Studi e Saggi Linguistici

I contributi pervenuti sono sottoposti alla valutazione di due revisori anonimi.

All submissions are double-blind peer reviewed by two referees.

Studi e Saggi Linguistici è indicizzato in / *Studi e Saggi Linguistici* is indexed in

ERIH PLUS (European Reference Index for the Humanities and Social Sciences)
Emerging Sources Citation Index - Thomson Reuters
L'Année philologique
Linguistic Bibliography
MLA (Modern Language Association Database)
Scopus

STUDI E SAGGI LINGUISTICI

LIX (1) 2021

rivista fondata da

Tristano Bolelli

Edizioni ETS

SSL

STUDI E SAGGI LINGUISTICI

www.studiesaggilinguistici.it

SSL electronic version is now available with OJS (Open Journal Systems)
Web access and archive access are granted to all registered subscribers

Abbonamento, compresa spedizione
individuale, Italia € 50,00
individuale, Estero € 70,00
istituzionale, Italia € 60,00
istituzionale, Estero € 80,00
Bonifico su c/c Edizioni ETS srl
IBAN IT 21 U 03069 14010 100000001781
BIC BCITITMM
Causale: Abbonamento SSL

Subscription, incl. shipping
individual, Italy € 50,00
individual, Abroad € 70,00
institutional, Italy € 60,00
institutional, Abroad € 80,00
Bank transfer to Edizioni ETS srl
IBAN IT 21 U 03069 14010 100000001781
BIC BCITITMM
Reason: Subscription SSL

L'editore non garantisce la pubblicazione prima di sei mesi dalla consegna in forma definitiva di ogni contributo.

Registrazione Tribunale di Pisa 12/2007 in data 20 Marzo 2007
Periodicità semestrale
Direttore responsabile: Alessandra Borghini

ISBN 978-884676128-6
ISSN 0085 6827

Sommario

Saggi

Economy and Explicitness. Easiness and Faithfulness. Iconicity and Efficiency. Are these terms equivalent? 9
Paolo Ramat

Sillaba e sillabazione nelle scritture sillabiche egee con particolare riferimento alla lineare A 25
Carlo Consani

Il Raddoppiamento Fonosintattico nel sardo medievale 75
Rosangela Lai

Narrative abilities of Italian preschool children with Developmental Language Disorder 119
Francesca Beraldi, Gloria Gagliardi, Milvia Innocenti

SSL

Saggi

SSL

Narrative abilities of Italian preschool children with Developmental Language Disorder

Francesca Beraldi, Gloria Gagliardi, Milvia Innocenti

Abstract

Oral narrative skills have shown to be a valid measure of the linguistic competence of preschoolers and a significant predictor of their academic achievements. A deficiency in this area can lead to long-term sequelae in socio-emotional well-being in their adult life. This paper aims to provide a complete communicative picture of narrative discourse produced by monolingual preschoolers with Developmental Language Disorder (DLD) and typical peers matched by age, taking into account around fifty verbal and non-verbal features, computed on the spoken productions elicited by retelling tasks. The main finding is that although traditional standardized neuropsychological tests fail in capturing communicative deficits of DLD children, subtle but persistent language production difficulties are demonstrated by speech disruptions, reduced syntax complexity, and overt gestural signs of discomfort. This last finding is quite intriguing, considering that self- and hetero-adaptor gestures result from uneasiness and anxiety, usually escaping awareness. Taken together, the present results suggest that the observed deficits in DLD are not exclusively linguistic in nature, but may be associated with deficient planning abilities and monitoring processes difficulties.

Keywords: Developmental Language Disorder (DLD), preschooler, oral narrative skills.

1. *Introduction*

Narrative competence, namely the ability to tell structured stories about something that happened or to recount a fictional plot, describing the main events as well as the thoughts and the feelings experienced by the characters, plays a pivotal role in human communication, making it a crucial milestone in the ontogeny of language function (Karmiloff and Karmiloff-Smith, 2001). It is a species-specific feature of human beings, the evolutionary adaptation that distinguishes humans from other animals (Ferretti *et al*., 2018).

Received: February 2020
Accepted: September 2020

SSL LIX (1) 2021, pp. 119-150
doi: 10.4454/ssl.v59i1.270

Listening to stories and telling one's own allows children to not only practice all levels of spoken language, but to also take part in the social interactions of their community; through stories, children learn to establish causal/temporal relationships among events, fostering logical thinking and verbal reasoning.

Despite its pervasiveness in daily life and early acquisition, the production of narrative discourses entails a wide range of cognitive capacities that include memory, attention and executive functions: it requires keeping in mind the main events of the plot, relating them while navigating time and monitoring both new and already introduced information, producing well-formed utterances organized in a coherent way. For this reason, story generation and retelling tasks are often used by researchers and speech therapists to investigate children's trajectories of language development, both at the formal (i.e. phonological or morpho-syntactic) and the functional level (Bonifacci *et al.*, 2018), emerging as a reliable instrument for the assessment of language impairments and the prediction of future academic achievements (Zanchi *et al.*, 2019).

Therefore, it is not surprising that narrative acquisition is highly vulnerable to a variety of developmental disorders: for example, narrative deficits are extremely common in Autism Spectrum Disorders (Westerveld and Roberts, 2017; Ferretti *et al.*, 2018; Lee *et al.*, 2018), Attention Deficit Hyperactivity Disorder (Tannock *et al.*, 1993; Papaeliou *et al.*, 2012) and hearing-impaired children, with or without cochlear implant (Griffith *et al.*, 1990; Soares *et al.*, 2010; Murri *et al.*, 2015). Difficulties have been also largely reported in the Developmental Language Disorder (DLD), a clinical condition for which children can present persistent difficulties in the acquisition and use of language across modalities (i.e. spoken or sign language), not attributable to hearing or other sensory impairment, motor dysfunction, and neurological damage or disease (APA, 2013; Bishop *et al.*, 2017), the condition addressed by this study.

The integration of world and pragmatic knowledge necessary to understand and produce narratives, which requires the application of both linguistic and cognitive abilities, creates a task that is more challenging than simply engaging in conversation (MacLachlan and Chapman, 1988; Boudreau, 2008). It is widely known, from clinical experience, that these high-level difficulties remain despite an adequate logopedic treatment of the phonological and morpho-syntactic deficits, possibly leading to long-term reper-

cussions in socio-emotional well-being in adult life (Norbury and Bishop, 2003; Duinmeijer *et al.*, 2012).

A growing body of scientific evidences suggests that even when grammatical accuracy of DLD children is comparable with typical developing peers, linguistic difficulties could take the form of speech disruption during sentence formulation (Hall, 1996; Finneran *et al.*, 2009) and poor complex syntax (Nippold *et al.*, 2008; 2009). Moreover, children with language impairment produce narratives that are structurally poorer (i.e. with fewer episodes, story grammar components and information units) than their peers; more seriously, these difficulties manifest in ways easily recognizable to others, including both clinicians and naïve listeners (McFadden and Gillam, 1996; Newman and McGregor, 2006; Boudreau, 2008).

Nevertheless, the quantification of the development of oral narrative skills and the formal assessment of potential deficits are not trivial tasks (Marini, 2014). Unfortunately, traditional standardized neuropsychological tests assessing linguistic and narrative functions are not sensitive enough to capture insidious weakness in this area (Marini *et al.*, 2008).

These issues have crucial theoretical and clinical implications for speech-language pathologists, for the planning of an effective and long-lasting therapeutic intervention.

2. *Method*

2.1. *Rationale*

This work aims to provide a complete communicative 'picture' of narrative discourse produced by Italian monolingual preschool children with DLD who have already received logopedic treatment and 'typical' peers matched by age, in order to identify areas of weakness not adequately detected by standardized testing. To this purpose, the study takes into account around fifty verbal and non-verbal features, computed on the spoken productions elicited by three different retelling tasks. As a matter of fact, a huge number of papers have been published on narrative skills in preschoolers with DLD (e.g. Domsch *et al.*, 2012; Marini, 2014; Roch *et al.*, 2017), but less attention has been paid to their outcomes after rehabilitation.

