

“Choose Two or Three Scapegoats and Make Your Point!” Should I? Critical Thoughts on a Fabulous Experience and Its Heritage

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Invited to comment on the legacy of Jean Piaget’s ideas in my own work, I will first turn back to the genesis (a Piagetian habit, I suppose!) of my contacts with him, to the reasons why I chose to study in his institute and to the socio-cognitive experience of entering psychological research from a Piagetian perspective (of course, not only Piagetian, as I have also had the chance to study with other very different researchers, among them Basil Bernstein in London and Willem Doise in Geneva). I will then choose more specifically a few of Piaget’s ideas that weave throughout my own work.

On the steps of the university, I was hesitating between psychology and education, teaching mathematics or philosophy, going into social or youth work, not daring to imagine myself as a researcher. My father, a physicist, then gave me some very good advice: choose an expert rather than a discipline and observe him working. This is how I came to Piaget, known for his important empirical work in the social sciences—and I have not been disappointed. Being a student of Piaget was a breathtaking experience from the beginning: his sphere of knowledge was so extensive that it became immediately clear to me why his large audience at the university was made up of students that were studying with him as long as

four consecutive years. It took indeed quite some time to be introduced into the complex questions that Piaget was raising and to gain a minimal familiarity with the scientific world that was the arena of his thoughts. I also ventured beyond the walls of his institute into other faculties of the University of Geneva. This additional experience helped me not only to put into perspective the originality of Piaget's contributions but also to renounce any ambition of full mastery of any of the questions raised. Complexity, models, intellectual traditions, changes—they all became keywords.

Knowledge is fascinating. Piaget had knowledge as his main object of study (and not the child—which was quite a surprise to me). I felt deep relief when I understood that knowledge could be better described as a *process* (i.e., knowledge-in-the-making) than as a state of the art. This was perhaps my main Piagetian “finding” during my studies. Of course, I should not say “finding,” I should say “learning”—a better term, because I cannot claim for myself such a finding. But Piaget made a very important point: he legitimized the idea that a student, even a child, is in fact “finding out” for himself¹ everything he learns. The experience of “discovery” (in its various forms—insight, sudden understanding, etc.) is at the root of Piaget's description of cognitive development. He sees it as the basic and fundamentally motivating intellectual and emotional experience. It was also what I was experiencing and enjoying, although not uncritically.

I was wondering if children—and we students—were likely to find out things that would diverge fundamentally from what Piaget and his intellectual forebears or opponents had already “found out.” I hoped so because I did not want to depart from the idea that there is social space for the new generations to be creative. But was the creativity of the individuals

not becoming lost if the main opus of their development was considered by Piaget to be the reconstruction for themselves of concepts that others had already developed? I had the strange, insecure feeling that I was trapped in some variety of ego-socio-centrism: not the egocentrism that Piaget had attributed to the child, nor the socio-centrism that he had discussed, but a form of adult-centrism in which the kind of adult that Piaget is would be the norm (Piaget-centrism). Indeed, why would the auto-equilibration process *necessarily* lead to those (formal) modes of thinking that Piaget had experienced and described as the last stage of development? Should every normal person end up thinking like him? What could the alternative criteria be for the acknowledgment of a cognitive advancement? Why were children of Iran (Mohseni, 1966), Morocco (Bovet, 1974) and other distant places (Dasen, 1972) reported to have delayed development in the acquisition of operatory concepts? Were we not socio-centric in considering that this time lag was due to a “less facilitative” environment?

<H2>Is Formal Thinking Always the Unique and the Best Endpoint?</H2>

Reflecting on school visits in the classes of progressive education teachers, I was wondering why would students’ inquiry learning be expected to make them necessarily “discover” the concepts presently used in the sciences. Of course, modes of reasoning and established scientific knowledge are available in children’s environments, somehow already there to be “rediscovered” by them. But why would individual creativity end up reinventing necessarily, via the reequilibration of cognitive conflicts, the existing scientific (and supposedly so “logical”) world? Nor, in my eyes, could social determinism explain why the personal involvement of an I “in search of meaning”² would necessarily be satisfied by the type of

knowledge described by Piaget and like-minded scientists? We also had some distant echoes of Smedslund's criticisms that helped us in becoming aware that Piaget's "logical operations" were constraining explanation of behavior to some kind of logical reductionism (Smedslund, 1966, 1992).

