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# General introduction

In this week’s lecture we are going to investigate how an understanding of linguistics / psycholinguistics can help us devise more effective therapies.

# Multimodal approaches

## Definition

These approaches recruit non-linguistic representations (e.g. shape, colour and gesture) to support linguistic representations.

## Use of shape and colour

“Shape coding” is a very popular system devised by Susan Ebbels. Sentences are presented to the child and shapes and colours are used to highlight particular phrases and functions, e.g. subjects are highlighted by ovals and auxiliaries are highlighted by diamonds. It is multimodal as it exploits visual information (shape and colour). It is based on another multimodal approach which is used to treat clients with aphasia, colour semantics (Bryan)

The approach is informed by many of the linguistic concepts we have covered in this course

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 - the Verb Phrase (Verb plus its complements) is shown in a special shape (a kind of pointed rectangle)
4. Some of the shape-coding conventions are iconic (one-to-one relationship between the diagram and the thing it represents), e.g. double-underlining to show plurals.

This is one of the few intervention approaches with a strong evidence base and is becoming increasingly popular among therapists (see references below). Having said this, most of the evidence comes from relatively old children. Do young children have the “metalinguistic” skills (the ability to think about language) to benefit from this approach?

## Use of gesture

This is relatively underexplored area. There is some evidence that co-speech gestures (i.e. gestures occuring at the same time as speech) can boost children’s comprehension of complex sentences (Theakston et al. 2014). In this particular study, gestures (based on sign language) were used to demonstrate which noun is the subject, and which is the object.

# Difficulty gradients

## What are difficulty gradients?

In the lecture on the comprehension of complex sentences, we saw that many factors affect processing difficulty:

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

We can manipulate these factors to make a difficulty gradient.

Many other linguistic structures/items can be arranged in difficulty gradients, e.g.

1. **Past tense**: these are more difficult when verbs are atelic (without a natural endpoint, e.g. *she laughed*), and end in a complex cluster (e.g. *paid* versus *taped*).
2. **Passives**: children start off using stative passives, e.g. *the chair was broken*, where the past participle describes a state. They then move on to eventive passives, e.g. *the chair was broken by the child*, where the past participle describes an event (Israel et al. 2000).
3. **Speech sounds**: these exhibit implicational universals, e.g. if a language has sound X it will also have sound Y. For example, if a language has plosives it will also have fricatives, but the reverse is not true. Gierut has argued that treatment of the “implied” sound (Y) will generalise to the “implying” sound X, e.g. if you treat fricatives a child will get better at plosives.

## How can we implement these in language intervention practice

So what do we do with these gradients? Generally, in Speech and Language Therapy practice, clinicians gradually increase difficulty. This generally reflects a Vytostkyan approach to learning. However, some researchers have suggested we treat complex items first (Gierut, Thompson, Van Horne). Van Horne (2017) adopts an “exemplar” approach. An “exemplar” is an overly-specific linguistic representation. For example, when young children conflate tense with aspect, as they find it difficult to use past tense with atelic verbs (e.g. *dropped* is easy, as there is a natural end state, but *laughed* is difficult as there is no natural end-state). Exposing children to more difficult items, e.g. *laughed* well help them to make their exemplars more abstract.

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

# Lexical variation within slots

## Variation versus no variation

When treating a new structure, one needs to acheive a degree of lexical variation in the argument slots. This is supported by experimental studies (Childers and Tomasello, 2001)

1. Look! **The dog** ’s dacking **the ball**. See! **The dog** ’s dacking **the ball**.
2. Look! **The dog** ’s dacking **the ball**. See! **He** ’s dacking **it**.

When trained in condition 2, the children acquired better verb-general knowledge of the transitive.

## Skewed distributions

It has been suggested that variation works better when the distribution is skewed (a small number of high frequency words, and a large number of low frequency words). Such skewed distributions seem to be a characterstic of natural language. There is evidence that when novel constructions are trained with such skewed distributions, children learn them better (Casenhiser & Goldberg, 2005).

# Other psycholinguistic approaches

## Distributed learning

For many types of knowledge, we learn more rapidly in a distributed condition, characterised by relatively large gaps between learning episodes. For example, if you give 12 presentations of a novel word to a child, they will learn it better if they are distributed over four days, rather than compressed into one day (Riches et al. 2005). (in other words “cramming doesn’t work”, or “cramming will get you through an exam but you won’t remember anything you crammed a week later”).

Distributed learning may actually work better if gaps between learning episodes are gradually lengthened (an “expanding series” regime)

However, some types of learning, e.g. motor learning, appear to benefit from highly repetitive drills, e.g. the Lee Silverman Method for improving intelligibility in Parkinson’s. So generally speaking, if you’re training words or grammar think about distributed training, but for other types of learning, consider more repetitive approaches.

## Active learning

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. Though in the short term, there is not too much difference between these types of learning, in the long term, active learning (technically known as “test ehanced learning”) leads to much better retention.

A recent study by Laurence Leonard and colleagues (2019) taught langauge-impaired and language-typical children novel adjectives in two conditions, one of which contained many retrieval episods (the active learning condition). The active learning condition led to far better recall of the adjectives.

# