

Linguistic Approaches to Intervention

Nick Riches

Newcastle University

May 12, 2020

(1) Multimodal approaches

Definition

Use of shape and colour

Use of gesture

(2) Difficulty gradients

What are difficulty
gradients?

Difficulty gradients

(3) Lexical variation within slots

Variation versus no variation

Skewed distributions

(4) Other psycholinguistic approaches

Distributed learning

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Recruit non-linguistic representations (e.g. shape, colour and gesture) to support language learning.

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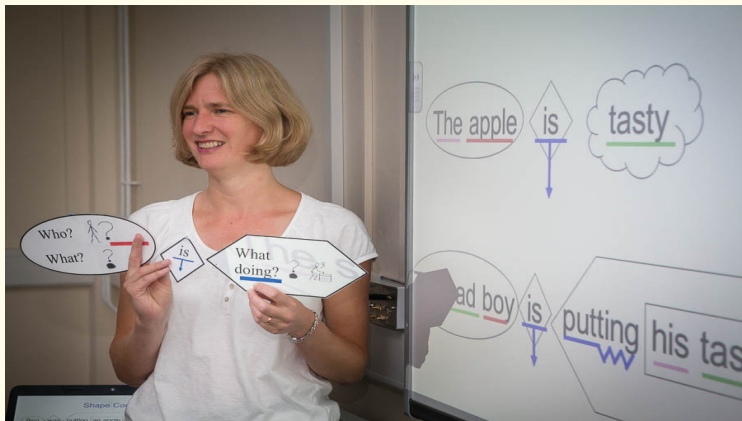
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Use of shape and colour

“Shape coding” is a very popular system devised by Susan Ebbels.

Based on ‘Colourful semantics’ (Dorothy Bryan)



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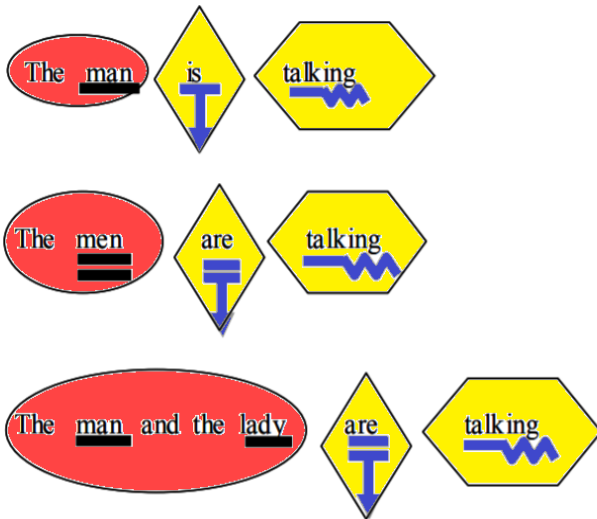
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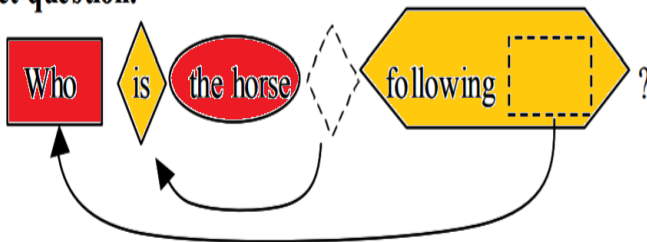
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Use of shape and colour

Subject question:



Object question:



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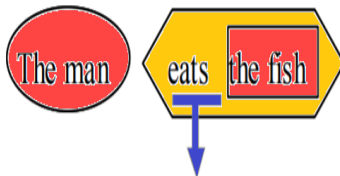
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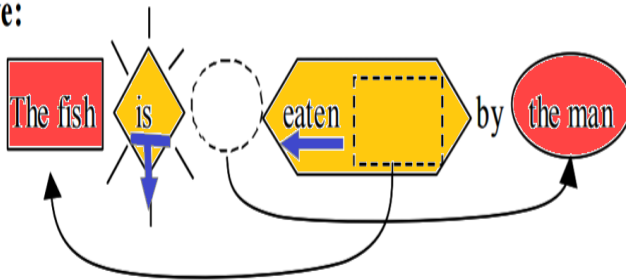
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Use of shape and colour