Reading the few texts of Vygotsky that were available in those days did not solve the problem: why would children appropriate the expert's knowledge? The idea that the learning of formal knowledge was the result of adults joining in the child's zone of proximal development and introducing proper semiotic tools was quite a contrast with Piaget's views. It opened up new perspectives, particularly in understanding the social origin of internalizing processes in the child. But why would the line of "development" be equated with this "learning of formal knowledge?" Why would development end up necessarily in the present state of the experts' knowledge? We were not certain that this was really what Vygotsky and Russian psychology had been saying, but it was difficult for us, in those days, to check.

Later, Hundeide (1991, 2005), with his discussion of the meaning of specific schooling and teaching practices in specific contexts, would comfort me in my doubts about the line of development being usefully equated with (or reduced to) the development of abstract thinking.

Social Interactions in Real Life and in Theory

In the meantime, I was really becoming interested in the pseudodialogues between mothers and babies described by Schaffer (1977): he shows that the protoconversation itself is

coconstructed, and the partners are interdependent. The distant echoes of Bruner's ongoing work on language acquisition and the role of social formats mediating, structuring, even engendering adult-child conversations, narrated by researchers from Oxford, intrigued me as well. We later read them (Bruner, 1983).

Were all these conversations and asymmetrical interactions between expert and novice, including Piaget's clinical interviews, sophisticated imitative exercises or truly open conversations? They had to be both, certainly. It was not easy to discuss these questions openly. Piaget was busy building his theory. He was not granting much free space to his students and research assistants. Reciprocity (in spite of being such an important concept in Piaget's model) was not at the core of the system of social relationships that Piaget was developing around him. In 1968, when students asked him why, I remember him answering by proudly showing a letter: "Why are you not happy to contribute to my work (*mon oeuvre*)? Is this not sufficient? Plenty of students abroad would envy you. See the letter that the Americans have just sent me: they are even founding a Jean Piaget Society!" A climate of scientific "orthodoxy" prevailed at the institute, which proved successful in having research efforts converge. It was sometimes emotionally painful and intellectually confining for those that did not fully agree. Yet Geneva was a fascinating place, attracting scholars from all over the world. Some would stay; some felt too critical to stay. But students and young researchers learned to grasp the ideas that circulated in the corridors and the cafeteria.

A delicate point of the "orthodoxy" was the relation to education. The Institute Jean-Jacques Rousseau, which had gradually become a school and then a faculty of psychology and educational sciences, was founded by Edouard Claparède, who wanted to root progressive

education in empirical research and to offer the possibility for teachers in training to attend university and learn about educational research. Piaget had been called to Geneva by Edouard Claparède and Pierre Bovet to contribute to this project (Oelkers, 2008). He did so, notably, as director of the International Bureau of Education. His writings from this period are collected in several books on education. But Piaget never did empirically study education, *per se*. He reminded me of his cocitizen, the Neuchâtelois writer Denis de Rougemont³ (1929), who also had very definite ideas about education, strongly criticizing school education, sometimes rightly, but sometimes with arguments that could cast some doubts on the understanding of the complex social challenges that schools were facing. Were both these authors forgetting that not all families provide their children with the same learning opportunities as those that these gentlemen had experienced in their families and cultural environments (Perret-Clermont and Barrelet, 2008)? Were they claiming that the specific stimulating experiences that had positively sustained them at home should also be provided by schools and therefore should be implemented in teacher training and curriculum? Yet Piaget never did personally investigate possible alternatives to the ongoing traditional teaching. He was so critical of his school education and its formal teaching that he was not far from thinking that schooling disturbed children's spontaneous learning processes: "Children should not be taught answers to questions that they have not asked."

