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grounded theory. a research method for advancing the comprehension of philosophy for children's processes[1].

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abstract
The Philosophy for Children (P4C) approach was developed by Matthew Lipman in the 1970s to stimulate pupils' critical and complex thinking. Today, Lipman's P4C, and other programs based on it, are disseminated around the world in elementary and secondary schools. But does philosophical praxis have an impact on pupils' thinking? To answer this question, pupils' thinking must be evaluated in order to measure what is acquired, what is in the process of being integrated, and what needs to be stimulated. Many quantitative and qualitative methods of research exist; we chose the Grounded Theory (GT) method since our aim was to elaborate a rigorous and meaningful evaluation tool that would contribute to evaluation and comprehension of the cognitive processes of children who benefit from philosophical praxis. The GT method has the advantage of showing an "objectivized" portrait of pupils when they engage in dialogue within a philosophical community of inquiry, rather than attempting to verify or validate a particular theory. It comprises six steps in analysis, namely data collection, coding, grouping codes into categories, definition and variation of categories, final integration of theory, and researcher self-evaluation. In the first part of the article, we describe the rules and steps in analysis of the GT method as proposed by Charmaz, Glaser & Strauss and Laperrière. Examples from our own research experience are used to illustrate each of the methodological elements, which led to the elaboration of the model of the developmental process of "dialogical critical thinking" (DCT).

keywords: research method; grounded theory; philosophy for children; dialogical critical thinking; epistemological progress.

teoria fundamentada. um método de pesquisa para avançar na compreensão dos processos de filosofia para crianças

resumo
A abordagem de Filosofia para Crianças (fpc) foi desenvolvida por Matthew Lipman na década de 1970 para estimular o pensamento crítico e complexo dos alunos. Hoje, a fpc de Lipman e outros programas baseados nela são divulgados em todo o mundo em escolas primárias e secundárias. Contudo, a *praxis* filosófica tem impacto no pensamento dos alunos? Para responder a esta questão, o pensamento dos alunos deve ser avaliado para medir o que é adquirido, o que está em processo de incorporação e o que precisa ser estimulado. Existem muitos métodos quantitativos e qualitativos de pesquisa; escolhemos o método da teoria fundamentada (Grounded Theory, GT), pois nosso objetivo era elaborar uma ferramenta de

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avaliação rigorosa e significativa que contribuísse para a avaliação e compreensão dos processos cognitivos das crianças que se beneficiam da práxis filosófica. O método GT tem a vantagem de mostrar um retrato "objetivizado" dos alunos quando eles se envolvem em diálogo dentro de uma comunidade filosófica de investigação, em vez de tentar verificar ou validar uma determinada teoria. Inclui seis etapas de análise, a saber, coleta de dados, codificação, agrupamento de códigos em categorias, definição e variação de categorias, integração final de teoria e auto-avaliação do pesquisador. Na primeira parte do artigo, descrevemos as regras e etapas na análise do método GT, conforme proposto por Charmaz, Glaser & Strauss e Laperrière. Exemplos de nossa própria experiência de pesquisa são utilizados para ilustrar cada um dos elementos metodológicos, que levaram à elaboração do modelo do processo de desenvolvimento do "pensamento crítico dialógico" (DCT).

palavras-chave: método de pesquisa; teoria fundamentada; filosofia para crianças; pensamento crítico dialógico; progresso epistemológico.

teoría fundamentada. un método de investigación para avanzar en la comprensión de los procesos de p4c

resumen
El enfoque de Filosofía para Niños (FpN) fue desarrollado por Matthew Lipman en la década de 1970 para estimular el pensamiento crítico y complejo de los alumnos. Hoy, la FpN de Lipman y otros programas basados en ella, se difunden en todo el mundo en las escuelas primarias y secundarias. Pero, ¿influye la praxis filosófica en el pensamiento de los alumnos? Para responder esta pregunta, el pensamiento de los alumnos debe evaluarse para medir lo que se adquiere, lo que está en proceso de integración y lo que necesita ser estimulado. Existen muchos métodos cuantitativos y cualitativos de investigación; Elegimos el método Grounded Theory (GT) ya que nuestro objetivo era elaborar una herramienta de evaluación rigurosa y significativa que contribuyera a la evaluación y comprensión de los procesos cognitivos de los niños que se benefician de la praxis filosófica. El método GT tiene la ventaja de mostrar un retrato "objetivizado" de los alumnos cuando entablan un diálogo dentro de una comunidad filosófica de investigación, en lugar de intentar verificar o validar una teoría particular. Comprende seis pasos en el análisis, a saber, la recopilación de datos, la codificación, la agrupación de códigos en categorías, la definición y la variación de categorías, la integración final de la teoría y la autoevaluación del investigador. En la primera parte del artículo, describimos las reglas y los pasos del análisis del método GT propuesto por Charmaz, Glaser & Strauss y Laperrière. Los ejemplos de nuestra propia experiencia de investigación se utilizan para ilustrar cada uno de los elementos metodológicos, lo que condujo a la elaboración del modelo del proceso de desarrollo del "pensamiento crítico dialógico" (DCT).

