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**Applications of Artificial Intelligence & Mnemonics in
Learning Foreign Vocabulary**

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INTRODUCTION

The primary goal of this theory is to propose a method to study and develop the use of mnemonics using artificial intelligence in remembering foreign vocabulary. I am basically interested in designing a solution, which will allow computers to help the learners in generating their 'own' mnemonics for remembering foreign words. The challenge is to analyze the 'word' to be remembered and then suggest patterns or *simple short words* based on the user's background like – native language, language used at work/school, field of study/work etc. Based on the computer's output, it would be easier for the learner to generate his 'own' mnemonic. The use of 'own' is further vitalized by the fact that mnemonics generated by one person, may be not so appealing or sometimes totally irrelevant for some other person as shown by many studies. Hence the aim is to direct the machine to be a facilitator and *not* the creator of the mnemonic.

THEORY

The theory contains two separate parts, dealing with English words and Japanese Characters:

PART A

Following theory for splitting English words is proposed (which can be later extended to other languages):

Assumptions:

- a) The learner is above average/good at his native language and average at English language with a desire to increase his vocabulary in English Language.
- b) The learner has a relatively weak memory in the sense that the total study time required by him to study using the proposed mnemonic method is less than that

required by rote learning.

1. For words in English language:

- a) Splitting the English word directly into valid syllables which make sense in English or the native language of the learner.
- b) An extension of *clause a* with the computer trying to rhyme/match the syllables to simple valid English/native language words.
- c) An extension of *clause a and b* under which the computer will match the syllables with the user's profession/dialect and other larger social group which use a particular set of jargon.
- d) An extension of *clause a and b* with the computer also recognizing the syllables to skip which do not fit/rhyme with any valid word with simple English or Native Language.

The valid syllables thus created, can further be processed by the computer to form meaningful sentence/image or suggest further keywords to the learner so that he can form his own mnemonic.

Examples (Using Hindi as native language)

(For clause a & b).

1. abysmal – split as – 1. aby 2. small

‘aby’ rhymes with ‘abhi’ in hindi meaning ‘now’

‘smal’ in English converted to ‘small’.

The aim is to achieve the above splitting to be performed by the computer.

Suggested mnemonic (**imagined by learner**): now its small but soon will grow to abysmal (*very great, limitless*) depths.

2. Onerous – split as - 1. one 2. ras

‘ras’ Means ‘juice’ in hindi.

Suggested mnemonic: Extracting out one glass of ras(juice) from the sugarcane was an onerous (*burdensome, wearing*) job for the poor man

3. Opulence – split as – 1. o 2. pul 3. lence

O is skipped (*clause d*)

'Pul' converted to 'pull'

lence converted to 'lens'

Suggested mnemonic: The Girl pulled out her lenses and changed to new ones everyday, showing her opulence (*luxury, extreme wealth*)

4. melancholy – split as 1. melan 2. choly

'melan' converted to water 'melon'

'choly' (read kholi) means 'open' in hindi.

Suggested Mnemonic: When mother cut open the melon, she turned melancholy (*gloomy, depressed*) as it was completely soiled and decomposed.

5. Pachyderm – split as 1. pach 2. hy 3. derm

'pach'(paak) means 'clean' in hindi(urdu).

'Hy' converted to 'hai' meaning 'is'

'derm' converted to 'dermis' (*clause c as for doctor/healthcare*)

Suggested Mnemonic: The sheep's skin remains clean because it is a pachyderm (*thick skinned animal*) with lot of hairs to prevent dirt from getting in.

PART B

The Japanese/East Asian language poses a unique problem to learners as the Kanji characters reading and meaning both have to be learnt separately unlike English where the word can be read, by looking at it, but only the meaning should be remembered.

This theory describes a method of learning the meaning of the Kanji.

Assumptions:

1. For people learning Japanese language, they learn to speak/hear and comprehend sounds relatively faster as compared to writing/reading.

2. The Learner has knowledge about speaking/hearing and comprehending words which he wishes to learn to read/write.

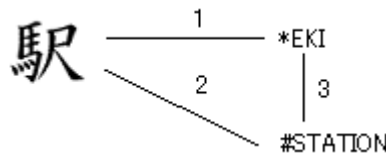
Example:

Kanji Character---- 駅 Read as: Eki* Meaning: Station#

In the above example * is how the word is pronounced while # conveys the meaning in English.

Explanation:

The following diagram will further clarify the aim:



Here it is assumed the learner knows that 'station' is called 'eki' in Japanese but does not know how to write it in Japanese kanji. We will put our efforts in forming the link 2 assuming link 3 has been formed by previous knowledge thus leading to form link 1.

Lets analyze the Kanji character. The left part can be imagined in the form of *signals (red,green etc) and light bulbs* while the right part can be imagined as a *flag* both of which are used at railway stations. Thus the mnemonic symbolizing *station* can be formed.

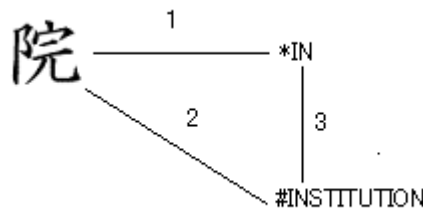


The left part as signals and bulbs.



The right part as a flag.

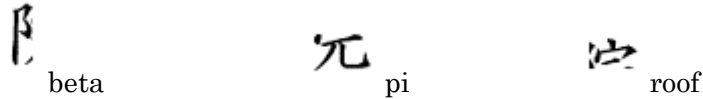
Lets take another example:



Here again, we need to create link 2 assuming the learner already has formed

link 3 through previous learning.

Analyzing the Kanji character, we find that the left part is a symbol for *beta* and right lower part symbolizes *pi* while the right upper part can be imagined as a *roof*. Now a place under which beta and pie are taught can be thought of as an institution. Thus mnemonic symbolizing *institution* can be formed.



Though I have quoted easy examples, even complex kanjis can be converted in the same way with some directed imagination. I was able to form such mnemonics for about 200 kanji characters. Hence, if efforts are put to split the 'kanji character' into recognizable images using artificial intelligence and further associate them with simple short words then it will make reading/writing Japanese relatively easier.

CONCLUSION:

Both the parts above suggest to generate a group of simple short words (in the learner's native or second language) for a given English word or Japanese Kanji. These SSW (simple short words) can be utilized by the learner to create his 'own' mnemonic or can be further processed by the computer to suggest a suitable personalized mnemonic.