A Candidate Methodology for Analyzing Meaning Making: The *Natural Logic* of Grize

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Abstract

This paper aims at presenting a candidate methodology for studying psychological processes involved in meaning making. The analysis of meaning making processes poses methodological challenges. Grize's proposes a neo-Piagetian theory, Natural Logic, which can be used as a methodology approaching the making and the interpretation of meaning, approaching discourse as a complex process interrelating cognitive, social and cultural dimensions. The making of new meaning is nevertheless approached through language use, yet both as a creative process in choosing and assembling words together, and as an interpretative process of reasoning in listening to or reading discursive material. This paper presents some main features of a new methodology for studying meaning making and interpretation processes in psychology, and a quick introduction to its practice based on a short example of analysis. The objective is to contribute to detailed analysis of meaning making, as we find it in complex cognitive activities such as interviewing, presenting or listening to a political discourse, debating, or teaching.

Introduction

The analysis of meaning making processes poses methodological challenges. It requires methodologies which can deal with the complexity of a multidimensional activity, addressing the wholeness of bodily, affective, cognitive and ethical dimensions of experience (Tateo, 2015). Since these analyses are most often based on verbal data, such methodologies are expected to deal with the linguistic and semiotic features.

Grize's proposes a theory referred to as *Natural Logic,* which provides a candidate methodology for studying meaning embodied in a discourse and its making as a progressive situated (co-)construction (Vergès, 2004; Campos, 2010; Kohler, 2015; Miéville, 2016). The logic developed by Grize after his work for Piaget's genetic epistemology is a non-formal logic, which works as an open system, as a logic of singularity and a logic of action, unlike most known logics, which are specifically focused on the truth value of *propositions* and do not concern *actions* at all. Grize's logic contributes to a development of Genetic Epistemology with a *critical model of communication* (Campos, 2014). It is set in irreversible time and particular contexts, considering cultural preconstructs, interlocutors' image of the self, and other elements such as the finality of the schematization. It allows to study meaning making at various level of analysis – for instance it has been suggested for the study of social representations (Grize, 1993) – from the discourse, yet in relation with cultural, social and cognitive processes.

However, Grize's theory has been only rarely used as a methodological tool for studying meaning making, notably because of its interdisciplinary roots: Widely known in the field of Argumentation Theory (see for instance: van Eemeren et al., 2013), the actual use of the theory as a methodological tool requires the appropriation of its theoretical and methodological specificities by human scientist from other disciplines such as Psychology, Sociology, Communication Sciences, etc. It is of high concern for the Theory of Psychology, firstly for opening new arena to scientific inquiries in the field, and secondly for its theoretical positions which could lead, after empirical validation, to major change in the representation of the human dealings with meaning, in the intertwinement of logic, discursive, cognitive and socio-cultural dimension of human activity.

Theoretical Foundations

From Formal Logic to the Study of Meaning in Construction

Natural Logic was first a part of Piaget's Genetic Epistemology (Campos, 2007) dedicated to the logic of thinking (Beth et al., 1962; Apostel, Grize, Papert & Piaget, 1963; Piaget, Grize, Szemińska & Bang, 1968). Genetic Epistemology aimed at understanding the development of knowledge through research on the child's development. Piaget and his collaborators tried to adapt the formal logic available at his time to represent concrete and formal operations (Inhelder & Piaget, 1955), and build a theory of knowledge grounded in the actions of the subject (Piaget, 1967). Piaget's collaborator, the logician Jean-Blaise Grize, eventually considered formal logic unadapted to represent the logic of thinking, notably because it is a formal and closed system (Grize, 1982). Piaget recognized explicitly the limits of formal logic towards the end of his work (Piaget, 1970). Grize developed his *Natural Logic* after his commitment for the Center of Genetic Epistemology, which may explain why it remained relatively unknown in Psychology.

