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" *Once upon a time, there was a fairy who walked in paradise* "
The child finalized, mediated and creative narrative activity

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Abstract

The research on children storytelling is dominated by approaches that focus on contents, structure and process of narrative storytelling. We propose a change of paradigm that considers the narrative activity in its finalized, situated, mediatised and creative properties.
To do it we focus on several theoretical contributions stemming from activity theories, instrumental approach, the cycle of the creative activity of imagination and the transitional zone of experience (Vygotsky, Rabardel, Winnicott). The narrative activity model generated from these theoretical contributions is grounded on empirical researches conducted with children from 6 to 8 years old. It includes four phases, exploration, inspiration, production and sharing. We show the usage of instruments that the children make in these four phases. Indicators stemming from a typology of transitional instruments and from several forms of narrative activities (linear, spiral, editing, sieving) are used to refine our conceptualization of the narrative activity as mediated activity.

Introduction

There are many ways to consider children stories. Their roles in child development attracted psychologists and teachers during long years (Bamberg, 1997). From 1970, the psychological and linguistic research on children storytelling was dominated by formal approaches. Then, in the literature, we find three points of view that consist in looking at the contents, at the structure or at the process (Engel, 1999). Stein (1982) or Mac Cabe (1997) look at the structure of children stories as way of conceptualizing the child thought structure. How are the episodes connected? Does the story have a beginning, middle, end? Are the sentences assembled in a logical way? How many episodes contain the story and what connects them? How many words are used to embellish the heart of the action or the event? These researches focus their interests on the contents and the structure, for instance the linguistic construction of the structure narrative as the product of interactive parameters (Bamberg, 1997), or the narrative structure specific to language, to parental influence, to genre and to culture (Mac Cabe, 1997). Few researchers analyse the process of storytelling itself. Clinicians for instance are interested in the story as a process and what it reveals of the emotional life of the narrator, for example are conflicts present? What motivates the narrator to tell a story? Does the narrator define himself as being the protagonist? How are described the other members of

his/her family? What the narrator reveals of previous events of his life? Does he revise his story in accordance with the audience? Nicolopoulou (1997) shows that narrative as tools contribute to the development of identity formation of self and social groups.
While these approaches tackle important aspect of children storytelling, we believe however that they leave aside, or require precisions on very interesting aspects of children narrative (Decortis, 2008). These aspects concern narrative activity dimensions as finalized, situated, embodied via multiple languages, mediated and creative. In this way, the questions are and become: what motivates the child to tell a story? How does the child use his experience and how does he mobilize his imagination to build a story? What resources does the child use to build his story? How does the child give a meaning to his experience through the narrative? How does the child build a story in interaction with his peers? How the child who commits into a narrative activity, absorb and integrate his own experience, and how does he build himself in this way?
By narrative activity, we intend the activity by which the child gives meaning and reports his experience in a creative way. With this definition and the reference to "activity", we give a central place to what the child does when he builds a story. The importance of action, in other words the active face of narrative construction, was neglected in the theoretical perspectives mentioned earlier. It is what we intend to fill by embracing a perspective of the narrative which is wider, more anchored in its context of production, but also a narrative which builds itself by multiple resources and channels of expression, one serving as lever to the other one, one becoming richer through the other one (Decortis, 2005, 2008).
Indeed we consider that the reality and the environment supply materials that will be used by the narrators in their production. In constructing their stories, children draw on images and resources present in their cultural environment, which shape their imagination and sensibility in profound and subtle ways (Nicolopoulou, 1997; Vygotsky, 2004). Thus, the understanding of these processes requires relating the child narrative activity to the socio-cultural context of daily interaction, communities and the cultural world.
We try to understand the instrumental mediations that operate during the construction of a narrative, that is the resources, tools, instruments which the child uses and which transform his narrative activity. Malaguzzi (1997) underlined that the children learn to express themselves in hundreds of language. At school, while most of the narrative activities are centred on the written and verbal production, the teachers know that the narrative activity is often enriched by other media such as drawing, music, self-expression through movement (Ackermann, 2001).
Children tell by miming, dancing, drawing. The multiple artefacts (papers, pencils, books) or symbolic (mimes, songs, dances, drawings) that they use "transform the connections of the subject to the world" as specified by Rabardel (1995). These tools build, shape the interactions of the children with their environment, reflect the experience of the other persons who tried and transformed them previously to satisfy their own needs. Therefore we are interested in the relations between the subject and the object of his activity mediated by an instrument, which integrates external constituents (artefact) and internal ones (schema of uses) (Rabardel, 2005).
Finally, we believe that creativity can be an essential constituent of the construction of the narrative activity. Vygotsky (1930/1983) shows that by play or narrative, which are not simple reproductions of lived impressions but the creative re-elaborations of these, the child puts in relation and assembles the data of the experience to build a new reality answering his curiosities and needs. These form what Vygotsky (2004) calls the cycle of creative activity of imagination. He considers that reality and imagination are not antithetic but correlated. Alternating between imagination and experience is essential for the child development (Papert, 1993, Dewey, 1938). Vaucelle (2010) bases her research on this alternation and on

different perspective taking (for example looking at a tree and climbing into a tree are different perspectives).
The story created by Elisa, age 6 (figure 1) who imagined and drawn, at first, then dictated to the adult, and finally copied out in a dedicated story book, illustrates our theoretical perspective.



Figure 1. **"Once upon a time, there was a fairy who walked in paradise "**
On the left page of the story book the drawing, on the right page the story.

