

Comments on “Quantified Logic of Awareness and Impossible Possible Worlds”

Jeremy Shipley, May 08

Giacomo Sillari's paper extends the known result that a propositional epistemic logic with awareness structures (AWA) and propositional epistemic logic with impossible possible worlds structures (IPW) are equally expressive by showing equal expressivity for quantified predicate logic with the respective structures. Sillari mentions applications of these epistemic logics in economics modeling. I am interested in whether they are probabative of philosophical issues as well, so I have a few questions that are focused on the applicability of these formal systems to epistemological concepts and to our understanding of human cognition.

Early in the paper Sillari mentions that it has been noted that AWA best captures the "modelers perspective" while IPW best captures the "agents perspective". Though not central to the arguments of the paper, this claim struck me as interesting in light of the equal expressivity results. I have an inkling of why the claim is made but I thought it might be clarifying to ask: What is the sense in which equally expressive semantical structures are better or worse at capturing different perspectives? What exactly is meant by "capturing a perspective" here?

When the neighborhood functions are introduced they are given from W , the set of worlds, to the power set of the power set of W , the set of sets of subsets of W . I understand that well enough. The range is said to be given intensionally for the neighborhood functions. Later, when awareness structures are introduced, the same approach is not used. At each world each agent is assigned a set of formulas of which

she is aware. Is this choice significant? Are formulas taken to *be* propositions? In applying or interpreting this logic as describing actual agents are we taking the objects of awareness to be formulas and/or expressions or to be propositions, objects, and/or properties?

I also have a question about logical omniscience within the confines of those propositions of which one is aware. In an ordinary way of speaking I take myself to be aware of Goldbach's conjecture. So, on your understanding of AWA will that place a formula ϕ expressing Goldbach's conjecture in my awareness set? If so, supposing that Goldbach's conjecture is true it would be the case that $(M, w) \models K_i \phi$ and $(M, w) \models A_i \phi$; hence, $(M, w) \models X_i \phi$. That doesn't seem right. Isn't the reason that I don't know whether Goldbach's conjecture is true simply the fact that I don't know of any proof of it? AWA seems to require that a failure to (explicitly) know a necessary truth be explained by one's being unaware the proposition or an expression of it. And furthermore, is there any ordinary sense in which I even tacitly know all necessary truths? Restrictions on awareness seem beside the point.

Along the same lines, regarding IPW one might plausibly insist that the reason that one doesn't know Goldbach's conjecture (again, supposing it is true) is not that one considers an impossible possible world in which it is not true, but just that they don't know whether it is true in this world and in all the worlds they consider as well. I would not say of any world I consider that Goldbach's conjecture is true or that it is false in that world, precisely because I expect it to either be true in all worlds or false in all worlds and I don't know which. The concern is that while AWA and IPW provide technical

tools for limiting logical omniscience they may not be probative of our ordinary epistemological concepts.

Next, I'd like to consider whether the epistemic logics developed by Sillari are meant to capture cognitive structure. If propositional attitudes have and are identified with neural correlates then it seems to me to be an open research question whether, say, connectionist models (if those are the right way to understand brains) of brain-states capture such logical structure. As I understand Quine for example, according to him these kinds of propositional attitudes are to be understood in terms of dispositions to assent to sentences so that their contents are strictly quotational and hence not logically structured. I think that both the connectionist and the behaviorist may understand logical structure as more of a feature the language we use to ascribe attitudes to agents than of the attitudes themselves. One might understand the predicate AWA as suggesting against these theories that propositional attitudes are logically structured in virtue of the role that awareness of objects and awareness of predicates has in cognition. I would like to know if Sillari thinks that predicate AWA or predicate IPW captures the structure of cognition.

Lastly, I should note that I found no formal errors in the paper and really enjoyed working through the different formal semantics.