A few empirical work using elements of *Natural Logic* are available, among which early work on written discourses (Miéville, 1979, 1981; Grize et al., 1970-72; Apothéloz et al., 1989), analyses proposing alternatives to Grize's set of operations (Miéville & Berandonner, 1997), and—more recently—analyses of oral interviews (Vergès, 1997; Grize & Montmollin, 2008; Vergès, 2010) and cinematographic data (Campos, 2010). The diversity of these first empirical research stresses the potential of *Natural Logic* for studying a variety of research material. Nevertheless, there is no consensual use of the theory in the analysis, nor any standard methodological procedure emerging yet. It can be considered positively as a mark of the great adaptability of *Natural Logic*, but the methodological choices also need to be more explicit, since various questions emerge from its practice.

In the rest of the paper, I will limit my contribution to the particular methodological choices and adaptations for Psychology developed in my research on situations of misunderstanding in physics (Kohler, 2015). However, in order to avoid the long presentation of complex analysis on students' (and teacher's) dialogue about physics, the example presented in this paper has been developed exclusively for this introduction, focusing on a short extract of a research interview. Before discussing the methodological procedure, Grize's theory will be minimally presented, providing only the absolute necessary for understanding the example. The interested reader will find a short introduction to the theory in English in Grize (1993).

A few Concepts of *Natural Logic*

Natural Logic is defined by Grize (1982, p.191) as "the study of thought operation in the action of elaborating a schematization"[1]. *Natural Logic* is only a part in Grize's broader theory of communication (1996). The concept of schematization is defined as a *discursive representation* (Grize, 1982, 1996), which is continuously transformed by the interactants throughout the process of discourse making and meaning making. Hence, the schematization is both a *process*, emergent and evanescent, and a *product*, that the research can study afterward, through recordings or other discursive traces. The schematization itself is theorized as an open system, and its progressive transformation can inform the researcher about the process of meaning making, while its state at a particular moment describes the (temporary) logico-discursive product.

The process is approached in reference to a set of logico-discursive operations, which constitutes a theoretical model and provides the mean for a description of the process of construction of the schematization. The analysis of logico-discursive operations provides clues for the researcher to make hypothesis on the meaning interactants are making throughout a discourse construction, interpretation or both together. Logico-discursive operations are not general forms, abstracted from their particular use in a given context: The writing of the operation by the analyst conserves the specific linguistic terms used by the

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[1] All quotes from Grize are translated from French by the author.

interlocutors, and results from a careful study of the meaning and use of language in relation to the situation of enunciation and its broader socio-cultural and historical context.

A schematization is described by the discursive (or semiotic) means actually used by the interlocutors involved in the meaning making, which can differ for each interlocutor. The potential of Natural Logic for stressing divergence between various interlocutors' points of view makes it a theoretical framework able to deal with situations of misunderstanding that remain unnoticed by the interlocutors themselves (Kohler, 2015). Keeping the logical, discursive, cognitive and socio-cultural dimensions together allow the researcher to ground hypotheses on the meaning, based on the locutor's self-coherence, which is assumed as a postulate (without evidence of the contrary). It is interesting to notice that a methodology dealing with all these dimensions as intrinsically interrelated – an inseparable *unit* - was the way for studying thinking processes called for by Vygotsky in 1934:

> The study of thought and language is one of the areas of psychology in which a clear understanding of inter-functional relations is particularly important. (...) The atomistic and functional modes of analysis prevalent during the past decade treated psychic processes in isolation. Methods of research were developed and perfected with a view to studying separate functions, while their interdependence and their organization in the structure of consciousness as a whole remained outside the field of investigation. (Vygotsky, 1934/1986, p. 1)

The "atomistic and functional modes of analysis" still prevail nowadays, both in cognitive Psychology and discourse analysis. The analyses provided as examples later in the paper stress this difference. Since thinking processes remain ultimately invisible to researchers, the methodological *modus operandi* of a constructivist theory like *Natural Logic*, consists in analyzing the progressive transformation of objects of discourse, and of their relations one with another, over the course of the sequential order of the conversation or text, in order to infer hypotheses about the thinking processes at the origin (or genesis) of the discourse. Such hypothesis on the meaning making are based on semiotic, linguistic, pragmatic and situational clues. As Grize puts it, the transformation of discourse are certainly not the whole of the thinking of the actors under study, yet there is definitely some sort of thinking involved in the construction of a schematization. This statement is based on the idea, now commonly accepted, that language shapes our thinking and vice-versa (Vygotsky, 1934/1986).