In this article, our objectives are in the first place to describe the theoretical and empirical foundations of our conceptualization of the narrative activity in its mediated, finalized and creative dimensions. We present NAM ++, a narrative activity model stemming from this effort of conceptualization, which can be used to conceive technologies enriching for the children. Secondly, to progress in our exploration of relations of mediation of the narrative activity, we extrapolate a typology of relations of mediation stemming from an analysis of travelers' narrative activities (Bationo-Tillon, 2006). Our objective here is to take indicators from this typology to see if they resound with regard to our results obtained with the children.

1. Narrative Activity Model (NAM++)

In a previous research (Decortis, Rizzo & Saudelli, 2003), we found empirical evidence that the cycle of creative imagination proposed by Vygotsky as a psychological process could be used to inform the design of narrative technology-enhanced learning. Vygotsky (1930/1984; 2004) considers the centrality of the psychological processes of creativity and imagination in the educational process. For Vygotsky, imagination is present in all aspects of the cultural life and makes the artistic, scientific and technical creativity possible. Reality and imagination are correlated according to Vygotsky by at least four relations: 1) Imagination is built starting from reality. The richer the experience, the more the individual will have materials to build his imagination. 2) The social practices and experiences exchange with our pairs. 3)

Emotions, the feelings influence imagination and vice versa. 4) The crystallization of imagination in external and shared objects. Moreover, Vygotsky identifies the mechanisms of imagination and creativity: the experience and the re-elaboration of experience through disassociation, association and mutation.

Therefore narrative activity can be decomposed in four phases namely, exploration, inspiration, production and sharing (figure 2). Broadly speaking, this model describes how the individual experiences the external world, elaborates the impressions received, assembles them in a novel way and shares this production with others (Decortis et al. 2003).

Exploration consists of the interactions with the real world, which can be either direct or mediated by social relations. The sensory experiences constitute the starting point for the theme and for the ideas, what the child has seen, heard, touched or encountered in various experiences (museum, forest) or even in the classroom with the support of objects and people. At this stage, the child uses instruments appropriate for exploration (e.g. microscope, points of view, etc.) and handles various materials (e.g. earth, shells, sand, photos, objects, etc.).

Inspiration is a phase of reflection and analysis on the experience during the exploration. The child is encouraged to think about the previous experience, discuss it and sort out the elements they gathered. Individual writing, drawing or group discussion usually supports this phase.

Production corresponds to the recombination of the elements dissociated and transformed during the previous phase. It is the moment where children, based on selections and choices of elements, produce new content usually through a great variety of media. During this phase, the children mainly use their notebooks, pens and pencils for illustrations, cardboards, puppets, posters and bricolage sets.

Sharing is the phase in which children's externalised productions start to exist in their social world. Children present the result of their production and verify the effects of this production on the others (e.g., children, teachers, parents). Sharing can be supported by instruments such as notebook or it is a full-scale performance of groups of children or of the whole class.

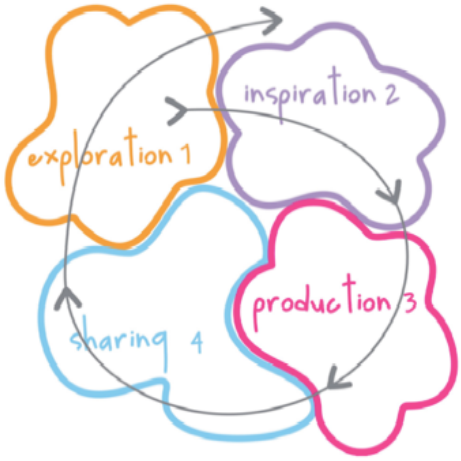


Figure 2. NAM++ model

2. Grounding the model on empirical findings

Hereafter, we are going to resume some empirical results stemming from the observation of children's narrative activities (Decortis, 2008). In the direction of the clinical method drawn by Piaget (1947), these data were obtained from the observation of more than twenty narrative activities of children from 6 to 8 years old organized at school. Each of these activities lasted between 2 at 5 hours. Data were collected by means of observations and videos recordings.

2.1. Exploration

The first phase of the cycle of the creative activity of imagination consists of the interaction of the child with the environment, which can be either direct, or mediated by social relationships. As Vygotsky shows (1930/1983), the imagination builds itself through elements of the reality which are collected by experience. During this phase, the impressions are perceived as a whole and will afterward be separated. This dissociation implies that children select certain elements and that they push aside others (Vygotsky, 1930/1983).
The narrative activities that we observed are anchored in the experience of the child, they rest on what makes sense for her/him and express the singular experience. Concerning the experience we can, as Dewey (1987), speak about the experience in a general perspective, because there is constantly experience, or of a singular experience. We consider that the child lives an experience when the material that makes the object of the experience goes up to the end of its realization (Dewey, 1987). The exploration is going to lean on these two levels of experience. At school, the teacher looks to lean on a singular experience forming a whole, possessing characteristics that individualize it and makes it self-sufficient. In this particular case, it is frequent that the meeting with a person is the point of departure of the exploration of a theme, for instance the meeting of a mom presenting her newborn child, a parent explaining his job. A dialogue makes a commitment between this person and the children who can wish to question them and to understand their work or their experience. It is also a means of exploration allowing the child to imagine elements of the reality, to represent itself to them according to the narrative and the descriptions made by others (cf. second relation between reality and imagination described by Vygotsky).
The exploration can be introduced by a sensory activity (listening, looking, feeling, touching). These modalities are particularly worked during a visit of a museum, a walk in forest. For example in the book of observations, the children tell an experience which they personally experienced. The exploration is mediated by diversified artefacts, books, movies, binoculars, reports, microscope, etc. chosen according to the investigated situations. The children can be brought to manipulate natural elements (e.g. air, fire, earth, water) by using some plasticine, balls.
Places particularly appreciated for exploration are opened, the quarter, a forest during a walk. These places can be punctually invested and new for the child (e.g. a museum, a hospital, or a forest) either known of the child as for example the garden, the school park, or another first and personal place as for example the house.
The exploration can be realized by every child individually or by small groups as it is the case in the Rhythm laboratory. The children appreciate the exploration in small groups, each can draw the attention of his /her peers on such or such element of the reality and they can exchange their points of view.
The exploration can be completely free, without instruction, or be managed. The teacher can, at first, direct the activity to sensory experiences, which will constitute then the point of departure of the theme which will be worked and ideas which will be developed.
In certain situations, the exploration can concern a subject to observe in its singular constituents or on the contrary to multiply the perspectives of the same subject. For example around the birth, a mom comes to show her newborn child, the children are going to visit a maternity hospital, cut images from magazines and collect objects, discover the video of an echography, etc.

