full sentences containing a clitic.

(t2)

	Trials full clitic phrase	**Trials clitic only**	**Total**	**Magnitude**
Priming effect	3	2	5	50%

Three out of the five productions without RCs contained verbs which the child already knew, while the others contained the verbs "pesare" (to weigh) and "sciogliere" (to melt) (table 3). The verbs had been explained in the training session, yet the child substituted them

with other two expressions: “sta guardando le ore” (checking the time) and “si ghiaccia”. During the priming task itself I provided the infinitive form of the two verbs again, yet the child described the pictures without RCs, which is strange for the second production since it was immediately preceded by her own production containing a RC (“si ghiaccia”). The error type for un primed sentences was omission.

(t3) 1  ***Sta guardando le ore → pesa***

2 *Si ghiacchia →scioglie*

One week later the same priming task was proposed again and the amount of production with a correct RC turned to 7, 4 of them were primed by full sentences containing a RC (table 4). The error type for unprimed sentences was omission.

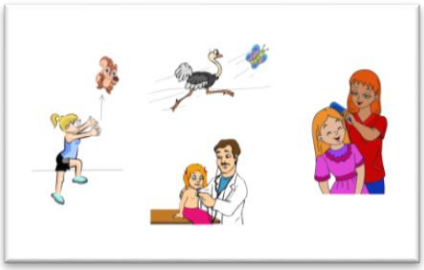
(t4)

	Trials full clitic phrase	**Trialsclitic only**	**Total**	**Magnitude**
Priming effect	4	3	7	70%

Subsequently, a prime task for DOC pronouns was proposed following the same structure of items design (role taking picture description) as shown in the pictures 46 and 47. It was an8-trials priming task and trained the use of singular DOCs in sentences describing events with human agents and human patients. Half of them were primed by full clitic sentences, and the other half by sentences only containing the clitic and the verb. No difference in animacy was present within the same trial and between the trials. Prime sentences (and pictures) contained an SVO and a clitic sentence with an animate agent and an animate patient and the same was for target pictures (as in 48 and 49). Therefore. the only animacy condition trained in this priming task was P.

animate - T. animate. The task involved repetition of the prime, but not lexical boost.This task was preceded by a training session as well (pictures 44 and 45). Filler trials elicited simpler structures, for instance containing monovalent verbs (picture 50).

44. 

45. 

46. 

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48. 

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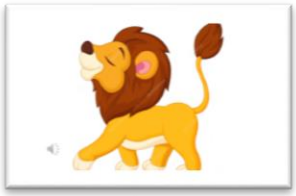
50. 

The participant produced 6 targets containing DOC showing a consistent priming effect (table 5). She seemed to omit clitics to a far lower extent. Despite this result the child only produced *lo* clitics, therefore she incorrectly selected 2 clitics, which should have been *la* (table 6).

(t5)

	Trials full clitic phrase	**Trials clitic only**	**Total**	**Magnitude**
Priming effect	3	3	6/8	75%

(t6)

LO clitics produced	**6 (4)**
LA clitics produced	0 (2)
errors	2

In one of the unprimed productions the child used the strategy of the direct speech which allowed her to avoid mentioning the theme of the action.

Cosa fa lo squalo alla sirena?

T: "dice hello sirena"

In the other unprimed production the child omitted the clitic.

In the last priming taskwhich I proposed I manipulated the animacy condition between the primes and the targets. If the prime presented an animate agent and an inanimate patient as in (51), the target would contain an animate agent and an animate patient as in (53) and vice versa (54 and 56). The task contained 13 experimental trials and 13 filler.7 trials primed LO clitics, 6 trials primed LA clitics. What changed in this prime task was that the filler item was inserted between the prime and the target in order to enhance the distractive power and to create a syntactic competitor with a different structure. Therefore, in this task the filler was composed of a picture to describe (52, 55). This allowed to verify whether the clitic phrase stays activated despite the presence of a totally different competitor. All primes contained full clitic sentences, for instance "*la bambina lo lancia*" and had to be repeated.

51. 

52. 

53. 

54. 

55. 

56. 

The child produced 12 sentenced with DOC (table 7). Again, the priming magnitude stayed strong across many trials indicating that the child is sensitive to priming effect. The only different production is a substitution of the clitic with a full DP:

P: Il cane lo morde

Cosa fa il dottore alla bambina?