Active:



Passive:



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1. Movement processes, e.g. auxiliary movement in questions, are **graphically** demonstrated
2. Subject-verb agreement is **graphically** demonstrated
3. Phrase structure / constituent structure is **graphically** demonstrated
4. Some conventions are 'iconic', e.g. double-underlining to show plural

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Strong evidence base, but most data collected from older children (11;0 and above)

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Co-speech gestures (i.e. gestures occurring at the same time as speech) can boost children's comprehension of complex sentences (Theakston et al. 2014)

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Use of gesture

a



b



c



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What are difficulty gradients?

Recap on factors affecting processing difficulty in complex sentences

- ▶ Position of embedding (middle of sentence versus end)
- ▶ Presence / absence of animacy cues
- ▶ Discourse properties of Noun Phrases, e.g. do we use a Noun or Pronoun in subject position.

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- (1) **The boy** [_ that pushed **the girl**] was naughty
- (2) **The boy** pushed **the girl** [_ that was naughty]

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(3) The boy that the rock squashed _ was large

ANIMATE

INANIMATE

(4) The car that the man drove _ was very fast

INANIMATE

ANIMATE

(5) The cow that the pig chased _ was spotted

ANIMATE

ANIMATE

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(6) The cow that he chased _ was spotted

FULL NOUN
PHRASE

PRONOUN

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What are difficulty gradients?

STATE PASSIVE (Israel et al., 2000)

- (7) Car broken. (Adam 2;4)
- (8) Pumpkin stuck. (Nina 2;1)
- (9) Now it's fixed. (Peter 2;0)

EVENT PASSIVE

- (12) That dolly's gonna be washed cause she's dirty (Nina, 3;2)

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What are difficulty gradients?

STATE PASSIVE (Israel et al., 2000)

- (7) Car broken. (Adam 2;4)
- (8) Pumpkin stuck. (Nina 2;1)
- (9) Now it's fixed. (Peter 2;0)

INTERMEDIATE PASSIVE (participle ambivalent between an event and state)

- (10) I want them opened (Nina, 3;0)
- (11) She doesn't need it cut (Nina, 3;1)

EVENT PASSIVE

- (12) That dolly's gonna be washed cause she's dirty (Nina, 3;2)

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We can manipulate these factors to make a difficulty gradient?



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	No cluster	Cluster
Easy semantics (natural endpoint)	fried /d/	baked /kd/
Difficult semantics (no natural endpoint)	hummed /d/	laughed /ft/

Van Horne et al. (2017) - much greater learning in a complex-first condition.

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Why do we need to make items complex?

Exemplar theory: children have immature representations, or "exemplars"

These are initially overly-specific, and will become more abstract over time.

Language-impaired children may be overly dependent on exemplars (Dell and Chang, 2013)

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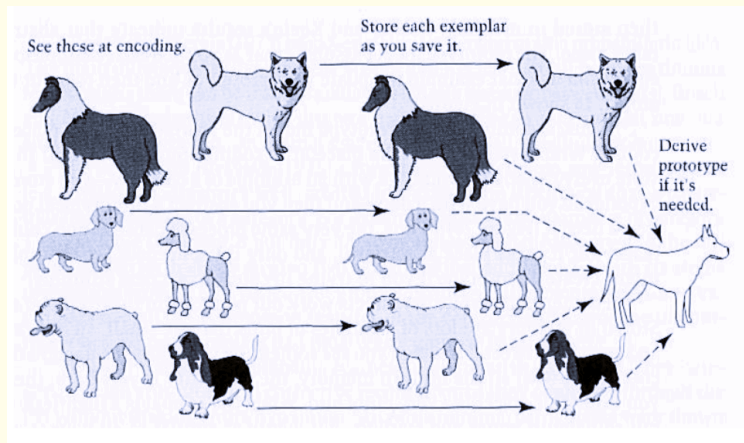
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Exemplar – Specific examples