2.2. Inspiration

The impressions received during the phase of exploration of the outside world are complex entities which include a big quantity of different parts. In order for fantasy manifestations to operate, the dissociation or the division of this quite complex entity in its parts is fundamental as Vygotsky explained (1930/1983). The dissociation also implies to give relevance to certain characteristics and not to others.

As we observed, this phase corresponds at a moment of reflection and analysis of the experience. After the phase of exploration, the teachers dedicate time to think the experience by asking children to think of what is relevant for them, to remember and to tell orally, graphically or by writing, the striking elements that they lived. In Vygotsky's terms, it allows the process of dissociation to operate. The narrative operates through an epistemic mediation, it allows to progress in the knowledge of the object.

The dimensions that characterize the inspiration concern the object (what?), the modalities (how?), or even the moment (when in connection with the event) of the dissociation.

In certain situations, the children are invited to revisit their feelings, to remember themselves the lived experience, what they made, if they liked what they made or saw, why they liked, what they preferred.

But it can also be question to return on a story: revisit the intrigue, the beginning of the story, its parts, the characters and their personalities, the favorite sequences, what this story says to them. It can also be important to dissociate the properties of certain objects as for example the sounds of an instrument. Ex.

Various modalities of dissociation were observed such the exchange and the discussion between children and teacher, drawing or writing. In certain situations, the dissociation can be mediated and facilitated by objects. And it can be interesting to revisit the experience via objects. The book of observation is an instrument allowing to dissociate the past experience, to tell his/her holidays, a walk in forest etc. …

The dissociation can be made in the course of activity or after the exploration took place. In the first case, the children experiment the properties of certain objects and are brought to distinguish these from other objects to define their peculiarities.

For example, the children experiment the sound properties of instruments that they made themselves with bottles and diverse materials found in the garden of the school and they compare them with the sound properties of the percussion instruments which they have in class. In the second case, the children return on a past experience and they are invited to remember themselves the most important events they experience and to share the experience of the others.

Two other cases of dissociation are: revisit first feelings or revisit feelings elaborated by oneself. In the first case, the children revise their feelings of a lived experience that did not give rise to the constitution of tracks and to the crystallization of these on a support. In the second case, the children work again tracks which they elaborated themselves previously, who were already outsourced, as for example elements which they recorded beforehand using descriptions or collages in their exercise book of observation.

The dissociation can be spontaneously made by the child or be guided by the teacher who plays an important mediating role. The dissociation in the direction where Vygotsky (1930/1983) understands it is an individual process, every child defines for himself the outlines of his experience. But this work can also be made with the support of the group, and in that case all the children can listen and possibly benefit from what is important for the others. The children can also exchange their ideas as it is the case when, while observing a scene, they invent a new story in connection with this one.

It is then a mechanism of intersubjectivity that is set up as Bruner describes it and which facilitates the understanding of what the other children think or feel. And we could go farther

by saying that it allows every child to understand the way his/her peers operate a dissociation of the experience. To what, their companions give importance and what they do not retain.

2.3. Production

The children exploit elements chosen previously to produce a new content, generally through diverse types of media. This phase refers in particular to the mechanism of association which is a means to gather and combine the separate and transformed elements. In other words, during the production the children exploit their choices and produce new contents, investigate various means of expression and discover those who correspond best to their needs and expressive and meaning intentions.

Furthermore, it is rather evident that the production offers them an opportunity to outsource the product of their imagination and their feelings through writing, drawing, or through a story.

During the production, the children write, read or dictate orally fragments of stories to the adult, play physically by expressing their feelings and draw by giving an iconic shape to the stories told orally.

The dictation to the adult (figure 5), in first year, is a particular moment when the child offers his/her first ideas which he/she discusses individually with the adult. Indeed, the children who learn to write are invited to dictate their story to the adult and, then, to copy out this story in a dedicated book.

Two instruments are used for this interactive activity between the adult and the child, the scratchpad and the story book. The scratchpad is a tool shared between the teacher and the child. The teacher writes in this one the story dictated by the child. It is then used by the child to copy out the story in a personal book, the story book. The only marks which the child brings to the scratchpad are the ones produced by the child who erases words which were already copied. Whereas the story book contains only tracks of the child in whom he expressed himself personally.

The production is marked by the multiplicity of artefacts. The drawing, the verbal expression or the creation of costumes are so many tools as the children can use to produce their stories. For example, the children are invited to draw the characters whom they chose to embody before making themselves the costumes which they will wear during the sharing of their stories in front of an assembly.

The production can be individual or collective, or the child dictates to the adult his/her story who copies it as we saw it earlier, or a group of children produces collectively the story, each proposing a part of this one. In that case, the children negotiate the common parts which must be written or drawn and they decide together on peculiarities of characters and dialogues.

2.4. Sharing

As evoked earlier, the cycle of the activity will be complete only when the imagination will have taken shape, will be crystallized in external images (Vygotsky, 1930/1983). During the phase of production, the children already outsource the product of their imagination by the dictation to the adult. During the sharing phase, the children tell their stories to other children, present their theatrical games in front of their relatives, explain their drawings and their stories in front of the class and the teacher. Any outsourced demonstrations which influence the outside world of the child. The phase of sharing adds a dimension because the outsourced productions begin to exist in the environment of the child and can have an effect on the others (children, parents, teachers).

This last phase of the cycle closes the buckle opened by the first phase: from the real world towards the imagination which returns then towards the real world shared enough so that it

becomes object of experiences for others, the last decisive phase of the imagination creative as described by Vygotsky (1930/1983).
Several modalities of expressions: verbal, physical, musical can characterize the sharing.
The children speak about their experiences, what they made, why they like such thing.
By sharing their stories, the children express themselves through their body by using the space, dancing for example, or by the use of costumes. The children can use one of its modalities or several at the same time. For example, they can alternate between oral and musical story :

- Alexandra and Marie (7 years) tell a story that they created to the children of their class: "*Once upon a time, it was the day of Easter, a girl was in the forest* (Alexandra plays the tambourine) *and a horse arrived* (Marie shakes a bottle which she filled with stones) *and it began to gallop* (Marie increases the rhythm).
- *The day of Easter, she returned home and there were Easter eggs* (Marie plays delicately with little spherical bells), *and here is!* "

The sharing can be mediatized by an instrument which can be diegetic, the instrument is inside the space of the story (example the musical instrument), and it can serve to give rhythm to the story; or extradiegetic, the instrument is outside of the space of the story and is of use as support to the sharing, for example when the child uses an exercise book as a reminder and\or to show his/her story to the others.
The sharing can be made in dedicated and collective spaces (for example the gymnasium of the school), or in usual spaces, in class.
The sharing can have been prepared and contribute to create tracks which have a certain durability (the time of the school year): a poster, a board ; or on the contrary to be short-lived and to last only the time of the presentation.
The sharing can be the opportunity to establish an exchange with those who come to attend the narrative production and who did not participate in the creation (spectators, parents).

3. Mediated instruments and transitional zone of experience

To articulate more precisely NAM ++ model with the instrumental approach, we lean on a study about travellers' narrative activities (Bationo Tillon, 2006; Bationo Tillon, Folcher, Rabardel, 2010). In this research, we have adopted a unit of diachronic analysis that encompasses the collection procedure during the journey, as well as the drafting of the story afterwards. We suggest using the concept of "transitional instrument" to identify what is occurring within these discontinuous narrative activities. During the journey, the narrators work with various instruments (e.g. photographs, notes) as a way of distancing themselves from the experience. At this stage they create their own transitional instruments. After the journey, the narrators are once again immersed in the travel experience through a display of the items collected, such as sketches, notes and maps. They compose the story by assembling these transitional instruments.
Concepts stemming from this research can be questioned by the empirical data of children's narrative activities. Indeed, travellers' narrative activities (ethnologists, passionate persons of journeys) highlights spatial and temporal dimensions of narrative activity as well as functions attributed to transitional instruments.

3.1. Diachronic narrative activities

The narrative activities provoke a paradoxical situation. The narrators have to extract themselves from the situation in which they are immersed. This distance is possible thanks to

the collection (notes, photos, drawings). During the elaboration of the narrative (inspiration, production), the narrators need to re-connect with the past experience.

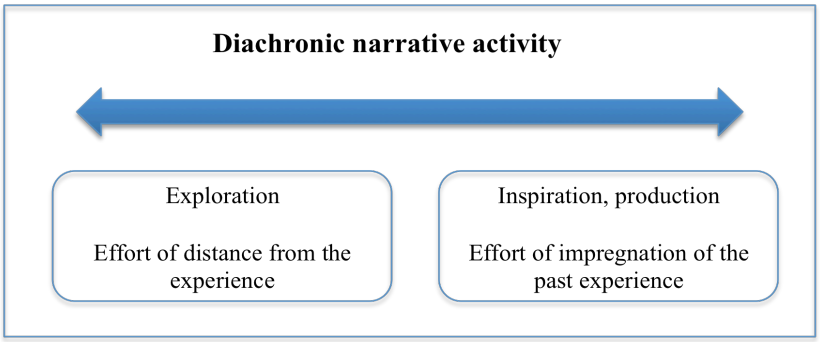


Figure 3. A unit of diachronic analysis of the story

During a travel, the narrative activities interfere, disturb the experience. They allow to cut and to fix the flow of the experience. The writer is pulled between two attitudes: filling his note-book and investigating his surroundings, meeting people (Barthes, 2003).

This tension is present for all narrators (ethnologists, journalists, writers or passionate persons of journeys). "We believe that we are going to travel, but soon it is the travel which makes you" Bouvier (1999). The travel is the discovery of a faraway land and a dialogue with oneself. Without the collection and the writing, the visible would remain vague, confused, muddled and would be forgotten (Laplantine, 1996).

