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# Homework

1. No head injury is too trival to ignore

Here are two possible interpretations. Most people would choose the former.

1. No head injury should be ignored no matter how trivial
2. All head injuries should be ignored no matter how trivial

Now, how about this sentence?

1. No donut is too fattening to eat

This clearly means

1. All donuts should be eaten no matter how fattening

So “No head injury is too trivial to ignore” actually means “All head injuries should be ignored no matter how trivial”. It is a linguistic illusion.

This seems to happen because the lexical semantics of the sentence, combined with our world knowledge of what one should do in the case of a head injury strongly predispose a particular interpretation such that we ignore the actual meaning. In other words we “go for gist”. This is consistent with the “Goodenough” theory of language comprehension (Fernanda Ferrara) which argues that we process language in a relatively shallow way, doing just enough processing to extract a contextually-relevant meaning, but no more.

# Defining complexity

## An example of complex language

1. The cat chased the mouse
2. **The mouse** was chased \_ by the cat

Which is more complex and why?

Passives are generally regarded as more complex than actives? Why?

1. Semantically non-canonical word order: the patient comes before the agent.
2. because they contain syntactic movement (movement of NP *cat* from after the verb *chased*)

## Canonicity

We can refer to **syntactic** and **semantic** canonicity.

In **syntactically canonical** sentences, the subject comes before the object.

1. The teenager likes parties

In **semantically canonical** sentences, there is an **alignment** between the Subject and the Agent argument

1. The man ate the donut
2. The dog chased the cat

In some cases the subject may not be an Agent, but it will definitely have more agency than the object

1. The boy smelt the theme

Here are some examples of non-canonical sentences

1. The mouse was chased by the cat (syntactically canonical - subject comes before verb, but semantically non-canonical - subject maps to least agentive argument)
2. There’s the mouse that the cat chased (syntactically non-canonical - object comes before subject, but semantically canonical - subject maps to agent argument)

For three place predicates, which is the canonical word order?

1. John gave her a book (DITRANSITIVE)
2. John gave a book to her (PREPOSITIONAL DATIVE)

### Canonicity across languages

1. English is SVO (40%)
2. Japanese is SOV (35%)
3. Classical Arabic is VSO (15%)
4. Fijian is VOS (10%)
5. Xavante is OSV (<1%)
6. Hixkarayana is OVS (<1%)

Strong tendency for S > O (75% of world’s languages) and weaker tendency for V > O (65%)

Some languages allow words to come in almost any order, e.g. Latin & Finnish. However, even these have a preferred word order, e.g. it has been argued that the basic Latin word order is OSV.

### Canonicity and movement

Syntactically non-canonical sentences are assumed by many linguists to result from a movement process:

1. **The mouse** was chased \_ by the cat

T**he mouse** originates in the direct object position (shown by \_ ) and moves to the front of the sentence. \_ is sometimes called the *gap*, and the mouse is described as the *filler*. This is because when we mentally “fill in” the mouse when we arrive at the *gap*. The gap is also called the *trace* (shown by *t*) especially among generative linguists.

### Exercise

Are the following sentences syntactically canonical? For non-canonical sentences specify the filler and the gap?

1. It was **the boy** that **the girl** pushed
2. **The** **boy** apparently pushed **the girl** into the puddle
3. **The boy** that **the girl** pushed was upset
4. **The boy** was pushed by **the girl**
5. **The boy** that pushed **the girl** was naughty
6. It was **the boy** that pushed **the girl**

### Movement / canonicity and processing difficulty

Sentences are more difficult to comprehend when they (a) contain movement, (b) when the movement is longer. This effect is particularly strong in language impaired individuals, e.g. language impaired children. For example, while differences between lanaguage-impaired and language-typical children are relatively small for canonical sentences, they are large for non-canonical sentences.

## Position of embedding

Dependent clauses are easier to process when they are embedded in the middle of a sentence

1. **The boy** \_ that pushed the girl was naughty
2. **The boy** pushed the girl \_ that was naughty

Why is this the case? (1) Separates a subject from its verb *the boy / was*. It also misleads the hearer as, if we ignore the complex structure of the sentence, *the girl* “looks like” the subject if *was naughty*. Language impaired individuals are often misled by this kind of superficial analysis.

When there is multiple centre-embedding the sentence is almost impossible to understand:

1. **The girl** that **the boy** that **the teacher** scolded \_ pushed \_ \_ hurt her knee
2. Theres’ **the boy** that the teacher scolded \_ \_ that pushed the girl that \_ fell and hurt her knee .

