Individual Learning in the Group

From a project called "A Games Manual for the Three-year-olds"
Authors
Five- and six-year-old children
Teachers
Evelina Reverberi
Paola Strozzi
Project coauthor and consultancy
Vea Vecchi
Photographs by
Vea Vecchi

When talking about group learning, there may be a misapprehension that it only occurs when the group cooperates in the construction of the same product. In our opinion, a learning group must be defined as such even when the product and process are individual but are generated and constructed within the network of relationships, self-assessment, and assessment carried out by the group and in the group.

We present below a brief look at some individual processes, a full description of which is given in what we call a research and study notebook (a small photocopied book with images, which gives an overview of the whole experience). Here the graphic representation of children playing Ring-around-the-Rosy begins with the production of individual works, which the children then go on to compare with the products of their groupmates. These works evolve quite quickly into a group cultural product while remaining individual products.

We often like to explore even traditional subjects such as drawing in order to discover the invisible content which is often concealed in the products we normally come across. It is a kind of investigation of "very low-definition truth," as Ruggero Pierantoni has described the critique and perception of everyday matters and events.

Effort and pleasure

In comparison to the past, a great many images are available to children today, many of which come from TV—images that are beautiful or ugly, inventions that are intelligent, standard, or stereotyped.

Having exposure to many images does not necessarily mean having the ability to draw better. Perhaps there is a greater distance between mental images and the level of graphic ability linked to biological

age; children seem to find it harder than they did in the past to accept a graphic result so far removed from the representations of reality that they see and that contribute to constructing their imagery of the world.

Equally, children find it hard to accept that better representational skills, and consequently greater satisfaction with their products, are gained by drawing more and accepting that they have to put themselves to the test again and again when drawing the same subject. In order to evolve, the graphic language, like all other languages, needs opportunities for expression, trials, and practice. Children's accepted time lag between desiring an object and attaining it has probably become shorter.

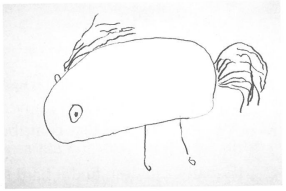
It is difficult to predict what role drawing will have in the future. Perhaps it will be replaced by other forms of expression or, alternatively, it may even become a language that is more precious than it is today. We believe it would be a pity to lose a language so rich in expressive potential and conceptual content; therefore, we try to ensure that the children maintain an active desire to draw and do not turn away from drawing because of excessive frustration.

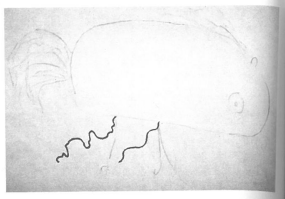
As teachers we believe it is important never to separate the two conceptual aspects—that is, the strictly expressive and the cognitive. Though we are aware that a visual representation is made up of many facets, we are prepared to support the child in a representational process that sometimes favors one part over the other.

The episode described below is a fragment of a situation that highlights the effort of learning, but also the pleasure the children derive from seeing their own competencies grow.

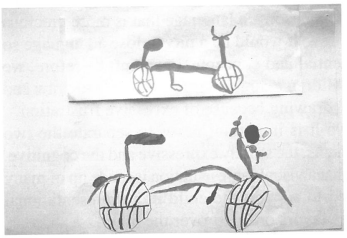
The effort and determination that are always required in learning situations are more acceptable to children when they are aimed at a clear and shared objective or when they are applied to interesting situations, but above all when they are associated with pleasure and gratification.

Over the years, we have collected a great many observations and documentation materials that provide evidence of how children even at three years of age pose problems to themselves about the three-dimensional quality of the images they have drawn. They use various graphic strategies to answer the questions raised, such as using both sides of the paper for the same object or resorting to three-dimensional techniques.

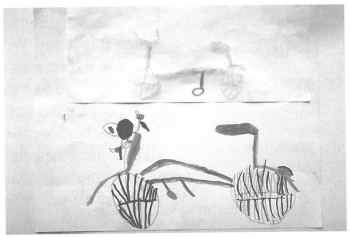




Federica (age three years, two months) announces her wish to draw a running horse. Once her drawing is completed, she looks at it and comments aloud: *A horse has four legs*. She turns over the sheet and draws two more running legs.



Elisa and Valeria (both five years, six months) draw two bicycles on separate occasions and both find similar solutions for representing them three-dimensionally.



Elisa turns over the sheet and draws the second pedal.

After finishing her drawing, Valeria comments: *"A bicycle has two sides!"* She goes to the window, turns over the sheet, and traces the whole drawing of the bicycle on the blank side of the paper.

We choose to support these types of research efforts because we think they are very interesting. We try to engage other children in thinking about the problems raised, not by suggesting models or solutions, but by identifying occasions that could more forcefully highlight the problems that the children are investigating on their own. The episode described below (the longest of all those appearing in this chapter) also falls within this context.

Project Hypotheses

Before embarking on work with the children, we always jot down some notes and hypotheses on the project we are going to undertake, as tools for initial orientation and reflection and as a basis for discussions with our colleagues. We set out below the initial stages of the project, written by the teachers, as we believe these are important for understanding the strategies we use to approach new projects.

