

PINKER WORDS AND RULES

Humans possess a mental lexicon containing a finite number of words, and a finite grammar of rules.

A word is composed of a stem and an optional suffix. These themselves are stored in, and retrieved from, the mental lexicon.

Walked is a word, but the listemes walk and ed are what is stored in the lexicon, to save space.

Irregular words tend to be common words that are used often. Since retrieving a word from memory is quicker than applying a rule, their past tense forms are memorised. The past tense versions of less common words are generated using a rule. Thus, rules cut down our mental storage needs and make human language more efficient.

Regular past tense forms are generated by a rule (*add -ed*), and irregular past tense forms are stored and retrieved as words.

If a past tense verb form is stored in memory, the rule is blocked. If no past tense form is stored, then the rule is applied.

A child could only learn the blocking principle from scratch by learning explicitly that overregularised forms are wrong. They need some form of negative feedback to realise this, but research shows that negative feedback has no effect on a child's language acquisition. So, the blocking principle must be an innate part of linguistic knowledge.

So why do adults use the blocking principle more effectively than children? Why do only children generate overregularisation errors?

This makes sense, because we can create the past tense of a new word that we have never seen before by extending the rule to it. We do not just repeat words that we've heard. We are capable of forming the past tense creatively, even when we've never heard the word used before.

The words and rules theory does not explain why irregular verbs seem to display some pattern. One hypothesis is that all irregular past tense forms used to be regular, but for any irregular past tense form in modern English, some past generation of English speakers have failed to grasp the relevant rule. Instead, they memorised the past tense forms as separate words, then passed them on.

Language acquisition has slightly imperfect fidelity. Each generation has a slightly different version of the language.

Well, because adults have more experience than children. They hear the irregular verb forms more often, and memory retrieval improves through repetition. In fact, adults overregularise new words too, if they are unfamiliar words. Irregular forms are not predictable, and can only be produced if they've been previously heard and memorised. If children have not heard a word enough, it cannot be recalled on demand, and so they the rule is applied.

CHOMSKY AND HALLE ALL RULES

The Sound Pattern of English details just three additional rules that could be applied to create any irregular past tense form. These rules focus on replacing consonant vowels, and mean that several simple rules can be applied to count for one complex change.

SPE provides no explanation of how children learn words. It is simply a theory of how words are represented in our minds. It does not explain children's U shaped learning curve.

Since memory retrieval is faster than applying rules, this theory does not explain why English speakers can produce irregular forms more quickly than regular forms. Quite often, several of Chomsky's rules have to be applied to produce an irregular past tense form, so retrieval of irregular words should actually be slower, since it involves more computation..

The model also relied exclusively on sounds to compute the past tense, and so could not tell the difference between two words that sounded the same. A human could do this, if they were provided with context, whereas the model could not.

RUMELHART AND MCCLELLAND NO RULES

Rumelhart and McClelland presented a neural network model. They trained it on pairs of inputs and then tested it on unseen inputs. There was no lexicon of words, and no rules.

The main issue they faced was representing an entity made of a fixed arrangement of parts, such as a word, if units could only be switched on or off. Their solution to this was to use Wickelphones, which were three sets of phonemes in a row.

This approach argues that there are no rules. Word learning relies on memory alone, a general associative mechanism for recognising patterns.

However, the model could only produce past tense forms. You could not get the model to work backwards and produce present tense forms, like humans can.

The model demonstrated child like behaviour by overregularising words. It also displayed a U shaped learning curve.