As "the present sticks on eyes" (Barthes, 2003), the narrator takes some distance by noting the present as one goes along. The language thus allows to bind, to separate and to fix contents in the continuum of the flow. It categorizes and organizes the experience (Meyerson, 1948).

Bourdieu (1965) postulates that the photography is a voluntary classification of past. Indeed, to take photography supposes a distance with regard to the present. The photographer tries to retain the time. He is conscious that the present already falls over to past. So while becoming soaked with a new universe, the narrator chooses deliberately to make a collection by means of a variety of tools which are going to allow him to take some distance towards its experience.

A re-impregnation of experience

The narrative activities join a succession of stages distributed in space and time. The narrator transforms collected and annotated elements to elaborate a narrative. The heterogeneous information of the travel diary is modified in the final narrative. It is about a real re-creation of the journey (Pinault, 1994).

Latour (1996) describes the transformations and the transmutations made by the anthropologists on the collected elements. These transformations succeed one another until the scientific publication. He speaks about a chain of reference: the brazilian forest becomes samples of lands, the words exchanged during the exploration of the forest become sentences written in a notebook, the observation of the Brazilian ground's colour become figures noted in a notebook.

In every successive stage, this reversible chain loses of its materialism and its complexity. But it becomes more transportable, handier and more useful in a more and more wide network. So, the elements of the narrative are transformed, modified, remodelled, dislocated in time

until to find a point of balance, a coherence. As such, Bruner (1990) underlines that the narrative does not stick on any hidden reality. The narrative results from the construction of a coherence, an adequacy between the external and internal worlds.

3.2.Transitional instruments

To understand this progressive construction of a coherence, a diachronic approach is needed. Furthermore, the concept of 'intermediate area of experience' proposed by Winnicott seems to us operating. Indeed, according to Winnicott (1971), the transitional phenomena are relays allowing to feel that the experience did not abruptly end. He speaks about a neutral area of experience that will not be disputed. This intermediate area of experiences is a place of rest for the individual who consists in maintaining, at once separated and connected the one with the other one, internal reality (the subjective reality) and outside reality (the objective reality). Winnicott underlines that these transitional phenomena mark the progress towards the lived experience. The transitional object for the newborn child becomes less involved when the cultural interests of the child begin to develop. Then, these transitional phenomena do not disappear but are transformed. They spread in the intermediate area of experience.

This intermediate area of experience continues all the life of the individual. It is indispensable in the arts, the imaginary life, the creative scientific work. These transitional phenomena allow human being to release from the tension aroused by the confrontation of the internal reality and outside reality. In this perspective, the transitional phenomena allow to keep the link with one experience while objectivising it, considering at it as outside one. Now, the materials of the story are constituted by collected heterogeneous elements, made or captured during the travel.

Then secondly, they play the role of mediators for the narrator who revisits the lived experience in order to elaborate a narrative. They mark the progress towards the lived experience, towards the distance but at the same time they are indispensable for the ré-impregnation. For all these reasons, they belong to the transitional phenomena described by Winnicott.

We include the heterogeneous materials of the narrative activity (notes, photos, drawings, videos) under the category of transitional instruments to try to understand their generic properties. We propose a first classification:

a) A transitional instrument is an inanimate artefact in which the narrator confers a certain number of properties. The transitional instruments are constituted, made, or appropriated by a narrator. An artefact becomes a transitional instrument when a subject attributes it the particular status of a reminder, an evidence of an experience.
b) An instrument is transitional because the subject makes it transit from a situation (a place, a space, one moment and a given context) to another. A transitional instrument is the reification of the links created by the subjects to establish the coherence, the continuity (from an intrinsic point of view) within intermittent activities (from an extrinsic point of view). They are enough flexible to retain some characteristics of the past situations, while being able to be integrated later into diverse activities.
c) These artefacts pass from a situation to the other one while maintaining a certain unity of the individual or the experience and/or while preserving and maintaining certain information of the situation. Transitional artefacts are malleable enough to change status in the model of the instrumented activity. Sometimes they occupy the pole of object of the activity, sometimes the one of the instrument.

At the time of its constitution, the transitional instrument allows to take the necessary distance with the experience. It is an instrument to distinguish parts of the reality. During its later re-use, it allows the narrator to plunge into his past impressions, to re-connect with his experience, with the reference situation.
The subject can pass these transitional instruments from a support to another one, from a shape to another one during time. He can articulate and dislocate the association of these transitional instruments. The narrator handles, transforms, sculpts these transitional instruments in order to understand better his past experience as well as to develop his competences.

