Collaborative storytelling in distance education: a preliminary research with pre-school children

Lo storytelling collaborativo nell'educazione a distanza: una ricerca preliminare con bambini della scuola dell'infanzia

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Abstract

Distance education was adopted in schools in many countries around the world as a result of the COVID-19 pandemic during 2020. Especially for pre-school children, distance education presents many critical issues, including children's sense of isolation and poverty of interactions with peers. In order to overcome these limitations, it is necessary to think about how to redesign didactic activities normally carried out in class without penalizing the relational aspect. This research deals with collaborative storytelling, considered an important tool for the development of emotional, cognitive and social processes as well as a means for media literacy education in children aged 3-6. Specifically, the experiment aims to compare the use of three ways of collaboratively narrating fictional stories in asynchronous mode. Results show that when the children alternate in the roles of author/critic and coordinator/author, stories are more coherent in terms of relationship and continuality of story elements and children's perception of positive interdependence is greater than in the co-author condition.

Keywords: distance education; pre-school; collaborative storytelling; story grammar; children's perceptions.

Sintesi

L'educazione a distanza a seguito della pandemia da Covid-19 del 2020 è stata adottata nelle scuole di molti stati. Specialmente per i bambini di età prescolare, questa modalità didattica presenta numerose criticità, fra le quali vengono segnalati il senso di isolamento dei bambini e la povertà delle interazioni fra pari. Al fine di ovviare a questi limiti è necessario pensare a come realizzare a distanza le attività didattiche normalmente svolte in presenza senza penalizzare l'aspetto relazionale. Nella presente ricerca viene affrontato il tema dello storytelling collaborativo, ritenuto un importante strumento di sviluppo per i bambini nella fascia di età 3-6 anni. Nello specifico, l'esperimento si propone di confrontare l'utilizzo di tre modalità alternative di costruire storie di fantasia in forma collaborativa a distanza in modalità asincrona. I risultati dimostrano che quando i bambini si alternano nei ruoli di autore/critico e di coordinatore/autore, le storie risultano più coerenti in termini di relazione e continuità fra gli elementi della storia e la percezione di interdipendenza positiva dei bambini cresce rispetto alla condizione in cui i bambini assumono il ruolo di co-autori della storia.

Keywords: educazione a distanza; scuola dell'infanzia; storytelling collaborativo; grammatica delle storie; percezioni dei bambini.

1. Introduction

Distance education generally refers to the delivery of lessons and courses over the Internet in synchronous or asynchronous form (Hrastinski, 2008; Moore, Dickson-Deane & Galyen, 2011; Singh & Thurman, 2019; Watts, 2016).). It is adopted in many contexts and especially in universities to broaden the educational offer and meet the needs of working students (Moore et al., 2011; Rao & Tanners, 2011). It is also adopted in schools of all levels in situations which prevent in-person attendance at classes (Singh & Thurman, 2019; Yildiz & İşman, 2016). In school contexts, distance education contributes to solve geographical problems and makes it possible to remedy attendance impediment of students who are hospitalized or anyway forced home due to illness. In March 2020, the use of distance education was necessary in many countries around the world due to the Covid-19 pandemic.

Especially for university students, distance education offers some advantages such as autonomy in the choice of times and place of learning, flexibility in learning pace, broader self-determination (Bailey & Card, 2009; Bell & Fedeman, 2013; Cole, Shelley, & Swartz, 2014). On the other hand, even in these privileged contexts, students run the risk of isolation compared to face-to-face courses, which translates into demotivation and a higher dropout rate (Brindley, Blaschke, & Walti, 2009; Lee, Choi & Kim, 2013; Yuan & Kim, 2014).

It is especially when applied to preschool children that online education limitations become apparent. Children have limited experience with online learning tools (Lindahl & Folkesson, 2012; McPake, Plowman, & Stephen, 2013); require adult supervision for Internet access and adult availability and involvement during the lessons (Plowman, Stevenson, McPake, Stephen, & Adey, 2011). Besides, especially asynchronous learning requires adults to read written information for children and type responses when needed (Fedynich, 2014; Schroeder & Kelley, 2010). Furthermore, compared to adult learners, children need to be involved in more play and hands-on activities, which are difficult to recreate at a distance (Manches & Plowman, 2017). In many situations, it becomes necessary to explain the activities and purposes of the lesson to parents in advance, ask for their cooperation to make available the materials required for the lesson (Fedynich, 2014).

A further negative factor is the scarcity of interactions between children (Lindahl & Folkesson, 2012). In the constructivist perspective, sociability and collaborative learning are fundamental for an adequate cognitive, emotional and social development in early childhood (Jonassen, 1999; Papert, 1991). Consequently, although technological difficulties inevitably encountered by children also represent an opportunity for the construction of digital skills (Stephen & Plowman, 2008) and the need for help given by caregivers has the positive side of involving parents in their children's learning (Plowman et al., 2011; Schroeder & Kelly, 2010), the scarcity of relationships between peers is a factor that must be necessarily modified.

In order to recreate collaboration conditions and interactional dynamics between children in distance education, the present research explores the theme of collaborative storytelling, which is increasingly included in pre-school curricula. The research is articulated into the following points:

1. examination of the literature related to the psychological and educational dimension of collaborative storytelling in early childhood (par. 2);
2. presentation of the research and contextual analysis of the results (par. 3);
3. discussion of results with reference to the experiment (par. 4);
4. implications for research (par. 5).

2. Literature Review

The term storytelling refers to a mode of thought, even more than of expression, which is deeply rooted in the human race and complementary to the paradigmatic or logical-scientific thinking mode (Bruner, 1986). The narratological mode contributes to building the social identity of humans and creates a meeting point between sense making (internal cognitive construction) and the negotiation of meaning with others (external social construction) (Bruner, 1990).

With reference to children, there are two fundamental ways of understanding storytelling: one relating to the stories that adults tell children; the other, referring properly to the stories created and narrated by children, be they factual or fictional (Rollo, 2007). It is precisely the latter meaning which is of direct interest here. As highlighted in Bertolini (2017), active storytelling refers to two different narrative modes: unintentional storytelling, which takes place during pretend play, largely widespread among young children (Hall, 2001), and intentional storytelling, which is more practiced as the child grows, and in which children give life to stories about personal experiences or, alternatively, about knowledge contents (Boase, 2013).

2.1. Young children's storytelling: developmental perspective

The development of unintentional storytelling is linked to the manifestation of the spontaneous fantasy play (Singer & Singer, 1990). As observed by Vygotsky (1967), inventing and telling stories is a creative act that gives rise to new things by combining known ones, a process that develops over time and that becomes more and more social over time (Auwarter, 1986; Bondioli & Savio, 2004; Corsaro, 1992; Garvey & Kramer, 1989). Through collaborative imaginative play, children also progressively become able to construct stories that increasingly obey the rules of the story grammar (McCabe & Peterson, 1991; Peterson & McCabe, 1983; Stein & Glenn, 1979; Stein & Albro, 1997).

Intentional storytelling is recognized as equally important for the development of children's narrative skills (Boase, 2013; Robin, 2016). In intentional storytelling children are stimulated to invent a story. In the first type of stories the child's attention is focused on play and conversation while the story arises spontaneously; in the second one, the child's attention is on the narrative invention (Bertolini, 2017; Bondioli & Savio, 2004).

2.2. Peer collaboration and role-taking in children's storytelling

Both children's fantasy play and the construction of intentional stories mature in social contexts. In this regard, the superiority of play with peers over play with parents has been demonstrated, in terms of creativity (Doyle & Connolly, 1989; Fein & Fryer, 1995; Haight, Wang, Fung, Williams & Mintz, 1999; Whiting & Whiting, 1975). As Bondioli and Savio (2004) observe, it is precisely through confrontation with peers that narrative thought develops by discussing and negotiating story meanings (Neuman, 1991; Preece, 1992).

Analyzed from a linguistic/conversational viewpoint, children's interactions show high degrees of complexity. Preece (1987; 1992) noted the following pairs of roles in which collaboration takes place: (i) author and critic; (ii) facilitator (coordinator) and collaborator. The roles of author/critic are assumed during the actual narration, while the roles of facilitator /collaborator are established before and during narration in the form of meta-narration (Sachs, Goldman, & Chaille, 1983). In the first architecture, collaboration occurs between author and critic. The critic uses the following linguistic acts: he makes

suggestions when the author hesitates in the narrative without however having the author take them into account; he formulates corrections the author should take into account to avoid future conflicts; both authors and critics may ask questions for further clarification or request additional information and provide related answers. In the second configuration, collaboration takes place between collaborators and facilitators/ (coordinators) who give instructions on the roles to be assumed, on the ideas to be developed, on the plot to be built.

A third type of verbal interaction is highlighted in the study by Ryokai, Vaucelle, and Cassell (2003) which involves pairs of five-year-old who collaborate together in a fantasy play with the help of a virtual agent. In conversations, alongside the roles mentioned above, the role of co-author occurs, through which subjects can alternatively cooperate: (i) in a regulated fashion, by alternating roles (role-play); (ii) in an unregulated fashion by competing for the role of first author and/or by assuming simultaneous roles. Unlike the roles seen above, in this case there is neither any story coordinator to negotiate with who has to narrate what on a metanarrative level, nor any explicit author; on the contrary, subjects share the responsibility for the story advancement by alternating in the role of authors. The strategy used in these cases is that of implicit negotiation through dialogue (Sawyer, 1997; 2002).

2.3. Collaborative storytelling: Educational perspective

Starting from early infancy, storytelling is considered an important tool for developing children's personality. Through this practice it is possible to simultaneously feed children's narrative thought, creativity, imagination, and the ability to solve problems, as well as help children to develop expressive and linguistic skills, sociability and collaboration (Bertolini, 2017). Further support to these educational objectives comes from the use of digital storytelling (Boase, 2013; Buckingham, 2003; Rivoltella, 2017).

From an educational viewpoint, the collaborative dimension of both traditional and digital storytelling is strongly supported as can be seen from the analysis of two school-project works. In the European project STORIES (2015-2018) entirely dedicated to digital storytelling in pre-school, from the joint examination of the literature and of 19 school practices (Bertolini, 2017; Bertolini & Contini, 2018), the focus on collaborative aspects emerges: (i) in the preparation of adequate spaces and times in which children can cooperate; (ii) in the activities preceding storytelling in which children are invited to collectively explore the materials available to them; (iii) in the course of storytelling, by offering children the opportunity to discuss situations; (iv) after the activity, when the children review, discuss and possibly modify the story (Bertolini & Pagano, 2018).

The PoliCultura project (Di Blas, 2016; Di Blas, Paolini, & Sabiescu, 2010) refers to the stories created by students using the dedicated authoring tool 1001stories in preschools, primary and secondary schools participating in the project. From the questionnaires returned by teachers in 2008-2009 it was clear that the greatest didactic benefit was due to engagement generated by the story collective authoring. A related educational benefit was the development of teamwork capacities due to a greater sense of inclusion, a strengthened cohesion both between children and between teacher and children.

2.4. Collaborative-oriented story-telling technologies

It is equally noteworthy that educational digital tools expressly designed for children's storytelling do support collaboration-focused functionalities. These are implemented alike in: (i) computer-based tools (2D and 3D); (ii) Tangible User Interfaces (TUIs), possibly

mixed with robotic technologies; (iii) Story Listening Systems (SLS). Among computer-based tools, for example, KidPad is a 2D tool that allows users to operate on a single computer using multiple mice to draw, insert text, create multidirectional hyperlinking. The tool has proved capable of making children interact in all phases of design and presentation as well as in drawing (Hourcade, Bederson, Druin, & Taxén, 2002).

Equally collaboration-oriented are the Tangible User Interfaces (TUIs), systems that associate digital information with physical environments and objects. For example, TellTable is a tangible multitouch plan that allows multiple children (usually couples or small groups) to operate simultaneously with physical and virtual objects through natural and intuitive social interactions (Cao, Lindley, Helmes, & Sellen, 2010). At the crossroads between TUIs and robotic technologies, RoboTale (Leversund, Krzywinski, & Chen, 2014) is a mixed reality tool that allows children through a tangible multitouch interface to create and tell stories featuring a robot (Harris et al., 2009).

Evidence on the benefits of collaborative storytelling also concern digital tools created in play environments which are known as Story Listening Systems (SLS) (Bers & Cassels, 1998). Similarly to multitouch plans, these tools have the advantage of mixing real world and digital technologies by involving children in sensory experiences capable of stimulating their imagination. For example, the experiments carried out on the use of Story Mat (Cassell & Ryokai, 2001) show that the tool encourages storytelling collaborative aspects both when the child plays alone, thus confirming the mat as a virtual peer, and when he plays with another child.

