Samantha Jenks The Unconscious Juggling of Mental Objects COG 366

- 1. The main topical theme of the Preface 2 is how the mind is able to manipulate representations. There is not one set way of perception, and therefore, there is no right or wrong way to perceiving. This preface is important because it alludes to the idea that there is a lot more involved when solving a jumble than people think; most of it is behind the scenes or unconscious. For example, the concept of the jumble seems relatively simple, but as the author goes more into depth, they revealed that solving the jumble is moderately complex by demonstrating that a simple work such as night can be interpreted and broken down in many different ways.
- 2. The glom is the product of the emerging components from a word that represents a novel entity, separate from what it first started off as.
- 3. The two well defined passes of "glooming" are internalizing the letters, and then using a top down process of manipulation to be able to get to the desired outcome. Moreover, the first pass of internalizing the letters can be analogous to encode the letters, which is a bottom up process. Then for the second pass you have to be able to manipulate the letters in a fashion that will optimize your results and then proceed to judge if you made a word; this is a top down process. In general, the processing of glooming involve a bottom up and top down pass until the solution is complete.
- 4. When Hofstadter states, "objects float on neural hardware but that are certainly not easily describable in terms of neurons or networks of neurons," he is alluding to the fact that the virtual objects aren't the actual object nor is the combination of neuronal firings or the way that the neurons are connected. The virtual object is on a different level of abstraction, and while the neuronal firings and connectivity are important there is a lot more to the virtual object then just a series of voltage fluctuations.
- 5. Some people have asked Hofstadter why even look at such a frivolous activity in the first place, and his answer had to do with how the brain/mind's processing changed as a result of the gradual increase of proficiency of jumbles from beginner to expert. When people first start out with a jumbe their brain processing and they go about solving the problem is a much slower and inefficient process then compared to the proficient jumblers. Hofstadter noted that the proficient jumblers were able to have highly automated and rapid responses; the automation is what Hofstadter wanted to investigate further, how the automation of the skill occurred rather than the skill itself.
- 6. The most salient idea of this passage is when Hofstadter discovered that the Brute-Force anagram programs were infinitely faster than his six - letter challenge. This later uncovered the idea that it wasn't how fast the program worked, but how it worked to solve the problem at had. Hofstadter was trying to create a conceptual model that involved making a program to mimic the thought process of a human. The Brute-Force anagram program used rapid-search techniques that Hofstadter deemed the exact opposite of what he was trying to accomplish.

- 7. The Hearsay II project was about how the knowledge source interacted with blackboard. What was significant was the fact that top-down and bottom up processing were able to run in parallel. Specifically, the top-down processing was considered preconditions that the knowledge structure was already aware of; this lets the top-down structure know if they found what they were looking for. The bottom-up structure would be the scanning and then reporting of the content of the conditions that were present on blackboard.
- 8. Hofstadter's relationship to the "fateful footnote" was that it was what gave him the insight to merge his probabilistic processing with the parallel top-down and bottom-up processing. This would later result in him making his own technique of parallel trace scan featuring top-down and bottom up processing in parallel.
- 9. A parallel trace scan is a process where there are two entities that both use bottom up and top down processing. Both entities use top-down and bottom-up processing to limit each a component or components so at each stage there is a decrease in computational expense from both types of processing.
- 10. Hofstader uses the example of people going through "rush" to demonstrate the parallel terraced scan. This example featured the people in the sorority and the rushees as the two entities. Both the sorority members and rushees used top-down and bottom-up processing in order to make a decision about which sorority the rushees would eventually end up in. The top-down processing was the sorority girls knowing what type of rushee they wanted, and the rushees knew what type of sorority they were looking to join (if not obvious at first definately by the first culling). The bottom up processing was them assessing the communication, and as each culling progressed theis bottom up processing increased in input because they had more time to parse what the greeklife was really like. The aspect of probability was also featured in this example because the rushees didn't know if they would get an invitation and the sorority girls didn't know if the rushee would accept.
- 11. Another example of parallel traced scan from "real life" would be college applications. The two entities are application board and the applicants. At first pass the interaction between the applicants and the application board are brief due to the sheer number of applicants. Then the first cull happens when the student is asked back on an interview. This is where both the application board and the applicant are able to really use their bottom up processing to see if they would be a good fit together. Then after another judgement call, based on their preconceived idea of who should be in school and if the applicant likes the school they are either asked for another interview or are accepted to the school. Either way, this example features to entities that are able to do top-down processing and bottom-up processing in parallel, as well as use that information to decrease the expense of computation.
- 12. Hofstadter believed that the word jumble represents the fundamental cognitive process of word perception, because it allows us to analyze all of the different ways that we can perceive a word. However, one thing that Hofstadter doesn't take into account is the fact that one word can have different meanings based on how it is used in a sentence. For example "object", is it the noun or verb. Additionally another example of something that

would be contrasting to what Hofstadter said is a word in another language: Torschlusspanik (to rush to accomplish something before its too late). Humans are able to process this is a word, however, they would have no idea how to jumble it in the way that Hofstadter is suggesting because they won't know what it means.