T: Visita la bambina

This finding allows to hypothesize that the participant learned the syntactic structure in which Docs are involved. Again, morphological accuracy was lower as the child produced 10 masculine clitics when 4 of them should have been feminine (table 8). In the only unprimed production the participant omitted the clitic.

(t7)

Primed clitics	**12**	**92,3%**
Unprimed clitics	1	

(t8)

	Produced clitic phrases	**Error**
LO	10 (6)	4
LA	2 (6)	4

5.4.2 Passive structures

The aims of the priming tasks were firstly to to observe whether the participant would produce more passives structures after being primed with passives than after being primed with actives, secondly to assess the abstractness of her representations and thirdly, to improve unconscious learning. Neither of the two priming trials had lexical boost between primes and the targets.

The first priming task which I proposed contained both active and passive trials.26 were the experimental trials and 10 were the filler trials. 13 trials would prime actives (pictures 59 and 60) and 13 trials would prime passives (pictures 63 and 64). The task was preceded by a training phase in which comprehension of the depicted

actions was assessed and possibly integrated (pictures 57 and 58). Filler trials contained syntactically unrelated structures like monovalent verbs or reflexives and they did not appear within the trials (pictures 61 and 62). The condition of animacy was manipulated between the prime and the target so that when the prime would have an animate agent and animate patient (pictures 59), the target would have an animate agent and an inanimate patient (picture 60), and vice versa. Given the complexity of passive structures, the priming task involved repetition of the prime.

43. 

44. 

45. 

46. 

47. 

48. 

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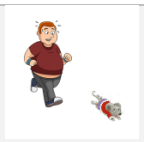
In this priming task the child did not produce any sentence in the passive structure. When describing pictures depicting the action “to chase” (inseguire) she produced active constructions, but seemed to exchange the thematic roles as the following table (9) show:

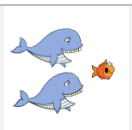
(t9)

n	Target picture	Production	Characheristics/error type
1		*Il papa si corre dal topo*	*Correre da* (run from) used as *inseguire* (to chase); addition of a reflexive clitic
2		*Il bambino corre dal coniglio/segue dal coniglio*	*Correre da* (run from) used as *inseguire* (to chase);
3		*Il bambino corre dalla macchina*	*Correre da* (run from) used as *inseguire* (to chase);
4		*I orsi corrono dalla zebra*	*Correre da* (run from) used as *inseguire* (to chase); article selection error in the subject DP

Different kinds of productions are reported below (table 10).

(t10)

n	Target picture	Production	Charateristics/errortype
5		*I due gatti che giocano a pallavolo*	SR clause production
6		*I topolini scappano dal papà*	Attention is focused on the patient of the action, but the structure stays active
7		*Noi corriamo i gatti corrono*	Coordination of two simple structures
8		*Il papà sta cucinando (cosa?) l'uovo*	Omission of the full DP expressing the object
9		*Si piove*	Addition of a reflexive clitic

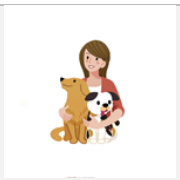
10		*Ilelefante dipinge (cosa?) la lavagna*	Omission of the full DP expressing the object; Article selection error in the subject DP
11		Le balene corrono tra i pesci	Simplification of the structure through the use of a monovalent verb

What is interesting about sentence 6 is that the child was able to shift attention on the patient of the action, while still choosing an active structure to describe the sentence, which may imply that she is developing awareness on thematic roles, but the passive structure is still too complex to be activated or retrieved. In productions 7 and 11 she chose monovalent verbs and arranged the rest of the sentence according to this choice: in production 7 she coordinates two SV structures, while in production 11 she connected the verb with the PP *tra i pesci*. Sentence 9 contains an error which the child seems to frequently produce also in spontaneous productions: the addition of reflexive clitics in non-reflexive verbs.

The second syntactic priming task on passive structures was a 42-trial task composed of 34 experimental trials and 8 filler trials and it involved repetition of the prime as well. It was designed using the same trials as the previous one to which 8 new trials were added. Just like the previous one, this task was preceded by the same training session as the previous task. Half of the experimental trials primed active sentences (17 trials), and half of them primed passive sentences (17 trials). Again, filler trials contained syntactically different structures. The condition of animacy was manipulated between the prime and the target in order to test the magnitude if priming independently of animacy or meaning. For instance, if the target sentence had an animate agent and an animate patient, the target had an animate agent and an inanimate patient. In this case, fillers were considered whole trials therefore were not inserted between the prime and the target. In this priming the child produced only one

passive structure after the passive prime "*il vestito viene strappato dallo scoiattolo*" (table 11).

