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Climbing on Piaget's shoulders to look beyond with a cultural-historical perspective: Argumentation as a situated activity in young children. Insights from the empirical study of their inferences

Perret-Clermont Anne-Nelly
Professor of University of Neuchâtel, Switzerland

Greco Sara
Assistant Professor of Università della Svizzera Italiana, Lugano, Switzerland

Can 2–6 year old children contribute to argumentative discussions? And when they do, how do they reason? This is the central question that our interdisciplinary research team has investigated in the ArgImp project. We will present some of our observations of children's thinking, in designed and naturally occurring activity settings. We will consider not only their language but also their thinking as it appears in verbal and non-verbal, explicit and implicit, elements of conversation in context. In doing so, we will rely on some major resources of Piaget and Vygotsky's foundational works in psychology, and on recent analytical models offered by theories of argumentation. Our data reveals how deeply children's reasoning is rooted in a cultural, material and social context and develops during the conversations; and how their argumentative minds seek "reasonableness" (more than deduction) to reach their goals and give meaning to the interactions in which adults embed them.

Starting from classical concepts borrowed from Piaget, which allow for fine-grained analysis of children's cognitive moves (e.g. child's own activity, sensori-motor action, concrete or formal operation, physical vs logico-mathematical experience, cooperation in symmetrical relations, genesis, feeling of equilibrium), we have further elaborated his approach in two directions: 1) with post-Piagetian concepts (e.g. Grize's schematizations addressed to an audience; socio-cognitive conflicts; co-construction of intersubjectivity) that allow to consider children cognitively at work within specific social interactions that put demands on them; 2) with Vygotsky's legacy that has called for a deeper understanding of interiorization processes that follow social interaction and the collective resolution of problems; for specific attention payed to the role of semiotic resources; and to go beyond the existing concepts of interest and motivation, to consider the goal and scopes of the activity, as well as the global (active, cognitive *and* emotional) personal experience in the face of events. When Piaget was limiting himself to a consideration of "horizontal" peer interactions as a source of reciprocity and reflective logical reasoning, V.V. Rubstov invites to a refined understanding of joint action, if well designed, as a rich opportunity to experience different social positions

and meta-reflect on the learning experience that enacting these different social roles has provided: from decentration to an understanding of the organization of the activity in its complexity. With these perspectives in mind, our ArgImp research team has endeavored to study children's argumentation. We intend to use these concepts not only to approach the child's argumentation but also the adult's thinking when acting as a researcher, a teacher or a parent.

Most often, in child and educational psychology, following the pioneering work of Kuhn and of educationalists interested in debates as pedagogical resources, argumentation is considered as an individual skill that requires proper education to develop both on the linguistic level (e.g. complex linguistic skills can allow for rich interconnections of multiple arguments) and on the social level (e.g. learning to listen to and take into account the partners' statements and connect to them). But inspired by both Piaget's and Vygotsky's legacy, we have preferred to consider argumentation as a contribution to a critical discussion (in the pragma-dialectical perspective of van Eemeren et al.) that happens at a given historical moment, in a specific activity setting with its goals and rules, and with partners that are (rightly or wrongly) supposed to share some common grounds in spite of their different social positions. In this dialogical perspective, we have chosen to focus on knowledge-oriented argumentation within activities in which solutions are found to social or technical problems. The expected cognitive moves in these argumentations are not only reasonings of the type described by Piaget but also (perhaps mostly) inferential reasonings.

To analyze the recorded argumentations collected in our observations and appreciate in a detailed way children's argumentative contributions, we have used two analytical tools (or frameworks): van Eemeren's reconstruction of argument schemes and structure; and Rigotti & Greco's Argumentum Model of Topics (AMT). The first framework allows to describe the richness and complexity of the argumentation as a dialogical and social activity (and not as a "static" product). The second permits to distinguish between the procedural (formal) nature of the inference that happens within this dialogical context and its concrete (extra-logical) backing anchored in the material, contextual and cultural background of the persons involved.

This leads us to novel descriptions of some aspects of children's reasoning. They don't make everything explicit and sometimes use action as a "proto"-argument. If this is taken into account, if adults don't interfere by stopping them, then children appear to be more competent than expected. They offer multiple arguments, often interconnected. They use other cognitive moves than those described by Piaget in terms of "operations". They raise issues and sub-issues (thus opening up new discussions) and advance standpoints but these are likely to change in the course of the conversation as their intention is usually not to defend a standpoint but to reach their goals.

They call on past experience in different ways. They engage with their partners in different manners. They try to manage joint action and conflicts.

Investigating children's implicit premises reveals something of their understanding of reality, for instance what they take for granted and what they believe their interlocutors take for granted; how they relate to authority, how they understand rules, and what inference schemes and endoxa they have interiorized. This is also useful because it opens questions about how adults position themselves in discussion with children, and what they (adults) take for granted or expect children to take for granted.

It also invites researchers to reconsider what argumentation is within a time perspective, for instance: how do issues arise, what it requires to put forward a standpoint. In other words, researchers are invited to consider how discussions evolve over time and not only single episodes or single argumentative productions.