3. Research methods

The study involved an empirical research, comprised of children's collaborative story production and of children's perceptions on three crucial aspects of collaboration (sense of ownership; story improvement; interdependence). Descriptive (percentages) and inferential (one-way ANOVA) methods were adopted to analyse, respectively, children's stories and collaboration levels and questionnaires.

3.1. Research objectives

Traditional/digital face-to-face storytelling for pre-school children presupposes the creation of collaborative contexts that are not immediately feasible in distance education, so it becomes essential to pursue this aim through the creation of suitable alternative solutions. A possible way may be to work on role alternation. While face-to-face storytelling presupposes continuous and fluid role alternation, roles should be explicitly proposed to children in online contexts, especially when implemented asynchronously.

With this aim in mind, the present experiment pursues the objective of comparing the educational impact of three different ways in which preschool children actively cooperate in the creation of fantasy stories in online asynchronous collaborative contexts. Since storytelling activities carried out with small groups of children are the most effective (Boase, 2013; Garrety, 2008), planned activities involve the participation of dyads of children and three different storytelling organizational modes:

1. a mode in which children alternate in the role of co-authors (Group A);
2. one in which children alternate in the roles of author and critic (Group B);
3. one in which children alternate in the roles of coordinator and author (Group C).

Modality (i) (control condition) reproduces a basic architecture in which each child narrates a story piece without explicit metanarrative negotiation of who shall narrate what. Conditions (ii) and (iii) are considered experimental conditions. Condition (ii) is designed to test whether suggestions and corrections made by children in the role of critics are taken up by children in the role of authors. Condition (iii) is aimed at seeing if advice and suggestions given by a child in the role of coordinator before a story fragment is told by a child in the role of author, contribute to better story production.

3.2. Research questions

Since the present research focus was to compare three different children distance storytelling modalities, the research questions identified were the following:

RQ1: Are there any differences between the stories told by the three groups of children in terms of story-grammar?

(RQ2): Do children in the three groups have different perceptions regarding the activities carried out?

3.3. Sample and context

The research involved 24 children who attended a homogenous preschool class at IC Udine V in 2019/20. The school serves a varied audience in terms of families' origins and socio-cultural background. Collaborative storytelling is implemented as a curricular activity for the construction of communicative and social skills, and it is also developed in numerous curricular projects carried out over the years in collaboration with the local Library and with the help of various cooperatives to support children's interest in books and theater. The children had an average age of 5.1 years (range: 4.6-5.9 years). The decision to involve children of this age instead of younger children was made because two of the proposed roles (critic and coordinator) involve metacognitive skills children of this age have already sufficiently developed. Different group construction criteria were discussed with the teachers and in the end a friendship criterium prevailed as it was believed that children linked by friendship would show greater commitment and motivation in the construction of stories. The 24 children were organized into three groups (A, B, and C), each with an equal number of children (eight). The work was organized in dyads, so as to have four dyads for each group.

Before the experiment, it seemed important to understand how storytelling was reorganized after the school lockdown due to the Covid-19 pandemic in March 2020. As emerged from informal interviews with the teachers of the class involved in the experiment, the reconversion of storytelling from in-person activity into online activity was problematic. In most cases, active storytelling in which children tell their own stories was not taken up again and children just listened to stories and nursery rhymes narrated or dramatized by the teacher via the digital platform used by the school. At the end of the listening, children were asked to say if they liked the stories or alternatively to: (i) cut out, color and rearrange the scenes of the story to make a book; (ii) draw, color and cut out the characters of the story; (iii) transform themselves into the story characters to stage it at home; (iv) draw similar stories or invent similar characters. Only on two occasions was active storytelling proposed in which children were asked to invent a story starting from an incipit given by the teacher and in which each child had to produce a small piece of the story which was transcribed by children's caregivers and passed on to the next child via e-mail. In the end, the teacher made up the whole story along with children's drawings via a digital

presentation tool. Furthermore, digital storytelling experiences at a distance were not proposed due to children's need to receive concrete support from teachers even when this kind of experiences were carried out in class. With respect to results of the two active storytelling experiences, teachers reported that the stories produced by children at home were less cohesive and coherent than the stories they were used to tell in circle time experiences.