Vygotsky continues the passage quoted above, with a proposal for the adequate *unit of analysis* for research on language and thought:

> Psychology, which aims at a study of complex holistic systems, must replace the method of analysis into elements with the method of analysis into units. What is the unit of verbal thought that is further unanalyzable and yet retains the properties of the whole? We believe that such a unit can be found in the internal aspect of the word, in word meaning. (Vygotsky, 1934/1986, p. 5)

Grize also chooses a basic unit for *Natural Logic*: The word-class, which is the smallest component of a schematization. This unit is precisely at the level of the word meaning of Vygotsky: The word-class contains the words used by locutors, as it appears throughout the discourse they produce themselves. The concept of *class* is understood according to Lesniewski's mereology, which is particular in the fact that such a class is not only capable of containing its own elements but can also contain parts of these elements. Consequently, such a class is potentially infinite, and remains ever open: It is always possible to add parts of the elements already contained.

I would like to comment the translation of "word-class*"* from the French "classe-objet*",* since it could be more literally translated into object-class, where "object" refers to an *object of discourse*—in reference to Peirce's semiotics—and simultaneously corresponds to an *object of thought* of Genetic Epistemology. Yet, I have chosen to translate it with "word-class" in reference to Vygotsky smallest unit of meaning i.e., the *word meaning,* since the *objective* or *objectal* nature of an *object of discourse* would require a long epistemological discussion in order to avoid a common misunderstanding about Piaget's concepts of *object* and *subject* (for more details, see Atkinson, 1983/2006). I understand these concepts as *relational concepts*, and using it does not lead to state the existence of *objects*, ontologically: The distinction Piaget makes between the *(thinking) subject* (or *epistemic subject*) and the *(thought) object* should not fall under the critique of reification, nor of a dualist epistemology separating *objects* and *subjects* ontologically (for more details, see Kohler, 2020a). For these reasons, too briefly exposed, I interpret Grize's *object* as mainly referring to a *unit-like thing*, and not as a reference to an *existing thing*, as in the use of "object" in epistemological discussions about *objectivity* or *subjectivity*. An *object of discourse* is understood, in this sense, only as an *object of thought for someone in a particular situation, put into discourse by someone in a particular situation*, etc.

Another important *unit* of *Natural Logic* is the *operation*, which is an *action* on discourse, transforming these objects and its relations. It is of crucial importance that *action* is understood here as a *transformation*—in the Piagetian sense—which is always performed by a particular *agent*, and not just treated as a *behavior*. Hence, *Natural Logic* can refer to the emic perspective of each single point of view of any particular agent in a given situation (Kohler, 2018).

The most basic operation (α) consists in *extracting* a word from a *primitive notion*: Calling a |HOUSE| a "house", for instance, is represented in the model as an operation α, a logico-discursive operation extracting a new object into the schematization under construction. In short, this operation is written in *Natural Logic*

$$\alpha: |\text{HOUSE}| \rightarrow \{\text{house}\}$$

The word-class is the result of the operation and is written between curly brackets for indicating the particular epistemic status of the term "house" when used to refer to a word-class, as in {house}. These specifications allow to distinguish between this or that house (to be specified), and the {house} which is a particular object of discourse at a given moment of a specific schematization.

The arrow represents the transformation from the primitive notion to the word-class, yet it cannot be isolated from the rest of the writing, since the entire operation is indivisible: It works as a *unit*. Operation α commits the meaning making by a particular semantization, which could have been different. Indeed, one could have made {cottage}, or {villa} out of |HOUSE|.