palabras clave: método de investigación; teoría fundamentada; filosofía para niños; pensamiento crítico dialógico; progreso epistemológico.

grounded theory. a research method for advancing the comprehension of p4c's processes

introduction

P4C was created by Lipman for the purpose of stimulating critical and complex thinking in children (LIPMAN, 2003). In its original format, P4C consists in reading a text that is said to be "philosophical" in that it is based on ambiguous and paradoxical situations and concepts. The goal of these ambiguities and paradoxes is to arouse pupils' curiosity and encourage them to ask questions they would like to discuss as a group. In P4C, questions do not come from the teacher but from the pupils themselves – this gives them power over their learning and an intrinsic motivation to discuss these questions with their peers. This dialogical exchange within a "community of inquiry", which aims to help pupils progress socially, discursively and cognitively, is at the heart of the P4C approach (LIPMAN; SHARP; OSCANYAN, 1980).

Today, Lipman's P4C, and other programs based on it, are quite popular in elementary and secondary schools (UNESCO, 2007, 2011). But what are their impacts on pupils? The question of evaluating philosophical discourse raises a paradox insofar as philosophy is supposed to be free to express itself. However, in the context of P4C, philosophizing means "learning to think" (LIPMAN, 2003; LIPMAN; SHARP; OSCANYAN, 1980). As P4C praxis[3] occurs within the school like any other school subject, learning to think must be evaluated in order to measure what is acquired by pupils, what is in the process of being integrated, and what needs to be stimulated. This evaluation of pupils' progress should guide the teachers' facilitation of P4C. This ensures that pupils are engaged, within the community of inquiry, in the critical and dialogical processes.

[3] We consider P4C to be more a praxis than a practice. Indeed, practice can be a simple repetitive exercise, whereas praxis, following Freire's meaning (1974), is a dialogical activity that is interrelated with everyday actions, that empowers pupils, and improves the quality of their experience.

In that perspective, there are a number of research methods that are useful and relevant in the field of education, and thus in P4C. Among others, let us mention speculative research, evaluative research, research action, interpretative research, meta-analysis, experimental research (for methodological descriptions, see in particular: DENZIN & LINCOLN, 2005; MOREHOUSE, 2012; POUPART *et al.*, 1997; VAN DER MAREN, 1995). Research methods follow paradigms that are either theoretical, qualitative or quantitative. No matter which method in used, most of the time researchers engage in research to better understand or to better control the physical and human environment in which they live.

We elected to use the Grounded Theory (GT) method, as our aim was to elaborate a tool that could contribute to the evaluation and comprehension of processes (cognitive, dialogical and social) inherent in the praxis of P4C within the classroom. The GT appears to be the only method that emphasizes the theoretical, the qualitative and the quantitative aspects of research. We consider it to be the most complete method, both for understanding the process of progression in philosophizing pupils and in contributing to the advancement of knowledge in the field of P4C.

In this article, we first present questions for which the GT method is well suited. These questions are situated in the fields of education and P4C. Then we describe the GT method, its rules and its steps in analysis. To illustrate each of the steps, we refer to the model of the developmental process of dialogical critical thinking that emerged from our analysis using GT.

2. grounded theory research method

2.1. origin

According to Barney Glaser & Anselm Strauss, from Columbia and Chicago Universities respectively, qualitative research methods tend to prioritize

interpretation over theorization, and quantitative methods tend to focus on validating theories to the detriment of practice (GLASER & STRAUSS, 1967).