Of course, to some extent, this is right: too often students learn statements without understanding to which questions they are the answers; they retain information with no idea of their possible use; the meaning of what they learn, to them or to society, gets lost. On the other hand, why would children ask questions about things that they have not even heard of? Jean Brun, Jean-Paul Bronckart, and several others of us wanted to address these educational

questions seriously, and we moved from the department of psychology to educational sciences in order to conduct research on those activities that have specific and explicit teaching–learning purposes (didactics). This was supported by the energetic reshaping of the department of educational sciences that Michael Huberman was promoting. Unfortunately, it contributed to an unintended divide between *psychology*—henceforth discharged of the responsibility of systematically caring about education as a major cultural and institutional component of children’s lives (a rupture with Claparède, Bovet, and their collaborators’ initial project)—and *education* (to some extent left to the domination of adults’ perspectives, such as those of teachers, administrators, or politicians), as the child’s perspective, usually voiced by Piaget and other psychologists, tended to be left behind.

This was a great disappointment to me, but it oriented me toward a new project: moving to Neuchâtel and founding a new institute of psychology and education at the University of Neuchâtel, where research could develop around more or less “forbidden” or “taboo” elements of the Piagetian research scene. These would include taking explicitly into account the sociocultural constraints and supports of the child’s (but also young adults’ and adults’) growing “minds” and an understanding of these as emerging personalities, nested in social activities, in quest of life skills as well as of identities. Special attention would be paid not only to cognitive learning but also to meaning construction and the relevance of educational activities for the learners, without forgetting that learning also occurs in settings that have not been designed as learning settings: therapeutic settings, workplaces, peer groups, and on other informal occasions, and also without forgetting that the “universal learner” or “mind” does not exist. The researcher can only meet real people (and not abstract representatives of a “growing mind”) who come along at a given moment in their life

trajectories (Zittoun, 2009), situated in time and space, with their past experiences and future perspectives.

<H1>“Choose Two or Three Scapegoats and Make Your Point!”</H1>

Piaget was not only teaching but also advising his students. I remember hearing him often give us this tip: “If you want to write a paper, choose two or three scapegoats and make your point!” There was something self-descriptive to this advice: Piaget was often introducing his own perspective as if it were a counterargument to a famous, previously mentioned author’s statement. Perhaps every philosopher and every scientist does this. But with Piaget, more than in any other of our classes, it drew us (in the role of listeners) systematically into century-long ongoing debates. It was not only stimulating but also overwhelming: at certain moments our awareness of the scarcity of our education and culture in these debates was growing; at other times we would retreat into a sort of admiration of our professor and then falsely conclude that the author just mentioned by Piaget was an isolated (!) thinker and that Piaget’s statements were completely (!) new.

Why only two or three scapegoats? Why was Piaget using such a negative term (scapegoat) and inducing us into such an aggressive social relationship? Was he a social psychologist with a (strange) theory of the social construction of knowledge? No, in fact, he did not see much point in developing a social psychology of cognitive development (Perret-Clermont, 2004, 2008). It seemed paradoxical to us that, in his theory, Piaget would grant so much importance to cooperation and reciprocity as a main dimension of rationale thinking and that now, in practical terms, the idea of cooperation would be replaced by some type of fight. Piaget was usually speaking of “*inner* cognitive conflicts”—and here he was presenting

himself as an efficient writer via a sort of punching game—obviously a *social* game! This puzzled me. Later, I had the opportunity to come back to this issue in various ways: through researching the impact of socio-cognitive conflicts on development (Doise et al., 1975, 1976; Perret-Clermont, 1976, 1980; Perret-Clermont and Carugati, 2001; Muller Mirza and Perret-Clermont, 2009); when intrigued by the role of the audience in logical reasoning, as Grize describes it, in particular, when he distinguishes models and schematizations—the latter marked by the addressee and never detached from its initiator (Grize, 2005, p. 71); and when Rigotti introduced me to a renewed pragmatic and contextually situated understanding of the long tradition of thinking as an argumentative process among debaters of differing standpoints (Perret-Clermont, 2006; Rigotti and Greco Morasso, 2009; Rigotti and Rocci, 2006).