Prototype – Abstracted from examples



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Adult
representation

Verb + ed
= AN EVENT TAKING
PLACE IN THE PAST

Child representation

Verb + ed
= A COMPLETED EVENT

A general rule of thumb is that it may be beneficial to “stretch” children by introducing difficult items as long as these are not overwhelmingly difficult. It is a fine balancing act.

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Variation versus no variation

1. The dog 's dacking the ball
2. He 's dacking it
3. The cat 's dacking the pencil
4. He 's dacking it

1. The dog 's dacking the ball
2. The dog 's dacking the ball
3. The dog 's dacking the ball
4. The dog 's dacking the ball

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Children (aged 2;6) trained in a high variability condition demonstrated better learning of the transitive construction (Childers & Tomasello, 2001)

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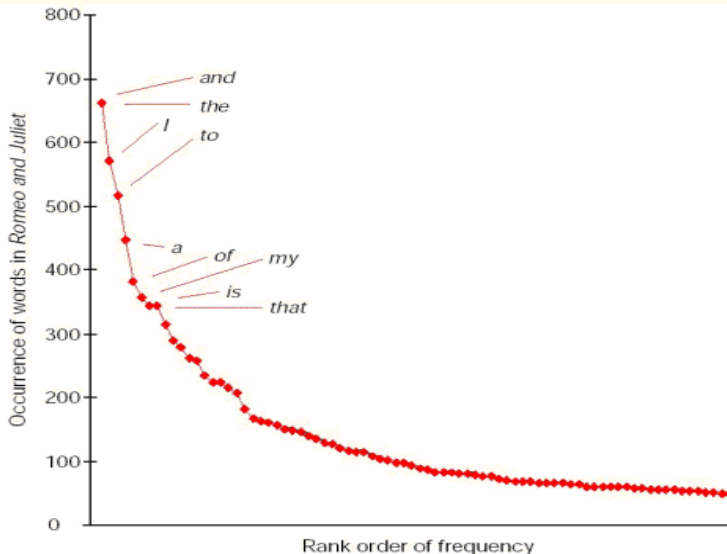
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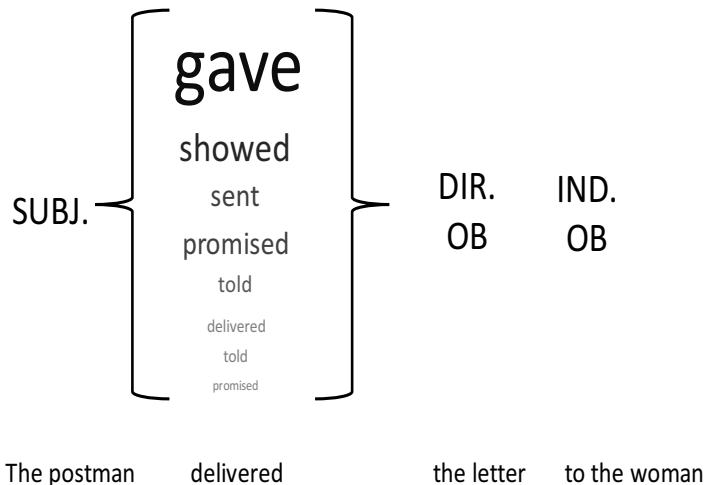
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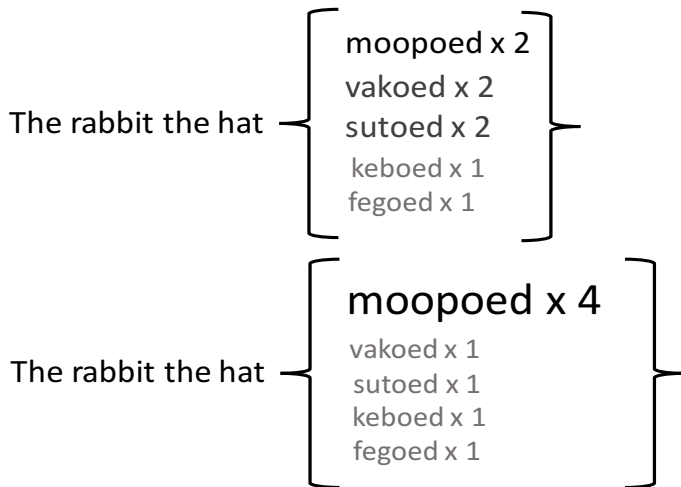
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Casenhiser & Goldberg, 2005