3.4. Research instruments

In order to answer the research questions, the following instruments were adopted:

(i) an instrument aimed at measuring the correspondence of stories to story structure concept. As regards children, the main analytical storytelling instruments are the following: highpoint analysis (Peterson & McCabe, 1983) and story grammar (Stein & Glenn, 1979). Although different, both deal with the classic story structure or true narrative (Labov & Waletzky, 1967).

Highpoint analysis categorizes stories along a continuum from disoriented to impoverished, chronological, leap-frog, ending at highpoint, classic (Peterson & McCabe, 1983). Story grammar developed by Stein and Glenn (1979) refers to the psycholinguistic concept of parsing stories into episodes which can be configured in many different ways. According to story grammar, children's stories can be classified according to four levels of narrative structure:

1. sequences without structure;
2. sequences of descriptions and/or actions that are chronologically ordered but not causally connected;
3. sequences of actions linked together by causal links but not directed to a specific goal;
4. sequences of actions driven by a character's explicit or implicit purpose.

Regarding story progression, stories without structure and descriptive stories were shown to be prevalent in the 3-5 year age group (Stein & Albro, 1997).

In the present research, the step sequence developed by Stein and Albro (1997), already applied in previous researches (Bertolini & Pagano, 2018), was used to determine whether formal story conventions were included in children's stories. Due to the preliminary nature of the study, further complementary linguistic analyses of the stories (MLU; fluency; vocabulary; etc.) was not considered;

(ii) a tool to detect collaboration levels in story construction. As storytelling is an activity normally carried out in class, cooperation between children is detected through the observation of ongoing group dynamics and in particular of group discussions (Bondioli & Savio, 2004). However, since in this case asynchronous communication is involved, it was preferred to use evidence as captured in the produced story. For this purpose, the number of incorporations present in each story was measured. Following Cassell and Ryokai (2001) and Ryokai and Cassell (1999), incorporations refer both to linguistic expressions and registers and to themes or elements of content. According to this methodology, story transcripts were analysed by examining the number of story elements incorporations from the former child's contribution into the latter child's contribution.

(iii) a tool aimed at detecting children's perceptions on the collaborative creation process. In particular, a Likert 5-point questionnaire structured in three parts of four questions each for a total of 12 questions was used. The three sections respectively explore the sense of

ownership of the story, with phrases like "I felt like a real writer", the perceived improvement of products through using peers' resources (e.g. "The story was improved thanks to my friend's suggestions"); the sense of positive interdependence (e.g. "My friend helped me a lot"). To ensure the content validity of the questionnaire, it was examined by a panel of two psychology students and adjusted on the feedback received. Crombach's alpha coefficient was calculated for the total scale to evaluate internal consistency reliability, and the result was 0.77 indicating that the questionnaire reliability was acceptable, although this datum is exposed to a bias risk due to the small sample considered. The Likert response format was 5 points marked by the words from "not true" to "very true".

3.5. Procedure

Stories were narrated in children's homes (no further determined spaces) with the help of a parent/other caregiver. Before starting, parents were briefly informed to assume an accepting and understanding attitude with children and to use verbal mirrorings and solicitations as main communication strategies, and to avoid explicit suggestions. Verbal mirrorings (Rogers, 1951) are communicative interventions that take up the interlocutor'words in a dubious form to urge him to continue speaking. In the educational field, the effectiveness of verbal mirroring was demonstrated especially for text understanding (Lumbelli, 1982; 2009). Solicitations consist of explicit invitations addressed to interlocutors to express their own opinions and thoughts (Bassa Poropat & De Vecchi, 1995).

Parental duties varied according to the child's role in the story. Authors had to be encouraged to advance the story. Children in the role of critics had to be encouraged to say what they didn't like about their friends' stories and what they thought could be changed. Finally, the parent of the child who assumed the role of coordinator had to encourage him to give directions on how to begin, continue and end the story.