That is why, in the mid-sixties, Glaser & Strauss devised a mixed research method that aims to construct empirically-based theories about social phenomena (LAPERRIÈRE, 1997). To do so, GT bridges qualitative and quantitative methodologies; it is a method that brings together the rigor and objectivity of quantitative analysis while considering the social constructs of the agents who participate in qualitative research. "*A grounded theory approach encourages researchers to remain close to their studied worlds and to develop an integrated set of theoretical concepts from their empirical materials that not only synthesize and interpret them but also show processual relationships.*" (CHARMAZ, 2005: 508). The GT emphasizes analytical procedures, comparative methods and conceptual development as well as experience, meanings and processes. By combining quantitative and qualitative components, data analysis and emergent theories become both rigorous and relevant.

GT's methodological principles are influenced by American pragmatism, which emphasizes processes, searching for meaning, and interrelations between reflective thought and experience. These methodological principles are also influenced by socio-constructivism, according to which individuals are rooted in a social context in which the social world doesn't exist *per se*, but is always interpreted, represented and constructed by the social agents themselves (CHARMAZ, 2005).

The GT method is recognized as playing a significant role in the advancement of knowledge, as it guides researchers in the conceptualization and modeling of evolutionary contexts, processes, behaviours and attitudes. It also serves to improve practitioners' practice in that it provides them with a better-situated and richer understanding of the contexts in which they operate and of the strategies and processes they can use to help them progress.

2.2. some research questions for which the gt method is well suited

This means that most educational phenomena can be analyzed using the GT method. In GT, the object of research is a little-known social phenomenon for which researchers wish to further theoretical understanding.

Following are a few examples of research questions in the field of education: What is education today? What values underlie contemporary education? What place do pupils occupy in the school system? How, in what context, and why do participants act, react, progress and regress? What are the pupils or teachers' meanings or representations? What interaction modes are active in the co-construction of living-together? In a pluralistic context, how is a living-together education manifested?

Here are some examples of research questions linked to P4C: What are the impacts of philosophical praxis on pupils? On teachers? On society? What representations do pupils or teachers have of a philosophical concept (education, freedom, childhood, justice, friendship, etc.)? What conditions are needed for a philosophical community of inquiry to progress? By what processes is the classroom transformed into a community of inquiry? How does philosophical dialogue construct itself? What are its learning processes? What are the components of Dialogical Critical Thinking (DCT)? How does DCT develop in pupils?

Based on the GT methodology, during the last decade we conducted three main research projects subsidized by the Social Sciences and Humanities Research Council of Canada (SSHRC). In the first research project[4], our research question was: "*How does the community of inquiry progress within the P4C sessions?*" In the second project[5], the research questions were: "*What are the characteristics or criteria of philosophical dialogue among children?"* And, parallel to that, "*What are the manifestations*

[4] For the first project, the head researcher was M.-F. Daniel and the co-researchers were L. Lafortune and R. Pallascio (Quebec).
[5] For the second project, the head researcher was M.-F. Daniel and the co-researchers and collaborators were L. Lafortune and R. Pallascio (Quebec), C. Slade and L. Splitter (Australia), and Teresa de la Garza (Mexico).

of dialogical critical thinking (DCT) in pupils?" In the third project[6], the research question was: "*Is the developmental process of DCT that emerged in the previous research comprehensive? How can it be completed and/or refined?"*

In the next sections, we describe the rules and steps in analysis of the GT method as proposed by Charmaz (2005), Glaser & Strauss (1967) and Laperrière (1997). Examples from our own research experience illustrate each of the methodological elements.

3. rules prior to analyzing data

In the GT method, there are some rules prior to analyzing data. First, researchers must set aside as much as possible their experiences, knowledge and perspectives, and let data from the field speak for themselves. Indeed, GT is a method centered on *discovering* a theory or a model, not on *verifying* facts, theories or hypotheses. Yet researchers cannot approach reality as a *tabula rasa*, and they sometimes have to refer to the literature to deepen their comprehension of the findings or to ensure advancement in their thinking.

Another fundamental rule in GT is that the question or the subject of the research must refer to a *process* and it must be approached from the angle of the *evolution of a phenomenon*. Indeed, the object of research in GT is a social phenomenon for which we aim to extend the theoretical analysis. It is therefore appropriate to situate the analysis of any phenomenon within the overall process in which it is situated and develops. For example, as previously mentioned, we studied: a) the gradual development of a community of inquiry during a school year, b) the learning process of philosophical dialogue by groups of pupils, and c) the developmental process of Dialogical Critical Thinking (DCT) in these groups of pupils. Each of these research subjects refers to developmental processes in pupils, as the passage from a "group" of pupils to a "community" of inquiry is an evolutionary process that occurs

[6] For the third project, the head researcher was M.-F. Daniel and the co-researchers and collaborators were M. Gagnon (Quebec) and E. Auriac-Slusarczyk (France).

over time; as the passage from anecdotal and monological exchanges to philosophical/critical dialogue among peers is a process that develop in the long term with weekly praxis; as for the pupils to pass from simple thinking to DCT also presupposes a process that requires time and praxis.

