From preference between arguments to preference between explanations

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A recent branch of studies within the field of epistemic logic has been the analysis of justifications that an epistemic agent possesses to support one or another belief regarding a specific topic. Nevertheless, there is something that has not received enough attention yet: how epistemic agents might prefer certain justifications to others, in order to have better pieces of evidence to support a particular belief. It seems clear that the manner we prefer one justification to another for our beliefs depends on a variety of factors. In an ongoing work, we have developed a formal analysis of the preference between a particular kind of justifications: *deductive arguments*.

More concretely, let a be an epistemic agent, let φ be a proposition and let t,s be a couple of (possibly different) deductive arguments: *i)* Which of the arguments (t or s) is preferred by a if she pretends to support φ? The motivation for this question and the applications of our answer are diverse and belong to different fields. For example, knowing which argument is better for a given agent would imply knowing which argument will be selected by her in the context of an argumentative dialogue.

According to our approach, the preference between deductive arguments is reducible to other notions. In particular, it can be analysed attending to the following list: the syntactic shape of the arguments, the epistemic attitudes of the agent with respect to the arguments, the sources from which arguments are taken from or construed, and lastly the quantity and complexity of information contained in both arguments. We have built a system that is able to capture this analysis using tools taken from epistemic logic, justification logic and logics for belief dependence; and that allows us to reason systematically about particular problems that may arise in this context. The mentioned system has some natural connections with some earlier works in abstract argumentation frameworks.

If we move our attention from arguments to explanations, we could reformulate question *i)*. There are some structural similarities between arguments and explanations as was frequently stated. An argument, roughly defined, is a pair (Γ, φ) where Γ is a set of propositions (*premises*) that try to support a proposition φ (*conclusion*). An explanation, roughly defined, is a pair (Γ, φ) where Γ is a set of propositions describing established facts and principles (*explanans*) and φ is a proposition describing a fact (*explanandum*) to be understood in terms of Γ. Accepting this analogy, we could then reformulate the question above as follows: given two explanations t, s for the same fact φ and given an agent a that is considering them: *ii)* Which of the explanations (t or s) is preferred by a to explain φ?

A proper answer to question *ii)* represents a new approach to abductive reasoning understood as explanatory practice. Knowing the logical mechanisms through which the agent considers which explanation is better from her epistemic point of view would allow us to understand why she chooses such an explanation. Of course, some of the criteria that have been taken to solve question *i)* might be modified or even deleted, and some new other criteria might be introduced in the analysis of *ii)* to simulate what in the literature on abduction are called *explanatory virtues*. During the talk, we will pursue two goals: explaining our solution to *i)* and sketching a solution for *ii)*.