Before the transformative action of the logico-discursive operation α, the theory poses a pre-discursive object of thought or perception called a *primitive notion,* which is written between vertical lines in *Natural Logic.* Primitive notions are defined as "systems of complex representations of physical and cultural properties i.e., properties of objects coming from the manipulation necessarily taking place within cultures" (Grize, 1996, p. 82). For instance, from using a screwdriver one gets the primitive notion |SCREWDRIVER| which is not only a representation of the properties of the material object, generally related on *cultural preconstructs* such as the idea "it is for (un)screwing screws", but also entails—for who knows it—the actual movement of turning it (anti-)clockwise while pushing, what Rabardel (1995) would call a *social scheme of use[2]*. The concept of primitive notion is hence particularly useful in the model for relating cognitive and perceptive knowledge, and referent in the cultural and material world, with the discourse (the schematization under construction). Hence, the word-class {house} can be related to a particular existing house, or rather to another representation, as for example the house drawn by a child on a piece of paper.

Writing down—or telling—primitive notions is somehow paradoxical, since primitive notions are precisely not yet put into words according to *Natural Logic*. For this reason, the analyst can choose the linguistic terms in between the vertical lines for specifying a primitive notion: This is exceptional for *Natural Logic*, as all other content involved in logico-discursive operations is taken from the actual discourse and linguistic terms chosen by the locutor. Since the primitive notion is referring to something before it is put into discourse, there is obviously no empirical data about it, and its content can only be guessed by mean of the context and other traces. To say it differently, the theory does not allow us to distinguish between |SCREWDRIVER| and |STRANGE LONG THING|, even if the first is probably more useful than the second for the purpose of designating the object.

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[2] Translated by the author from the French "schèmes sociaux d'utilisation".

For the purpose of this paper, I only presented her the most basic operation (α). A brief account of the whole range of operations can be found in English in Grize (1993). The detailed discussion of the logico-discursive operations is available in French (Grize, 1996).

A Methodological use of Natural Logic

Procedure for a Situated Descriptive Approach

The brief introduction to *Natural Logic* presented here only focuses on a few elements in order to show how it works as a descriptive theoretical framework, notably how it provides a synthesized account of the meaning under construction from discursive data. In *Natural Logic*, then analysis consists in a reconstruction of the participants' schematization(s). The schematization itself might be considered more or less extensively, depending on the researchers' interest or questions. The selection of data is therefore the first phase of the methodological procedure. There is no inconsistency to present partial schematization when the selection is relevant: A schematization is never completed once for all, as any intervention of interlocutors coming back on it may change it retrospectively. In return, the researcher must justify the selection in respect to the question the analysis is supposed to answer to. For instance, for a research question focusing on what is a teacher actually teaching about phylogenesis during his speech to the students (Kohler, 2020b), the selection of data will include the teacher's discourse addressing the topic, and maybe book extracts and other documents provided to the students. During the problematization of the research question, specific attention must be given to the choice of a relevant level of analysis in order to proceed to a relevant selection of data and provide the mean for reconstructing a schematization that is relevant for answering the research question.

The second phase consists in the reconstruction of the meaning making *from the various points of view* of all actors involved, and *over time* (sequentially). This is done by raising questions which are relevant to the situation and requires further inquiries, notably further analysis at a more micro level. To this aim, the methodological procedure draws on general methods of case-study: In the previous example, the question raised was wherever the teacher's intended teaching about phylogenesis corresponded to the actual discourse produced during his biology lesson. Additional discursive data were collected about these intentions, for a comparison of the teacher's schematization before and during teaching.