The other rule concerns the choice of participants. These must first be determined according to their theoretical relevance to the research question. For example, in our three previous research projects, participants were groups of pupils from kindergarten and elementary school, and teachers dedicated about one hour per week to P4C praxis for an entire school year. Because the participants benefited from regular and continuing philosophical praxis, they were likely to help clarify our research questions and to help us better understand how a community of inquiry evolves, what a philosophical dialogue is, what the components of DCT are, and how these processes are constructed in pupils.

Moreover, participants' situations and locations should be taken into consideration. Although the research phenomenon is first studied at one particular site, it must be compared with other sites that are similar but contrasting. In GT, data interpretation must be as objective as possible. The means to making data interpretation objective is to study various cases; moreover, cases that *a priori* appear to be *negative* or situated *outside the framework* must not be ignored. Indeed, the objective is to obtain as much data diversity as possible. Data diversity reflects the empirical world, which is composed of diversity and contradictions. Diversity expands the researcher's meanings and representations of the phenomenon studied. Diversity also serves to stimulate original relationships; raise different questions; test our own conclusions, and construct new, dynamic, and contextualized theories. Because of the search for diversity when using the GT method, the initial sample may be extended during the analysis.

As an example of the rule concerning similarity and contrast in sites, our first research project (regarding community of inquiry) was conducted with

philosophizing groups of pupils in the same age group (8 to 12 years), but who attended Quebec schools in different socio-economic areas (upper, intermediate and lower economic groups). The second research project (regarding philosophical dialogue and DCT) was conducted with philosophizing pupils in the same age group (8 to 12 years), but who attended schools located in countries where the culture, language and teaching programs were different (Quebec, Mexico and Australia). The developmental process of DCT was refined, completed and validated in a third research project conducted with philosophizing pupils of different age groups – including preschool (from 4 to 12 years) – who attended schools from yet other cultures and teaching programs (Quebec, Ontario and France).

RESEARCH PROJECT	SIMILARITIES	CONTRASTS
1. Community of inquiry	Pupils with P4C praxis; Same age groups (8 to 12 years).	Schools from different socio-economic backgrounds (upper, intermediate, lower economic economics groups) in Quebec.
2. Dialogue + DCT	Pupils with P4C praxis; Same age groups (8 to 12 years).	Schools from countries where the culture, language and teaching programs were different (Quebec, Mexico and Australia).
3. DCT	Pupils with P4C praxis.	Different age groups (from 4 to 12 years); Schools from yet other cultures and teaching programs (Quebec, Ontario and France).

In short, the fundamental rules of the GT method concern the objectivity of the researcher, the research question that refers to an evolving process, the choice of participants and the diversity of sites.

In the next section, we describe the six steps in analysis of the GT method based on the major works of Glaser & Strauss (1967), Charmaz (2005) and Laperrière (1997). These steps are data collection, coding, grouping codes into categories,

definition and variation of categories, final integration of theory, and researcher self-evaluation. We illustrate these steps by referring to the two research projects (mentioned above) associated with the developmental process of DCT.

4. steps in analysis

4.1. data collection

GT methodologists assert that data can be collected by way of observations, interviews, or anything that allows the researcher to better define the theory surrounding a social phenomenon.

To collect data for our research projects, exchanges among pupils were videotaped; in each class a complete P4C session was recorded (30 or 60 minutes, depending on the usual practice in that class). Depending on the objectives of the research projects, from one to three recordings were made during the school year. The recordings were then transcribed in their entirety, word for word (verbatim).

4.2. coding

According to Laperrière and Charmaz, the coding operation may be considered as an unnecessary delay or a burdensome task to many researchers. Consequently, some of them scarcely code their data, or do not proceed to iterative coding to discover new properties. In GT, coding must be systematic and exhaustive; all of the data (actions, words, etc.) must be coded. This serves to avoid vagueness and bias in the creation of a potential model or theory. Coding aims to define action and to explain implicit assumptions.

