Give three concrete examples of explanation based on the use of analogy in one or more areas of Cognitive Systems. For each, explain why it is interesting—i.e., how it helps with understanding.

Some concepts in the study of cognitive systems may be hard to grasp. Hence, there exists analogies to provide general understanding of concepts using minimal technical terms. Examples of the use of analogies includes the explanation of recursion in computer science, problem solving, and in developing psychological theories.

In programming, there is a technique called ‘recursion’. For learning purposes, an analogy is used to better explain what happens when this certain function calls upon itself multiple times. It begins with someone in a movie theatre that is asked for their current row number (Krolik, 2014). Instead of counting, they ask the person in front of them for their row number and add one (Krolik, 2014). However, the second person then proceeds to ask the person in front of them, and so on (Krolik, 2014). This happens until they reach row 1, where the message is then passed back up (while adding 1 each time) until it reaches the top (Krolik, 2014). This analogy shows the computation process of a recursive function in a vivid, simple manner that is easily communicated.

Another use of analogies helps in solving problems by thinking of information in a different domain. An example of this is Duncker’s (1945) radiation problem. An experiment was done on subjects who tried to solve the radiation problem, where only ten percent of subjects were able to solve it (Gick & Holyoak, 1980). With the help of an analogy of a story in a different domain (capturing a fortress) that is seemingly unrelated, ninety-two percent of subjects were able to devise a solution to the radiation problem (Gick & Holyoak, 1980). Because of the similarity in the two stories, the solution given for the second story helped shape the direction of thought to converge to a solution for the radiation problem.

Analogy are also “a valuable resource in developing psychological theories,” (Haig, 2013). In developing Darwin’s (1958) theory of natural selection, analogy was used to argue for his theory. A logical reasoning was used to deduce this, called “analogical abduction”, where, in short, the hypothesis of artificial selection was correct in the cases of selective breeding, and so domestic breeding is like cases of natural evolution (Haig, 2013). In Darwin’s discovery, analogy was used to create new knowledge claims.

Overall, analogies provide the same constraints in the original problem but is instead formatted in a tangible manner. With this, concepts are more easily learned, solved, and discovered by wrapping similar problems in different words.
References