1 **Initial delimitation of the field of investigation and identification of the theme to be proposed to the children**

Noticing the children's independent research on representing three-dimensional subjects using a two-dimensional medium such as drawing, we try to find a project design that can support their investigation, disseminate it, and allow new questions to emerge.

We identify a series of graphic themes as initial opportunities to bring out more forcefully the problems of representation in relation to different contexts, such as a soccer match, the game of Capture the Flag, and so on.

2 **Identification of a meaningful context within which to place the project**

We decide to suggest to the children that they produce a manual of games and associated rules, including illustrations, that can be left as a memory to the three-year-old children who will be joining the school the following year.

3 **Initial questions to be considered regarding the identified theme**

To what extent will the children to whom we make the proposal have a prior idea about the graphic and conceptual difficulties they will encounter?

Can asking them to make predictions about their drawings be helpful to the children as a way of *focusing* on possible problems, and thus enable them to face these problems with a greater degree of awareness?

4 Preliminary lines of observations related to the children's verbal hypotheses

What difficulties will the children perceive in the proposal?

- Drawing the human figure?
- The different points of view from which the figures will have to be drawn in order to make the representation clear?
- The difficulty of producing a two-dimensional representation of a three-dimensional subject?

How many children participate in this game of anticipating hypotheses?
What kind of verbalizations do they formulate?
What are the other children's level and quality of listening to these verbalizations and what do they contribute to them or actively discuss?

In the morning assembly where the whole class gathers together, the children appear to be interested in the proposal of explaining a number of games and the related rules to the younger children. They suggest using very direct forms of communication (which can be achieved with minimal effort), such as coming to the school in person to explain the games verbally, or getting someone to record them with a video camera as they play the game and subsequently showing the recordings to the three-year-olds.
After a process of negotiation between children and teachers, the proposed solutions, which are all intelligent suggestions, are eventually narrowed down to two: one is communication by video recordings and one is a manual with written texts and drawings.
The first game that the children propose to describe is Ring-around-the-Rosy, as they consider it to be particularly suited to three-year-old children.

5 Ring-around-the-Rosy: Identity of the game

"A children's singing game in which players dance around in a circle and at a given signal squat." (Merriam-Webster's Collegiate Dictionary, 10th Edition, 1994)
"… as if children's Ring-around-the-Rosy did not mean going around nothing, as if with their circling action they were going around a space that, though it may contain nothing, is nevertheless delimited and made to become *something*, thanks to that circling action." This is what the philosophers Alessandro Dal Lago and Pier Aldo Rovatti wrote in their manual *Per gioco*.
This *going around* is an ancient game that, we think, is played in various ways by almost all the children in the world. Yet it is also a complex representational situation, since the representation has to account for the rotation of the human figure (front, back, and profile) placed within a circumscribed space delimited by the children holding hands. Our culture defines this space as perspectival (even if this is stating the obvious, we should always remember that perspective is not an objective situation but a cultural interpretation).
While we are aware of the manifold metaphorical and philosophical interpretations that may be attributed to the Ring-around-the-Rosy game, our intention in this case is to use it primarily as a well-known context, frequently *inhabited* by children, which has the capacity to highlight the research problems and possible solutions involved in representing figures at different perceptual levels.

6 Method of the proposal

Various graphic materials, sheets of paper of different sizes. The proposal was made to all the children in the class, leaving complete freedom in the choice of group formation.

Lines of observation

- What kinds of group formations do the children choose and why?
- To what extent do the problems that were expressed when the children made their verbal hypotheses re-emerge at the moment of graphic representation? In what way do they do so? Do they resolve them silently or by asking questions? To whom do they address their questions?
- What dialogues are taking place? What cross-influences emerge?

7 Self-assessment and assessment

Ask groups of four to five children to comment on the drawings produced and the relationship between their verbal predictions and their drawings.
The groups are formed by taking into account the degree of communicative harmony between the members and the different graphic solutions used.
The intention is to underline and clarify the value of the children's constructive processes.

Lines of observation

- What aspects do the children emphasize most?
- What kind of verbal language do they use to do this?
- Do the children have any preferred graphic solutions? If so, which and why?
- Do the authors abandon or defend the solutions that are least appreciated? What kinds of arguments do they use? Are these solutions being stored, to re-emerge perhaps in other situations?

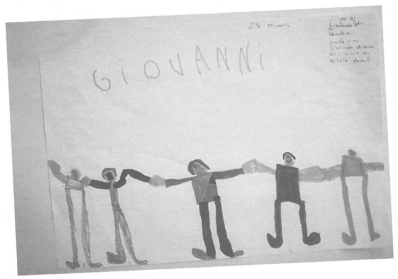
These approaches made up the initial framework of the project outlined by the teachers; henceforth the focus will be on the work done with the children.

The Ring-around-the-Rosy Game

Though this project was conducted with all the children from the same class, our narrative deals with only part of the story. This episode concentrates on the graphic representations of the Ring-around-the-Rosy game produced by three children: Giulia (four years, ten months), Leonardo (five years, six months), and Giovanni (five years, seven months). The episode is emblematic of the individual learning that is constructed within and with the contribution of the group.

