EPIC Tutorial - Exercise 2
A. Hornof - 7/27/04

The goal of this exercise is for you to get some practice modifying an EPIC model, both the production rules (PRs) and the parameters, and to see the change in the model's behavior and prediction. Steps 1 through 6 create a model that only looks at objects with the target color. You can do something completely different if you like, but steps 1 and 2 are still recommended.

__ 1. Run the Williams model with the "Random_ID_Search.prs" strategy for 10 trials and with 100 search objects. (Set "Device parameter string" to "10 100" and set the Cycles/Run very high, such as 1,000,000). Write down the mean RT of the resulting Monte Carlo simulation for comparisons later. Keep in mind that many more trials would be needed for the RT to stabilize, but you now have a rough prediction.

__ 2. Copy the "Random_ID_Search.prs" strategy to a file named something like "Random_Color_Search.prs" and open the new file in a text editor.

__ 3. Modify the PRs to get the color feature from the probe, and to store it in Tag memory. You can try to do this on your own, but we have put a couple extra rules at the end of the Random_ID_Search.prs to assist you. To assist in human readability, you should move these rules up to just after the "Get_label" rule, and then modify these two rules, as well as the Get_label rule, so that the new rules will fire. Run the model to verify that the rule fires and that a Tag item is created for Color.

__ 4. Modify the two rules that conduct the search, "Start_random_search" and "Continue_random_search", limit their search to items with the probe color. You will need to add two conditions to the LHSs of these two rules. One condition will match against the Tag memory, and the other will match against the color of objects in visual working memory. (Hints: The second condition will be roughly similar to the "Status Visible" condition. The two rules will be linked by a common color variable.)

__ 5. Run the model. It will likely run for a little while and then stall when it finds no rules to fire. This is because it will run out of unchecked items of the probe color to examine. The easiest way to get around this problem, for now, is to make color available in a wider field of view by adding the "Eye Availability Zone" parameter at the start of the PRs. (The second numerical parameter is the zone radius.)

__ 6. Run the model for 10 trials. Compare the prediction to the previous model, and to the human data. Which is more accurate for the observed "ID only" RT? For the "Color" RT?

From here on, you could make another copy of your PRs and:

- Write some new rules so that the strategy will work with the usual color availability setting (of 7.5°). This could be done by creating rules that nominate color objects (temporarily putting them in Tag memory) and, if no color objects are available, any random object is chosen.
- Note that, in the models, the eyes move roughly twice per second, which is a little slow. Decrease the fixation time by not waiting to decide if the currently-fixated object is the target before moving the eyes again.
- Eliminate the memory for which objects have already been inspected.
- Prepare the next eye movement in advance.
- Any other modifications you can think of!