Also, in GT, coding must be open, as the codes are dynamic; they interact with each other so that each new code can clarify, specify and add nuance to previous data. In other words, there should be constant comparison between codes. By comparing the codes, similarities, contrasts and even oppositions may come to light – and these are all valuable elements that must be taken into consideration. This

comparative analysis ensures that the theory or model generated is integrated, consistent and grounded in data. Throughout the analysis, codes remain provisional; coding evolves in parallel with theoretical reflection – the further the research progresses, the clearer and more coherent the theory becomes.

In our study of the developmental process of DCT, we coded each pupil statement that was recorded and transcribed[7]. To illustrate, a one-hour discussion corresponds to between 180 and 300 statements per group, depending on the lengths of pupils' statements. Coding focused specifically on the form of thinking (i.e.: statement that is justified or not) rather than the content (i.e.: whether a statement reflects a prejudice or not). In other words, coding took into account the manner in which points of view were articulated, not the matter that inspired them. Short answers ("yes", "no", "I don't know") directed at the teacher were not included in the coding because there was no way to verify whether this type of answer implied some thinking or not. Indeed, a pupil may answer the teacher's question with a random "yes" or "no" without having given any thought to his or her position. Finally, coding applied only to what was explicitly expressed in the transcript in order to limit as much as possible subjective interpretation of the pupil's statement. In short, each code served to determine the inherent cognitive skills displayed in pupils' discourse (statement, justification, example, etc.).

[7] P4C is social in its essence. In that perspective, the pupils' meanings and representations of situations and concepts that they discuss within the community of inquiry are the product of a co-construction among peers. In other words, the content of the exchange belongs to the group, not to one or a few pupils. This is why our research results concern class-groups. That being said, to achieve a group portrait, each individual's statements must be taken into consideration and coded.

Here is an example of coding, within an exchange about mathematics:

PUPIL	STATEMENTS	CODES/THINKING SKILLS
Pupil 1	*In multiplications, if we multiply a number by zero we get 0,* *but 1 + 0 = 1.*	**Statement** of a coherent and expected point of view, related to information acquired in the classroom +**Comparison** between two mathematic operations
Pupil 4	*…(zero) does have a value* *it's just that it's like in a car, it's put into neutral.*	**Statement** **+ Analogy**

4.3. grouping the codes into conceptual categories

The next step is the development of conceptual categories. As GT's purpose is to construct a model or a theory, the researcher's role is to focus on concepts or conceptual categories. These are not the codes, but that to which the codes refer.

Glaser & Strauss and Laperrière recognize that at first, conceptual categories are numerous and ill-defined. They become clearer and take shape as a result of iterative analyses by the researcher. Conceptual categories, just like codes, are provisional; they are analyzed and reshuffled repeatedly, until no new data contradict them. In other words, the researcher constructs concepts about participants' skills, attitudes, behaviours, meanings, and so on, that are more and more abstract, then the researcher examines specific data more deeply to add nuance to, refine and verify the conceptual categories that emerged.

In our study, grouping the codes (i.e.: thinking skills) eventually brought to light four conceptual categories, which we understood as four thinking modes inherent in DCT:

CODES (Thinking skills)	CONCEPTUAL CATEGORIES (Thinking modes)
Statement, definition, description, explanation, reasoning, justification, argumentation, etc.	**Logical thinking**
Example, analogy, comparison, counter-example, nuance, divergent relationship, etc.	**Creative thinking**
Statement, description, explanation, etc. related to a social/ethical behaviour, rule, principle, value.	**Responsible thinking**
Retrospection on a thought, a task, an emotion, a situation, and self-correction.	**Metacognitive thinking**

In this step, the scientific literature has influenced the labeling of our conceptual categories. Nevertheless, as the next section shows, the definitions of these categories (thinking modes) were essentially based on the pupils' statements as recorded in the transcripts.

Once again, before ending this step in analysis, Laperrière recommends that researchers consolidate their categories by systematically searching for negative cases or cases that appear to be situated outside the frame of reference.

4.4. definitions and variations of conceptual categories

4.4.1. definitions

When the conceptual categories are consolidated, methodologists recommend examining the emergent properties in connection with data from the field so as to integrate and define the conceptual categories.

In our research, the conceptual categories that emerged were the four thinking modes. As previously mentioned, we were familiar with the traditional definitions associated with each thinking mode. However, in accordance with GT, we attempted to de-emphasize these and focus as much as possible on the pupils' manifestations of DCT, our objective being to analyze data arising from the pupils' exchanges.