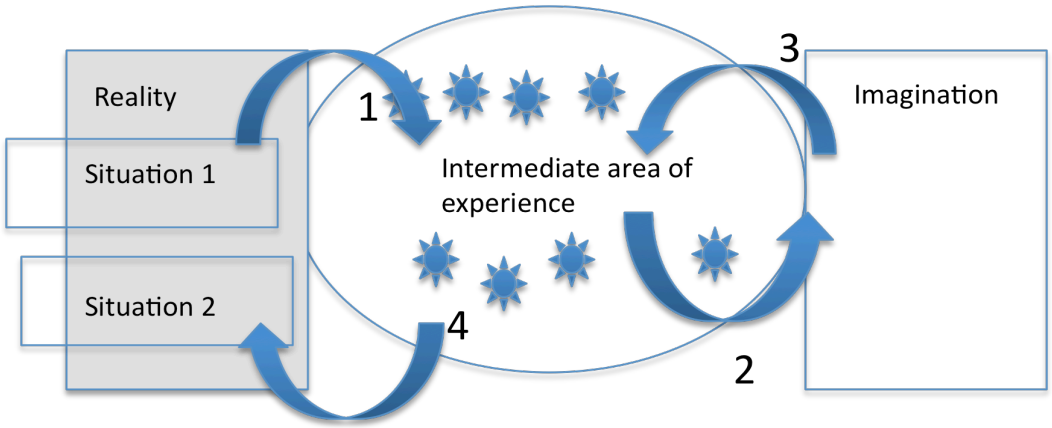


Figure 4. Articulation of Winnicott and Vygotsky's theoretical contributions
Transitional instruments

As shown with figure 4, situation 1 corresponds to the exploration of the world, situation 2 corresponds to sharing narrative with others. The intermediate area is constituted by flexible transitional instruments.
Transitional instruments are constituted thanks to the internalization and the dissociation of the experience operated by the narrator (1). These transitional instruments can be transformed, reelaborated (mutations) with the work of the imagination (2-3). Finally associations, new dissociations and re-associations can take place before being externalized under the shape of a shared story (4).
So, the constitution, the manipulation, the transformation, the association and the externalization of a combination of transitional instruments allow the narrator to produce a story but also to transform and to work his experience, as well as to enrich his intermediate area of experience.

3.3. What transitional instruments appear in narrative activity for children?

The concept of transitional instrument allows us to think at the same time, the narrative activities during the travel (exploration / inspiration) via the constitution of a collection of data and the narrative activities after the travel (inspiration / production) via the elaboration of the narrative from the collection of data.
The tables below present the characteristics of the main transitional instruments identified during the previous study (Bation-Tillon, Folcher, Rabardel, 2010). These transitional instruments are constituted on several supports (notebook, video, photos, sketch etc.), then they are resumed, cut again and integrated within the same support.
So, the segmentation of the transitional instruments is not superposable to the technical segmentation of supports. We are going to resume the typology of the transitional instruments

to confront it with children narrative activities. To illustrate this typology, we are going to take examples stemming from children's productions using traditional tools (e.g. exercise and story books) and children productions using POGO, an environment composed of digital tools distributed in class (Decortis et Rizzo, 2002; Decortis et al. 2003).
Let's start with Sarah's narrative activity, age 6. The following pages (figure 5) result from Sarah's story book. She told and drew her holidays in Africa (1). One month later, Sarah uses her past experience in order to invent a new story (2).

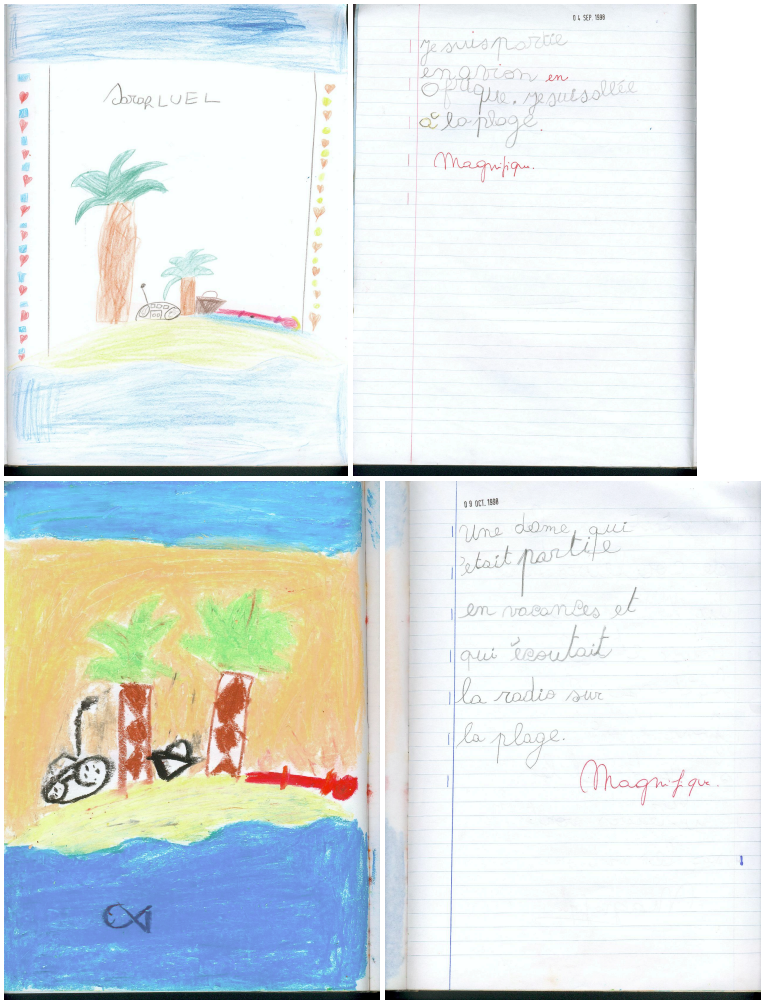


Figure 5. Sarah, age 6. In the first story (in September), she tells her holidays in Africa: " I left by plane for Africa, I went to the beach". In the second story (in October), Sarah uses her experience: "a lady who had gone on holiday and who listened to the radio on the beach". In her exercise book, the story is written on the right page and illustrated on the left page.

