

Hick Hyman's Law

- Examine's the relationship between the number of stimuli present and an individual's reaction time to any given stimulus.
- Predicts the time it takes to make a decision in selecting among possible choices.
- It measures cognitive information capacity.
- The more stimuli to choose from, the longer it takes the user to make a decision.

The formula for Hick's Law is defined as follows:

$$RT = a + b \cdot H$$

Where ,

H = entropy

a, b are constants that are empirically determined.

With equal probabilities:

$$H = \log_2 (n)$$

With unequal probabilities:

$$H = - \sum_{i=1}^n p_i \log_2 (1/p_i)$$

Steps:

1. Identify the set of participants and tasks. Vary the tasks by varying the choices.
2. Determine the entropy for each tasks
3. Empirically determine the reaction time for each task for each participants. Take the average of all participants.
4. Thus, you get the RT (average of all participants) and H for each task. Plot these values in a RT-H plot (RT along the Y-axis and H along the X-axis).
5. Use the linear regression on the data points to relate the RT and H with the line equation (in the intercept slope form). The intercept and slope values in the equation are the values for the constants A and B respectively.

Assignment Hick Hyman's Law

You have to design a menu structure for ordering house-hold items from a mall directly to your home through a mobile phone interface. Categorize the items in whatever way you wish into menus and submenus. Design 3 alternative screens or menus for effectively ordering items from listed categories, making use of Hicks Law. Compare your designs by actually measuring the reaction time for various test cases and also using the Hick's Law expression.

(Consider the following test cases while designing the Menus

1. To use a more deep menu with more initial choices
2. To use a hierarchy of multi-level shallow menus
3. User's prior knowledge and experience about the domain and interface)