A general definition, closely linked to pupil discourse and to the codes that emerged from analyzing their statements, was attributed to each of the four emergent

thinking modes: *Logical*: Logical thinking refers to formal logic but also to informal logic in which the main characteristic is a search for coherence. Coherence is observed in the articulation of language and the convergence of ideas. It allows congruity between the question posed and the answer provided, between the statement and its justification, etc. In its more complex manifestation, logical thinking refers to formal logic; it implies rigorous argumentation, that is, premises are justified, analyzed and evaluated in cooperation with peers. *Creative*: Creative thinking refers to a search for meaning, a contextualization of points of view and a transformation of perspectives. It may manifest itself in concrete examples, in analogies, and so on. And in its complex manifestations, this mode of thinking presupposes divergent relationships. Indeed, creative thinking presupposes the formulation of questions that stimulate doubts regarding the certainty of participants' meanings and representations and, in so doing, it provides access to more complex resolutions of the problem and/or exploration of the question. *Responsible*: Responsible thinking combines cognition (e.g.: explanation, evaluation) and emotion (e.g.: empathy, sensitivity to others) in an interdependent relationship. The responsible thinking mode is related to reflections on social/ethical beliefs, rules, actions, principles, values, etc. It represents the balance between the right to express oneself and the responsibility to do so with sensitivity. It anchors evaluation of facts, of points of view, and so on, in concern for others and eventually in concern for a common good. *Metacognitive*: The metacognitive thinking mode refers to awareness of a thought ("thinking about thinking") but also, in its simplest expression, to awareness of a task completed, emotion experienced, point of view expressed, etc. The metacognitive mode is the only mode that allows for retrospection that eventually leads to self-correction.

4.4.2. variations in conceptual categories

According to the GT method, once the conceptual categories are defined in a general manner, researchers must observe their inherent movements or variations.

Indeed, categories are not static; they vary according to contexts and to criteria such as quantity, intensity, frequency, extension and complexity. In other words, during this step, researchers come to describe the overall movements or variations in each conceptual category in order to bring to light a more thorough understanding of the phenomenon being studied.

In our research, we found this step to be determinant and fundamental to the emergence of a theory or model that reflects as closely as possible the developmental process of DCT in philosophizing pupils. We had indeed observed that thinking (whether logical, creative, responsible or metacognitive) is not a static product; it underlies a dynamic process in that each of these modes can be manifested in a simple or in a complex manner. For example, logical thinking could manifest itself in the simple statement of a belief, or in a complex negotiated argumentation; creative thinking could manifest itself in a simple personal example, or in the elaboration of complex divergent relationships. Variation could depend on diverse factors such as pupils' ages, the length of their experience with P4C (weeks, months, years), and so on.

To take into account the variations in our conceptual categories (i.e.: thinking modes), we analyzed all of the transcripts of exchanges once more, this time paying a particular attention to the manner in which each of the four modes of thinking becomes increasingly complex. The transcripts revealed, on one hand, that pupils' viewpoints may concern the self, or others or society (we understood this as a de-centering process) and, on the other hand, that these viewpoints may be expressed by simple units based on concrete experience, or by convergent relationships rooted in generalized experience, or by complex and conceptual relationships (we understood this as an abstraction process). In other words, a process of increasing complexity (composed of de-centering and abstraction) emerged from the analysis of the transcripts. To render these findings meaningful, the scientific literature inspired us;

we referred to the notion of "epistemological perspectives", as epistemology relates to the processes of construction and acquisition of knowledge.

Following are the characteristics of two processes (de-centering and abstraction) inherent in the increasing complexity of the thinking modes that manifested themselves in the transcripts of pupils' exchanges and that contributed to the emergence of six epistemological perspectives:

CATEGORIES/ THINKING MODES	**CHARACTERISTICS DE-CENTERING PROCESS**	**CHARACTERISTICS ABSTRACTION PROCESS**	**EPISTEMOLOGICAL PERSPECTIVES**
Simple thinking	Me	Units based on personal and concrete experience	Simple
	Me + Close relatives *(e.g.: my brother)*	Units based on concrete experience	
	Close network *(e.g.: my friends)*	Units based on somewhat generalized experience	
	Known others *(e.g.: pupils in my school)*	Simple (convergent) relationships rooted in generalized experience	
	Distant others *(e.g.: children)*	Complex (divergent) relationships rooted in generalized experience	
Complex thinking	Society	Complex (evaluative) and conceptual relationships	Complex

