The challenge of formalizing conditional

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All those dedicated to teaching logic agree about the difficulties presented in translating conditional sentences of natural language into propositional formal language of classical logic. Fundamentally these difficulties occur either when we try to determine the truth value of a conditional sentence in the case of false or when we try to analyze the fallacies of statement of consequent or of negation the antecedent. On the other hand, from the cognitive psychology, a lot of experiences describe these difficulties in the natural thought of adult people that have not received before logic learning. In general, most of these experiences conclude marking a clear difference between the material conditional and the conditional used in the natural language. Furthermore, there are models that describe the people competence in relation to the conditional sentences and its associate inferences.

Our hypothesis is that such difficulties constitute didactic obstacles that come from two different sources which are closely linked to each other: on one hand, the diverse senses in which the expression "if...then..." is used in the natural language and the characteristics of the conditional reasoning in the natural thought, and for the other, the meaning of the material conditional itself, because it allow to formalize from contingent conditional sentences even analytic sentences.

So, the task of the teacher will consist in, keeping in mind these difficulties, creating the didactic situations that overcome them. We also seek to delineate a strategy that makes possible to do that. As a final comment, we will do some theoretical observations about the use of the conditional in natural language and about the theoretical proposals for their formalization from the logic of defeasible conditionals.

We will begin by analysing the different types of conditional sentences in natural language. In our daily life we use conditional sentences with different senses. We used them in order to give orders, make questions, make promises and make certain assertions. Some of these uses are not declarative and all they come be expressed under a great variety of linguistic forms that use the expression 'if...then...'' In principle, there are several types of

conditional sentences that could be understood under this general pattern. So, the first task will be to analyze all this variety of uses in order to determinate among these sentences which of them can be captured by the material conditional.

In second place, we will try to show that in natural thought conditional sentences always occur inside a significant language context and that it is just inside this context where people reason involving conditional sentences. Although natural, this process present a particular normativity . The common acceptance of the rules such as the Modus Ponens and the Modus Tollens and the problematic acceptance of the associate fallacies, show this normativity. Our didactic proposal will consist of to sketch a strategy that integrates the semantic and syntactic aspects of the material conditional taking its natural uses as possibility conditions.

Finally, we will expose some problems related with the question of adecuation between the models about defesasible conditional sentences and the conditional sentences used in natural language. We want to know if there are good reasons to incorporate its problematic to the teaching of logic.