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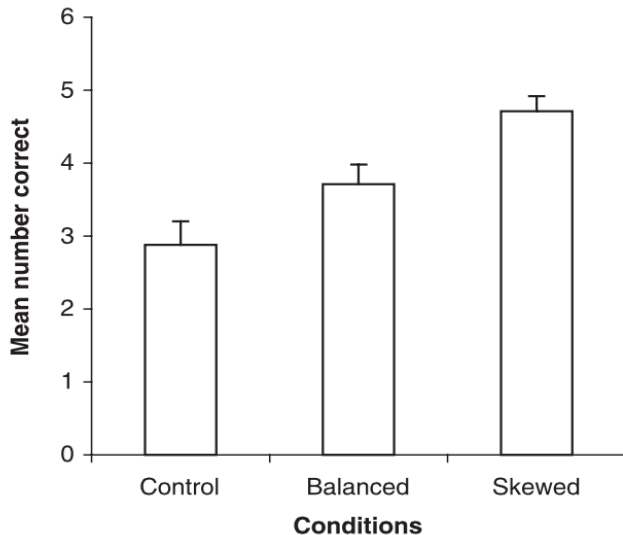
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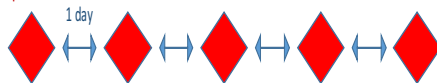
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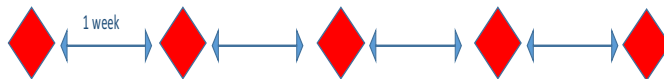
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Learning
episode



"Massed" condition



"Spaced" or "distributed"
condition

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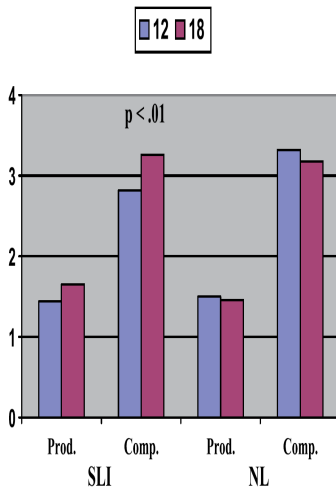
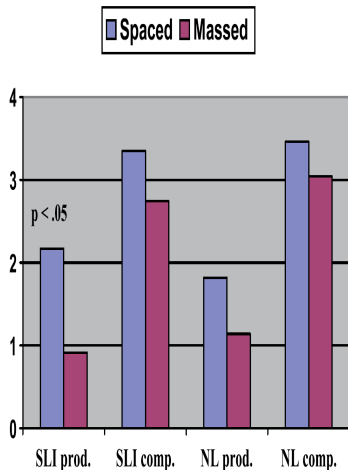
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Distributed learning leads to better retention of words
(Riches et al. 2005)