Then, as recommended by the GT method, we named and gave a general definition, based on transcripts of pupils' discussions, to each perspective: *Egocentricity* is the perspective that underlies the most simple meanings and representations. It implies certainty and concrete representations of the world, which are not influenced by divergent points of view. In this perspective, statements refer to the pupil's specific personal experience, are centered on simple units (vs. relationships) and are without nuance. *Post-egocentricity* is also a perspective characterized by concreteness and centering, but it underlies a slight increase in sophistication of representations and meanings. Pupils' statements refer to the specific experience of a pupil's immediate environment (e.g.: family), centered on simple units, and not justified. In *Pre-relativism*, pupils describe their points of view to peers. These points of view underlie the beginnings of generalization, but remain

grounded in familiar surroundings or contexts. *Relativism* is an epistemological perspective that presupposes a rupture in the groups' representations. Pupils seem to become aware that the world is not so simple (good/bad, right/wrong). They seem to become aware that others have different beliefs, points of view, etc., as they learn to listen to others more actively. On the other hand, they want others to understand the meanings of their ideas, hence their statements are more elaborate than in the previous perspectives, and they include justification. Justifications are stated in the form of concrete and/or incomplete explanations with underlying simple relationships between points of view or contexts; pupils' justifications are still grounded in experience and concreteness. *Post-relativism/pre-intersubjectivity* illustrates the continuation of the process of de-centering and abstraction that began in the previous perspectives. It implies that statements are generalized and show the beginnings of conceptualization; they include a justification that is explicitly articulated, presented in the form of a "good reason" (supposing an underlying inference rather than linked to a practical experience), related to peers' points of view. Statements imply the beginnings of a constructive evaluation. In *Intersubjectivity,* representations and meanings are complex, as statements are conceptualized and are presented in the form of questioning or as a constructive evaluation of points of view, premises, etc., underlying a search for different meanings (vs. for a single truth) that includes argumentation expressed in negotiation form. Statements include justifications that are explicitly articulated, are presented in the form of criteria (subjective or objective), are well developed although not comprehensively, and are linked to peers' points of view. They are not presented as closed conclusions, but rather as questions or doubts that lead to a transformation of perspectives. They underscore an ability to categorize social/ethical behaviours and rules into values and principles so as to improve experience. Finally, they explicitly show correction.

4.4.2.1. variation: the recursive progression

One difficulty when using the GT method lies in the need for iterative analyses to ensure that the categories and their variations are all taken into consideration in a comprehensive manner. In our research, we realized that this step was inescapable if we were to achieve a model of the developmental process of DCT in pupils. Indeed, although we know that the progression of thinking is a natural movement of the mind (DEWEY, 1960; INHELDER & PIAGET, 1955; VYGOTSKY, 1985), there is still a debate in the academic literature concerning whether this progression of thinking manifests itself in a sequential and irreversible manner as the Piagetians and Neo-Piagetians maintain, or in a recursive manner as, for example, Dewey and Vygotsky argue.

A final analysis of the variations clearly showed that the progression of epistemological perspectives is not manifested sequentially and in stages; instead, it occurs in a recursive manner as in Dewey's (1960) and Vygotsky's (1985) theories. Recursiveness presupposes that thinking progresses according to a "scaffolding" process (VYGOTSKY, 1985; WOOD, BRUNER & ROSS, 1976). That is, it presupposes that the thinking goes back and forth between the known and the unknown, between certainty and uncertainty; that it gradually appropriates complex representations while remaining rooted in simpler representations that will disappear little by little as thinking is transformed and enriched (for details and examples, see DANIEL & GAGNON, 2011, 2016).

4.5. final integration of theory

According to the GT method, integration of all the data that emerged since the beginning of the research, even data that seemed contradictory at first, results in a description of social phenomenon processes that are likely to lead to a theory or to a theoretical model.