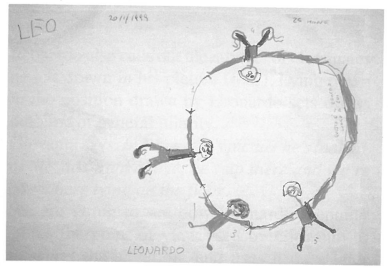
The children play Ring-around-the-Rosy, talk about "Ring-around-the-Rosys," predict the way in which they can be represented graphically, and then draw them.
We will begin by putting together the verbal predictions and the individual drawings of the three children who are the protagonists of the story.

Giovanni: *Drawing a Ring-around-the-Rosy is easy! Because you draw some kids with their faces in front and then… not all of them with their faces, but also with their backs.*
Giovanni seems to have clear ideas about what to do: he identifies the need to draw children from various points of view.



This is the Ring-around-the-Rosy that Giovanni drew after making a verbal prediction of the representation. He comments on his drawing as follows:
I drew a different kind of Ring-around-the-Rosy, with the kids with their heads in front.
Giovanni seems to *make light of his error* by giving a definition of "difference" that can include many things, even a Ring-around-the-Rosy in a straight line.

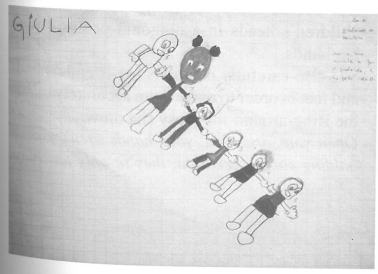
Leonardo: *I think it's easy to draw a Ring-around-the-Rosy of kids because you draw a round shape like this* (he traces it in the air), *then the kids… then… it's done!*
To Leonardo, the circle seems to be the guiding shape of the whole representation.
Once his drawing is completed, to his great satisfaction, Leonardo comments on it like this:



Look what a great Ring-around-the-Rosy! There's an arm here that's a little longer, but otherwise it wouldn't reach!
In his drawing, Leonardo followed the schema that he had previously hypothesized verbally, drawing the circle first and then drawing four children on it.

When the children have completed their drawings, they are called on in groups to comment on their own Ring-around-the-Rosy and those of the other members of their group. The groups are formed partly following the children's own suggestions and partly under the guidance of the teachers, who take into account the different strategies adopted by the children, both in the way they define the problems and in the search for different ways to resolve them.

The children begin to make their first comments, and then turn to Giulia:
What about your drawing, Giulia? Will you show it to us?
Giulia (leaning her elbows and forearms on her drawing):
No, okay, I know I got it wrong, I made a line, not a circle of children… it's hard!



The teacher's assessment is not as harsh as Giulia's, since in her drawing she set the children on a diagonal line across the page. From this layout we glean that she has been asking herself some intelligent questions and playing with ideas intelligently to convey the spatial situation of the Ring-around-the-Rosy through her drawing.
The teacher elicits comments on all the drawings.
Giulia: *Well, they're not really Ring-around-the-Rosys but we did the best we could.*

Giovanni: (laughing) ***Why don't we all stand like the kids in our drawings?***

Giovanni's idea, which turns around the usual approach of interpreting reality through drawing, appears to us to be excellent; in this way, even the *trip-ups* of the representation can become elements of fun in order to advance thinking. It is an intelligent idea, brimming with questions, trials, and fun. The teachers pick up the idea and later relaunch it to all the children in the class, group by group.

Here we will follow only the work of two of the children we have already introduced.

Giulia: *I want six kids because I drew six!*

She examines her drawing at length and appears to be wondering how to get her classmates to stand in the strange diagonal position she has drawn.

She solves the problem by positioning the children's heads in a diagonal position with her hands.
She also carefully positions her friends' hands and feet in order to make them accurately match the Ring-around-the-Rosy she drew.
Open your arms out, your hands aren't exactly holding each other tight, they're only touching.

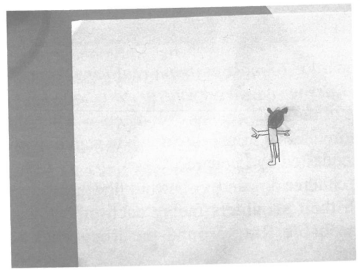
Leonardo also calls out the number of classmates he has drawn in his picture (four). Lying down in the position drawn by Leonardo sets off an outburst of general hilarity.
Giovanni says: *In Leonardo's picture he's looking at the kids from above, he's up there and we're down here lying on the floor.*
We are going to see how Leonardo mentally stores the point of view used by Giovanni to *interpret* the situation, and uses it on a later occasion. Very often it is other people who, with their comments and interpretations, make us more conscious of the choices we make.

Leonardo: *To make it into a real Ring-around-the-Rosy we need everyone to stand up!*
One of the most amusing moments is when the children move from lying down to standing up, as requested by Leonardo.
The children do stand up, but they find themselves with their shoulders facing each other in an improbable Ring-around-the-Rosy back to front.
Leonardo: *No, this isn't right. This Ring-around-the-Rosy is kind of small and a little silly. The backs are turned toward the other backs, but the bodies have to face the other bodies.*
Giulia: *But the picture is always still. How can you make the Ring-around-the-Rosy so that it shows?*

Giovanni: *Come on guys, let's try to do a Ring-around-the-Rosy for Giulia, then we can see what we look like, like a photo!*
Through his words, Giovanni seems to be positioning himself from an external point of view in order to get an overall view of the situation. It is important to know how to move through space with your thoughts.
Giovanni: ***There are some kids that you only see their backs. I can see Giulia's back, she's looking at Giorgio's face, Leonardo's side (profile), who's looking at Matteo's face.***
Some statements can be seen as generators of thoughts that *enlighten* the mind. Giovanni's is one of these: backs and fronts, then profiles and fronts of human figures who are looking at each other and are positioned in a relational space. This relational situation will become an important aspect of the experience that other children will take up and use as guidance.