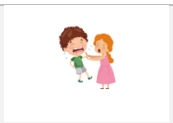
(t11)

N	Target picture	Production	Characteristics/error type
12		*I cagnolini sono abbracciati dalla signora*	Passive structure with *essere* as an auxiliary

It is interesting to notice that the passive structure produced has "*essere*" as an auxiliary, since the child had been primed only with passive structures with the auxiliary "*venire*".

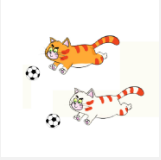
In all the other trials the child described the picture using active sentences. Only in two case the participant active sentences with resumptive clitic pronouns (table 12).

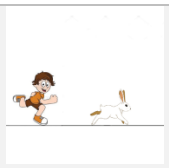
(t12)

N	Target picture	Production	Characteristics/error type
13		*La mamma la fidanzata la spinge*	Active structure with resumptive clitic pronoun
14		*Il papà lo abbraccia e lo bacia alla bambina*	Active structure with resumptive clitic pronoun; incorrect clitic selection

The verb *inseguire*, (to chase) elicited productions like the ones found in the first task (table 13).

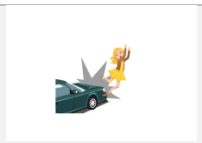
(t13)

N	Target picture	Production	Characteristics/error type
15		*Il gatto corre dalla palla*	*Correre da* (run from) used as *inseguire* (to chase)

16		*Il papa corre dal topolino*	*Correre da* (run from) used as *inseguire* (to chase)
17		*Il bambino corre dal coniglio*	*Correre da* (run from) used as *inseguire* (to chase)
18		*Loro si corrono dalla zebra*	*Correre da* (run from) used as *inseguire* (to chase); addition of a reflexive clitic

Different kinds of productions are reported below (table 14).

(t14)

N	Target picture	Production	Characteristics/error type
19		*-La bambina si muore -La macchina sta avvicinando la bambina corre*	Sentence simplification using a monovalent verb; addition of a clitic pronoun
20	IMG	*Il bambino pettura (cosa?) la montagna (questo è un qua?) quadrato*	Omission of the full DP expressing the object
21	IMG	*La bambina si fa male*	
22	IMG	*Il papa cucina (cosa?) il uovo*	Omission of the full DP expressing the object; incorrect article selection
23	IMG	*La mucca mangia le mucche mangiano (cosa?) l'erba*	Omission of the full DP expressing the object
24	IMG	*Il bambino ruba la carniciotta*	

The last priming task was a 15 trials task with 10 experimental trials and 5 filler trials. It was designed on the basis of the previous ones, but two conditions were changed in order to verify whether the production of passives would be encouraged. Firstly, the whole task only primed passive structures. The reason behind this choice was to isolate possible representation of passives from the representation of actives avoiding structural competitors. Secondly, in half of the trials features of the message were changed. The trials would contain sentences describing an event which may lead the listener to focus attention on the patient and target pictures depicted events which may have triggered the same effect (pictures 51 and 52). The rest of the trials would present the same pictures as targets but were preceded by more neutral primed from the message perspective (pictures 53 and 54).

51 P la corona del re viene spezzata dalla strega

52 INSERISCI IMG il vaso prezioso viene roto cl cane

53 P. il ponte vene costruito dai signori

54 INSERISCI IMG la collana preziosa viene rubata dal ladro

No difference was found between the two conditions since the participant did not produce any passive structure. The participant described the pictures using active structures. Other kinds of productions are reposted below (table 15).

(t15)

n	Target picture	Production	Characteristics/error type
25		*Il bambino piange perché la sua fidanzata li ha spinto*	Attention is focused on the patient of the action, but the sentence stays in the active form with a resumtive clitic; incorrect clitic selection
26		*L'orso corre dalla zebra*	*Correre da* (run from) used as *inseguire* (to chase