In the final phase of our study, we integrated all of the findings that emerged from our analyses of transcripts, namely the thinking modes, the epistemological perspectives, and the characteristics of the de-centering and abstraction processes inherent in these conceptual categories. From this ensued a model of a developmental process of what we call "Dialogical" Critical Thinking (DCT):

operational model of the developmental process of dct

MODE/ EPISTEMOLOGICAL PERSPECTIVE	**LOGICAL**	**CREATIVE**	**RESPONSIBLE**	**META-COGNITIVE**
EGOCENTRICITY	Statement based on the perceptual experience of a specific and personal fact.	Statement that gives meaning to a personal and concrete point of view.	Statement that is related to a personal and specific behaviour tied to a social or moral belief.	Retrospective statement about a personal and specific task, point of view, feeling, etc.
POST-EGOCENTRICITY	Statement based on experience (personal or someone close) + reasoning.	Statement that gives meaning to a personal point of view (but distanced from self).	Particular/concrete statement tied to a moral or social rule (learned). Not contextualized.	Retrospective statement about a personal task, point of view, feeling, etc. (distanced from self).
PRE-RELATIVISM	Somewhat generalized statement that is not justified or with an implicit, circular or false justification.	Statement that is new, divergent or that presents different situations/solutions/hypotheses (units) in relation to a personal idea or to someone else's idea.	Statement linked to a somewhat generalized action in a moral or social perspective.	Descriptive retrospective of a personal task, point of view, feeling, etc. (distanced from self).
RELATIVISM	Incomplete or concrete justification (explanation)/ reasoning based on experience.	Relationship that gives meaning to a peer's point of view (by completing it or adding a nuance).	Statement that explains a will to understand/include others (from the immediate environment). (Contextualized).	Descriptive/explanatory retrospective of another person's task, thought, etc. (immediate environment).

POST-RELATIVISM/ PRE-INTER SUBJECTIVITY	Justification based on "good reasons"/simple reasoning.	Relationship that presents a different context that takes into account the group's perspective.	Statement that justifies a desire to understand/ include others (distant environment). (Contextualized)	Descriptive/explanatory retrospective of another person's task, thought, etc. (distant environment).
INTER SUBJECTIVITY	Justification based on criteria. Conceptualization based on evaluative reasoning. *Conceptualization*	Evaluative relationship that provides a different meaning and transforms the perspective. *Transformation*	Doubt that underlies the evaluation of categories (rules, principles, social/moral values). *Categorization*	Evaluative statement that expresses a change in perspective following the integration of criticism. *Correction*

4.6. researcher self-evaluation

According to the GT method, in the sixth and final step of analysis, the researcher must question his or her results based on the following criteria:

a) Credibility: Did I systematically compare the empirical data to emergent categories? Do these categories cover a wide range of empirical observations? Are there logical links between the data collected and the arguments I propose?

b) Originality: Are the emergent categories original? Do they offer a new understanding of the phenomenon? Did a new theory or a new set of theoretical concepts emerge from my analyses? How does this study question, complete or refine current ideas, concepts or practices?

c) Resonance: Do the categories that I proposed at the end of the analysis process reflect all the aspects of the phenomenon? Do they make sense to participants? Do the results produce a finer and deeper understanding of the phenomenon for all participants in my field of study?

d) Usefulness: Can the interpretations I provided be useful to others in improving or enriching their practice or experience? Can the categories that emerged from the analyses be generalized and applied in diverse contexts? Can the results

stimulate other research? Can this overall work contribute to the improvement of social experience?

5.conclusion

GT is a rigorous qualitative method of research which has its sources in Pragmatism and Socio-constructivism. GT allows us to understand social phenomena and to shed a new light on their inherent processes. It aims to construct theories about social phenomena that are not well known. It is particularly well adapted to research questions in the field of education. It comprises six steps in analysis, namely, data collection, coding, grouping codes into categories, definition and variations of categories, final integration of theory, and researcher self-evaluation.

The GT method emphasizes the researchers' analytical objectivity as well as their sensitivity to participants and contexts. Yet it does not aim to discover Truth, but to elaborate theories or models that are viable because they are anchored in their context. It does not seek absolute objectivity, but objectivization by means of intersubjective negotiation with the participants.

GT is primarily intended for researchers and graduate students. Nevertheless, the theory or model that emerges from its steps in analysis is usually socially meaningful. In our example, the model of the developmental process of DCT that emerged from analysis by means of GT represents a valuable tool for teachers who wish to evaluate their pupils' learning progress in terms of epistemology and cognition while consolidating or improving their philosophical facilitation, as well as for school directors, educational policy makers, school curriculum designers, and all those who care about pupils' progress in terms of "good-thinking".

For further research, it would be interesting, among other projects, to use GT as a research method to evaluate different P4C approaches, as well as their specific impacts at different plans (e.g. social, ethical, discursive, affective).

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