Ring-around-the-Rosy 2

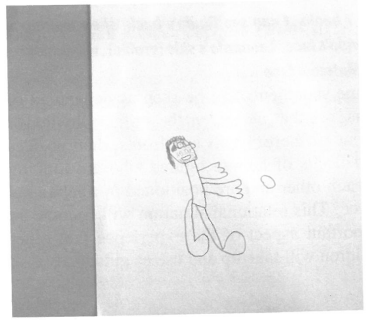
At this point, we suggest that the children make a second individual graphic representation of the Ring-around-the-Rosy, and place them in mixed-gender groups of four to six children. The groups are proposed based on the interpretations the teachers made during the first Ring-around-the-Rosy experience. We continue our focus on Giulia, Leonardo, and Giovanni.



Giulia seems to be the most perplexed: *I'm going to do the kid from the back because you need…*

She gets up from the table and holds out her arms to look like the figure she has drawn, thinking and expressing her thoughts aloud. *Okay… I have to draw some kids who are standing like I am right now. I made this girl with her back turned…* (she holds her arms out in front of her). *But what about the others, how do I get them to look like they're standing up? I don't know how to draw the kids from this side.*

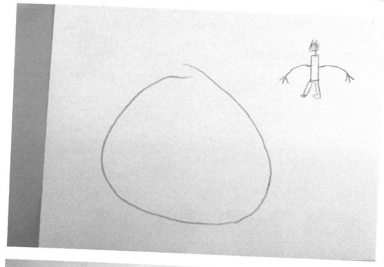
Giovanni: *Giulia, you have to draw the profile…*



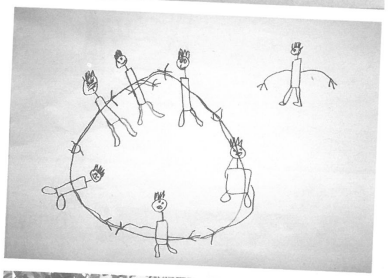
He shows Giulia the first figure he has drawn. The strategic position of the figure is worth noting: the arms are stretched out in front, ready to link up with another figure seen from a front view and one seen from behind. The figure shown in profile is a structural peg of Giovanni's Ring-around-the-Rosy.

This is the profile. Giulia, it's better to draw the profile first because otherwise you keep going on and on and then you can't tell what's going on any more!

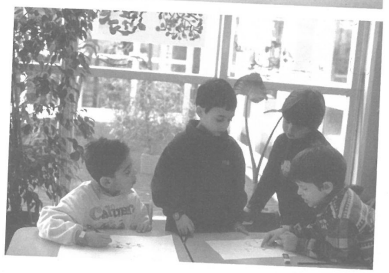
This may be what happened to him in his first drawing (the Ring-around-the-Rosy in a line).



Leonardo: *I know how you draw a Ring-around-the-Rosy of kids. First you draw a circle, like a Ring-around-the-Rosy… then you need a kid who's standing outside and looking at it…*

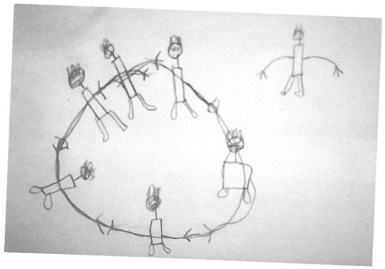


Leonardo's initial schema that we saw earlier is still very strong and seems not to have been undermined by the real-life trials of the Ring-around-the-Rosy or by his classmate's comments. Or, if it has been undermined, since a graphic model is a conceptual schema, it will need time to be modified. At times we may notice that the schema we are using is not appropriate, but we do not know how to modify it.



Giovanni: *Hey Leonardo, you can only see your kids from the front! Because the ones you see from the back are always there, always!*
Leonardo: *Okay, then I'll put some hair on this one, this one, and this one.*

Leonardo takes a pencil and covers up the faces of the figures in the foreground.



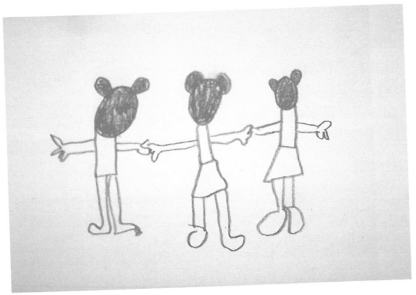
In this second Ring-around-the-Rosy all the children have chosen to use pencils, a choice that probably shows an awareness of the difficulties involved and therefore of the possibility of modifying the drawing. Error and modification are integral parts of research and learning. It is necessary to accept them as such intelligently and without worrying about them.

Leonardo: *This is okay because... look: this kid is looking at this one, then this one's looking at this one, this one's looking at this one… there, it's done*!

