1 Introduction

The Article is about the production of inflexion at the example of the past tense form of English verbs.

It covers a theoretical part / discussion & 5 psycholinguistic experiments.

2 Part one: Literature

1. In the early 80’s, the idea of having rules to produce inflexion was dominant.

2. In the 80’s, there started a debate about psycholinguistic/cognitive processing; the creation of past tense forms in English was established as a main domain for this discussion (Ramscar even calls it battleground).

3. (Rumelhart & McClelland 1986:) Mental model: There are no explicit rules, but there is rule-like behaviour derivative from weighted connections / analogies that lead to decisions. (new paradigm: Mental Processes are much less hierarchical and rational than believed by the first cognitive scientists)

4. Establishment of two major groups, who can claim and do claim differences in the data as evidence for their models (footnote p. 46).

2.1 Two different approaches

1. Ramscar describes the rule theory as a derivative from Generative Grammar. However, irregularities cannot be explained by simple memorizing
a list of them, because these irregulars do cluster (groups with the same irregular pattern) and can act as the basis for nonce verbs. This leads to the so called dual route approach: Rules for regulars, phonological analogy for irregulars. (i.e. Pinker & Prince 1988)

2. the idea of phonological analogy is used by other authors to describe even the regular inflexion (stem+ED) (Marcus et al. 1995)

2.2 Homophones

Homophones is a major example of debate.

(1) to brake → braked
to break → broke

The dual-route approach is connected to the model of grammatical analysis. That is: Before rule processing grammatical information are necessary to take the right rules. I. e. in English all verbs derivative from nouns are inflected regular despite their phonology. Brake is denominal and is regular, break not. Ramscar will try to show, that semantic similarity can be used to explain that behaviour; thus there will be no need to use rules (and grammatical information)

2.3 The role of semantics

There are some accounts for the influence of semantic similarity in inflexion (MacWhinny & Leinbach 1991). However, its role is still controversial. Authors like Pinker (dual route) have criticized this idea. They do not see any influence of semantics on past tense production.

(2) slap/hit/strike (have different past tense forms)
sting/sing/drink/stink etc. (are semantically not similar)

Ramscar sees this not as an absolute negotiation of semantic influence, as he provides semantic similarity as a cue for analogies for phonological similar verb

forms (that is his interpretation of the MacWinny & Leinbach 1991 text).

2.4 Empirical evidence

One often used method for investigating this topic is the use of nonce verbs.

Ramscar criticizes experiments, where Participants had to produce past tense forms of nonce verbs in a sequence, because there is reason to think a) of an order effect (already made choices or examples influence one’s choice) b) of a priming effect (regulars prime stronger than irregulars).

3 Part two: Experiments

3.1 Experiment 1:

Question:

Is there influence of previous given verb forms on tasks producing inflexion in nonce words?

Procedure:

Participants were asked to produce the past tense of given nonce verbs. The choices were spoken, not written. There were 4 groups of participants. One was given an regular example (-ed), the other an irregular. 1/4 was given no example at all while the last fourth was given ucteria to have an irregular plural. The task word was phonologically dissimilar to the example.

(3) Every Wednesday, John likes to frow. Last week, John frowed a lot.
Every Friday, John likes to frin. Last week, John _____ a lot.

(4) Every Wednesday, John likes to frow. Last week, John frowed a lot.
Every Friday, John likes to frin. Last week, John _____ a lot.

material was frow, spoink, cleed, frinka, spling
Results:

1. 68,5 % produced a form consistent to the example (significant).
2. Those without an example were statistically not different from the group with irregular example, but from the one with a regular one! (77,5% irregular)
3. Irregular plural group (78,5 %) and control group were not different.

Discussion:

Previous inflexions can influence the choice of producing past tense forms of nonce verbs, which is important for the interpretation of previous results as well as for the procedure of further ones.

3.2 Experiment 2:

Question:

Does semantics influence inflexion of nonce verbs?

Procedure:

3 short texts given with different semantic domains (drink / blink (wink) / meditate (heal); controlled by LSA; phonological domain controlled) were used to carry the nonce words spink or frink, who are phonologically similar to drink (irregular) / blink (regular).

Example was wucterium to avoid influence (phonological and past tense pattern) as shown in Experiment 1.

(5) A single wucterium can be very dangerous. When they breed and multiply, a buildup of ____ can proof lethal. (fill in wucteriums, wucteria . . .)

Participants were given only one task.