Parents were asked to digitally transcribe the story by repeating children's words aloud. This method of collecting stories, known as adult recorded stories (Hall, 2001), requires the story to be read to the child who has the opportunity to modify it. The operations of downloading and sending stories to designated peers were to be carried out by the parent/caregiver with the child's participation. Although the intervention is not conceived for media literacy education, the joint use of the computer by adult/child may allow the child to acquire informal digital knowledge relevant to the task. Finally, with the help of their parents who told them they were interested in knowing what they thought about the experience and explained how to express their feelings on the scale, children filled out a Likert 5-point questionnaire which elicited their perceptions on the collaborative story creation process.

Parents were also invited to record the storytelling sessions. However, due to the preliminary character of this research, compliance was on a voluntary basis so as not to burden parents with an additional task as well as not to make them feel controlled but instead make them fully responsible for the process.

Story starting points consisted in a character, generally an animal in an environment, accompanied by a drawing. No initial events or other structural elements were provided. Each child in the dyads took three speaking turns in each of the intended roles. Each dyad produced a story, for a total of 12 completed stories. Time limits were not strict, although

families were asked to send back the stories no later than two weeks. All the stories were actually produced and returned over a period of approximately one week.

Results were reviewed by two independent judges, the author and a psychology student, with 90% agreement. Cases of disagreement were further discussed. Data are analyzed by means of descriptive statistical procedures (percentages) and, in the case of the questionnaire, by means of inferential procedures (analysis of variance).

3.6. Findings

Before examining stories in terms of narrative structure, child-caregiver interactions were examined to verify whether caregivers' verbal behaviors had conformed to the indications given in the protocol. A total of 15 registrations were checked since 9 parents did not comply with the optional request to register the sessions. None of the 66 verbal interventions registered contained explicit suggestions for the story. More precisely, 39.3 % of solicitations and 30.3% of mirror interventions were detected. In order to classify verbal behaviors not falling within the previous categories, "other" and "management" categories were used on the basis of the instrument developed by Bertolini and Cardarello (2012) and applied to interactions between children. The "other" category includes interventions unrelated to the task, such as observations about the surrounding environment (e.g. "Do you want me to turn on the heating?"). The "management" category includes verbal behaviors used to draw/keep children's attention on the task (e.g. "You will eat after you have finished it"). In the present research 19.6% of the interventions fall into "other" category and 10.6% into "management" category. Overall, parents' compliance with the protocol was considered adequate.

RQ1: Are there any differences between the stories told by the three groups of children in terms of story-grammar? As for the analysis of the stories in terms of story grammar (Figure 1), research results shows that 75% of stories in condition A (author-author) fall in the descriptive-action sequence category and 25% in the no-structure sequence category. As for the group of children who alternated in the role of authors and critics (Group B), 75% of the stories were classified in the reactive-sequence category while 25% in the descriptive-action sequence category. Finally, in the group of children who alternated in the position of coordinator and author (Group C), 50% of the stories produced were classified as reactive-sequence and 50% as descriptive-action sequence. Therefore, conditions B and C led to better results with respect to story correspondence to story-grammar rules. Given the limited number of stories, inferential analyses were not performed and the data that emerged are to be considered as only tendential and susceptible of further investigation.

Story Structure Levels	Group A	Group B	Group C
1. No-structure sequence	25%	0	0
2. Descriptive-action sequence	75%	25%	50%
3. Reactive-sequence	0	75%	50%
4. Goal-directed sequence	0	0	0

Figure 1. Number of stories per story-grammar categories.

As for the number of story incorporations, results showed a total of 42 incorporations in the 12 stories examined, with stories in Group A having the lowest percentage of incorporations (19.04%) and Group B stories having the highest percentage (47.61%), while Group C had an intermediate number of incorporations (33.3%). These data tend to reflect children's different collaboration levels in the three storytelling conditions.

Children's perceptions about this experience were explored through a three section questionnaire, whose answers are summarised in Figure 2. Results showed the factor "ownership" as significant ($F(2,21)=41.25$; $p<.01$). In particular, post-hoc comparisons (Tukey test) showed that significance is due to the fact that A group perceived a greater sense of ownership than groups B and C ($p<.01$), while no significant differences were found between groups B and C. The other two factors, namely "perception of peers' contributions" and "sense of interdependence", were also significant (respectively, $F(2,21)=63.8$, $p<.01$ and $F(2,21)=52.72$; $p<.01$). As for peers' contribution, comparisons between groups were all significant ($p<.01$) with group B expressing the highest positive evaluation. As for the positive interdependence factor, post-hoc revealed a difference between groups B and C and group A ($p<.01$), with groups B and C having developed a greater sense of interdependence than group A. Due to the small sample considered, however, the data may not be representative of the children's population.