5.5 Discussion

The combined approach has shown evident beneficial effects for clitic pronouns. An initial training on simple SVO sentences and the argument structure revealed itself to be essential to encourage aware practice of the A movement. R. seemed to positively react to explicit activities using sentence manipulations. Activities based on TUF, in particular, allowed a double modality training since they would focus on guided production and comprehension. Syntax was not the only domain involved in TUF activities. R. had the chance to practice morphology by producing and comprehending clitic pronouns which were closely connected to nouns and pictures, training gender and agreement. Yet the difficulty which I observed throughout the explicit phase was that R, would struggle developing metalinguistic awareness. In particular, she would positively respond to questions on thematic roles, for instance "*chi sta pettinando?"* (who is brushing?) and "*chi viene pettinato*?" (who is being brushed?), but she would show consistent difficulties in associating them to grammatical functions. Moreover, she would very easily forget my instructions. As expected, priming tasks had rather relevant benefits in the child's productions. Priming effect were found in all tasks and the condition of animacy did not appear to influence productions. Such findings confirm previously collected data on TD children and children with SLI (Chapter 2). The magnitude which emerged in the last priming task is consistent with the idea that priming could be a form of language learning, yet a remark on this finding needs to be done. I observed that the participant may have achieved a stronger activation of the structure, which could be considered learning, but this kind of learning process seems to be mainly structural. R. seems to produce agreement errors, which belong to the area of morphology to an extent which cannot be neglected. As discussed in the first chapter, agreement errors have been found in L2 learners, while omission errors characterize productions of children with SLI. This would fit with R.'s profile as an L2 learner, yet it is important to remind that the main error type which emerged from the first administration of the test of clitics was omission. This finding indicates that the structural activation which priming encourages allowed the child to develop awareness on the sequence of words and to "fill" the

wholes which she would leave empty and that improvement is evident. In order for awareness on gender and agreement to be developed the explicit instruction using TUF appears more effective.

Similar benefits were not found for passive structures in production. Implicit instruction seemed to fail to activate representations of passive structures, which is not consistent with data from Messenger, Braningan, and McLean (2011) and Bencini and Valian (2008). Yet representations seemed to be stronger enough to demonstrate comprehension of thematic roles during TUF activities. Moreover, while training with sentence puzzles, the child seemed to gradually acquire structural knowledge. The first passive structures which she would build presented order errors like constituentsexchange, which she would correct by looking at the pictures. After the three sessions training she would build passive structure correctly using puzzles,anddistinguish thematic roles. Since improvement in comprehension was evident, it is possible to hypothesize that production may be enhanced through a longer explicit training.

6 The post intervention assessment

6.1 Assessment of storytelling. The Bus Story (Renfrew, 1991)

The transcription of the administration is provided below.

L.	R.
Ok adesso me la dici l'ultima volta ma guardando le immagini? Ti puoi aiutare con le immagini così ti ricordi ancora più cose. Allora, questa è la prima, guarda le immagini e dimmi la storia di nuovo	Ok allora, un giorno un signore guidava la macchina. Quindi la macchina non voleva che qualcuno gli guidasse e quindi scappò via e lui stava correndo. Va dal treno, fanno una gara, il treno gli diceva "aspetta io non vorrei di fare la gara" quindi va via in una città e lui corre e dopo viene il signore che suona il fischietto ma lui non lo ascolta. E dopo lui corre dalla mucca e dopo si cade nel fango e dopo stava cadendo così forte… non così piano. Si capisce anche. E lui dopo era triste. E dopo il ragazzo vede che è nel fango quindi dopo prende la macchina e sta li dentro e la macchina era triste.

Va bene	Perché era triste?
Perché lui non voleva tornare nella città, voleva rimanere nella campagna. Bravissima!	

Contrary to the first administration the story structure is more complete. The participant mentions almost all the events. She adds an extra piece on information (…) (…) *il treno gli diceva "aspetta, io non vorrei fare la gara*". In one mentioned event she changes the action which the driver is performing (…). While
(…) "*non voleva che qualcuno gli guidasse*", for "mentre il guidatore cercava di ripararlo"
This change may depend on the fact that "riparare" is a low frequency verb, therefore it was substituted by a more common verb which fits the context. It is important to notice, thaw, that it is not a lexical substitution in which a certain word is replaced with a more general frequent one with the same meaning or with a periphrasis. Lexical substitutions with more general nouns are present as well as shown in examples (…)
(…)
(…) *il signore* for the driver
(…) *il signore che suona il fischietto* for the policeman
(…) *il ragazzo*
(…) *la macchina* for the bus
(…) *lui* for the bus
However lexical retrieval could be the basic issue in both cases. Simple syntactic structures are correct, moreover the child produces one SR "il signore che suona il fischietto".

6.1.1 Results of the second administration following the explicit instruction. Clitic elicitation task (Arosio 2014)

After the explicit phase the child produced 8 clitics.