Results:

1. Semantics have an influence on the inflexion of nonce verbs (75,3% prime consistent choice).
2. semantic context similar to regular known word (blink) –> 73% regular (significant)
3. semantic context similar to irregular known word (drink) –> 77,5% irregular (significant)
4. no differences between nonce in blink or meditate condition, but in drink and meditate condition (70% regular in meditate condition)
5. Question 1 and 2 showed significant priming of semantic domain (that supports the results 1-3). Question 3 showed that the semantic context was understood as intended.

Discussion:

A nonce verb will be inflected like the semantic similar form if there are both, regular and irregular phonologically close/identical existing verbs.

3.3 Break for discussion

Ramscar takes a closer look to the control group (meditate) from Experiment 2. 70% regulars in meditate condition seems to suggest: If a nonce has no semantic similarity to a phonologically similar irregular, but to a phonologically dissimilar regular (meditate/heal) –> inflexion is done regular!

But Ramscars interpretation seems to be more likely, because of Experiment 1: (no semantics (LSA) no example, the inflected forms of sprink/frink were 72,5% irregular) Why this finding alone could be explained by the analogy with the most frequent word that is phonologically similar (drink is much more frequent
than blink), in Experiment 2 there is a semantic domain associated with meditate
–> inflexion is produced regularly.

So regular and irregular inflexion seem to be produced by analogy with factors of
weight and overall activation (what is now active) of 1. phonology, 2. semantics
and 3. frequency. Dual route approach seems to need to adopt (semantic)
alogy within regular productivity to cover this results.

Question: Is it possible, that the dual-route approach is more likely than anal-
ogy?

a) Can we explain analogy and rules for regular inflexion? (discussed in Exp. 2)
b) Are rules necessary to explain aspects of inflexion?

3.4 Experiment 3:

Question:

Is inflexion determined by grammatical analysis or not?

Homophone inflexion can be explained by grammatical analysis. Denominals are
always regular (brake – braked). So there must be used grammatical information
before inflexion processes (which supports the dual-route approach).

Procedure:

Similar to Experiment 2 except that the three texts were expanded to introduce
the nonce as nouns, and a test group controlled the perception of the nonce as
nouns. The 4th text was from Kim et al. (1991). Three questions at the end as
known from Experiment 2.

Results:

1. Control group could identify the heritage of the nonce.

2. semantic context *drink* (irregular/denominal) –> 72,5% irregular

   semantic context *blink* (regular) –> 75% regular

   semantic context *meditate* (regular, phonologically dissimilar) –> 70% reg-
   ular

3. context from Kim et al. (1991) (described as semantically neutral) –> 11,4
   % chopped/hammered/sliced produced instead of nonce verb; most other
   past tense forms (87,2 %) werde produced regular. LSA showed strong
   linking to chop/hammer/slice that are regular

Discussion:

The Kim et al. (1991) findings seem to be based on semantics. Semantic con-
text was shown to be priming inflexion of nonce verbs with noun heritage, no
grammatical analysis seems to be needed to explain these findings.

3.5 Experiment 4:

Because of Ramscar’s critique on Kim et al. (1991), some findings shall be
re-examined.

Question:

Does semantic similarity or grammatical status best predict the acceptability of
irregular past tense forms?

Procedure:

Pairs of homophones with different semantic context were presented. Only one
part of the pair to one person. Participants rated the semantic connection /
others the grammatical status and a control group, how the verb fits into the
context.

Results:

1. significant relation between semantic anticipation and both regular/irregular
   acceptability.

2. significant relation between grammatical analysis and irregular acceptabil-
   ity, but not for regular verbs
3. significant relation between grammatical analysis and semantic anticipation.

Discussion:

Grammar and semantics are highly correlated. Semantics can better predict inflexion. If the single route approach is correct, grammatical rules could be thought to be describing the outcome of semantic analogies.

3.6 Experiment 5:

*To fly out* is regular in the U.S., because in baseball it became a noun, then again a denominal verb.

Question:

Is a grammatical analysis or semantic analogy responsible for different inflexion of *to fly out*?

Procedure:

British and American participants were presented a text, that explained a verb (*fly out*) as denominal. They were asked to build a past tense form.

Afterwards they had to tell, if they had been already aware of this special meaning.

A control group (British) was given the nonce *give along*.

Results:

1. 91.7% British produced an irregular form.
2. 66.7% American produced a regular form.
3. control group 89.4 % produced an irregular form.

Discussion:

it seem to depend on the knowledge of the past tense form in memory, not on the knowledge whether a verb is denominal or not.

4 General Results:

The idea of needing grammatical status is not supported. However, the single-route approach of analogy with phonological, semantical similarity and word frequency can explain experimental results better than the dual-route approach (with rules for regular inflexion). Other findings were successfully criticized in their material choices and interpretation of results.

5 References:


