**Language** **used**: Tamil

**Area of study**: Effect of semantic context on lexical access

**Research paper chosen**: Lexical ambiguity, semantic context, and visual word recognition (Schvaneveldt,Meyer 1976) [Journal of experimental psychology Human perception and performance]

1. The study by Schvaneveldt et al examines the previous research on lexical ambiguity as well as the proposals put forth on the process of lexical access during ambiguous word recognition. These proposals were **multiple access**, **selective access** and **weak access** hypotheses. Data from different experimental paradigms of the time did not favour any of these theories strongly over the others. Hence this study was undertaken in 1976 to provide additional insights into ambiguous word recognition and access to meanings in varying contexts with or without semantic priming.
2. The implications of the study can be analysed on two fronts. One is that of ambiguity processing.
   * This study along with other studies done at the time provided impetus to the **selective access model** [context provides enough information such that only one meaning is activated]. While this theory was later weakened by cross modal priming tasks that strengthened the multiple access model, this study had an impact on our understanding of semantic priming and how context does restrict the accessed meaning very quickly.
   * The findings of the study also impose more constraints on **passive models of word recognition such as the logogen model**
   * Passive models (such as logogen model) follow template matching and feature counts wherein a word meaning is accessed when certain threshold is crossed. The findings from Schvaneveldt study mean that, for passive models, spreading neural excitation can explain increased feature counts for words with similar meanings. Semantic priming occurs such that when one word meaning is activated, words with similar meanings can be activated quickly or with fewer feature matches. But it also means that there needs to **be a mechanism of inhibition or gating sensory information** from other feature counts, so **that other meanings are not easily accessed.**
3. The language used for my study is Tamil. Tamil differs from English in its morphology and syntactic features. Tamil is agglutinative and complex words can be derived using process of affixation. Homographs and lexical ambiguities exist in Tamil and for the purpose of this study, only un-inflected forms are considered (as inflection often gives insight into the type of meaning to be accessed)]
4. The task designed by Schvaneveldt was a lexical decision task wherein subjects had to identify if a presented string was a word or non word. The paradigm involved creation of word triplets which had a set of three words (combinations of non-words/ambiguous words/related words/unrelated words etc). I have tried to replicate this task in Tamil and the stimuli was designed based on the following conditions/controls
5. 2 or more common meanings in use for the ambiguous word
6. Pronunciation of the ambiguous word was the same for both meanings.
7. Short words were selected so as to control for exposure and knowledge of subjects
8. Related words chosen for concordant pairs were common words
9. Frequency (common words with similar frequency of occurrence of both meanings)
10. Forms of the word- All words selected were nouns in their un-inflected forms so as to derive meaning solely from context
11. **Stimuli**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ambiguous word** | **Meaning A** | **Related word 1 (Ra1)** | **Related word (Ra2)** |
|  |  |  |  |
| pa:l | Milk | ma:du (cow) | ka:pi (coffee) |
| Nagai | Jewel | thankam (gold) | va-la-jal (bangle) |
| kannadi | Mirror | mugam (face) | a-zha-gu (beauty) |
| ma:lai | Evening | iravu (night) | ne-ram (time) |
| a:ru | Six | et-tu (eight) | enn (number) |
| nu:l | Thread | u:si (needle) | theiyal (stitch) (n) |
| ɵundu (thundu) | Towel | ku-li-jal(bath) | mu-gam (face) |
| Mani | Bell | ko-il (temple) | osai (sound) |
| na:najam | coin | pa-nam(money) | ru:bai (currency) |
| kani | Fruit | inimai (sweetness) | pa-la (jackfruit) |
| Mei | Truth | poi (lie) | cattiyam (truth) |
| Vari | Line | pa:t-tu (song) | kavithai (poem) |
| va:sam | Aroma | malar (flower) | manam (fragrance) |
| at-tai | Cover | puthagam (book) |  |
| ka-jam | Wound | thazhumpu(scar) | ratham (blood) |
| kom-bu | horn | ma:n (deer) | a:du (goat) |
| ach-chu | mould/press(n) | pathirikai (newspaper) | nagal (copy) |
| vi-lan-gu | Handcuff | Pu:t-tu (lock) | Kaithi (prisoner) |

**Alternate meaning**

Another set of Related words were selected pertaining to other meaning

|  |  |  |
| --- | --- | --- |
| **Ambiguous word** | **Meaning B** | **Related word RB** |
|  |  |  |
| pa:l | gender | a:nmai (masculinity) |
| nagai | laughter | sirippu (smile) |
| kannadi | spectacles | pa:rvai (vision) |
| ma:lai | garland | poo (flower) |
| a:ru | river | vel-lam (flood) |
| nu:l | book | patippu (study) |
| ɵundu (thundu) | piece/part | ka-thi (knife) |
| mani | hour | neram (time) |
| na:najam | integrity | ner-mai (honesty) |
| kani | mine for minerals | ka-ri (coal) |
| mei | body/form | udal (body) |
| vari | tax | varumanam (salary) |
| va:sam | dwelling | vi:du( house) |
| at-tai | leech | iratham (blood) |
| ka-jam | pungent taste | podi (powder) |
| kom-bu | twig | kilai (tree branch) |
| ach-chu | base/axle | vandi |
| Vi-lan-gu | Animal | Puli (tiger) |

**Random word set**

|  |  |
| --- | --- |
| **Ambiguous word** | **Unrelated word (Ua)** |
|  |  |
| pa:l | Ku:dai (basket) |
| nagai | Pa-gal (morning) |
| kannadi | Ma-yil (peacock) |
| ma:lai | Vangi (bank) |
| a:ru | Me-jai (table) |
| nu:l | Vali (bucket) |
| ɵundu (thundu) | Ma-lai (mountain) |
| mani | Paravai (bird) |
| na:najam | Padi (step) |
| kani | Kelvi (question) |
| mei | Mazhai (rain) |
| vari | Kana (dream) |
| va:sam | Medai (stage) |
| at-tai | Kolam (design) |
| ka-jam | Pattu (song) |
| kom-bu | Maina (bird) |
| ach-chu | Pal (tooth) |
| vi-lan-gu | Paanai (pot) |

Thus the stimuli consists of A (ambiguous word), Ra1 Ra2 (related words from 1 meaning), RB (related word from another meaning) and Ua(unrelated word)

**Design**

6 triplet associates can be created by combining the above stimuli

**Concordant : Ra1- A- Ra2**

**Discordant : Ra1 - A- Rb**

**Initial : Ra - A – Ua**

**Terminal : Ua – A - Ra**

**Separated : Rb - U - A**

**Null :U – A – Rc**

(Rc means that an ambiguous word is paired with a related word in the list not corresponding to itself)

**Analysis:**

Measurements are made for each of the 6 triplet categories among subjects in terms of reaction times (time taken to answer y/n on the lexical decision of the ambiguous word).

Error rates (How often they get it right). The average reaction times are compared for every pair of the 6 categories. We then establish if there is a statistically significant difference in the average reaction times.

**Expectation :**

1. Reaction times will show statistically significant differences in case of concordant and initial/terminal sets where there is a disambiguating context in the form of 1 or 2 related words
2. Initial and terminal sets will not show a significant difference due to the fact that the order of the stimuli does not impact access of ambiguous meanings
3. Similar result would be obtained for separated sets as well. No impact on reaction time when the stimulus and target are separated.

If the above expectations are met, then the context guided selective access hypothesis is strengthened as posited by Schvaneveldt et al in lexical ambiguity tasks.