The third phase is more specific: It starts from the questions raised in the second phase. For each question, the researcher sets an *analytical inquiry* on the selected research data, to evaluate possible answers (explanatory hypotheses) to the question. These *analytical inquiries* provide clues and arguments based on *Natural Logic* analysis of the meaning making from one or several point(s) of view. These hypotheses stand for answers to questions raised in the second phase, and can be explicitly discussed and debated, both as disputable *ways* of answering the question and as disputable answers in reference to the data

available. The possibility for critical discussion on explicited hypotheses about the meaning making is precisely what grounds the scientific value of this methodology.

Various Level of Analysis in Natural Logic

Analytical inquiries can be established at various levels of analysis. The most micro level involves semiotic analysis in reference to a model for the *sign*, investigating the various relation between the signifier, signification, object of discourse and referent. Inspired from one of Peirce's models of the sign, Grize's model for the sign is adapted to his neo-piagetian epistemology. At an intermediate level, the set of operations of *Natural Logic* allows a precise description of the hypotheses made by the researcher on the meaning constructed by the participant in the situation. Operations can be used to model actual discourse or to express the researcher's reconstruction of implicit meaning from the situation of interlocution. In both cases, *Natural Logic* works as a metalanguage, providing a language for the description of the various meaning interactants make out the discourse expressed in their natural language. At a more macro level, general features of a schematization can be described, drawing from Grize's model for communication, such as the *finality* of the schematization, the *images* of the interlocutors involved in the meaning making, etc.

In the next section, we present only analytical inquiries at the level of logico-discursive operations. Operations themselves are situated at different levels according to Grize (1981):

1. The operations producing (α) and transforming (γ, etc.) word-classes and predicates;

2. The operations coordinating word-classes together (δ), and determining modalities such as "always" (μ), and/or enunciative commitment such as "he doubts that..." (σ);

3. The operations coordinating determinations (τ) into a logico-discursive reasoning having its own hierarchy and organization, occasionally sketching *logical rules* specifically dependent on the context, the interlocutory situation, or even on the type of activity (gossiping, debating, explaining, etc.).

I will now present two examples of *analytical inquiries* on the same data. The first one focuses on operations α and γ (level 1, see above). The second one focuses on a few higher-order operations (levels 2 and 3).

Examples of Analytical Inquiries

Setting Up Analytical inquiries

The data used in these examples were collected through interview in a research aiming at better understanding the *feeling of entrapment* (Cabell, 2013). The presented analytical inquiries are restricted to the first ten speech turns of the interview.

First Analytical Investigation

This analytical inquiry aims at a description of the elaboration of a word-class. To do so, all operations on one particular word-class are listed following the sequential order of the conversation, describing the progressive construction and the produced word-class. Word-classes are progressively filled throughout the schematization, including elements in quasi-equivalence. Grize (1996) specifies the various way something can be logically quasi-equivalent to something else. Presenting the word-class consists in a research result, for this study, since the research aims at a description of what entrapment is for the participant, which is precisely corresponding to the word-class {entrapment, ...} in *Natural Logic*. There are mainly two types of operations involved in the construction of a word-class: operation α when a new word-class is introduced in the schematization, and operation γ^3 when a word-class previously mentioned in the discourse is elaborated further. Let us take the example of the first speech turn:

> Interviewer: —"Alright so first I'm just gonna read kind of a little opening just kind of so respond however, you know, you'd like. Like I explained, I'm looking at people's experience of being trapped (.) this may mean being trapped in a situation (.) trapped by a person (.) by one's thoughts and feelings"

From the transcript above, the analyst identifies an operation introducing a new word-class, written

α_1: |ENTRAPMENT| → {people's experience of being trapped}.