Correct answers	8/18	44,4%
Incorrect answers	10/18	55,6%

The strategies which the child used in her incorrect productions are described as follows.

Clitic pronoun	Omiss.		DPs		Incorrect clitic		Other	
DOC *lo*	2/6	33,3%	1/6	16,7%	0/6	0%	O/6	0%
DOC *la*	0/6	0%	1/6	16,7%	1/6	16,7%	0/6	0%
RC *si*	5/6	83,3%	0/6	0%	0/6	0%	0/6	0%
total	7/18	38,8%	2/18	11,1%	1/18	5,6%	0/18	0%

Omission errors significantly reduced for DOCs. In most cases correct clitics were produced and in two cases they were substituted by a full DP. A change is visible also in error rate which appears more homogeneous between omissions and DP substitutions for DO clitics. This is not the case for reflexive clitics, instead, which have been equally trained yet result in the majority of omissions (5/6).

6.1.2 Results of the third administration following the mixed explicit-implicit instruction. Clitic elicitation task (Arosio 2014)

Correct answers	**8/18**	**44,4%**
Incorrect answers	10/18	55,6%

Clitic pronoun	Omiss.		DPs		Incorrect clitic		Other	
DOC *lo*	0/6	0%	0/6	0%	0/6	0%	0/6	0%
DOC *la*	0/6	0%	2/6	33,3%	3/6	50%	0/6	0%
RC *si*	3/6	50%	1/6	16,7%	1/6	16,7%	0/6	0%
total	3/18	16,7	3/18	16,7	4/18	22,2%	0/18	0%

Results did not differ from the intermediate administration. Yet an implicit improvement of syntactic knowledge emerged also by an analysis of incorrect productions. Clitic omissions significantly decreased, and production of incorrect clitics increased. This result show that the participant developed a more robust knowledge on the movement derived structure including clitics, was able to apply the syntactic movement and created a representation of a non-canonical structure.
As already observed in priming tasks the difficulties seem to be related to gender agreement. The participant produced correct *lo* clitics. DP substitutions did not occur for lo clitics. Concerning *la* clitics, she produced one more DP substitution and two more incorrect clitic in comparison to the previous analysis. For reflexive clitics. Omission remained the most evident error, but the error types occurred more homogeneously.

6.2 The comprehension of passive clauses. The picture selection task (Verin, 2010)

6.3 Results after the mixed explicit-implicit instruction

	Experimental stimuli		Filler stimuli	
Correct answers	23/24	95,8%	0/6	0%
Incorrect answers	1/24	4,2%	0/6	0%

The participant's performance with comprehension of passive clauses significantly improved with only one error, which is a thematic role exchange.

	Stimuli	**Picture**	**Given answer**	**Error type**
	In quale foto Sara viene inseguita da Marco?		Picture 3	Thematic role exchange

This improvement may underlie an improvement of the ability to assign thematic roles, which emerged as the most evident issues in the first assessment. It is possible to hypothesize that the most effective kind of instruction in this case was he explicit one based on the TUF methodology, as it encouraged the participant to focus conscious attention on thematic roles and their discrepancy with grammatical functions.

6.4 Test for the production of passive structures (Verin 2010)

The same result was not obtained with production of passive sentences as the participant did not produce any of them. Again, she would describe pictures using different strategies, which are reported below following the scoring used in the first assessment.

	Strategy	Action verbs		Non-action verbs		Tot	
A	Active structure with full phrases (SVO)	7/12	58,3%	10/12	83,3%	17/24	70,8%
B	Active structure with full phrases (SOV)	0/12	0%	1/12	8,3%	1/24	4,1%
C	Active structure with clitic (SOV)	3/12	25%	0/12	0%	3/24	12,5
D	Active structure with resumptive clitic	0/12	0%	0/12	0%	0/24	0%
E	Active structure DP omission	2/12	16,7%	1/12	8,30%	3/24	12,5%

The most used strategy for both action and non-action verbs remains strategy A (Active structures with SVO order). Compared to the first assessment, the child produced less active structures with a clitic pronoun despite the focused training. The use of active structures with an SOV order and the use of a clitic pronoun is used only with action verbs. In 2 action verbs and 1 non-action verb the participant produces active structures with DP omission. In two productions the child transformed the non-action verb *amare* into the action verb *abbracciare* confirming finding of Volpato et al., (2015).