The transitional instruments identified during our previous studies (Bationo, 2006; Bationo & al., 2010) bring to light four forms of narrative activities. A *linear activity* which consists in making a copy of the narrative fragments almost as before. An *activity in spiral* which consists in enriching widely a brief note, or a sketch. An *activity of editing* which consists in articulating the collected materials and an *activity of sieving* which consists in reducing, in erasing certain collected elements. So the nature of the transformations is more or less important within each of these activities.

Linear narrative activities

Type of transitional instruments	Narrator's activity during the elaboration of the story	Type of transformations of the story fragments
Mirror	Copied, reproduced, reused as before	Transformation of the shaping or the size (police, image size, etc.)
Translated	Reuse to translate from one media (or one frame of reference) to another media (or frame of reference)	Change of frame of reference or media

Table 1. Mirror and translated transitional instruments

Mirror transitional artefacts are elaborated during exploration or inspiration, and then they are copied out during production. They have the same meaning, same presentation, same appearance and same function.
For grown-up narrators, mirrors transitional instruments often correspond to brief notes of spatiotemporal indexations in the journey diary (for example dates, places). These elements will be resumed as before during the elaboration of the narrative.
In the case of Sarah, there are no dates, on the other hand the place where the story takes place is resumed, copied out (the beach). There is also a transitional translated instrument.
In September, Sarah draws a radio (1) then in October, she redraws the radio and inserts into the text "a lady listened to the radio " (2). The mirrors transitional instruments and translated do not thus undergo alteration or important change. They transit in the intermediate area of experience then are almost cut again and resumed identically (1-2). This linear activity around the mirrors transitional instruments and translated is present and similar for the adults and the children.

Spiral narrative activity

Type of transitional instruments	Narrator's activity during the elaboration of the story	Type of transformations of the story fragments
Elliptical	Material are enriched, developed in order to elaborate correct sentence (grammatical and semantical aspects)	Transformation of the organisation, increasing of the volume of the story
Embryonic	Ideas are developed, enriched, filled out	Transformation of the editing, organization, increasing of the volume of the story

Table 2. Elliptical and embryonic transitional instruments

For travelers narrators, elliptic and embryonic transitional instruments correspond to brief note-taking, which are then developed during the elaboration of the narrative.
Indeed, embryonic transitional instruments encourage the narrator to deepen a theme later, but also the reflections, the links in the head of the narrator during the elaboration of the narrative, when he meets again the collected elements.
They make reference to several "diegetic" levels of the story, in other words in the co-presence, in the final story, of the narrator traveler who moves by fixing his thoughts and his/her observations and the narrator who gives his point of view *a posteriori* (after the journey).

In Sarah's activity, these embryonic transitional instruments would correspond to the sketch realized in September that is transformed into drawing completed in October. So in the sketch, the drawing and the text are less rich. We find later, similar elements which were resumed and enriched: a fish appears henceforth in the sea, the trunk of palm trees is more detailed, all the plans of the drawing are coloured, tints are more intense.
We identified for other children a development and an exaggeration process. So from a photo, transformed here by the child using the “Beamer” POGO (Decortis and al. 2003), the child stresses the forms of the face as shows the illustration below.



Figure 6. A photo transformed using POGO
This activity of exaggeration, transformation resounds with the definition of the imagination of Bachelard, for whom imagination is the capacity to deform the images supplied by the perception. We believe that this activity which consists in enriching a material, in distorting it, join in embryonic transitional instruments. In that case, the transformation, the change, and the development of the materials of the story are important (1-2-3-4).

Cumulative narrative activity

Type of transitional instruments	Narrator's activity during the elaboration of the story	Type of transformations of the story fragments
cumulative	Association of heterogeneous narration fragments according to a thematic	Spatial reorganization
mixed	Association of heterogeneous narration from different media (photo, drawings, notes) according to a thematic	Multimedia assembling

Table 3. Cumulative and mixed transitional instruments

Cumulative transitional instruments can supply a red thread in the story. During the elaboration of the narrative, they report various "diegetic" levels in particular of the articulation between elements stemming from particular circumstances of observation (when the narrator works elements of the collection) with general statements of a knowledge (when the narrator works formal information possibly stemming from dictionary, encyclopedia).
In sarah's narrative, we have no data to illustrate this cumulative aspect. On the other hand, she operates a change of focus of the narrative between the first version and the second version. The first narrative is "homodiegetic", the narrator is the one who "enonciates" Whereas in the second narrative, the focus is "extra diegetic", the narrator is different from the protagonist (a lady).

Furthermore, the collages are recurring within the narrative activities of the children as showed by the illustration below: the child drew a scene around a photography of face. For adults, these assemblies are translated by a sophisticated articulation around themes, by an assembly organized and enriched by materials stemming from multiple sources. Here also this assembly was realized by a child by using the POGO Beamer (Decortis et Rizzo, 2002).



Figure 7. The photo of the school founder is used to reinvent a story by juxtaposing drawing.

Sifting narrative activity

Type of transitional instruments	Narrator's activity during the elaboration of the story	Type of transformations of the story fragments
Pragmatic	Trick to remember something to do	Physical disappearance
Ghost	Evaluated as non relevant	Physical disappearance

Table 4. Pragmatic and ghost transitional instruments

Between both Sarah's narratives, elements disappeared: the borders of hearts do not appear in the second narrative. The ghost transitional instruments illustrate the impossibility to tell everything in a narrative. It is necessary to keep silent about elements.