Sentences such as (1) are used to motivate a separate between syntax and processing mechanisms. The structure is syntactically legal, but impossible to understand. Syntactic legality is confirmed by the syntactic mechanism, while comprehension difficulty arises due to limitations in some kind of processing mechanism

## Representational complexity

Word representations consist of a lemma (modality independent) and a lexeme (modality-specific). The lemma contains information about meaning, and **how to use the word in a sentence**. Verbs, in particular, determine the structure of a sentence after the verb. This is called the **subcategorisation properties** of the verb. Verbs differ in terms of the complexity of their subcategorisation properties

1. Mary fixed **the bike**
2. Ali donated **a book to the library**
3. Ali donated **a book**
4. Angie gave **Peter a book**
5. Angie gave **a book to Peter**
6. Angie gave **a book**
7. Janet said **her prayers**
8. Janet said **that she was sorry**
9. Erica asked **a question**
10. Erica asked **about the interview**
11. Erica asked **Mary a question**
12. Erica asked **whether Mary was tired**
13. Erica asked **Mary to be quiet**

Shapiro et al. (1987) used a lexical decision task to test processing difficulty after the verb. They found that processing difficulty was related to the representational complexity of the verb.

# Animacy and discourse factors

## Animacy

Because animate entities (people, animals) have volition, they make good agents. Agents typically occur in subject position.

1. **The boy** ate the sausage

Because inanimate entities (e.g. objects) do not have volition, they do not make good agents. Non-agents typically occur in object position.

1. The boy ate **the sausage**

Because of these correspondences, animacy cues can help children determine who did what to whom, e.g.

Which are easiest?

1. **The boy** that *the rock* squashed \_ was large
2. **The car** that *the man* drove \_ was fast
3. **The cow** that *the pig* chased \_ was spotted

## Discourse I - properties of NPs

Different argument slots also have particular discourse properties. The subject position often contains discourse-old information, e.g.

1. I like John. **He**’s a nice guy.

By contrast, the object position typically contains discourse-new information

1. Have you heard about John? He won the **lottery**

Complex structures are a lot easier to process when subjects have typical discourse properties (i.e. they are pronominal)

1. There’s the dog he chased \_ (Subject is pronominal = EASY)
2. There’s the dog the boy chased (Subject is a full Noun Phrase = DIFFICULT)
3. Which dog was he chasing \_ ? (Subject is pronominal = EASY)
4. Which dog was the boy chasing \_ ? (Subject is a full Noun Phrase = DIFFICULT)

## Putting animacy and discourse together

We can manipulate difficulty be combining animacy and discourse cues

1. There’s **the hammer** he dropped \_ (Supportive animacy and discourse cues)
2. There’s **the boy** that the girl chased \_ (Unsupportive animacy and discourse cues)

Animacy and discourse can actually “trump” syntactic complexity, e.g.

1. There’s **the hammer** he dropped \_ (noncanonical structure, but supportive animacy/discourse cues)
2. There’s **the girl** that \_ chased the boy (canonical structure, but unsupportive animacy/discourse cues)

Kidd et al. (2007) found that kids were actually better at repeating (1) than (2)

## Discourse II - structure of preceding utterances

We have a natural tendency to recycle the structure of preceding utterances. This is demonstrated by structure priming studies.

1. The participant hears a structure
2. The participant describes a picture which can either be produced with the preceding structure or a different structure

Participants use preceding structures at above-chance level.

Syntactic priming is a much studied phenomenon. It has been argued that priming is a consequence of an implicit structural learning mechanism (Peter et al. 2015). Structural priming is widely employed in intervention (Leonard, 2011). However, language-impaired children may be less susceptible to structural priming (Kidd, 2012)

# Homework

Complete the following sentences

1. It’s a game of two \_ \_ \_ \_ \_ \_ \_ \_ \_
2. Her presentation was all over \_ \_ \_ \_ \_ \_ \_ \_ \_
3. What’s a nice girl like you \_ \_ \_ \_ \_ \_ \_ \_ \_
4. Who’d a \_ \_ \_ \_ \_ \_ \_ \_ \_ ?

How many possibilities were there? What kind of factors influenced your completions?

# Bibliography

Kidd, E., Brandt, S., Lieven, E., & Tomasello, M. (2007). Object relatives made easy: A cross-linguistic comparison of the constraints influencing young children’s processing of relative clauses. *Language and Cognitive Processes*, *22*(6), 860–897.

Kidd, E. (2012). Individual differences in syntactic priming in language acquisition. *Applied Psycholinguistics*, *33*(02), 393–418.

Leonard, L. B. (2011). The Primacy of Priming in Grammatical Learning and Intervention: A Tutorial. *J Speech Lang Hear Res*, *54*(2), 608–621

Peter, M., Chang, F., Pine, J. M., Blything, R., & Rowland, C. F. (2015). When and how do children develop knowledge of verb argument structure? Evidence from verb bias effects in a structural priming task. *Journal of Memory and Language*, *81*, 1–15. <https://doi.org/10.1016/j.jml.2014.12.002>

Shapiro, L. P., Zurif, E., & Grimshaw, J. (1987). Sentence processing and the mental representation of verbs. *Cognition*, *27*(3), 219–246. <https://doi.org/10.1016/S0010-0277(87)80010-0>