6.5 The comprehension of relative clauses. The agent selection task (Volpato, 2010)

Comprehension of SR and OR clause did not improve after the intervention, which was expected as relative clauses were not treated. Half of the stimuli were not comprehended.

	Experimental		**Filler**	
Correct answers	31/60	51,6%	19/20	95%
Incorrect answers	29/60	48,4%	1/20	5%

The difference in performance between subject and object relatives is not relevant. ORp Mis sentences remain the most difficult ones. The mismatch condition of number features does not seem to help comprehension of OR clauses despite the intervention proposed sentences with mismatch condition in order to provide as many variables as possible.

Sentence type	**Incorrect answers**	
SR M	5/12	41,6%
SR mis	4/12	33,3%
OR M	5/12	41,6%
OR mis	7/12	58,3%
ORp mis	8/12	66,6%
F	1/20	5%

The participant sees to make more AG errors in the second administration of the agent selection task (Volpato, 2010), meaning that she chooses the correct action, but the wrong referent.

	SR M (12)		**SR mis (12)**		**OR M (12)**		**OR mis (12)**		**ORP mis (12)**	
Error R	3	25%	1	8,3%	0	0%	0	0%	2	15,4%
Error AG	2	15,4%	3	25%	4	33,3%	8	66,7%	4	33,3%
Error O	0	0%	0	0%	1	8,3%	0	0%	1	8,3%

6.6 The production of subject and object relative clauses (Volpato, 2010)

Production of SR clauses remained unchanged from the first administration. 2 OR clauses were produced, yet the improvement is not relevant.

Participant				
	SR		OR	
Target answers	12/12	100%	2/12	16,7%
Different answers	0/12	0%	10/12	83,3%

Sentence strategies used to replace ORs are reported below. The most used strategy remained the transformation of the OR clause into a SR with inversion of thematic roles, which indicates that the most evident difficulty related to relative clauses, be it comprehension or production, still is thematic role assignment.

Strategy			
A	SR with thematic role exchange	6/12	50%
B	SR without object DP	1/12	8,3%
C	C. Active sentence SVO	2/12	16,7%
D	Active sentence object DP omission	1/12	8,3
E	Other	0/12	0%

6.7 Test (Frugarello, 2013), an adaptation by Lantschner (2017)

Performance in the comprehension of OR clauses significantly improved as emerged in the second administration of the test. No relevant difference was found between Reversible and Irreversible sentences.

Participant	**Rev.**	**Fillers**	**total**	**Irrev.**	**fillers**	**total**
Incorrect	**3/36**	2/12	5/48	**0/36**	12/12	12/48
answers	**8,3%**	16,7%	10,4%	**0%**	100%	25%

Correct answers	33/36 91,7%	10/12 83,3%	43/48 89,5%	36/36 100%	12/12 100%	48/48 100%

	Incorrect Rev. **20/36**	Incorrect Irrev. 21**/36**	total	Correct Rev.	Correct Irrev.	Total
SS (Sing. Sing.)	0/9 0%	0/9 0%	0/18 0%	9/9 100%	9/9 100%	18/18 100%
SP (Sing. Plur.)	1/9 11,1%	0/9 0%	1/18 5,5%	8/9 88,9%	9/9 100%	17/18 94,4%
PS (Plur. Sing.)	1/9 11,1	0/9 0%	1/18 5,5%	8/9 88,9%	9/9 100%	17/18 94,4%
PP (Plur. Plur.)	1/9 11,1%	0/9 0%	1/18 5,5%	8/9 88,9%	9/9 100%	17/18 94,4%

7 Discussion

The analysis of the results, which emerged from the second administration of linguistic standardized and non-standardized tests evidences a general improvement, of the trained syntactic structures. The Bus Story test highlighted a significant improvement in story structure, coherence of information, syntactic complexity and lexical retrieval. Issues with lexical retrieval seem to persist also with high frequency words like “autobus”.

The participant performed much better in both the intermediate and the last assessment of clitic pronouns in comparison to the first administration. The assessment following explicit instruction evidenced a significative increase of correct *lo* and *la* clitics while the clitic *si* was still omitted. Omission was still the most frequent error type, which, again, contrasts with the results of Vender, Guasti, Garraffa and Sorace (2012). Omissions, indeed, are much more common in children with SLI or different language disorders, than in late L2 learners. Consolidation of the movement-

derived clitic structure through syntactic priming did not lead to increase in the production of correct clitics, yet after the mixed instruction a change in error types emerged. The child did not omit any *lo* or *la* clitic and omission of *si* clitics halved. DP substitutions increased of one production, which still may indicate a more robust representation of the simple SVO structure. It is important to remark, indeed, that prime sentences in the used priming trials contained bot the SVO structure with overt object and the movement-derived structure with clitic pronouns which would follow the question form "What does (referent)A do to (referent)B?". The important result is that error type *incorrect clitics* increased. The participant produced lo masculine singular DO clitics (lo) replacing 3 *la* clitics and 1 *si* clitic. Therefore, the assessment following the combined instruction led to results which are more similar to what expected by L2 children (Vender, Guasti, Garraffa, Sorace, 2012). The clitic structure seems to be acquired, while some issues remain in clitic selection. Concerning the influences of the two language instruction methods, an analysis of answer strategies allowed to interpret that explicit instruction may have strengthened the syntactic representation of simple SVO structure and developed awareness for the need of expressing the theme. The use of syntactic priming seems to have consolidated representations of clitic structures and to have built more solid syntactic frames. Concerning gender agreement errors which emerged in the third assessment,they may depend on the need of a more extensive training on agreement. The initial general training preceding instruction on clitics and passives involved familiarization with gender and number of articles and was carried out through articles selection activities which aimed at encouraging reflection on gender. The same kind of activity should be carried out for clitics to train the morphological aspects of the structure. In the case of DO clitics a potential influence from Bengali for incorrect clitics could be hypothesized as pronouns in Bengali do not distinguish for gender.

Improvement emerged in the comprehension of passive structures after the mixed instruction. Due to time constraints it has not been possible to evaluate comprehension and production of passive structures with an intermediate assessment before explicit instruction only. The initial project was to train passive structure using

priming only to verify the effects of implicit instruction alone. This choice was motivated by the following reasons which made me hypothesize the need for tasks providing a basic activation form of the structure.

- The difficulties which the child showed with thematic role assignment in the first assessment (especially with tests on comprehension of passive clauses and comprehension of relative clauses),
- the negative results of the passive production test which evidenced the lack of a syntactic representation for passives,
- the thematic roles discrepancy between canonical and passive structures which make processing of passives comprehension challenging,
- the attentional difficulties which the child had during my explicit instruction sessions,
- he child's very reduced metalinguistic competence which made her struggle to comprehend concepts like "agent" and "patient" difficult.

Nevertheless, after the positive reactions with the explicit instruction on clitics, I considered useful for potential improvements to add three explicit sessions on passive structures using the TUF methodology and test the participant's production and comprehension abilities at the end. Comprehension of passives production significantly improved. The role that priming tasks and tasks using TUF may have had in this result is similar since both of them involve the use of pictures to describe events. Involving visual stimuli, picture description may have a stronger potential in individuals with attentional issues in training connections between thematic roles and grammatical functions. On the other hand, the participant did not produce any passive structure. Therefore, difficulties with passive structures cannot be ascribed to structural differences between passives with and without by-phrase or to the differences between full and truncated passives but may depend on sentence complexity itself. Difficulties related to thematic roles seem to be overcome by the comprehension test. Syntactic priming tasks on passive structures have been

conceived as a training, rather than as tests themselves, yet it may be useful to notice that in the first two tasks priming both active and passive structures the child produced one passive with the auxiliary *essere*, which was "*I cagnolini sono abbracciati dalla signora" (the little dogs are hugged by the lady).* A single production cannot be considered a relevant result. Yet this result confirm what emerged in the production of passive structures in De Nichilo (2017).Concerning answer strategies, the pre-intervention assessment evidenced strategy A. as the most used one with non-action verbs and strategy C. (SVO active structure with clitic) as the most used with action verbs. In the post-intervention assessment, instead, strategy A emerged as the most used for both action and non-action verbs.

Concerning relative clauses, remarkable improvement has been found in the Frugarello (2013) test assessing reversible and irreversible OR clauses with manipulation of number features, yet not in the agent selection task (Volpato, 2010) test assessing comprehension of SR and OR clauses. The lack of OR productions in the SR and OR elicitation task (Volpato, 2010) evidenced that there is a discrepancy between comprehension and production of OR clauses

The main aim of this research project was to encourage linguistic improvement. Data which emerged by linguistic tests confirm that this aim was partially achieved. Concerning the research question which this work addressed the following hypothesis can be made.

1. The initial assessment demonstrated that the participant did not have syntactic representations of clitic structures. The explicit instruction on clitic pronouns led to improvements in production, which confirms findings of Levy and Friedmann (2009). The priming tasks evidenced that after explicit training, syntactic representations of DO and R clitics were partially activated and strengthened through the use of priming tasks themselves. These results corroborate findings of Huttenlocher et al. (2004). Syntactic representations appeared activated in the modality of comprehension, yet not accessible in production given the results of the post-intervention assessment. Considering the participant's age, this finding is not consistent with what emerged in Messenger, Braningan, and

McLean (2011) and Bencini and Valian (2008). Yet coherence of results was found between priming tasks and the TUF activities as the child would struggle building the sentence, but she would distinguish thematic roles. There seems to be a gap between comprehension and production which leaves the debate on the independence between representations and modality open.

2. Given the results of the post-intervention assessment, syntactic priming apparently led to implicit learning of clitic pronouns, yet not of passive structures. Comprehension of passives improved, but the structure was not accessible in production. The implicit instruction phase for clitic prnonouns followed the explicit phase, therefore, it is not possible to verify its effectiveness alone. Yet the absence of syntactic priming effects for passive structures is not consistent with Shin (2008) who found improvement in short term learning. Garraffa, Coco, and Branigan (2015) hypothesized that children with SLI have impaired learning mechanisms as priming effects emerged, yet children would struggle accessing the structure without prior exposure.

One of the hypotheses which I developed at the beginning o this research was confirmed, while the other was discarded

1. Syntactic priming had a beneficial effect on production clitics, but no effects on production of passive structures
2. Clitic pronouns improved more consistently and rapidly than passive structures.

Conclusions, and research directions

This research project aimed at collecting data on comprehension and production abilities of a sequential bilingual Italian-Bengali child aged 8 with a suspected learning disability. Linguistic tests have been used to investigate general abilities but focused on two complex structures: cltic phrases and passive sentences. The collected results were used to design a language intervention combining explicit and implicit instruction. The initial assessment evidenced difficulties related to production and

comprehension of syntactically complex structures, which the participant would substitute with different ones in production and with pragmatics. The control child manifested difficulties in production of complex structures, but better performances in comprehension and in storytelling (pragmatics). Differences were evident from the very beginning between the two participants. Their difficulties related to complex structures (which was more evident in production and comprehension of relative clauses for both of them) was hypothesized to depend on their reduced exposure to Italian since they both speak Bengali at home. Yet the control child seemed to have more accessible syntactic representations in comprehension and a more effective pragmatics. Differences were also evident in relation to attention and behaviour. Explicit instruction employed activities which followed the TUF protocol (Thompson, Shapiro, 2005) and sentence construction and manipulation activities which aimed at encouraging metalinguistic awareness and autonomy. The implicit phase involved the use is syntactic priming paradigms and had two main aims: consolidating the benefits of explicit instructions for clitic sentences and activating syntactic representations for passive sentences. The general aims were encouraging improvement in comprehension and production, assessing the abstractness of the participant's syntactic representations and evaluating the effect of implicit instruction on language learning. Results of the final assessment indicate that the aims of this research have been partially reached. Improvement has been found in the production of clitics and in the comprehension of passive sentences, yet not in the production of passive sentences. This result indicates a discrepancy between production and comprehension which leaves the question of the cross-modal nature of syntactic representations open. It appeared that syntactic representations of passive structures were activated, yet they were accessible only in comprehension. For implicit learning it appeared that syntactic priming alone cannot generate language learning. Yet it must also be considered that syntactic priming has been applied without the support of explicit instruction in a structure which presents a higher syntactic complexity than clitic pronouns. The distinction which emerges between production and comprehension highlights the need for a diagnosis, which would shed light on the nature of the

participant's language difficulties and provide a basis for the identification of the most effective teaching techniques. Concerning passive structures, it is possible that the child would need more conscious training, or that she may only need more occasion to practice a structure which would not be spontaneous without a support. The first solution would be appropriate if the underpinning difficulty is the reduces L2 input, the second can potentially be effective if the nature of the issue consists of an impairment in attentional and learning mechanisms. Therefore, I encourage further research aiming at investigating the participant's cognitive processes related to learning. It would be interesting to provide the control participant with the same instruction programme in order to compare the level of attention and awareness during explicit learning and the duration of syntactic activations provided by syntactic priming. Further investigations should also be carried out on L2 pre-school and school age children. Specific attention should be focused on children from immigrant families whose language difficulties often resemble difficulties of children with SLI.

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