Review of: "Mental Recognition of Objects via Ramsey Sentences"

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The idea that concepts could be rendered as "Ramsey sentences" has some attractive elements but also a couple of fundamental issues. The idea of concepts being broken down into decentralized networks of features is interesting and has some intuitive neural plausibility to it, that much I can agree with. The problems arise when considering 1) what distinguishes the necessity of the different features of a Ramsey definition of a concept and 2) whether the features could even in principle be defined in a satisfactory way that enabled concrete hypotheses. This particular paper also has a couple of presentation issues that make the argument itself less clear.

First, while the idea of parallel feature detectors is good, not all features are created equal. You can break the concept of 'dog' down into its component features, but some features are *absolutely* necessary for principled reasons (e.g., 'dogs are mammals'), and others are not (e.g., 'dogs wear collars'). It's not clear whether the Ramsey sentence architecture has a way of accounting for this. I base this critique in part on the work of Paul Haward and colleagues on principled connections, which draws a strong line between 'principled' features that are present in a kind *by virtue of* it being that kind, and other features which happen to be associated with a kind.[1]

Second, the features themselves seem like they will be difficult if not impossible to satisfactorily identify at a level that supports the formulation of concrete hypotheses. For example, is 'is three-dimensional' a necessary feature of the Ramsey sentence definition of the concept 'dog'? The problem here is essentially one of granularity, which at the lowest levels risks becoming circular, 'activates this particular pattern of neural activity' could be regarded as a feature. On the other hand, how about 'distends spacetime according to its mass'? This is a feature that is not observable, but also we would not expect it to be present in the mind of a child who nonetheless can identify the concept 'dog'. Here we have a problem of scope. Any Ramsey definition can be built out to an almost infinite degree either through granularity or scope, but the human mind is decidedly finite. The account offered here has no obvious way to constrain the set of features that should or should not be present in the sentence, and without that it's difficult to figure out how this theory can be readily applied.

Finally there are a couple of points that seem either tangential or not well-supported. The first is the argument that this account contradicts probabilistic theories. On the contrary, I would say that they could work together quite well. One solution to the principled features problem I mentioned earlier is a weighting of features, which one could model in a rule-like way or as a set of Bayesian priors about what features are or are not most essential to the formulation of the concept 'dog'. The argument that probabilistic accounts are felled by this view was not convincing to me, it either needs to be given

much more space and detailed argumentation, but I think it also isn't necessary to preserve the value of the account.

Relatedly, the comment at the end that this approach can be applied to other biological systems like the immune system seems wholly irrelevant. That might be an interesting paper unto itself, but I don't think it adds much here.

References

1. ^Paul Haward, Laura Wagner, Susan Carey, Sandeep Prasada. (2018). _The development of principled connections and kind representations._ Cognition, vol. 176 , 255-268. doi:10.1016/j.cognition.2018.02.001.