These ghost transitional instruments partially illustrate the dissociation which draws the outlines of the experience: some parts are underlined and preserved, others sink into oblivion. This logic is present in the same way in the children and adults narrative activities.

Mirrors and translated transitional instruments require a minimal effort of the narrator. On the other hand, elliptic, embryonic and cumulative transitional instruments, arouse a more important implication on behalf of the narrator. Transitional instruments reveal various forms of narrative activities: linear activities tend to resume as before a content; sieving activities consist in reducing; circular activities consist in enriching the story; activities of assembly consist in assembling, in editing several story elements.
It seems to us that the differences between children and the adults polarize around the activities of assembly and circular activities. Indeed, for children, spiral activities are especially constituted by development rather than by a thought which fills out and elaborates as time goes by. Furthermore, activities of assembly concern rather the collage and the assembly of visual elements. This can be explained by the difference of length of narratives (some lines for a child versus several pages for the adults).

Discussion

We have shown the role of mediated instruments, both traditional and digital ones, in narrative activity and their status in relation to the narrative activity phases that we identified. During the exploration, the children make the collection of small objects (« gri gri », stones, papers) which they collect on the place of their experience, which they take with them and bring at home or at school to constitute an imaginary collection. These same small objects, they will take them of the house, in a bag, to move somewhere else. During the inspiration, children use essentially the scratchpad, the observations book. The blackboard is of use as support to the discussion. Finally the collected objects during the exploration also becomes a support used during the phase of inspiration. During the production, the children use above all the stories book and coloured pencils to illustrate it.

The collection of small objects is a central activity for children. All these small objects serve to invent narrative universes, not inevitably written stories. We give moreover too much importance for the narrative in its written and linguistic dimensions (Ackermann, 2001). It is interesting, and the technologies can contribute to it, to envisage narrative possibilities which use other means of expression and which articulate self-expression through movements, drawing, music etc. All these small objects are specific for the grown-up traveler but also for the child who lives in a bigger world of mobility. So the children spontaneously commit in performative modes of expression as Bruner shows.

During the production of the narrative every child achieves in an independent and individual way the process of narrative creation. The inspiration in most of the cases passes by the writing in the exercise book of observations, a personal and individual tool where every child expresses his/her point of view on the experience, the places which he visited, the observations which he made etc. The production of the story also takes an individual character. It is nevertheless interesting to investigate the means by which these activities can be collectively made, so as to support the phenomena of social mediation between reality and imagination as Vygotsky shows it. And here again technology can play a role as we show earlier (Decortis et al. 2003).

The articulation of Winnicott and Vygotsky theoretical contributions to describe the creative and imaginative activities, seems to us fruitful. According to Winnicott, the intermediate area of experience is a rest area towards the tension between the internal and outside reality. It constitutes the largest part of the lived experience of the child. This intermediate area of experience allows to refine the regulations between the pole of the imagination and the reality.

Besides, it reports the double face of the creative activity, anchored on one hand in the physical and material world, on the other hand in the internal and imaginary world of the subjects. So, the narrative activity consists in working the materials of the experience until to reach a balance, an adequacy between the material world (transitional instruments) and the internal world (dissociation, association and transformation) of the narrator (Bruner).

Relating children and adult narrative activities allows to underline the supports necessary for the child to separate its experience as well as to associate it during the production. On the other hand, the transformation of the experience seems to be a dimension naturally invested by the child, in a much more visual and more full of imagery way than the adult.

The relationship which the adult and the child maintain to the past experience is of a different nature. During the collection of notes and photos, the adult tries to hold the present which falls over to past, he tries to keep tracks sent to himself. Then, he will try hard to re-connect with his experience thanks to his transitional instruments. The child does not seem to maintain this antagonistic relationship to the past experience.

Beyond these differences, the theoretical models are fruitful to analyze the narrative activities by children and adults. We thus propose a typology of the creative narrative activities, a

model with which the narrative activities transformed by the new technologies can be confronted. They are thus a first stage necessary to conceive new situations, new supports to narrative in particular to answer the following questions: How do new technologies transform the creative narrative activity of the children ? And vice versa, how the children appropriate these new technologies? In the service of what activity? How can we contribute to the development of the children as creative narrators ?

Previously, we investigated perspectives drawn by various narrative theories for their use to conceive environments supported by technology (Decortis 2004, 2008). Indeed, the theories in their epistemological and ontological dimensions direct design choices decisively. It is then essential to explain in what our theoretical perspective can be fertile to conceive narrative technologies for children.

In other words, our effort of conceptualization of the narrative activity has several purposes: 1) to understand, to analyze and to classify children narrative activities; 2) to serve as reference and to inform the design and evaluation of future storytelling tools.

For instance, NAM++ can be used by researchers to examine, compare and evaluate the influence of different tools on narrative activity. In this case, the model has a reference status. In a previous study we examined how narrators could use pinholes and video phone mobiles (Bationo-Tillon & Decortis, 2010). The model helped us to reveal the differences on each phases of the narrative activity: exploration-inspiration-production-sharing. NAM++ can also be useful for designers to choose technical functions in adequacy with their aim. For example, for a tool to enhance imagination, it will be important to think technical functions that allow the transformation of transitional artefacts: exaggeration, deformation, alteration of the transitional artefacts (colours, characters, etc). And finally, NAM++ can be considered as a pedagogical tool, to understand how the experience can be captured with different tools, and how these crystallisations of experiences can be worked in class individually, collectively, and their status in narrative activity. It can be helpful to integrate children's experience in education or children's imagination in narration.

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