Then, as a final comment on his drawing, he adds: *You can see these kids from above, like this*. He stands up and raises a hand, almost as if he were defining a point of view from as high as possible: … *and from the top they look like they're lying on the ground!*

In interpreting and commenting on his drawing, Leonardo uses two interpretive *readings* that were made earlier by Giovanni: one child who, in the relational space of the Ring-around-the-Rosy, is looking at the face of another child; and the point of view from above.

Here we can see quite clearly how, during the process of learning, continuous loans of knowledge, hypotheses, and points of view are being made among the children.



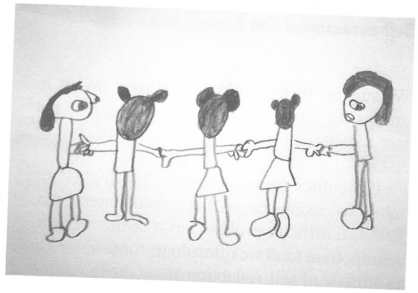
This drawing by Giulia shows three figures seen from behind.
Giulia is still a prisoner of her dilemma. She has understood that it is necessary to draw the children's backs, a conviction that has been strengthened by the dialogue taking place in the meantime between Giovanni and Leonardo. As a result of this, she has added two more girls, who can be seen from behind, but she is still not satisfied.

Turning to Giovanni, Giulia says: *How did you do the ones on the other side* (the children facing the front)?
Giovanni (pointing at Giulia's three figures seen from the back one by one): ***Giulia, I have an idea! Who are these kids looking at? Who's this one looking at? You have to put in the ones on the other side, otherwise they're not looking at anything.***

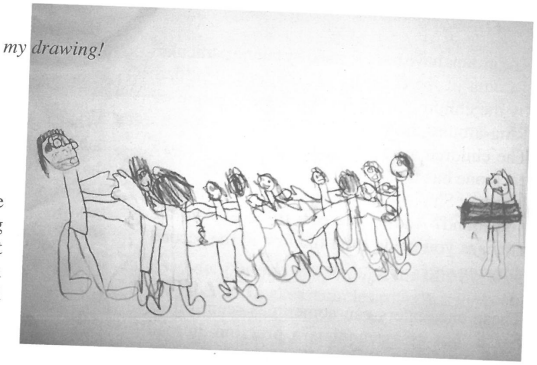
Giovanni: *Just look at this, we're doing a real Ring-around-the-Rosy. Guys, come here, let's do a Ring-around-the-Rosy! Okay, I'm looking at Giorgio for a while, then Leonardo for a while, Giorgio's looking at Leonardo, Leonardo's looking at Giorgio, then we go around, and for you who are looking at us, everything changes.*

Leonardo: *Now, Giulia, I'll explain the profile to you… look at me! See? It's like a little line that goes all the way down, like this.*

Finally reassured, Giulia then draws two figures from a side view, but the problem persists: *Yes, but now where am I going to put the other heads? Can I draw some more faces?*
Giovanni: *You can see a little bit of the front… not all of it, but you can see it… there's a little bit of room here in the middle to put in the kids who are looking at these ones!*

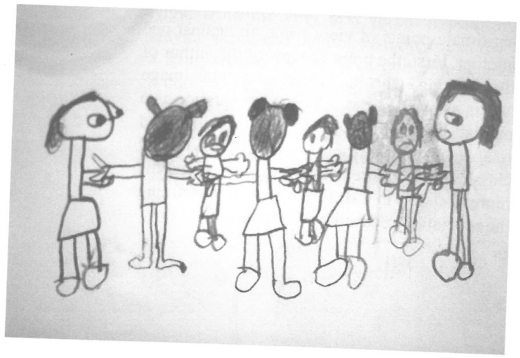


Giovanni: *Look at my drawing!*



After a few more hesitations, and casting a sidelong glance at Giovanni's drawing on the table every now and then, Giulia completes her drawing.

The rotation of the figure seems to have been understood, though perhaps not the representation of space yet, since the foreground and background figures appear to be compressed almost on a single baseline.



Self-assessment and Assessment

We suggest to the children that they revisit in groups the work that they have done. It is not just a matter of narrating their actions, but of re-thinking the process they worked through, the difficulties they encountered, the doubts, the solutions, and the issues that are still unresolved. This is a difficult process but it seems to us to be important (and we often do it) for developing an attitude of self-reflection about the things we do and our own strategies, supporting and at the same time fueling the processes through which we gain understanding.

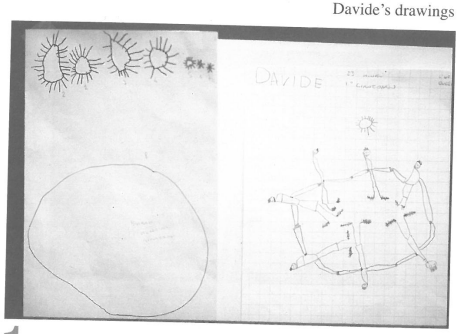
The groups have been formed by taking particular account of the diversity of solutions identified by the children in the second representation of Ring-around-the-Rosy.
The children are looking at both the drawings each one has made.
Teacher: Shall we try and compare the solutions you found? And, if you can, try to explain the changes you made from the first to the second drawing.