Still, why “scapegoats?” Is this not an attitude—and perhaps even a gender-biased attitude—that will scare off many students and citizens and turn them toward disliking argumentative reasoning and even thinking? Was Piaget not right (even if he seems to forget it when he talks of scapegoats) when he claimed that cooperation and reciprocity are important, as alternatives to competition, in fostering thinking, learning, and social relations? Fortunately, for those who dislike this idea of useful “adversaries,” even some research in neurosciences, much in line with our own experimental results in psychology (Perret-Clermont, 1980), is providing evidence nowadays that social concern for equity can be rewarding and intellectually stimulating (Fehr et al., 2008). Yet it is tempting to follow the tip and make Piaget a scapegoat to forge one’s own thoughts and then present them as entirely new. I am sure the reader can find excellent examples of this in scientific literature.

As an adolescent in high school, I remember being surprised to hear a famous artist's quote that he saw himself as "formed by the influence of others." I was at the age of difficult self-assertion and could not immediately understand why this accomplished adult was claiming the importance of others in his personal growth and expression. Later, listening to Piaget's advice about scapegoats, I wondered whose influence I should look for: that of being inevitably and thankfully formed (or shaped?) by others or that of self-assertion in a combative "scapegoat" mode? I disliked both. Why were the reported experiences of the artist and of Piaget so different? Were they contradictory? *Nos esse quasi nanos gigantium humeris insidentes, ut possimus plura eis et remotiora videre*⁴: this perspective—not a novelty in an educational perspective as it dates back to Bertrand of Chartres in the twelfth century and was an essential premise in the Middle Ages and Renaissance (Perret, 2011)—sounded safer. Hence, I resolved to consider Piaget in the position of the giant and to try to step on his shoulders and look beyond. I must confess that his shoulders were very high. But other authors and colleagues provided ladders. This climbing exercise created new openings: approaching another person's perspective is always an experience of "otherness." One of the consequences of approaching Piaget as a person was the need that I felt to "put him back" (so to speak) in his own sociocultural context, and this has inspired me to revisit the concrete Piaget growing and taking up his first scientific and professional duties in Neuchâtel (Perret-Clermont and Barrelet, 2008). This helped me understand in which ongoing debates he developed his own thinking and what stands he took. I am now happy to ask my students which of these debates and stands they think are still relevant today in the present context.

Mead (1934) considered how, during their lives, people experience different roles when they interact with others who are different and, as a result, interiorize this experience in

the form of a “generalized other.” But there is probably more to this. The “alterity” of another person cannot be reduced to the interiorized experience of having interacted with him or her. Although recognizing how much the “me” is (co)-organized by role-taking and social experience, I think that there is a kind of obligation toward a clearer distinction between “other” and “I.” This distinction is vital to experience the *presence* of the other person and for *dialogue* to exist. The encounter with the other, with an intention to respect his or her intimate uniqueness, is an individualizing experience for the self, and it creates an opening for the growth of the individual person (Levinas, 1947/1985).

In the paragraphs above, the reader will have recognized how some of Piaget’s basic intellectual attitudes have been a source of inspiration for me, even if I was often far from agreeing with him. I will now allude, in an absolutely nonexhaustive way, to a few of Piaget’s ideas that I have consciously borrowed.