2.2. *Participants*

We enrolled sixteen monolingual infants (13 M; 3 F) ranging in age from 4;2 to 5;4 (mean = 4;7). The sample was composed of a Control Group (CG) and a DLD Group, matched by age. The CG included eight participants (5 M; 3 F) without speech, language, hearing or cognitive impairments. The DLD group included eight male children who met the criteria for DLD with expressive deficits (APA, 2013), recruited through the AUSL *Toscana Centro*[1]. The diagnosis has been established according to national and international guidelines by expert clinicians, by considering anamnestic data, clinical observation and standardized testing. Participants underwent a complete language evaluation, but particular attention has been paid to the assessment of children's comprehension profile: all subjects performed within the normal range on the test of receptive vocabulary (TNL, *Test Neuropsicologico Lessicale per l'età evolutiva*, Cossu, 2013), morpho-syntactic comprehension (TCGB, *Test di Comprensione Grammaticale per Bambini*, Chilosi and Cipriani, 2006; PVCL, *Prove di Valutazione della Comprensione Linguistica*, Rustioni and Lancaster, 2007) and listening comprehension (TOR, *Test di Comprensione del Testo Orale 3-8 anni*, Levorato and Roch, 2007); therefore, expressive language problems occur essentially in isolation.

All the children of the DLD group underwent an extensive speech-language treatment before the study.

2.3. *Procedure*

Oral narrative skills were explored using three different tasks: a norm-referenced evaluation with the Italian version of the 'Bus Story Test' (I-BST, Renfrew, 2015; Cipriani *et al*., 2012; Mozzanica *et al*., 2016), and two semi-spontaneous retelling assessments, exploiting the renowned story 'Three Little Pigs' (3LP), and a brand new short film called 'Little Polar

[1] The samples examined are homogeneous for age and geographical provenience, but not for gender: the rationale behind this choice is due to the prevalence of neurodevelopmental disorders – and, in particular, DLD – among gender groups. As a matter of fact, there is growing evidence that being male appears to nearly double the risk of language disorder (Tomblin *et al*., 1997). However, to date, little efforts have been devoted by the scientific community to the detailed description of the epidemiology of this condition, and the reason for the sex difference is not well understood. Given this complex picture, and also considering that standardized tests are normed on the general population, the CG of this study includes several females.

Bear' (LPB). While the BST examines story retelling with colored picture support, the unnormed tests elicit children's verbalizations through a paper book and a tablet respectively. During the 3LP task, children were asked to retell the renowned story using the pictures as prompts while flipping through the pages; in contrast, the LPB task was administered showing the video (around 100 seconds) to the child who was then requested to recount the plot while following the scrolling images without sound. In order to avoid poor performance due to short-term memory limitations, the speech therapist was allowed to stop the video and guide the child. None of the children knew the three stories, including the generally well-known 3LP.

The trials were administered in a single test session of varying duration. The tasks have been videotaped for later analysis using a tablet placed in front of the subject. Data has been orthographically transcribed using ELAN (Wittenburg *et al.*, 2006), and a set of different communicative aspects (i.e. acoustical, lexical, morpho-syntactic cues and non-verbal behaviors) has been manually annotated. All parents gave their consent to data recording and processing.

Orthographical transcription is compliant with the L-AcT format (Cresti and Moneglia, 2018), a version of the standardized CHAT format (McWhinney, 2000) enriched with the tagging of prosodic parsing. We chose the 'utterance' as the reference unit in the speech continuum, defined as the counterpart of a speech act, namely «the minimal linguistic entity that can be pragmatically interpreted» (Austin, 1962; Cresti and Moneglia, 2018). Utterances are demarcated by prosody in the speech flow, therefore the identification of their boundaries is achieved through the detection of 'prosodic breaks'. A large body of evidence suggests that the perception of this suprasegmental phenomenon is a function of the simultaneous activation of some acoustic cues, such as F_0 reset, final lengthening, drop in intensity, pause, and initial rush in the next prosodic unit (Malvessi Mittmann and Barbosa, 2016). As a matter of fact, the identification of breaks reaches high inter-rater agreement in annotation, also among non-expert annotators (Cohen's *k* for Italian around 0.8; Danieli *et al.*, 2004), thus being a highly reliable chunking method. The main transcription conventions and diacritics are summarized in Table 1.

L-AcT diacritics for the annotation of prosodic structure	
Prosodic break Perceptively relevant prosodic variation in the speech continuum causing the parsing of the flow into discrete prosodic units	
Terminal Perceptual criterion: a competent speaker assigns it the quality of concluding the sequence	// ? (with an interrogative prosodic profile)
Non terminal Perceptual criterion: a competent speaker assigns it the quality of being non-conclusive	/
False start/retracting with repetition Non terminal prosodic break caused by a false start or retracting	[/]
Unintentionally interrupted sequences The speaker's program is broken; the interpretability of the sequence can be compromised	+
Empty pause Temporary silent hesitation or stop in the speech flow (lower-bound threshold: 250 ms)	#

Table 1. *L-AcT diacritics*.

The resulting corpus consists of 1h 57' 41" of recorded speech; the children's verbal productions amount to a total of 4551 words, 889 utterances (CG group: 2378 words, 418 utterances; DLD group: 2173 words, 471 utterances; I-BST: 1635 words, 303 utterances; 3LP: 1893 words, 369 utterances; LPB: 1023 words, 217 utterances).

In the wake of the pioneering works by Brandi (2002) and Andreini *et al.* (2017), a multidimensional quantitative analysis of the transcripts has been performed. Tables 2, 3, and 4 outline the complete list of features considered in the study.

In short, acoustic cues (Table 2) probes the fluency of the child's verbalization, quantifying the values and the proportion of speech and pauses.

Lexical and morpho-syntactic cues (Table 3) measure:

(i) the verbal productivity of the child, estimated through the number of words, utterances, and turns, their ratios, and the Mean Length of Utterance (MLU); in particular, MLU is considered a good marker of language delay/impairment in toddlers and preschool children (Brown, 1973);

(ii) the composition of speech turns in terms of verbless utterances, interrupted sequences, and sentences (further classified into main, coordinate, and subordinate clauses);

(iii) the number and correctness of clitic pronouns, which represent areas of special weakness in language impairment; as a matter of fact, in the age range of 4 to 6 years, their usage distinguishes Italian children with DLD from their same-age peers with high degrees of sensitivity and specificity (Leonard *et al.*, 1988; Bortolini *et al.*, 2002; 2006; Guasti *et al.*, 2016);

(iv) the use of past tense, which implies the ability to detach oneself from the here and now (i.e. 'mental time travel', a faculty that is supposed to develop in typical children between 3 and 5 years of age, cf. Atance, 2008; Ferretti *et al.*, 2018) and the consistency of verbal tenses, a way of creating coherence in the narrative through the use of temporal morphological markers, for ordering events in a way that can be interpreted as taking place in some meaningful temporal/causal framework (Bamberg, 1987); from a cognitive point of view, the consistency in the choice of verbal tense implies the ability to stay focused on a task for a prolonged time;

(v) the number of morpho-syntactic errors, to highlight possible weaknesses in the expressive use of grammatical forms;

(vi) the lexical richness, proxied by the type/token ratio: this feature quantifies the lexical diversity of a text, and therefore the richness of the vocabulary (Holmes and Singh, 1996).

Non-verbal cues (Table 4) catch non-verbal components of the communicative act, namely eye contact, facial expression, and gestural behavior. In particular, gestures have been taken into account because of their relevance in the child's transition to a linguistic system (Bates *et al.*, 1975; 1979; Volterra and Erting, 1990, eds.; Capirci and Volterra, 2008).

Lastly, the quality of the narrative has been investigated through the story grammar, a rule system devised to describe the regularities found in a narrative text (Propp, 1928; Lakoff, 1972; Rumelhart, 1975).

The model proposed by Stein and Glenn (1979) has been applied to the 3LP and LPB narratives. According to the authors, a 'good' story should contain:

(i) the 'setting' category: introduces the main characters, and describes the social, physical, or temporal context;
(ii) 'episode system': incorporates the entire story structure, and consists of one or more episodes related in several ways; the 'episode' is the basic unit of a story, and it consists of an entire behavioral sequence; it should contain: initialing event, characters' internal response to the event, characters' external response: attempt/action, consequence, reaction.

Spoken texts produced by the participants have been classified according to Paul's 'Narrative stage scoring system' (Paul *et al*., 1996):

(i) 'heap', stories where children are labeling and/or describing events or actions; there is no central theme;
(ii) 'sequence', labeling or describing events about a central theme;
(iii) 'primitive narrative', containing the three strong story grammar components of the initiating event, attempt or action, and consequences around a central theme;
(iv) 'chain', containing four story grammar components, three of which are the initiating event, attempt or action, and consequence; there may be an ending, but it is abrupt;
(v) 'true narrative', containing at least five story grammar elements, three of which are the initiating event, attempt or action, and consequence; the ending indicates a resolution of the problem.

Fluency		
Total locution time (TLT)		Speech time including pauses
Total phonation time (TPT)		Speech time without pauses
Hesitations	Number, duration and % of empty pauses (#EP, -EP, %EP)	Temporary silent hesitation or stop in the speech flow
	Number of filled pauses (#FP)	Vocalizations without a lexical meaning (e.g. *eeh*, *uhm*, *ehm*)
	Number of false starts/retracting (#R)	Any sequence of lexical segments that is interrupted prior to completion and reformulated *scapparono / su quella di* [/] *di legno //* "they ran away / on that of [/] of sticks //"
Verbal rate (VR)		The number of words in the sample divided by the Total Locution Time (Singh *et al.*, 2001; Roark *et al.*, 2011) #words/TLT
Standardized Phonation Time (SPT)		The number of words in the sample divided by the Total Phonation Time (Singh *et al.*, 2001; Roark *et al.*, 2011) #words/TPT
Standardized Pause Rate (SPR)		The number of words in the sample divided by pauses (Singh *et al.*, 2001; Roark *et al.*, 2011) #words/#pauses

Table 2. *Acoustic cues considered in the study.*

Lexical and morpho-syntactic cues	
Total number of words (#W)	The total number of linguistic 'tokens' i.e. a sequence of characters that are grouped together as a useful semantic unit for processing (e.g. *wolf, of, it*)
Total number of utterances (#U)	The total number of reference units In the transcripts: all word sequences ended by the diacritics // ? + *il primo porcellino / fa una casa di paglia //* "the first little pig / builds a house of straw //"
Total number of speech turns (#T)	The total number of stretches of talk by the same speaker in the speech session *il primo porcellino / fa una casa di paglia //* *il secondo / quella di legno //* *il lupo +* "the first little pig / builds a house of straw // the second one / that of sticks // the wolf +"
Mean Length of Utterance (MLU)	The average number of words for utterance, it is calculated by counting the number of tokens in each utterance divided by the number of utterances #tokens/#utterance
Words/Turns ratio (W/T)	The ratio of tokens to turns #tokens/#turns
Utterances/Turns ratio (U/T)	The ratio of utterances to turns #utterances/#turns
Number of verbless utterances (#V, %V)	The number of utterances containing no verb element at all (e.g. a phrase or interjections bearing illocutionary force) *il lupo //* "the wolf //"

Number of interrupted sequences (#I, %I)	Non-completion of the locutionary plan, due to a change of linguistic programming by the speaker or to a listener intervention; in the transcription: the number of word sequences ended by the diacritic + *in quella di le& +* "in that of sti& +"
Number of sentences (#S, %S)	The number of semantically complete syntactic units that include at least one verbal predicate
Number and % of main clauses, coordinate clause, subordinate clauses (#MC, %MC, #CC, %CC, #SC, %SC)	The number and the percentage of clauses produced by each child, categorized in: - main clause - coordinate clause - subordinate clause
Number and correctness of clitic pronouns (#CLIT, %CLIT, #CLIT-O, #CLIT-D, #CLIT-S)	Number of clitic pronouns correctly produced by the child; number of clitic omission, displacement or substitution (gender/number/case) in the speech sample
Use of past tense (TENSE)	The use of past tense in the oral text Options: yes/no
Consistency of verbal tenses (C_TENSE)	The consistency in the selection of temporal morphological markers Options: yes/no
Number of Morpho-syntactic errors (#ERR)	The total number of grammatical errors, i.e. bound morphemes substitution, unbound morphemes omission/substitution/addition and agreement errors
Type/token ratio (TTR)	The ratio of the number of different words ('types') to the total text length ('tokens') #types/#tokens

Table 3. *Lexical and morpho-syntactic cues considered in the study.*

Non verbal communication	
Facial expression	Non-verbal, facial communication voluntarily or involuntarily performed by the speaker; searching for approval, smiles and facial expressions 'tuned' on the emotions of the story have been particularly taken into consideration
Eye contact	Number and duration (in ms.) of eye contact moments between the child and care-giver
Gestural behavior	The feature quantifies the number of gestures, classified in accordance with Bonaiuto *et al.* (2002): - linked to discourse: - 'cohesive': repetitive hand movements supporting the continuity and coherence of the discourse - 'ideational': referring to the content of speech, this group can be further classified into 'deictic gestures' and 'icon gestures' - non-linked to discourse/adaptor gestures (Ekman and Friesen, 1969): - 'hetero-adaptors': contact with what is external to the subject ('object-adaptor' and 'person-adaptor') - 'self-adaptors': hand in contact with other parts of one's own body

Table 4. *Non-verbal cues considered in the study.*

Unfortunately, the video recordings have shown fickle quality and, for this reason, the annotations of facial expression and gaze have been excluded from the analysis due to very poor inter-annotator agreement between raters (Cohen's $k < 0.2$). Because of the small sample size, the non-parametric Kolmogorov-Smirnov and the χ^2 tests have been used to compare both the groups (CG and DLD) and the retelling tasks (3LP and LPB). A probability level of $p < 0.05$ has been considered to be statistically significant. R statistical software has been used for the analysis.

3. *Results*

Figure 1 shows the performance of the groups at the I-BST: all the participants performed within the normal range. Moreover, the differences between DLD and CG are not statistically significant ($p > 0.5$).

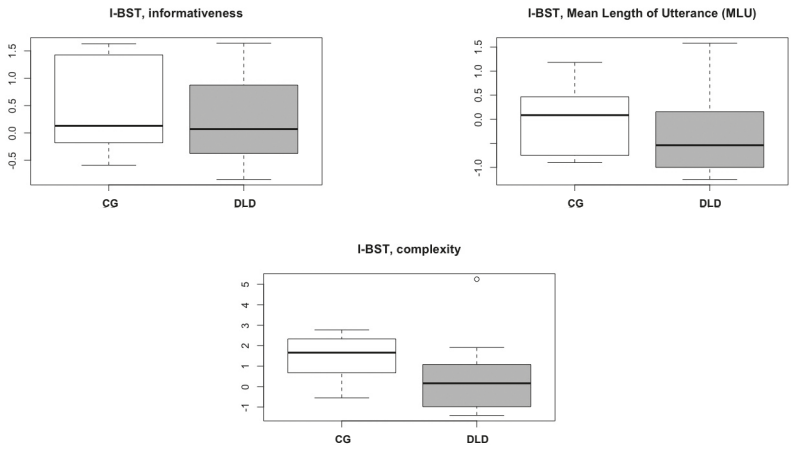

Figure 1. *Results of the I-BST, standard deviations from the normative sample of the test. Narrative impairment is diagnosed at 2.0 SD below the mean.*

However, are the performances of the DLD group really in line with the age expectations? Is this popular neuropsychological test adequately sensitive to detect potential linguistic impairment of the DLD children after the treatment? To investigate this point, and to depict a communicative picture of their narrative discourse, we conduct a deep quantitative analysis of the verbal productions.

The results of the comparison between CG and DLD on fluency cues are summarized in Table 5[2].

Both samples show extensive variability and only a few indices reach statistical relevance, but the DLD group clearly emerges as less fluent: DLD children take more time to recount the stories (cf. TLT, VR and SPT), and their spoken texts are richer with hesitation phenomena, namely empty pauses.

Conversely, none of the lexical and morphosyntactic features (Table 6) reach the statistical significance. This finding, in our opinion, indicates an improvement of the linguistic competence of DLD children at the formal level, especially in natural contexts[3]. As a matter of fact, DLD children have made more morphosyntactic errors than their peers, including clitic pronouns omissions and substitutions (the main clinical marker for DLD in Italian; Bortolini *et al*., 2002; 2006; Arosio *et al*., 2014; Guasti *et al*., 2016), but the difference does not approach statistical significance (Figure 2). However, the implications of the present findings are not clear-cut, since retelling tasks do not force the speaker to produce clitic pronouns: difficulties in this area are more likely to arise when dealing with repetition or elicited production tasks.

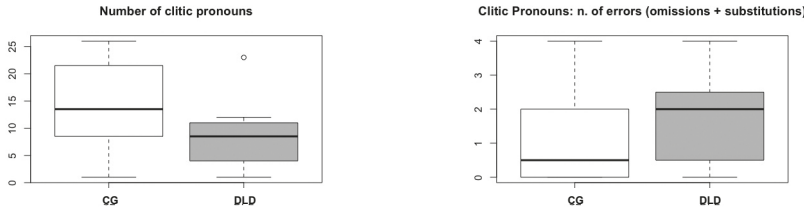

Figure 2. *Clitic pronouns: absolute frequency and number of errors.*

[2] Values are expressed as means and (standard deviations). Asterisks indicate when the group-related difference is significant under the Kolmogorov-Smirnov test.

[3] This statement may seem ungrounded: however, as already stated, current standardized tests are not reliable enough to detect subtle linguistic deficit (CLASTA and FLI, 2019, *a cura di*), such as those found in the post-treatment phase of DLD, and to monitor the trajectories of the impairments over time. For this reason, we decided to not re-administer them at a second-time point: we believe that, to date, the best way to evaluate children's progress in such situations is to directly compare their linguistic performance with the peers, thus providing significant statistical data. We thank one of the anonymous reviewers for bringing this to our attention and for suggesting us to better clarify the point.

Feature	I-BST		3LP		LPB		Total	
	CG	DLD	CG	DLD	CG	DLD	CG	DLD
TLT	86.70 (17.44)	160.61 (93.60)	93.20 (42.43)	121.67 (49.70)	63.86 (26.02)	114.71 (84.14)	243.76 (65.96)	397.00 (215.13)
TPT	66.27 (16.35)	80.69 (37.14)	66.70 (28.72)	79.88 (27.48)	45.78 (15.98)	47.58 (26.33)	174.76 (45.01)	208.14 (75.28)
#EP	14 (6)	31 (36)	10 (6)	16 (14)	10 (6)	26 (30)	33.87 (11.62)	72.75 (77.22)
-EP	24.43 (12.73)	79.92 (92.66)	26.50 (23.49)	41.80 (39.63)	18.08 (14.55)	67.13 (70.78)	69.00 (32.88)	188.85 (196.40)
%EP	0.28 (0.12)	0.41 (0.25)	0.24 (0.16)	0.31 (0.20)	0.24 (0.16)	0.53 (0.19) *	0.27 (0.09)	0.42 (0.20)
#FP	1 (1)	2 (3)	1 (2)	2 (2)	1 (1)	1 (2)	2.87 (3.48)	4.75 (6.16)
#R	4.87 (4.26)	7.75 (5.23)	5.37 (4.03)	6.37 (3.58)	2.37 (2.62)	3 (2.83)	12.62 (8.63)	17.12 (8.87)
VR	1.26 (0.47)	0.78 (0.43)	1.36 (0.31)	1.03 (0.41) *	1.19 (0.32)	0.57 (0.23) *	1.28 (0.33)	0.80 (0.34)
SPT	1.74 (0.57)	1.31 (0.35)	1.85 (0.54)	1.51 (0.37)	1.56 (0.16)	1.28 (0.40) *	1.75 (0.37)	1.39 (0.35)
SPR	9.24 (4.91)	5.79 (3.80)	15.51 (9.16)	12.31 (8.97)	14.29 (14.78)	3.44 (1.74)	9.84 (3.82)	5.87 (3.03)

Table 5. *Fluency cues across the tasks. Legend: I-BST, Bus Story Test (Italian version); 3LP, Three Little Pigs; LPB, Little Polar Bear; CG, Control Group; DLD, Developmental Language Disorder Group. Please refer to Table 2 for a description of the features' abbreviations. The asterisk (*) indicates statistical significance.*

Feature	I-BST		3LP		LPB		Total	
	CG	DLD	CG	DLD	CG	DLD	CG	DLD
#W	104.12 (25.99)	100.25 (39.70)	122.25 (59.20)	114.37 (31.6)	70.87 (23.86)	57 (26.90)	297.25 (74.30)	271.62 (70.52)
#U	16.62 (6.82)	21.25 (7.24)	23.25 (16.21)	22.87 (11.01)	12.37 (3.46)	14.75 (9.76)	52.25 (22.54)	58.87 (23.74)
#T	17 (7.11)	22.12 (7.75)	24.5 (16.04)	23.87 (10.23)	12.75 (3.61)	15.25 (10.64)	54.25 (22.78)	61.25 (24.22)
MLU	6.85 (2.37)	5.06 (1.99)	6.89 (4.18)	5.98 (3.14)	5.73 (1.24)	4.51 (1.91)	6.13 (1.46)	5.09 (1.81)
W/T	6.73 (2.39)	4.91 (2)	6.58 (4.29)	5.44 (2.36)	5.56 (1.15)	4.44 (1.91)	5.90 (1.49)	4.90 (1.77)
U/T	0.98 (0.03)	0.96 (0.03)	0.95 (0.09)	0.94 (0.10)	0.97 (0.04)	0.99 (0.07)	0.96 (0.04)	0.96 (0.03)
#V	2.75 (2.81)	4.5 (2.50)	8.12 (7.92)	7 (4.2)	4.12 (0.99)	6.12 (4.82)	19 (18.28)	17.62 (8.94)
%V	0.16 (0.11)	0.20 (0.07)	0.29 (0.15)	0.29 (0.14)	0.35 (0.13)	0.40 (0.22)	0.26 (0.10)	0.29 (0.07)
#I	1 (0.53)	3.5 (6.09)	1 (1.77)	3.75 (8.22)	0.5 (0.53)	1.62 (3.81)	3 (3.96)	8.87 (17.95)
%I	0.07 (0.04)	0.12 (0.18)	0.04 (0.07)	0.10 (0.18)	0.03 (0.04)	0.07 (0.13)	0.05 (0.06)	0.10 (0.16)
#S	12.87 (5.33)	13.25 (4.59)	14.12 (8.36)	12.12 (3.27)	7.75 (3.15)	7 (4.87)	41.12 (19.63)	32.37 (9.54)
%S	0.77 (0.12)	0.67 (0.21)	0.67 (0.15)	0.61 (0.21)	0.60 (0.12)	0.53 (0.25)	0.68 (0.10)	0.60 (0.19)
#MC	7.62 (6)	10 (2.27)	8.5 (6.46)	9.37 (3.81)	4 (2.67)	6.12 (4.36)	24.62 (17.23)	25.5 (8.73)
%MC	0.38 (0.21)	0.64 (0.24)	0.46 (0.21)	0.60 (0.26)	0.37 (0.19)	0.74 (0.22)	0.42 (22.12)	0.62 (0.22)
#CC	9.12 (3.94)	4.87 (5.33)	6.5 (3.46)	5.23 (5.12)	5.37 (3.58)	2.37 (3.58)	22.12 (7.77)	12.5 (10.73)
%CC	0.50 (0.22)	0.21 (0.22)	0.44 (0.24)	0.29 (0.25)	0.46 (0.28)	0.19 (0.19)	0.46 (0.20)	0.26 (0.20)
#SC	2.87 (2.23)	2.87 (3.27)	2.37 (2.77)	1.62 (1.77)	1.62 (1.06)	0.62 (0.74)	7.62 (6.50)	5.12 (4.58)
%SC	0.14 (0.08)	0.27 (0.28)	0.10 (0.10)	0.10 (0.10)	0.17 (0.13)	0.06 (0.09)	0.12 (0.08)	0.12 (0.09)
#CLIT	4.12 (3.36)	3.62 (3.25)	5.12 (4.12)	2.25 (2.05)	5 (3.21)	3 (2.67)	14.25 (8.61)	8.87 (6.83)
%CLIT	0.04 (0.03)	0.03 (0.02)	0.04 (0.03)	0.02 (0.02)	0.07 (0.05)	0.05 (0.03)	0.04 (0.02)	0.03 (0.02)
#CLIT-O	0.25 (0.70)	0.5 (0.92)	0 (0)	0.37 (0.74)	0.37 (0.52)	0.25 (0.46)	0.62 (1.06)	1.12 (1.36)
#CLIT-D	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
#CLIT-S	0 (0)	0 (0)	0.12 (0.35)	0.37 (0.74)	0 (0)	0 (0)	0.5 (0.53)	0.62 (0.74)
#ERR	0.62 (0.74)	1.5 (1.31)	0.75 (0.89)	0.87 (0.83)	1.25 (0.71)	1.12 (1.73)	2.62 (1.60)	3.5 (2.14)
TTR	0.51 (0.08)	0.49 (0.12)	0.45 (0.09)	0.40 (0.07)	0.53 (0.11)	0.55 (0.11)	0.38 (0.05)	0.36 (0.08)

Table 6. *Results: lexical and morphosyntactic cues. Legend: I-BST, Bus Story Test (Italian version); 3LP, Three Little Pigs; LPB, Little Polar Bear; CG, Control Group; DLD, Developmental Language Disorder Group. Please refer to Table 3 for a description of the features' abbreviations. The asterisk (*) indicates statistical significance.*

Taking into consideration the mastery of verbal morphology, all the children occasionally used the past verb tenses (*imperfetto*, *passato prossimo* or *passato remoto* of the indicative), but none of them were able to keep the same verb tense throughout their story-telling. Even though the children demonstrated a rudimentary ability to master temporal information, their capability to consistently link events causally connected to one another is still immature at the age of 5.

On the contrary, the data exhibits a general trend toward morphosyntactic weakness in the DLD group: compared to the peers, the group of DLD children produced shorter utterances and fewer complex sentences in all tasks. Taking into consideration the overall composition of turns and sentences (Tables 7 and 8, Figures 3 and 4), the differences are clear-cut and high significant ($p < 0.0001$).

	Interrupted sequences	Verbless utterances	Sentences
CG	4.75%	30.09%	65.15%
DLD	15.07%	29.93%	54.98%

Table 7. *Composition of dialogic turns.*

	Main clauses	Coordinate clauses	Subordinate clauses
CG	45.28%	40.69%	14.02%
DLD	59.13%	28.98%	11.88%

Table 8. *Composition of sentences.*

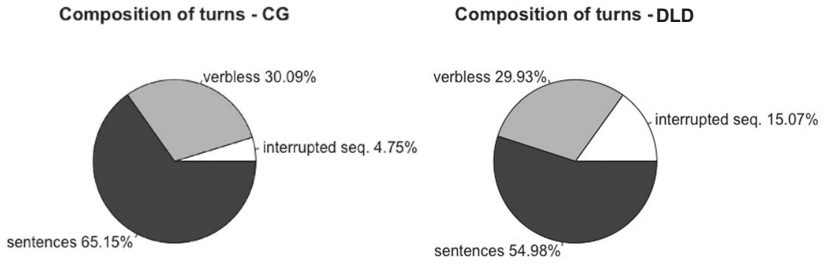

Figure 3. *Composition of turns: distribution of interrupted sequences, verbless utterances, and actual sentences.*

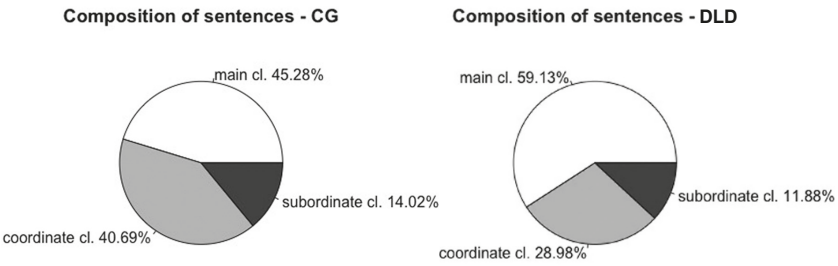

Figure 4. *Composition of sentences: distribution of main clauses, coordinate clauses, and subordinate clauses.*

This finding is very interesting, considering the tight connection between complex syntax and executive functioning (Weismer *et al.*, 2017; White *et al.*, 2017; Montgomery *et al.*, 2018; Delage and Frauenfelder, 2019): as a matter of fact, considerable evidences support the idea that processing of combinatorial information in sentences requires a strong engagement of cognitive components such as attention, memory, flexibility, and inhibitory control. In other words, children have to engage more extensively in self-regulation and attentional control in order to manage the increasingly complex translation of ideas into language.

Going into more detail on subordinate structures, content and relative clauses have been found consistently in both groups; among adverbial clauses, temporal and causal subordinates are the most represented in our corpus, but we also found some examples of purpose and space clauses. These findings are basically in line with the expected repertoire in the considered age range (Taeschner and Volterra, 1986; Devescovi and Pizzuto, 1995). The differences between CG and DLD do not reach statistical significance ($p > 0.05$). Turning to analysis of gestural behaviors, results of the comparison are summarized in Tables 9, 10 and 11.

Gesture	I-BST		3LP		LPB			Total	
	CG	DLD	CG	DLD	CG	DLD		CG	DLD
Non-linked to discourse	5.62 (2.72)	10.75 (9.56)	4.12 (2.64)	6.75 (7.52)	3.25 (1.90)	7.75 (4.06)	*	13 (5.29)	25.25 (17.87)
Linked to discourse	3.75 (3.73)	4.12 (4.01)	4.87 (4.15)	6.25 (4.20)	2.12 (2.23)	1.5 (2.77)		10.75 (6.88)	11.87 (8.76)

Table 9. *Gestural behavior.*

Gesture	I-BST		3LP		LPB			Total	
	CG	DLD	CG	DLD	CG	DLD		CG	DLD
Hetero-adaptors	1.25 (1.58)	2.12 (2.64)	1.12 (1.80)	2.5 (3.25)	0.5 (0.53)	0.65 (1.40)		2.87 (2.85)	5.25 (5.20)
Self-adaptors	4.37 (2.50)	8.62 (7.98)	3 (2.44)	4.25 (4.89)	2.75 (2.31)	7.12 (4.32)	*	10.12 (5.66)	20 (14.22)

Table 10. *Non-linked to discourse/adaptor gestures.*

Gesture	I-BST		3LP		LPB		Total	
	CG	DLD	CG	DLD	CG	DLD	CG	DLD
Deictic	3 (3.34)	3.75 (3.53)	2.25 (3.10)	5.12 (3.18)	0.62 (0.92)	0.62 (1.19)	5.87 (6.31)	9.5 (6.68)
Icon	0.75 (1.16)	0.37 (0.52)	2.5 (2.27)	1.12 (1.25)	1.5 (1.51)	0.75 (1.39)	4.75 (2.55)	2.25 (2.55)
Cohesive	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table 11. *Linked to discourse gestures.*

While the number of linked to discourse gestures is almost equivalent between groups, DLD produced many more adaptor gestures, especially self-adaptors; the difference achieves statistical significance on the LPB narration task. This finding is quite intriguing, considering that self- and hetero-adaptor gestures often result from uneasiness and anxiety, usually escaping awareness (Ekman and Friesen, 1969; Bonaiuto *et al.*, 2002): despite DLD children being comparable to CG peers in their lexical and morpho-syntactic variables, the retelling tasks clearly require a huge effort for them. From a qualitative point of view, a different communicative function of deictic gestures can also be observed: while most of DLD's deictics have a referential value, replacing the linguistic denomination of characters and actions, CG mainly uses them for directing the interlocutor's attention.

The analysis of story grammar for 3LP and LPB retelling task are presented in Tables 12 and 13[4].

No statistical differences between the groups has been found ($p > 0.05$) on both tasks. However, while 3LP narrations can be classified according to Paul's scoring system as 'sequences' or 'primitive narrations', LPB retellings are no more than chaotic 'heaps': the retelling activity appears to be very poor and laborious at the same time. This is the case for typically developing children as well, despite the elementary plot.

Interesting insight comes from the overall comparison of the 3LP and LPB tasks: the performances of the DLD participants globally decrease with the digital stimuli ($p < 0.05$). DLD children are less fluent (cf. VR and SPT, Figure 5), they produce both fewer words and sentences (Figures 6 and 7), and their narrations are poorer from both the lexical (cf. TTR, Figure 8) and the gestural point of view, since they do a small number of linked to discourse gestures, especially deictic, but more self-adaptors (Figure 9). Conversely, no differences are found for CG.

[4] The table reports the number of children that recall the element over the total number of children of the group.

	Setting			Episode system				
	characters	time	place	initiating event	internal response	attempt/ action	consequence	reaction
CG	6/8	3/8	2/8	7/8	3/8	2/8	6/8	1/8
DLD	7/8	2/8	0/8	7/8	4/8	4/8	5/8	2/8

Table 12. *Three Little Pigs: analysis of story grammar.*

	Setting		Episode system				
	characters	place	initiating event	internal response	attempt/ action	consequence	reaction
CG	6/8	1/8	7/8	7/8	2/8	5/8	2/8
DLD	8/8	0/8	5/8	7/8	2/8	4/8	1/8

Table 13. *Little Polar Bear: analysis of story grammar.*

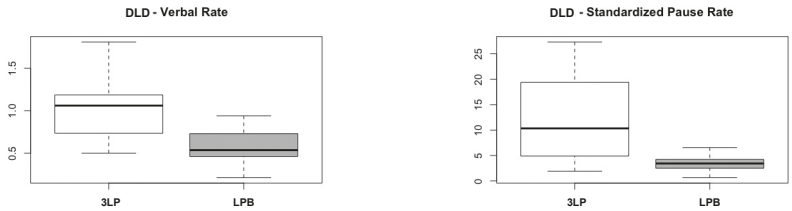

Figure 5. *Comparison of DLD children on 3LP and LPB tasks: fluency (Verbal Rate and SPR;* p < *0.05).*

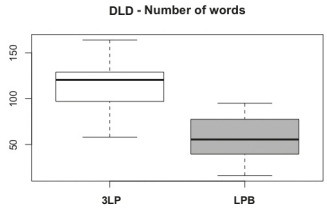

Figure 6. *Comparison of DLD children on 3LP and LPB tasks: number of words (*p < *0.05).*

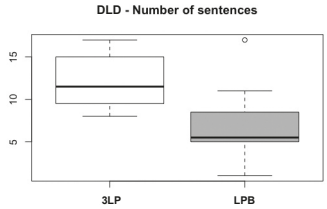

Figure 7. *Comparison of DLD children on 3LP and LPB tasks: number of sentences (*p < *0.05).*

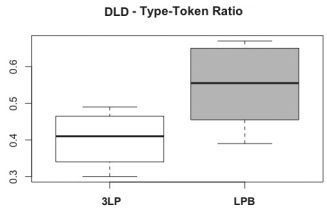

Figure 8. *Comparison of DLD children on 3LP and LPB tasks: lexical richness (*p < *0.05).*

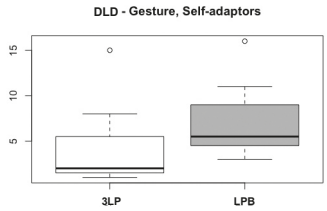

Figure 9. *Comparison of DLD children on 3LP and LPB tasks: gestures* ($p < 0.05$).

On the whole, most of the features investigated by our study are not statistically significant. The reasons of such an outcome may be different: (i) the positive effects induced by the speech and language therapy received by the children with DLD, which has allowed a partial recovery; (ii) the selected cues are not sensitive enough to catch the oral narrative differences between the two experimental groups. As already mentioned, in our opinion the first hypothesis is the most likely one given the clinical presentation of the children, which showed severe expressive language problems in absence of overt comprehension deficits at the diagnosis phase.

As we will discuss in the next section, broader studies will be needed in order to shed new light on this issue.

4. *Discussion and concluding remarks*

This study investigated the development of oral narrative abilities in preschool Italian children with DLD who have already received logopedic treatment, by means of a normed test, a printed storybook, and a short-animated film.

The key finding is that, as already acknowledged by Marini *et al.* (2008), traditional standardized neuropsychological tests are not sensitive enough to capture the individual's communicative performance on narrative tasks. But even when DLD children produce syntactic structures that appear to conform to the adult grammar, language difficulties often remain, appearing in subtle forms such as reduced fluency or speech disruptions in utterance production, overt gestural signs of discomfort, and deficits in complex syntax compared to their peers. In particular, DLD children tend to produce many more interrupted utterances, as well as shorter and simpler sentences, with fewer coordinate and subordinate clauses (Nippold *et al.*, 2008; 2009; Finneran *et al.*, 2009).

Moreover, this raises the question of the actual I-BST reliability on measuring the macro-linguistic dimension of message production, and therefore the need to develop a more sensitive test. Probably thanks to speech and language rehabilitation, the structural components of language (e.g. verbal inflection, agreement and clitic pronouns selection) have been substantially acquired by our sample of DLD children; however, a better characterization of persistent communicative weaknesses would allow a customized logopedic intervention. With this respect, in our opinion, a novel test should combine ecological and highly engaging visual stimuli, easiness of administration and rigorous statistical validation, based on a balanced, very large sample of typically developing children (i.e. at least around 1000).

Oral narrative skills are still immature at the chronological age of 5, and both CG and DLD children tend to focus on details, producing erratic retellings from the story grammar point of view. However, only DLD children show greater linguistic difficulties with the cartoon. This is the most controversial finding of our study with respect to the scientific literature: limited research has been devoted to the strict comparison of static stimuli, such as picture books, and animated ones. At this current state, the findings are not clear cut, and there is no evidence that the animations distracted children from listening nor that the multimedia addition, such as visual and sound effects, interfered with story understanding, at least in typical populations (De Jong and Bus, 2004). In addition, albeit the stories are very similar in complexity and were not widely known among the children, our experimental paradigm does not strictly control all the possible intervening variables.

Taken together, the present results suggest that the observed deficits in DLD are not exclusively linguistic in nature, but may be associated with deficient planning abilities and monitoring processes difficulties. Since morpho-syntactic accuracy is quite high, we can assume that the deficits arise from the frailty of various cognitive areas, such as short-term memory, attention span, executive functions (i.e. inhibition, working memory, and cognitive flexibility), or theory of mind, not tackled in the present study. This view is in line with the interpretation of DLD as a systemic condition, in which language weaknesses can co-occur with vulnerabilities in other cognitive, sensory-motor, or behavioral domains (Duinmeijer *et al.*, 2012; Leonard, 2014; Friend and Bates, 2014; Bishop *et al.*, 2017).

This is an exploratory study and additional work is needed to assess our tentative conclusions. Further research is required so as to deepen our comprehension of the complex relationship between verbal and non-verbal ability supporting narrative skills: in particular, future studies should test the generalizability of our interpretation with a larger sample of children, evaluating proper linguistic performances in the context of an overall assessment of cognitive development (e.g. memory and executive functions). In addition, some pragmatic aspects of narratives should be taken into account, such as cohesion discourse strategies (e.g. use of referring expression and connectives, mastering of direct and reported speech).

Acknowledgments

This paper is the result of the joint work of the three authors: Francesca Beraldi administered the tests, recorded the speech samples, and performed the gestural analysis; Gloria Gagliardi transcribed and annotated the linguistic data, performed the statistical analysis, and authored the manuscript; Milvia Innocenti designed the study. A preliminary version of this work has been presented at the *15th Annual Conference of the Italian Association for Cognitive Sciences (AISC 2018)*: *The new era of Artificial Intelligence: a cognitive perspective*, and a short abstract (written in Italian) has been included in the conference proceedings. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The helpful suggestions of the two anonymous reviewers are gratefully acknowledged.

References

APA - American Psychiatric Association (2013), *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (*DSM-5*)*, American Psychiatric Publishing, Washington DC / London.

Andreini, I., Innocenti, M. and Lucchesini, S. (2017), *La valutazione delle competenze narrative nei bambini di età prescolare*, Bonomo Editore, Bologna.

Arosio, F., Branchini, C., Barbieri, L. and Guasti, M.T. (2014), *Failure to produce direct object clitic pronouns as a clinical marker of* SLI *in school-aged Italian speaking children*, in «Clinical Linguistics & Phonetics», 28, 9, pp. 639-663.

Atance, C.M. (2008), *Future thinking in young children*, in «Current Directions in Psychological Science», 17, 4, pp. 295-298.

Austin, J.L. (1962), *How to Do Things with Words*, Clarendon Press, Oxford.

Bamberg, M.G.W. (1987), *The Acquisition of Narratives: Learning to Use Language*, Mouton De Gruyter, Berlin / New York / Amsterdam.

Bates, E., Benigni, L., Bretherton, I., Camaioni, L. and Volterra, V. (1979), *The Emergence of Symbols: Cognition and Communication in Infancy*, Academic Press, New York / San Francisco / London.

Bates, E., Camaioni, L. and Volterra, V. (1975), *The acquisition of performatives prior to speech*, in «Merril Palmer Quarterly», 21, 3, pp. 205-226.

Bishop, D.V.M., Snowling, M.J., Thompson, P.A., Greenhalgh, T. and The CATALISE-2 Consortium (2017), *Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology*, in «Journal of Child Psychology and Psychiatry», 58, 10, pp. 1068-1080.

Bonaiuto, M., Gnisci, A. and Maricchiolo, F. (2002), *Proposta e verifica empirica di una tassonomia dei gesti delle mani nell'interazione di piccolo gruppo*, in «Giornale italiano di psicologia», 4, pp. 777-807.

Bonifacci, P., Barbieri, M., Tomassini, M. and Roch, M. (2018), *In few words: Linguistic gap but adequate narrative structure in preschool bilingual children*, in «Journal of Child Language», 45, pp. 120-147.

Bortolini, U., Arfè, B., Caselli, M.C., Degasperi, L., Deevy, P. and Leonard, L.B. (2006), *Clinical markers for Specific Language Impairment in Italian: The contribution of clitics and non-word repetition*, in «International Journal of Language & Communication Disorders», 41, 6, pp. 695-712.

Bortolini, U., Caselli, M.C., Deevy, P. and Leonard, L.B. (2002), *Specific Language Impairment in Italian: First steps in the search of a clinical marker*, in «International Journal of Language & Communication Disorders», 37, 2, pp. 77-93.

Boudreau, D. (2008), *Narrative abilities: Advances in research and implications for clinical practice*, in «Topics in Language Disorders», 28, 2, pp. 99-114.

Brandi, L. (2002), *La produzione del testo fra oralità e scrittura*, Le Grafiche Cappelli S.R.L., Firenze.

Brown, R. (1973), *A First Language: The Early Stages*, George Allen & Unwin, London.

Capirci, O. and Volterra, V. (2008), *Gesture and speech: The emergence and development of a strong and changing partnership*, in «Gesture», 8, 1, pp. 22-44.

Chilosi, A.M. and Cipriani, P. (2006), TCGB. *Test di comprensione grammaticale per bambini*, Edizioni Del Cerro, Tirrenia.

Cipriani, P., Salvadorini, R. and Zarmati, G. (2012), Bus Story Test. *Test di valutazione delle abilità narrative*, Edizioni La Favelliana, Milano.

CLASTA - Communication & Language Acquisition Studies in Typical and Atypical Populations and FLI - Federazione Italiana Logopedisti (2019, *a cura di*), Consensus Conference *sul Disturbo Primario di Linguaggio* [available online at *www.disturboprimariolinguaggio.it*, accessed on 04.02.2021].

Cossu, G. (2013), TNL. *Test neuropsicologico lessicale per l'età evolutiva*, Hogrefe Editore, Firenze.

Cresti, E. and Moneglia, M. (2018), *The illocutionary basis of information structure: The language into Act Theory (*L-AcT*)*, in Adamou, E., Haude, K. and Vanhove, M. (2018, eds.), *Information Structure in Lesser-described Languages. Studies in Prosody and Syntax*, John Benjamins, Amsterdam / Philadelphia, pp. 360-402.

Danieli, M., Garrido, J.M., Moneglia, M., Panizza, A., Quazza, S. and Swerts, M. (2004), *Evaluation of consensus on the annotation of prosodic breaks in the Romance Corpus of Spontaneous Speech* C-ORAL-ROM, in Lino, M.T., Xavier, M.F., Ferraira, F., Costa, R. and Silva, R. (2004, eds.), *Proceedings of the 4th International Conference on Language Resources and Evaluation (*LREC *2004)*, ELRA, Paris, pp. 1513-1516.

De Jong, M.T. and Bus, A.G. (2004), *The efficacy of electronic books in fostering kindergarten children's emergent story understanding*, in «Reading Research Quarterly», 39, 4, pp. 378-393.

Delage, H. and Frauenfelder, U.H. (2019), *Relationship between working memory and complex syntax in children with Developmental Language Disorder*, in «Journal of Child Language», 47, 3, pp. 600-632.

Devescovi, A. and Pizzuto, E. (1995), *Lo sviluppo grammaticale*, in Sabbadini, G. (1995, *a cura di*), *Manuale di neuropsicologia dell'età evolutiva*, Zanichelli, Bologna, pp. 260-285.

Domsch, C., Richels, C., Saldana, M., Coleman, C., Wimberly, C. and Maxwell, L. (2012), *Narrative skill and syntactic complexity in school-age children with and without late language emergence*, in «International Journal of Language & Communication Disorders», 47, 2, pp. 197-207.

Duinmeijer, I., De Jong, J. and Scheper, A. (2012), *Narrative abilities, memory and attention in children with a Specific Language Impairment*, in «International Journal of Language & Communication Disorders», 47, 5, pp. 542-555.

Ekman, P. and Friesen, W.V. (1969), *The repertoire of nonverbal behavior*, in «Semiotica», 1, 1, pp. 49-98.

ELAN (Version 5.7), Max Planck Institute for Psycholinguistics, Nijmegen [available online at *https://tla.mpi.nl/tools/tla-tools/elan/*, accessed on 04.02.2021].

Ferretti, F., Adornetti, I., Chiera, A., Nicchiarelli, S., Valeri, G., Magni, R., Vicari, S. and Marini, A. (2018), *Time and narrative: An investigation of storytelling abilities in children with Autism Spectrum Disorder*, in «Frontiers in Psychology», 9, § 944.

Finneran, D.A., Leonard, L.B. and Miller, C.A. (2009), *Speech disruptions in the sentence formulation of school-age children with Specific Language Impairment*, in «International Journal of Language & Communication Disorders», 44, 3, pp. 271-286.

Friend, M. and Bates, R.P. (2014), *The union of narrative and executive function: Different but complementary*, in «Frontiers in Psychology», 5, § 469.

Griffith, P.L., Ripich, D.N. and Dastoli, S.L. (1990), *Narrative abilities in hearing-impaired children: Propositions and cohesion*, in «American Annals of the Deaf», 135, 1, pp. 14-21.

Guasti, M.T., Palma, S., Genovese, E., Stagi, P., Saladini, G. and Arosio, F. (2016), *The production of direct object clitics in pre-school- and primary school-aged children with Specific Language Impairments*, in «Clinical Linguistics & Phonetics», 30, 9, pp. 663-678.

Hall, N.E. (1996), *Language and fluency in child language disorders: Changes over time*, in «Journal of Fluency Disorders», 21, pp. 1-32.

Holmes, D.I. and Singh, S. (1996), *A stylometric analysis of conversational speech of aphasic patients*, in «Literary and Linguistic Computing», 11, 3, pp. 133-140.

Karmiloff, K. and Karmiloff-Smith, A. (2001), *The Developing Child. Pathways to Language: From Fetus to Adolescent*, Harvard University Press, Cambridge (MA).

Lakoff, G.P. (1972), *Structural complexity in fairy tales*, in «The Study of Man», 1, pp. 128-150.

Lee, M., Martin, G.E., Hogan, A., Hano, D., Gordon, P.C. and Losh, M. (2018), *What's the story? A computational analysis of narrative competence in autism*, in «Autism», 22, 3, pp. 335-344.

Leonard, L.B. (2014), *Specific Language Impairment across languages*, in «Child Development Perspectives», 8, 1, pp. 1-5.

Leonard, L.B., Sabbadini, L., Volterra, V. and Leonard, J.S. (1988), *Some influences on the grammar of English- and Italian-speaking children with Specific Language Impairment*, in «Applied Psycholinguistics», 9, pp. 39-57.

Levorato, M.C. and Roch, M. (2007), TOR. *Test di Comprensione del Testo Orale – 3-8 anni*, Giunti O.S., Firenze.

MacLachlan, B.G. and Chapman, R.S. (1988), *Communication breakdowns in normal and language learning disabled children's conversation and narration*, in «Journal of Speech and Hearing Disorders», 53, 1, pp. 2-7.

MacWhinney, B. (2000), *The* CHILDES *Project: Tools for Analyzing Talk*, Lowrence Erlbaum Associates, Mahwah.

Malvessi Mittmann, M. and Barbosa, P. (2016), *An automatic speech segmentation tool based on multiple acoustic parameters*, in «CHIMERA: Romance Corpora and Linguistic Studies», 3, 2, pp. 133-147.

Marini, A. (2014), *The development of narrative language in Italian-speaking school aged children*, in «Reti, saperi, linguaggi», 1, pp. 85-106.

Marini, A., Tavano, A. and Fabbro, F. (2008), *Assessment of linguistic abilities in Italian children with Specific Language Impairment*, in «Neuropsychologia», 46, pp. 2816-2823.

McFadden, T.U. and Gillam, R.B. (1996), *An examination of the quality of narratives produced by children with language disorder*, in «Language, Speech, and Hearing Services in Schools», 27, pp. 48-56.

Montgomery, J.W., Evans, J.L., Fargo, J.D., Schwartz, S. and Gillam, R.B. (2018), *Structural relationship between cognitive processing and syntactic sentence comprehension in children with and without developmental language disorder*, in «Journal of Speech, Language, and Hearing Research», 61, 12, pp. 2950-2976.

Mozzanica, F., Salvadorini, R., Sai, E., Pozzoli, U., Maruzzi, P., Scarponi, L., Barillari, M.R., Spada, E., Ambrogi, F. and Schindler, A. (2016), *Reliability, validity and normative data of the Italian version of the* Bus Story test, in «International Journal of Pediatric Otorhinolaryngology», 89, pp. 17-24.

Murri, A., Cuda, D., Guerzoni, L. and Fabrizi, E. (2015), *Narrative abilities in early implanted children*, in «Laryngoscope», 125, 7, pp. 1685-1690.

Newman, R.M. and McGregor, K.K. (2006), *Teachers and laypersons discern quality differences between narratives produced by children with or without* SLI, in «Journal of Speech, Language, and Hearing Research», 49, pp. 1022-1036.

Nippold, M.A., Mansfield, T.C., Billow, J.L. and Tomblin, J.B. (2008), *Expository discourse in adolescents with language impairments: Examining syntactic development*, in «American Journal of Speech-Language Pathology», 17, pp. 356-366.

Nippold, M.A., Mansfield, T.C., Billow, J.L. and Tomblin, J.B. (2009), *Syntactic development in adolescents with a history of Language Impairments: A follow-up investigation*, in «American Journal of Speech-Language Pathology», 18, pp. 241-251.

Norbury, C.F. and Bishop, D.V.M. (2003), *Narrative skills of children with communication impairments*, in «International Journal of Language & Communication Disorders», 38, 3, pp. 287-313.

Papaeliou, C.F., Maniadaki, K. and Kakouros, E. (2012), *Association between story recall and other language abilities in schoolchildren with* ADHD, in «Journal of Attention Disorders», 19, 1, pp. 53-62.

Paul, R., Hernandez, R., Taylor, L. and Johnson, K. (1996), *Narrative development in late talkers: Early school age*, in «Journal of Speech, Language, and Hearing Research», 39, 6, pp. 1295-1303.

Propp, V.J. (1928), Морфология сказки [*Morphology of the Folk Tale*], Akademia, Leningrad.

R Development Core Team (2008), *R: A language and environment for statistical computing*, R Foundation for Statistical Computing, Wien [available online at *http://www.R-project.org*, accessed on 04.02.2021].

Renfrew, C.E. (2015), Bus Story Test. *A Test of Narrative Speech*, Speechmark, Milton Keynes (UK).

Roark, B., Mitchell, M., Hosom, J., Hollingshead, K. and Kaye, J. (2011), *Spoken language derived measures for detecting Mild Cognitive Impairment*, in «IEEE Transactions on Audio, Speech, and Language Processing», 19, 7, pp. 2081-2090.

Roch, M., Florit, E. and Levorato, M.C. (2017), *Le produzioni di narrative in bambini con disturbo di linguaggio di età prescolare*, in «Giornale di Neuropsichiatria dell'Età Evolutiva», 37, pp. 72-81.

Rumelhart, D.E. (1975), *Notes on a schema for stories*, in Bobrow, D.G. and Collins, A.C. (1975, eds.), *Representation and Understanding. Studies in Cognitive Science*, Elsevier, Amsterdam, pp. 211-236.

Rustioni, D. and Lancaster, M. (2007), PVCL. *Prove di Valutazione della Comprensione Linguistica*, Giunti O.S., Firenze.

Singh, S., Bucks, R.S. and Cuerden, J.M. (2001), *Evaluation of an objective technique for analysing temporal variables in* DAT *spontaneous speech*, in «Aphasiology», 15, 6, pp. 571-583.

Soares, A.D., Goulart, B.N. and Chiari, B.M. (2010), *Narrative competence among hearing-impaired and normal-hearing children: Analytical cross-sectional study*, in «São Paulo Medical Journal», 128, 5, pp. 284-288.

Stein, N.L. and Glenn, C.G. (1979), *An analysis of story comprehension in elementary school children*, in Freedle, R.O. (1979, ed.), *New Directions in Discourse Processing*, Ablex Publishing Corporation, Hillsdale (NJ).

Taeschner, T. and Volterra, V. (1986), *Strumenti di analisi per la valutazione del linguaggio infantile*, Bulzoni, Roma.

Tannock, R., Purvis, K.L. and Schachar, R.J. (1993), *Narrative abilities in children with attention deficit hyperactivity disorder and normal peers*, in «Journal of Abnormal Child Psychology», 21, 1, pp. 103-117.

Tomblin, J.B., Records, N.L., Buckwalter, P., Zhang, X., Smith, E. and O'Brien, M. (1997), *Prevalence of specific language impairment in kindergarten children*, in «Journal of Speech, Language, and Hearing Research», 40, 6, pp. 1245-1260.

Volterra, V. and Erting, C.J. (1990, eds.), *From Gesture to Language in Hearing and Deaf Children*, Springer-Verlag, Berlin.

Weismer, S.E., Davidson, M.M., Gangopadhyay, I., Sindberg, H., Roebuck, H. and Kaushanskaya, M. (2017), *The role of nonverbal working memory in morphosyntactic processing by children with specific language impairment and autism spectrum disorders*, in «Journal of Neurodevelopmental Disorders», 9, § 28.

Westerveld, M.F. and Roberts, J.M.A. (2017), *The oral narrative comprehension and production abilities of verbal preschoolers on the Autism Spectrum*, in «Language, Speech, and Hearing Services in Schools», 48, 4, pp. 260-272.

White, L.J., Alexander, A. and Greenfield, D.B. (2017), *The relationship between executive functioning and language: Examining vocabulary, syntax, and language learning in preschoolers attending Head Start*, in «Journal of Experimental Child Psychology», 164, pp. 16-31.

Wittenburg, P., Brugman, H., Russel, A., Klassmann, A. and Sloetjes, H. (2006), ELAN*: A professional framework for multimodality research*, in Calzolari, N., Choukri, K., Gangemi, A., Maegaard, B., Mariani, J., Odijk, J. and Tapias, D. (2006, eds.), *Proceedings of the 5th International Conference on Language Resources and Evaluation (*LREC *2006)*, ELRA, Paris, pp. 1556-1559.

Zanchi, P., Zampini, L. and Fasolo, M. (2020), *Oral narrative competence and literacy skills*, in «Journal of Early Child Development and Care», 190, 14, pp. 2309-2320.

Francesca Beraldi
Centro Arké
Via Beniamino Gigli 3
59100 Prato (Italy)
beraldifrancesca1@gmail.com

Gloria Gagliardi
Dipartimento di Filologia Classica e Italianistica
Alma Mater Studiorum - Università di Bologna
Via Zamboni 32
40126 Bologna (Italy)
gloria.gagliardi@unibo.it

Milvia Innocenti
Unità Funzionale Semplice Salute Mentale Infanzia e Adolescenza
Azienda Usl Toscana Centro
Ospedale Santa Maria Annunziata
Via dell'Antella 58
50012 Bagno a Ripoli – FI (Italy)
milvia.innocenti@unifi.it

NORME PER GLI AUTORI

Le proposte editoriali (articoli, discussioni e recensioni), redatte in italiano, inglese o altra lingua europea di ampia diffusione, vanno inviate tramite il sistema *Open Journal System* (OJS) collegandosi al sito *http://www.studiesaggilinguistici.it* (ove sono indicate le procedure da seguire), utilizzando due formati: un file pdf anonimo e un file word completo di tutti i dati dell'Autore (indirizzo istituzionale e/o privato, numero telefonico ed e-mail).

Nella redazione della proposta editoriale, gli Autori sono invitati ad attenersi scrupolosamente alle norme redazionali della rivista, disponibili sul sito.

Le proposte di articoli e discussioni dovranno essere corredate da un breve riassunto anonimo in lingua inglese, della lunghezza di circa 15 righe o 1.000 battute (spazi inclusi) e da 3 o 4 parole-chiave che individuino dominio e tema dell'articolo.

I contributi saranno sottoposti alla lettura critica di due *referees* anonimi, e quindi all'approvazione del Comitato Editoriale.

Il contributo accettato per la pubblicazione e redatto in forma definitiva andrà inviato tramite OJS nei tempi indicati dal sistema, sia in formato word che pdf, includendo i font speciali dei caratteri utilizzati.

Edizioni ETS
Palazzo Roncioni - Lungarno Mediceo, 16, I-56127 Pisa
info@edizioniets.com - www.edizioniets.com
Finito di stampare nel mese di giugno 2021