These encounters can sometimes seem rather harsh, but assessment is a precious human measuring tool, especially if it takes place within *balanced* situations, among peers, and in a shared context. The evaluations are certainly not easy, since a number of different but equally legitimate points of view come up against one another. First, the point of view of the author of the drawing, who has a certain mental image and is aware that his or her representation is a mediation between what he or she thinks and is able to do, and then the points of view of classmates who often read the situation and the representation in a different way, undermining the mediation reached by the author.

What the children generally appreciate is the awareness they gain of the way their thinking has evolved. This is an important process that elicits a movement toward the possible—what Vygotsky calls the "zone of proximal development," in which the learners advance their understanding.
The teacher's role at this point is precisely to highlight this advancement, however small it may be. The child ought to emerge from these encounters as a *winner*.

Giulia: *Davide, your Ring-around-the-Rosy is great! The second drawing is a lot more Ring-around-the-Rosy!*
Davide: *Yes, I think my second one is really good, too, but maybe I need to change the shape of the circle… I should have drawn lots of Ring-around-the-Rosys with different shapes, because when we move in a real Ring-around-the-Rosy, the shape changes, and it doesn't always stay the same round shape!*

Davide's drawings



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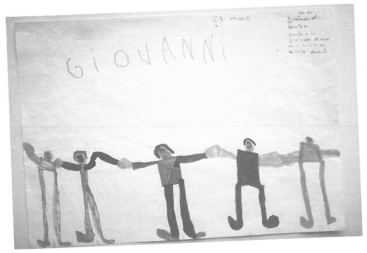
Davide: *If we do this, though* (he lifts the sheet of paper and makes it circle around), *it looks like it's going around.*
The child may not be an expert at drawing, but he has understood very well that the identity and the fun of playing Ring-around-the-Rosy lie in that very circling-around movement.
Right from the very first verbal hypotheses, Davide expressed the impossibility of drawing a Ring-around-the-Rosy of children because it could never really go around. Yet during his work he never gave up trying to find a solution to this problem. Conveying a sense of motion graphically is a very interesting problem; we address it in our follow-up to the project.

Giovanni's drawings



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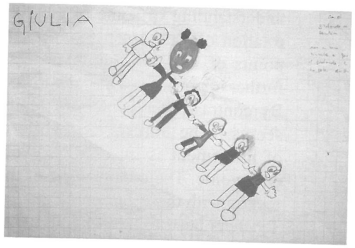
Giovanni: *Oh, it's always good for me to do experiments!*

Giovanni: *See that line? That was my first Ring-around-the-Rosy!*
I did it like that because it was easier. Then, when we tried to do a Ring-around-the-Rosy out there, I understood a lot of things, and then as soon as I got the sheet of paper… (Giovanni is speaking very slowly, as he often does when he is talking about a situation he has experienced, and he always seems to be describing something he is breaking down into sequences.)
I didn't start drawing right away… I stopped for a while… then I started to think… I thought about a Ring-around-the-Rosy… think and think again. (Conscious of everyone's silence and attention, Giovanni exaggerates his narrative style somewhat.) *A Ring-around-the-Rosy came into my mind… oh, it's just that it's like I was seeing it! So, copying from my mind, I got the Ring-around-the-Rosy right! I started from this one who's turned to his side… if I started doing the one from behind, everything disappeared from my mind… instead, I did the one on his profile with two hands like this* (held out) *who was just ready to hold hands with two other kids. The second one I did was one from behind, then this other one from the front… then on and on like that!*

Giulia's drawings

Giulia begins to explain directly from her second drawing.
The first thing I found out was that you really had to have the kids from the back. Then, for these (the profiles) *I already knew how to do them because I had already drawn some kids standing like that. But I didn't know that you had to have them in a Ring-around-the-Rosy just here on one side and on the other side. Giovanni explained it to me. Then we tried it out a few times and I understood that you had to have them. The hardest thing was to do these ones that you can see from the front. There wasn't any room left… so I made them small.*



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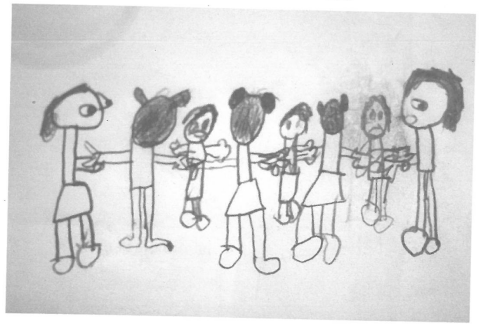


We think there is little need to add further comments and interpretations since, as this case shows, children are able to engage in self-reflection about their own processes with surprising clarity.
This is a valuable ability that requires frequent occasions for reflection, comparing ideas, and practicing your skills.

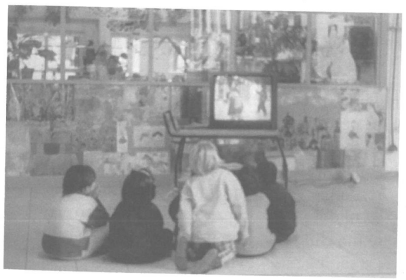
Relaunching the Problems

The subsequent steps of our work with the children are guided by our interpretations of the processes we observed and documented.
In the experience we just described, the children's understanding of some of the concepts, such as the rotation of the human figure in relation to different points of view, is certainly advanced, but it needs further opportunities in order to become consolidated. By contrast, the problem of representing space still seems to be unresolved, while the representation of movement is interesting, even though it is still embryonic. The continuation of the work thus has to reckon with these aspects.
Teachers need to have the ability to be in touch with the children's strategies and problems and to play that famous "ping-pong match" with them, as described so wonderfully in the metaphor often used by Loris Malaguzzi to explain the teachers' role.