<H1>Pushing Some of Piaget’s Ideas beyond Their Initial Meanings</H1>

<H2>Children Are Not Miniature Adults: A Matter of Qualitative Changes</H2>

The days in which Piaget became interested in psychology were those of the birth of pediatrics and the growing interest of Freud, Claparède, Montessori, Gesell, and others in understanding the specificity of the child’s body and of his⁵ developmental and educational needs. This was certainly at the root of one of Piaget’s basic premises that still seems relevant today: children are not miniature adults. They are not just *quantitatively* different from adults because of an eventual lack of experience, knowledge, or intelligence. Piaget used to compare the growth of the child’s intelligence to embryogenesis: just as the body of the fetus

undergoes major qualitative changes to become a baby, a child, an adolescent, and finally a full-grown adult, the child's ways of reasoning are not just becoming more complex, powerful, and informed, they are undergoing major *qualitative* changes.

Piaget tried to describe these qualitative changes in terms of "structures." The observation of *décalages* (gaps between the acquisition of different notions within a given stage) and many critiques of the reductionism of this structural hypothesis have weakened it. Changes in children's intelligence need not be reduced to logical structures nor explained in those terms. Yet it remains interesting to describe the coherence of a child's reasoning within a set of relatively similar tasks and to observe how newly acquired understandings are transferred from one task to another. For instance, interesting processes become noticeable when care is put in verifying that the individual learning observed after certain peer interactions is of an operatory nature and not only mere conformity or lip service to what peers are saying (Perret-Clermont, 1976, 1980; Schwarz et al., 2008; Tartas et al., 2010).

The interdigitation of social and cognitive components in the acquisition and use of qualitatively new operatory competence is a rich and open field of inquiry (Perret-Clermont and Carugati, 2001; Psaltis et al., 2009) with important implications for the design of curricula, as well as for learning and assessment methods (Schubauer-Leoni et al., 1989; Schubauer-Leoni and Perret-Clermont, 1997).

It is not only the Piagetian autoequilibration process but also the social regulation of the unfolding *conversation* that affects, step by step, children's states of mind and their reasoning, offering them opportunities to interiorize newly coconstructed operatory

competencies (Marro Clément, 1999; Marro Clément et al., 1999; Schwarz et al., 2008). Cognitive growth is not an addition of information nor a mere imitation or internalization. It is a coauthored constructive and interactive process (see Bronckart, this volume).

<H2>From the Importance of Children's Own Activity to How Learners Actively Construct Meaning</H2>

As just suggested, it is heuristic to consider that children differ from adults in their approaches to tasks, but the Piagetian hypothesis that this is due to the inner logical “structure” of their minds is not sufficient and not always necessary: the meaning (in terms of goal, symbolic value, status, sense of the self, foreseen consequences, etc.) that children attribute to the activity is of primordial importance to the learning and developmental process (Bruner, 1990; Perret-Clermont and Bell, 1987; Perret-Clermont et al., 1991, 2004; Zittoun et al., 2006). Piaget was right in calling attention to the psychological need of the child to be active, to the importance of the child's own previous experiences, and to the role of the child himself in reflecting upon his own actions in search of a feeling of mastery and understanding (Piaget, 1974). Although Piaget did mention it in one of his later writings (Piaget, 1972), he very rarely paid specific attention to the symbolic, social, and existential meaning of the activity or present situation for the child. The child's activity, central to Piaget's theory, had not been considered in all its dimensions: Piaget tended to reduce it to an epistemic activity.

When children are active and creative, they are not only epistemic subjects motivated to think, reflect, and contribute to social coordination, as Piaget viewed them, but just as importantly, they are also experiencing the pleasure of existence (via acting, talking, thinking,

interacting, or producing) as well as threats to their existence (failures of their actions, neglect from adults, discrimination from peers, misinterpretations of their intentions, losing face, painful facts, etc.). Identity is at stake when a person is involved in an activity trying to give meaning to its positive and negative feedback or ruptures. We have tried to investigate which interpersonal relationships (Hinde et al., 1985; Perret-Clermont et al., 2004) and social frames (Grossen and Perret-Clermont, 1992; Perret-Clermont, 2001) foster learning and development and allow for the person's active elaboration of her experience into meaningful resources for new situations (Bugnon et al., 2010; Perret-Clermont and Zittoun, 2002; Perret and Perret-Clermont, 2011 in press; Zittoun, 2006a,b).