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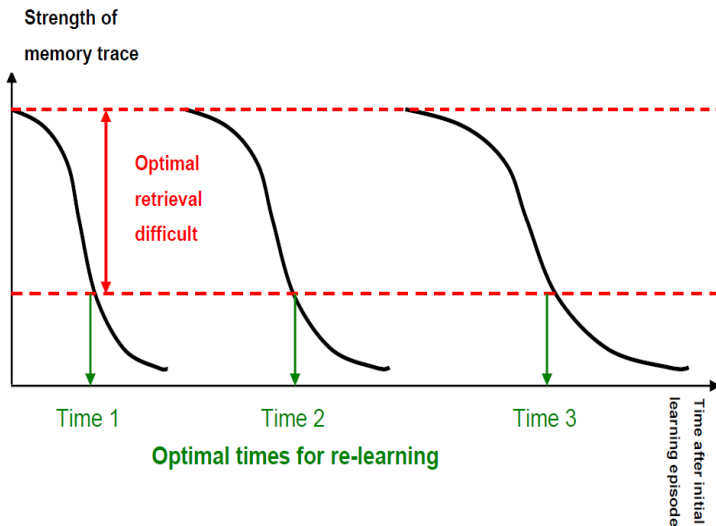
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But intensive training with short intervals seems to be better for motor learning, e.g. Lee Silverman treatment for Parkinson's

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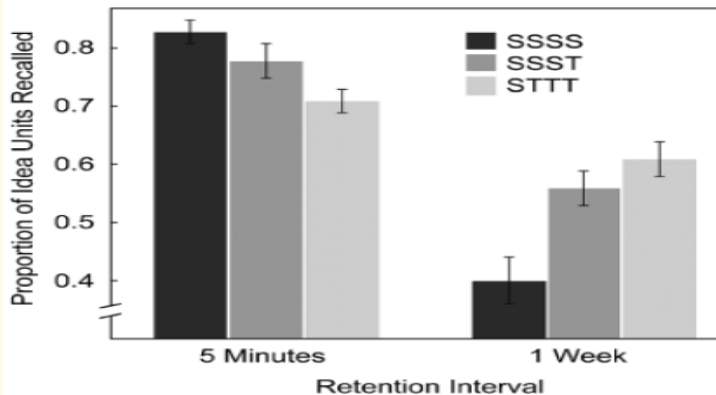
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We learn better when we learn actively, e.g. we continually test our knowledge of a particular topic, than when we learn passively, e.g. we just read about a topic.

Roediger & Karpicke, 2006



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Leonard, 2019 - Retrieval condition versus no-retrieval condition (study only)

Novel adjectives

Examples of Picture Stimuli for Novel Adjectives

Learned

Generalized

/təzmık/



/zogi/



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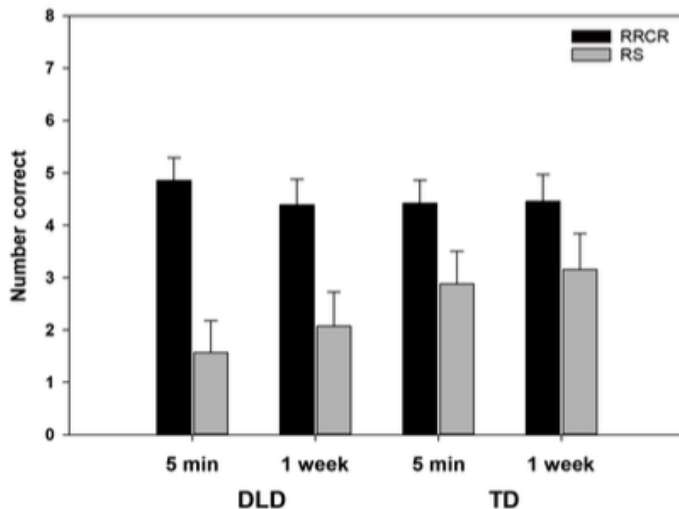
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A lot of the language theory we have covered is directly clinically applicable!!!

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