From the transcript above, the word-class is later transformed by various operations γ within the same speech turn, written

γ_1: {people's experience of being trapped} → {people's experience of being trapped, being trapped in a situation}

γ_2: {people's experience of being trapped, being trapped in a situation} → {people's experience of being trapped, being trapped in a situation, trapped by a person}

γ_3: {people's experience of being trapped, being trapped in a situation, trapped by a person} → {people's experience of being trapped, being trapped in a situation, trapped by a person, by one's thoughts and feelings}

Since discourse and dialogue have a large part that remains implicit, the analyst may want a convention for dealing with it. Here, for instance, I use square brackets: The interviewee

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[3] Depending on the version of *Natural Logic* (see for instance Grize, 1996; 2010), various types are provided for such operation, which I simplified here to γ in order to avoid long explanations.

telling "being trapped in a situation" may here implicitly recall "people's experience of" from the interviewer's question. Such recall is common in French oral discourse, and described by Blanche-Benveniste (1997) as *syntagmatic stacking*. If we accept this reconstruction of the implicit recall of the interviewer's schematization by the interviewee, it can be written:

"[people's experience of] being trapped in a situation".

Table 1 present the result of all operations on this particular word-class for the first 10 speech turns of the interview. To shorten the table, previous content of the word-class is mention with dots such as "…".

Table 1. Progressive construction of a word-class over the first 10 speech turns.

Speech Turn	*Locutor*	*Result of the operation*
1	Interviewer	{people's experience of being trapped} {..., [people's experience of] being trapped in a situation, [people's experience of being] trapped by a person, [people's experience of being trapped] by one's thoughts and feelings, feel trapped, have a strong desire to get away, [have a strong desire] to escape}
3	Interviewer	{…, anything kind of that, this stuff}
4	Interviewee	{…, a couple of small things}
6	Interviewee	{…, past relationships for one, past personal situations, the ubiquitous like being stuck in a conversation kind of stuff}
10	Interviewee	{…, a relationship that was pretty bad for a pretty long period of time}

The result of this analytical inquiry provides a qualitative description of how the word-class is progressively developed and specified in this particular interview (see Table 1). It appears that the interviewer starts constructing the word-class before giving word to the interviewee. Any logico-discursive operation on |ENTRAPMENT| made in this interview by the interviewee is hence an elaboration of the word-class (γ) implicitly recalled from the interviewer's question, rather than the introduction of a word-class (α) that would be "new" to the schematization. Given this result, it looks more accurate to consider the schematization of entrapment, as a schematization jointly elaborated by the interviewer and interviewee. The word-class is used by the interviewer both for getting a joint attention with the interviewee on |ENTRAPMENT|, and for the progressive construction of meaning through the refinement of a word-class. Furthermore, if this may sound like a methodological shortcoming of this

research, this biais is nevertheless well known for research methodology based on interviews; *Natural Logic* methodology only stresses this point as a problem specific to the dependence on discourse for the interviewer to communicate the topic of conversation, which later interferes with the actual answers of the interviewee, since the schematization has somehow already begun.

In addition to the analysis of each operations as it appears progressively during the making of the word-class, a quick overview is provided by the writing of what the word-class has become at speech turn 10:

> {people's experience of being trapped, [people's experience of] being trapped in a situation,[people's experience of being] trapped by a person,[people's experience of being trapped] by one's thoughts and feelings, feel trapped, have a strong desire to get away, [have a strong desire] to escape, anything kind of that, this stuff, a couple of small things, past relationships for one, past personal situations, the ubiquitous like being stuck in a conversation kind of stuff, a relationship that was pretty bad for a pretty long period of time, being caught in the same kind of just shitty situations over and over again, feeling kind of resigned to it}

Second Analytical Investigation

The first analytical inquiry stresses the difficulty to attribute parts of the schematization to one or another interlocutor in this interview. The second analysis draws on reflection about the way the interview actually works out, intersubjectively, and whereas the interviewee addresses the task the way it is expected by the interviewer. What logico-discursive operations is the interviewer asking the participant to perform? In order to inquire more precisely about the meaning making of each participant in the conversation, the various types of operations used in the interviewer's questions are listed and compared to the operations used by the interviewee when answering. This analytical inquiry focuses on the way interview techniques are used for triggering a process of meaning making from individual participants.

When the operations of the interviewee match the question of the interviewer, it provides clues of a joint attention in the conversation, sustaining intersubjectivity, while any mismatch may either inform the researcher about the specificities of the meaning making of each interlocutor or, for more critical cases, about issues in the construction of a common schematization, such as situations of misunderstanding.

The interviewer addresses 2 questions until speech turn 10.

> Speech turn 3: "Is there anything kind of that comes to mind when I talk about this stuff?"

> Speech turn 7: "Can you go more into detail about one of them, if you'd like?"

The first question invites the interviewee to bring new objects of discourse into the schematization, but which are belonging of the type {that kind of stuff}. The operations performed by the interviewer at speech turn 1 on the word-class about the primitive notion |ENTRAPMENT|, are somehow part of these questions since it is elaborated with {this stuff}. For this reason, I consider the question as asking for specifications on an word-class, calling for an operation γ. The second question more clearly call for one or more operations γ. The interviewee precisely replies with several operations γ at speech turn 4 and 6, and again at speech turn 10 (see Table 1). To these the interviewee adds an operation of determination (δ), with a modality (μ) and localization (λ) to a specific episode in his life.

δ: to be, {experience of being trapped, etc.} → (- that feelings of entrapment to be)

μ: (- that feelings of entrapment to be) → (- that feelings of entrapment to be, definitely)

λ: (- that feelings of entrapment to be) → (- that feelings of entrapment to be, definitely, at the coming out of high school and the beginning of kind of my college career)

Altogether, the inquiry shows that the interviewee often provides the operation asked for. In these first few speech turns, there is another operation of interest for the analyst: The interviewee proposes a configuration (τ) which could split the word-class {experience of being trapped, etc.} in two different word-classes, if the interviewer would not have specifically asked for the conversational elaboration of only one. This configuration can be written:

τ₁: {past relationships, past personal situations} -and then→ (- that always the ubiquitous like being stuck in a conversation kind of stuff to be)

It relates with the logical relation -*and then*→ the word-class under elaboration (γ) with a determination (δ) that could lead to a new word-class, but the explicit demand to focus on one of them from the interviewer ("one of them", speech turn 7) works as a pragmatic refusal of the proposed transformation of the schematization through operation τ₁. Since this configuration fails in the conversation, I also chose not to apply this distinction during the reconstruction of the collective schematization. Yet, the analysis allows us, here, to make the hypothesis of a divergence between the points of view of the interviewer and of the

interviewee, since for the first |ENTRAPMENT| is *one* thing (*unit*), while for the second it evokes *several* different things.

Conclusion or Summary

The analytical inquiries presented here, on the level of operations, have been useful for synthesizing data, while keeping the wording of the participants. This permitted to bring out subtle movement of meaning such as introduced by the interviewer in the first speech turn from {being trapped} to {feel trapped}. The loose identity of the mereological class to represent the discursive objects, allows to always remain open to additional content and seems a faithful description of the meaning making process from the point of view of the participants. They may recognize the description as what they were thinking during the interview. Analyzing the meaning making with the elaboration of a word-class shows how the interlocutors are working on the meaning of |ENTRAPMENT| by piling up successive layers. Additional meaning stacks up onto the previous occurrences in the discourse, specifying or enlarging the meaning, or operating slight movements to take a new direction. Yet, in the construction of a schematization there is no direct possibility to "erase" what has been already shared in dialogue or thought, nor to start over from scratch. The two short examples provided in this paper are very limited use of *Natural Logic* for analytical inquiries on the construction of an object of discourse. In other analyses based on *Natural Logic*, researchers may take a closer look at the process of meaning making by considering more thought operations (see Grize, 1996), and by complementing it with analysis of the interlocutory dynamics throughout the conversation (Trognon, 2001).

Providing the study of the meaning making with a methodology based on the piagetian epistemology can bridge together cognitive approaches in Psychology with approaches on historically and culturally situated meaning making. Yet, more research with explicited methodological choices must be put in dialogue for developing such methodology.

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