<H2>The Child's Own Activity: Let's Not Forget That It Takes Place within or at the Border of Larger Collective Activities</H2>

In learning settings, people are not only answering questions or performing, they are also trying thereby to meet their own goals. They are embedded in communication processes with the people who have set the task (with its frame, discourse genre, and instrumental resources) and who will evaluate their performances. The activity of the learner (most often the learner is a child, but it is also the case for adults) does not encompass only the expert's definition of the task but also the participant's own stakes in accepting to respond to these explicit and implicit expectations (Grossen and Perret-Clermont, 1994; Light and Perret-Clermont, 1989; Marro Clément and Perret-Clermont, 2000; Muller-Mirza and Perret-Clermont, 1999; Muller Mirza et al., 2003).

The expectation that students should be invited to be active and autonomous in constructing the knowledge that they are supposed to learn in a given teaching setting can be paradoxical in many ways. Why would they? How could they come to reconstruct precisely the kind of knowledge that the teacher expects? Is there such a mechanism as a unique “line of development” that would determine (unconsciously) the direction in which the learner reconstructs the knowledge that she is supposed to acquire? We don’t think so. Activity theory is helpful here to understand that the learning setting is an activity setting, at the crossroads of other activity settings (pertaining to the family and social life, peer group or professional activities, etc.), with different role distributions, tools and symbolic mediations, goals, values, and norms. Even when some intersubjectivity between the participants of a teaching–learning setting seems to have been explicitly reached, it might still be the case that it partly relies on implicit misunderstandings due to the transfer of previous or parallel experiences from other activity settings (Bausch et al., 2007; Perret-Clermont, 2009; Perret-Clermont et al., 2000).

In studies in which activities designed to foster argumentation have been introduced into the classroom (Muller Mirza and Perret-Clermont, 2009; Perret-Clermont and Schwarz, 2008), it is very interesting to observe how these activities solicit all sorts of psychological processes that hinder or foster reasoning (Arcidiacono and Perret-Clermont, 2010; Muller Mirza and Perret-Clermont, 2008; Muller Mirza et al., 2009). A dialogue, a critical discussion, the asking of a new question, or the accounting for one’s statements are all risky enterprises in which students do not venture without precaution. Social representations of gender (Psaltis, 2005; Psaltis and Duveen, 2006) and other social norms (Nicolet, 1995) affect their strategies. The school is an activity setting that is not independent of the other social

games in which children take part: they cross over boundaries and transfer meaning and learning in unexpected ways.

<H1>Time Perspective</H1>

To answer the question of how Piaget has influenced my research, I have tried here to describe the different lines of questioning that I have been following that are rooted in the Piagetian experience. But, more concisely, I see three main elements instigated by Piaget that will certainly continue to influence my work.

The first element is the habit that I will certainly not lose of considering a psychological event in its *time* perspective and to expect this genetic perspective to inform me at the epistemological level. The past does not fully “explain” the present. The future is open: imagining that the present fully determines the future would mean forgetting the creative forces at stake. The present can be considered a “snapshot” of long biological and sociocultural processes, both at the individual and at the collective levels. As in other sciences, instead of just stopping on the image given by the snapshot (Latour, 1985, Latour and Weibel, 2002), observing this process permits an operative understanding of reality, of the sociopsychological construction of reality and of the means to account for it. Among other implications, this is very important for education because it is a future-oriented activity that builds on the past (the past of the experienced child coming into a new lesson; the past of the expert generatively identifying or not with the learner; and the past of the culture offering or imposing cultural artifacts as mediations for the actions and knowledge of the new generation). Time itself is also to be seen in a time perspective: the representations of past, present, and future are man-made in their conceptual as well as their technical and normative

dimensions (Perret-Clermont, 2005). These are closely connected to the specific activities in which these representations of time are elicited, including the scientific disciplines themselves (Royer et al., 2006).

The role of *the learner's activity* is the second element that will certainly remain central to my research. It will continue to be enriched by the perspective of activity theory and not limited to the internal processes of the mind or to the cognitive aspects. Cultural mediations, individual and collective goals and values, gender and socially marked role distributions are part of the settings in which individuals think and learn. Yet specific attention needs to be paid to those elements that make it possible for the individual to adapt “creatively to newness and to live with the fundamental fragility dependent on her interiority and her sense of integrity” (Zittoun and Perret-Clermont, 2009).

The third element of Piaget's legacy that will continue to inspire my research is the question of the possible interdependency between the modalities of relationship experienced in *social interactions* and the *epistemic* status of the knowledge thereby acquired (Piaget, 1960). Learning itself has a micro-history: it is embedded in a time series of events and interpersonal exchanges (see Saada-Robert, this volume), often embedded within a conversation and under more or less explicit institutional constraints. As a result, the access to information, the possibility of testing the quality of this information—or even simply to feel, allowed to doubt and reason—will constrain the learner's understanding. Moreover, the possibilities that the classroom will (or will not) offer the students a place to be creative will affect the scope of the whole teaching–learning activity: teaching can be just a matter of transferring established knowledge and skills, but just as importantly, if not more, learning

can also be the moment in which creative acts offer both learners and teachers opportunities to gain new insights, knowledge, and know-how (Engeström, 1987, 2008; Giglio and Perret-Clermont, 2010). This understanding of learning rooted in the learner's creative activity will probably lead us into a reconsideration of the traditional (false) dichotomy in vocational training between "theory" and "practice": success and understanding are interdependent processes. They require adequate secure settings that can allow for doubts and trial and error: settings that sustain reflection on these moments by providing mediation, information, and support (Bugnon et al., 2009; Perret and Perret-Clermont, in press).

Finally, it is the combination of these three elements that is central to our present interest in research on argumentation (Muller Mirza, 2009; Perret-Clermont et al., in preparation): a cognition can be considered as a provisional standpoint that is more or less explicit or implicit, conscious or not. It is the standpoint of an individual or of a group. It is usually the result of argumentative moves and it opens debates. A cognition becomes knowledge when it has successfully been submitted for discussion and checked by explicit procedures (such as scientific methodologies). If knowledge is just imposed on the learner, the learning will be at risk of being so superficial that it is not really knowledge that the learner has gained. If the knowledge offered is critically discussed by active learners, the learning will be deeper: the knowledge acquired will then be some kind of living memory of past and present debates, opening ways for the learners' own understandings, thereby allowing them to reach the roots of their cognitive socialization (Bernstein, 1974) and shared common beliefs (endoxa) (Rigotti and Greco Morasso, 2009). This can happen in many fields and, in particular, in science education.

1. I am keeping the masculine form: masculine pronouns were the only ones used in those days.
2. *In Search of Mind* is the title of Bruner's autobiography (Bruner, 1984). But I was so enthusiastic reading this intellectual adventure that I keep thinking that its title is *In Search of Meaning*. Conceptualizing the distinction between meaning and understanding is something Piaget did not contribute much to. He can even be considered misleading when he explains the "meaning" of a child's behavior in terms of its relevance to the logical structure of the stage.
3. Born a few years later than Piaget, also from an established family in Neuchâtel and former student at the University of Neuchâtel, Denis de Rougemont was also a nonconformist philosopher, and, in Geneva, the founder of the European Institute of Culture, an international institution dedicated to the promotion of intercultural dialogue, peace, and political science.
4. "We are like dwarfs on the shoulders of giants, so that we can see more than they, and at a greater distance."
5. I will keep using the masculine form for historical reasons and to avoid designating the child as "it."

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