Sophie Sackstein **Cognition: BCS 153 Homework**

Question: Are symbolic/logical language-of-thought theories alternatives to connectionism or could they both be right? Argue for the side you believe is right, but give at least two arguments the opposing side would give and say what your response is to them.

I believe that connectionism doesn't provide the full picture of how a system works functionally. Although machine learning has proved connectionism can allow for a fairly accurate representation of how a system will predict outcomes, for complex systems like language there is a limit to the efficacy of machine learning techniques. Since language includes innate structures and learning through representations, there can be clustering where certain inherent properties of language emerge. When mental representations are compressed, there are hidden layers in which information can be abstracted into an irretrievable form. When something is completely mapped like nervous systems of flat worms- it may give us a crude image of what the system actually does. By reduction to pure physicalism, there is such a high level of abstraction that almost nothing can be gained from the more knowledge of the physical system without the completion of Marr's levels (computational, algorithmic and implementation). I believe that systematicity defines a set of rules and abstractions which allows for compositionality and productivity since we have the ability to use a set of finite rules in our system to create infinite representations as well as infinitely complex forms. Connectionism is limited by its ability to only deduce from a very complex hypothesis whereas language of thought would argue for underlying systems of representation. In Ned Block's "China Brain" this argument for connectionism is shown as something that is just representational, like connectionism argues is sufficient for mentalese. However I agree more with semantic externalism- the idea that there is no subjective truths, instead the same word may have different meanings for multiple identical systems. Thus a certain neuron firing in one brain doesn't directly correspond to what it would do in another brain- even if they appeared to be identical. Thus in Ned Block's "China Brain" this might show that each person acts in accordance with others, and each might not be trying to achieve the same goal, thus abstracting to a higher goal overfits the data creating a representation that was never there. Since certain sensations and meanings may be multiply realizable; through understanding low-level representations that don't reduce information, connectionism can have synergy with functionalism and structuralism- containing enough representation of combinatorial syntax without abstracting away from the core concept.