**Study Protocol**

We are conducting 3 between-subjects experiment design. Participants will be randomly divided into 3 groups (each containing equal number of participants) designated as A, B, and C.

Participants will navigate an IVR design consisting of 40 household items to select target items. Group A will interact with a list. Group B will interact with a shallow hierarchy. Group C will interact with a deep hierarchy. Participants in each group will interact with a unique structure.

Each participant will perform 5 tasks. Each task will consist of selecting a target item from the structure that corresponds to their group.

All participants will search for the same 5 target items irrespective of their respective group. An important question is how the tasks in list, shallow and deep hierarchy will be compared to each other.

We have measured the comparative complexity of tasks in different hierarchies on the basis of how many hops are required to reach the target item in a brute force manner. We have mapped each item with a number. The number is equivalent to the number of items a participant would listen before encountering the target item if they performed a brute force search of the structure. Thus, in a list of 40 items, he first item would be 1 and the last would be 40. In a tree, the left node at the last level of the tree would be 1 and the right node at the last level of the tree would be 40.

**Would be a good idea to add a picture here as well.**

Thus, participants in each hierarchy would be asked to find out the following items:

3: pants

10: blouse

19: rings

29: football

36: plate

Each participant will be asked to select the same 5 targets in the order of increasing number of positions. Each subject will be given 2 minutes to complete each task.

Experiments will be constructed as follows:

Subjects will be randomly assigned a group before entering the room. Each subject will be asked the following questions:

* Name
* Age
* Education level
* Gender
* Are you visually impaired?

They will be asked to sit and read the following statement:

“You will be using an interactive voice response system. You will sit at this computer and interact with a keypad on the screen. The system will read you items and a number corresponding to each item. Items are selected by pressing the number as told by the system. You will be asked to find 5 items by using the system and pressing the number corresponding to your target item. During the task you may be asked to proceed to the next task. We will now walk through a simple example.”

The example will consist of a simple five item list of animals where we are asked to select “cat”.

The participant would be given a demo corresponding to his group at most 3 times. After completing the example, the experimenter will proceed to the script on the data collection form.

**Subject Number**:

**Name:**

**Age:**

**Sex:**

**Educational Level:**

**Visually impaired:**

**Group**: A B C

“We will now begin the experiment. You will be asked to select 5 items from a list of common household items.”

PANTS: “Please select pants.”

**Time begun:**

**Time completed: PROMPTED TO PROCEED**

**Final selection:**

BLOUSE: “Please select blouse.”

**Time begun:**

**Time completed: PROMPTED TO PROCEED**

**Final selection:**

RINGS: “Please select rings.”

**Time begun:**

**Time completed: PROMPTED TO PROCEED**

**Final selection:**

FOOTBALL: “Please select football.”

**Time begun:**

**Time completed: PROMPTED TO PROCEED**

**Final selection:**

PLATE: “Please select plate.”

**Time begun:**

**Time completed: PROMPTED TO PROCEED**

**Final selection:**

“The experiment is complete! Well done. Thank you for participating!”