In this case, we suggest a representation of another game: "Red Light, Green Light,"* which, in comparison with Ring-around-the-Rosy, draws attention to an expanded space where the figures are clearly on different planes in relation to the observer.

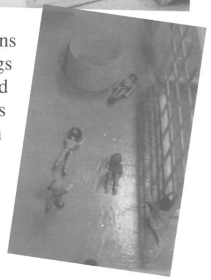
* The game begins with one child facing the wall with his or her back to the other players. The child says "Green light" and starts to count. The others, all starting from the same place, have to move quickly toward the wall against which the counting child is facing. When the child at the wall decides to turn around, he or she calls out "Red light," and the children who are running have to stop short. If the child at the wall catches a glimpse of anyone moving, that person is sent back to the starting point.

We think that recording the children with a video camera may provide a sort of *moving photograph*, according to the suggestions made by Giovanni and Davide.
The teacher takes particular care to record from different points of view, including one from the top of a ladder...

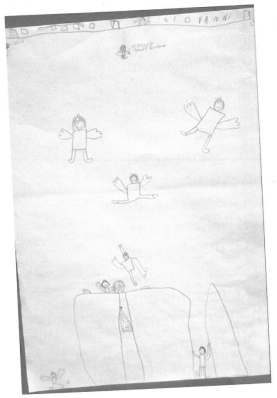


to allow the children, in groups, to then discuss their viewings from the various perspectives.

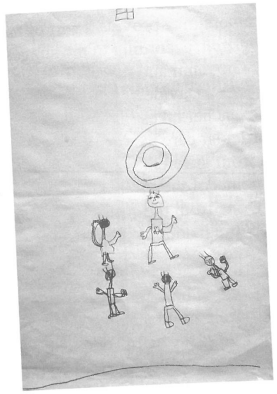
The discussions and viewings continue, and the game is simulated with a scale model.



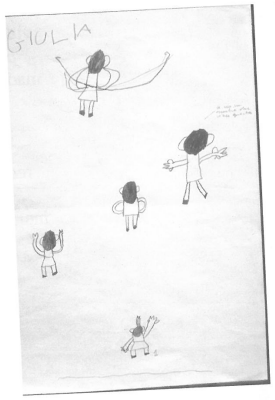
Representations of the "Red Light, Green Light" game



Giovanni's drawing reconfirms his understanding of both the rotation of the figures and the space. Indicating the figure at the top of the sheet, he comments: *I made it smaller because it's the one farthest away.*
In order to illustrate the whole scene of the game, he uses a representational technique that architects call "axonometric projection," which presents a perspective from above. It is a very advanced point of view, which gives a strong narrative sense of the situation.



In Leonardo's drawing, space is indicated by three perceptual levels: the closest part of the foreground is the atelier wall, then there is the dress-up play structure in the middle of the piazza where the child who is counting is standing, then the entrance door in the background. The game is taking place between the atelier and the dress-up play structure.
Leonardo: *The kid who's counting has just turned around and everyone has to stand absolutely still, otherwise they pay for it.*
Leonardo also seems to have understood the rotation of the figures as well as the representation of the space.



In her drawing, Giulia intelligently places herself at the viewing point that enables her to draw the backs of all the figures, this being a new representational discovery that she uses most successfully.
The way she arranges the figures across the space of the sheet leads us to suppose that she is engaged in spatial research that has gone beyond the stage where all the subjects are drawn on a single baseline (often coinciding with the bottom of the sheet), typical for children of this age.

All three of the children's drawings are made with the sheets of paper situated vertically, indicating the point of view from which each child is observing the scene. Above all, this technique shows that the children are making optimal use of the spatial opportunities offered by the sheet to allow multiple representational planes.
Further occasions are subsequently provided with other subjects in situations of play and movement represented graphically as well as with three-dimensional materials; for example, children sitting around a table playing dominoes, a soccer match, Capture the Flag, Hide-and-Seek, and so on.

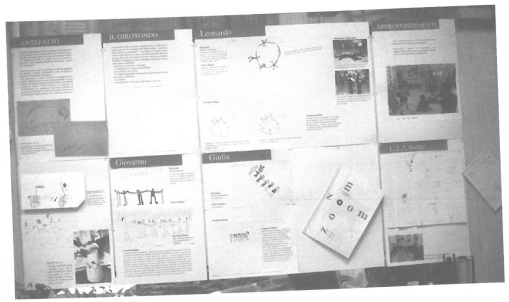
The documentation of the events, the comparison of the various drawings made over time by the same child, the recordings of the children's words and exchanges, and the dialogue among the adults, are all precious materials that allow a wider assessment to be made than one that simply focuses on the finished products (in this case, drawings). In particular, it becomes a friendly sort of evaluation that engages both children and teachers in self-assessment and assessment efforts that evolve over the course of the work they have performed together, and that do not make a fixed judgment but open the way to new possibilities.

Note: The compilation of the games manual did go ahead but it never reached the planned goal of publication, owing in part to the unforeseen initiation of other interesting projects.
During an assembly of all the children and teachers, it was decided that two other projects should be completed:

- the charter of home and school rules (a publication that originated from a discussion held by the children about the meanings, interpretations, and construction of rules, and from a direct dialogue and negotiation with the parents);
- the creation of a stage curtain for an important theater in the city of Reggio Emilia (the Ariosto).

Final Documentation

All the material produced in this experience was transformed into a slide documentary that was:



- presented to and discussed with the children, the parents, and teachers from other schools;
- organized into documentation panels on the wall arranged by summaries of the main stages: a prologue explaining the origins of the project, a theoretical presentation, examples from some of the children, and a research and study notebook reporting on the whole progression of the work.

This type of notebook can be photocopied at low cost and easily circulated in order to collect different opinions and other valuable interpretations that add to or are different from the ones we made.

All the documentation materials, in whatever form, should have the capability of being easily disseminated in order to elicit comparisons of ideas and interpretations.

The main problems presented by this kind of work are actually quite simple and are founded on a number of beliefs:

- that imagination and creativity are not separate from cognitive aspects;
- that knowledge is an adventure that should be experienced through personal and group-based research, taking place with different time frames, depending on individual and group-based rhythms;
- that the quality of the processes can construct a type of knowledge that is more capable of fostering creativity and interaction with different problems and languages (disciplines);
- that understanding can be fostered by the reflective thinking generated by in-process documentation and the constant comparison of ideas with others;
- that teachers should be careful not to let day-to-day practice and didactic activities betray the theories stated;
- that it is necessary for teachers to continue to learn; therefore, documentation materials such as these (or of a different kind) give us an opportunity to understand a little more about the children's and our own thinking strategies, and allow us to engage in something as important as exchanging thoughts and ideas with others.

Learning Indicators*

Are there any elements of assessment that can help us understand whether a group has learned and, if so, at what level? This is one of the many interesting questions that we have been asked by our Project Zero friends.

After some initial philosophical and psychological resistance to accepting assessment parameters that are formal and not context-based, we thought it would be inappropriate for us not to deal with this aspect of final assessment. While we remain convinced that many of the assessment processes are enacted during the work itself, we have nevertheless identified some elements that we believe to be representative of a learning process: the use of a certain type of verbal language, the construction of hypotheses, the formulation of theories, strategies of action, and so on. These elements were suggested to us in part from our readings, but most of all by our experience of field observations accumulated over time. We organized these elements by category and in long lists (no doubt excessively long), resulting in the construction of tables of indicators that we regard as being useful for assessing children's work as well as our own.

In order to establish the validity of these indicators, we then attempted to apply them to different themes and processes.

It is difficult to give an example, since these tables would be virtually incomprehensible without written or oral explanations. In addition, we need to have further trials, summaries, discussions, and exchanges of opinion about them. Nevertheless, we feel we can say that the indicators we have identified are for the most part useful for analyzing a learning process and for providing an overall assessment of that process. Most of all, they help us as teachers to build a mental map of *lines of observation* (situations to be noted) that orient and support the observations as the work proceeds. As indicators, they provide sensitive and pertinent elements for interpretation of the documentation produced, increasing our awareness in our daily work with the children.

They are therefore working tools that are certainly interesting, even if we still think that the most formative process for the teacher is the one we have adopted; that is, identifying certain indicators, discussing them with the other teachers, and verifying them. A reference list can certainly provide orientation, as long as we do not adhere to it so strictly that we become its prisoners and abandon our curiosity about children or our attitude of listening and research, which we feel are the real indicators of a good teacher.

* See also Proposition VII in the chapter "Form, Function, and Understanding in Learning Groups."

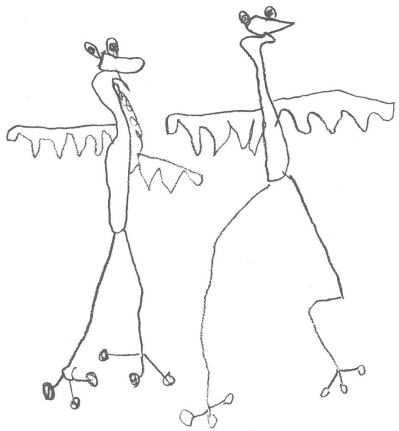
Falsification of Indicators

It is self-evident that there are subjects and processes for which indicators are hardly applicable, such as those that are mostly connected to processes of deep expressive force (which do not involve simply problem solving), as well as those in which attitudes and concepts are primarily *sown* in the hope that they will germinate in time.

Understanding the growth structure of a small leaf, for example—capturing not only its visible, formal structure, but also the rhythmic growth constituted by its pulse of life (and death), and approaching it as a living organism—means constructing a form of knowledge alternative to formal school-based learning (which is normally the most widely represented). It is a form of knowledge that is constructed through watchful and intense relationships—the very relationships that we hope to foster. In our opinion, it is this kind of learning that makes a difference, to both the children and the teachers and, more generally, to the culture.

This means an approach that involves constant attention to the quality of relationships and is thus difficult to verify by means of indicators, even sophisticated ones. In a sense, the language of relationships is one that we need to know how to speak ourselves in order to listen to it, to understand and assess it.

It is also a challenge, one which is not easy to assess, that we have faced together with the children day by day for many years.



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