



Dialogical history of a logical fallacy spontaneously produced during a predictive medicine consultation. Role of the causal connective *Puisque* in a discussion

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Abstract

This article presents the dialogical history of the production and the contesting of logical fallacies in a natural dialogue stemming from a Genetic Counseling for Predictive Testing consultation. These logical fallacies are errors in reasoning that are well-known in psychology and rhetoric: « affirming the consequent » and « negating the antecedent ». The authors construct a formal model of this dialogue which explains why the fallacy appears and why corrective attempts ultimately fail. They show that the causal connective *puisque* is an essential operator of the studied dialogue.

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1. Introduction

This article presents a case study of conditional reasoning and logical fallacy in the context of a genetic counseling dialogue. In effect, we propose to examine the achieving of a conditional reasoning within an institutionally-structured, natural dialogical practice: Genetic Counseling for Predictive Testing. This medical activity stems from discoveries in human genetics and has developed and become legally organized in recent years. As a result, the works devoted to this field have grown (Sarangi, 2003, 2010; Sarangi et al., 2004, 2005) and we are now beginning to understand the main features that constitute a genetic counseling consultation. Through a case analysis, our study extends these previous works, by specifically addressing the process of testing the epistemic stance (Dancygier and Sweetser, 2000) of a patient requesting a genetic test by/ in the dialogue she has with a specialized medical team.

All dialogue produces intersubjectivity (Clark, 1996; Schlegoff, 1991; Trognon, 2002, 2013; Trognon and Batt, 2010; Weigand, 2010). By « intersubjectivity », we refer herein to the process by which individuals share emotional and/or representational mental states, etc. This is the traditional definition of intersubjectivity as described by nearly all psychologists and linguists (in particular Lyons). It is the definition referred to by Zlatev et al. (2008:1) for whom

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Intersubjectivity is understood “as the sharing of experiential content (e.g., feelings, perceptions, thoughts, and linguistic meanings) among a plurality of subjects”. For Lewis (1969), the content of intersubjectivity is a mutual knowledge which develops on the basis of at least a three-level knowledge (Itkonen, 2008; Trognon, 2002; Trognon and Batt, 2010). In a dialogue, it is the progressive sequence of speech turns that allows the process of sharing to be set in motion. Indeed, thanks to speech connectives, these sequences often link pairs of statements for which the best known are invitation–acceptance, formulation–reformulation, questions–answers. They also structure sets of statements, thus achieving specific dialogical goals such as, for example, debating the truth of an assertion.

The purpose of a dialogue¹ such as the one currently under study is to formally create an information state that is mutually shared by the interlocutors (Carlson, 1983; Van Benthem, 2011). In this regard, genetic counseling has as its main objective to inform the patient on his or her genetic risk (Sarangi, 2003, 2010). Genetic counselors must, therefore, assess the appropriation of the knowledge received by the patient regarding “his/her” genetic risk. If the patient does not understand his or her genetic risk, it is deemed that he or she is not sufficiently “informed”. In this instance, the patient cannot sign the “free and informed consent” form, compulsory in France, prior to conducting the genetic test. Obviously, the correction of errors and misunderstandings is an important component of the activity of informative genetic counseling. It is thus a complex situation, with an eminently intersubjective character. Moreover, in practice, there is a process that has been specifically created to generate intersubjectivity. The ultimate goal of the strived-for intersubjective process is to produce a shared understanding of genetic concepts by all participants in the dialogue, e.g. a mutual understanding between health professionals and patients.

Perception of risk by the patients, which we have emphasized the importance above, has indeed undergone many psycho-logic, affective and cognitive constraints. It is the latter that are the focus of this article. Autosomal-dominant diseases have this very remarkable characteristic in that the laws of inheritance relationship are identical to the logical laws of the relationship of material implication of propositional logic. Knowing that (as concurred by many experimental studies) comprehension of material implication is subject to very strong reasoning biases, we therefore deduced that the comprehension of inheritance laws of autosomal-dominant diseases would surely make genetic counseling a natural recipe for fallacies.

To pursue our assumption, we had to fully record and carefully transcribe genetic counseling dialogues. These dialogues were then examined using two types of resources: (1) argumentation theory from semantic and pragmatic perspective; (2) logical theory of dialogue games (Trognon et al., 2011; Rebuschi et al., 2013). These resources are combined in the methodological framework of interlocutory logic (Trognon and Batt, 2010). They are hereto applied to a very enlightening case of Genetic Counseling for Huntington Disease Predictive Testing. Constituting a type of “experience of nature”, this case will allow us to approach, in a concrete manner, the functioning of conditional reasoning in a natural dialogue and to observe language markers in the intersubjective process that leads (or not) to the product of this sharing, namely to mutual understanding. We will thereby address the prominent role of all of the connectives that are mobilized, especially the connective *puisque* which is its central pivot.

2. Biases in conditional reasoning

2.1. The “condition” in natural and formal language

In natural language, the conditional sentence *If p, q* is a compound sentence that links two clauses using the subordinating conjunction *if*; where *p* is the subordinate clause and *q* is the main clause of the conditional sentence. A conditional sentence expresses a present, past, or future state or event (uttered in the main clause) that may or may not be true. Whether the future event or state is only potentially true, as in *If you get bad marks [it's possible but not certain], you will be punished*, or the present or past event or state is untrue, as in *If you had let me help you [which you didn't], you would have had time to finish the report*, we simply show that the state or event expressed in the main clause resulted, results, or will result from the realization of the condition expressed in the subordinate clause.

The speech act accomplished by the utterance in the context of a conditional sentence, which illocutionary logic sees as a complex speech act (Searle and Vanderveken, 1985:5; Vanderveken, 1988:31), was called “assumption” by Ducrot (1972). It “consists of asking the listener to accept a certain clause *p* for a while, which temporarily becomes the framework of the discourse, and more particularly that of the main clause, *q*” (Ducrot, 1972:167).

The conditional sentence *if p, q* is not the only means of expressing conditionality in natural language. There are other competing expressions containing other conjunctions (*for p, q; because p, q; since p, q*) or adverbs (*when p, q*), etc. These

¹ The purpose of a dialogue is one of the two characteristics of its logical form (Walton, 2007; Walton and Krabbe, 1995). The second is the entirety of its rules.

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