**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:

“Thank you for agreeing to participate in our study. You will be using an interactive voice response system. An IVR system is what you hear when you call a customer care number or bank or moviephone. You hear an automated voice and you have to select some options to access information. We will give you an example a bit later as well.

In this task, you will sit at this computer and interact with this keypad on the screen (**point to the keypad**). The system will read you items and a number corresponding to each item. Items are selected by pressing the corresponding number on the screen. You will be asked to find 5 items one after another. During the task you may be asked to proceed to the next task. We will now walk through a simple example.”

In the example, you will hear names of animals organized in a certain way. Your task is to find “Duck” from the names of animals. In order to select “Duck”, you need to press the number read by IVR system corresponding to “Duck”. Let us show you how.

**Show them the demo**

This is how your task will end. Now you can try doing it. You can try the demo at most 3 times.

**Participant try the demo**

Great, Now we are beginning the experiment. You will try experiment X. You have to press <X> as soon as the call is connected. You will have to find 5 items, one after other. We will tell you the next task once you finish the existing task.

So, lets begin.

**Tell and show them the first item to find.**

**Subject Number**:

**Name:**

**Age:**

**Sex:**

**Educational Level:**

**Visually impaired:**

**Have you used an IVR system before:**

**If yes, how many times:**

**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!”

**Pants**

**Blouse**

**Rings**

**Football**

**Plate**