Questionnaire	Groups	Mean	SD
	A	4.03	.82
Ownership	B	2.53	.80
	C	2.25	.87
	A	1.90	.68
Use of peers' resources	B	3.93	.80
	C	2.59	.94
	A	1.93	.75
Positive interdependence	B	3.90	.77
	C	3.81	.93

Figure 2. Results of questionnaire.

4. Discussion

Results showed that the stories produced by the children in conditions B and C met the criteria of the story grammar more frequently than the linearly produced stories (condition A). This result may be explained by the fact that collaboration in the dyads of children in conditions B and C was stimulated by the suggestions and corrections of the child who assumed respectively the function of critic or coordinator. On the contrary, in the construction of linear stories, collaboration presupposes evaluating the continuity and coherence of the text so far elaborated. In the absence of discussion with other children, as normally happens, these operations were difficult for children, who often preferred to make their own contribution to the story without taking into account others' contribution.

This explanation is corroborated by the result regarding the number of incorporations in the stories produced, lower in condition A than in conditions B and C, meaning that the

children in condition A contributed to the story construction without paying much attention to their partners' work. Furthermore, as regards the differences in the number of incorporations found between condition B and C, the result may be explained with the fact that children preferred to first freely create their own contribution and then review and modify their work based on the information received by their partner, rather than being forced to follow conditions from the start (condition C). This interpretation is, however, only temptative as the role of parents on nine stories was not controlled.

The given interpretation may find further support from the questionnaire regarding children's perceptions about the activity. The examination of children's perceptions revealed that children in condition A (linear story construction) manifested a greater sense of ownership and a lesser perception about the contribution of others' as well as about positive interdependence than children in the other two conditions. The results also showed that children in condition B appreciated the contribution of others' work more than group C. This result may be explained by children's higher preference for the author-critic condition than the coordinator-author one, although data about the perceived sense of interdependence, which is not sensibly different in the two groups, are not equally clear.

Although partially examined, the care-givers' verbal behaviors deserve some observations. The high adherence to the protocol by parents who in no case have suggested story continuation to children suggests how distance education is seriously taken by children's families. The classification of verbal behaviors into "other" and "management" categories is, however, more difficult to interpret. In particular, the relative high incidence of "other" compared to "management" verbal behaviors may be explained by the fact that the home environment in which the activity took place presented many opportunities for distraction for both parents and children, while, on the other hand, the low number of directives addressed to the child may be explained by the fact that the close child-adult interaction does not make it necessary to frequently draw the child's attention to the task.

Given the small number of subjects involved and of stories produced, the results of this research are so far to be considered only as indications. The research re-proposal must necessarily involve a larger number of children belonging to different age groups. Further possibilities for expanding the research paradigm concern the use of digital storytelling. In the present research, children were helped by adults in story editing and sending. This does not mean that the children did not collaborate in various ways since these activities were carried out together with their caregivers, but that children's levels of digital competence were not measured objectively. Moreover, since all the tools built or adapted for children's digital storytelling are designed for collaborative use in presence, analyzing how these tools may be used collaboratively at a distance represents a further interesting research objective.

5. Conclusion

Distance education represents a difficult challenge for young children, especially for what concerns the sense of isolation it creates and the risk of relational poverty between children and teacher and between children and peers. This disadvantage is particularly felt by children because interactions are the basis of children's learning processes. Often, however, the choice to adopt this educational modality is a necessity, as recently happened for the COVID-19 epidemic. Recreating interaction and collaboration conditions between children involved in distance education programs is therefore a priority.

The present preliminary research, which involved a limited number of children, had the aim to explore which conditions may actually favor storytelling experiences carried out at a distance and in asynchronous mode. According to the results of this preliminary research, conditions of effective collaboration in storytelling in online learning should be recreated by explicitly promoting children's alternating their roles in small group work settings. It is likewise desirable that not only distance storytelling optimal conditions may be further explored, but that also other activities in which children are involved in pre-school may be reprogrammed in distance contexts according to enhanced collaborative logic.

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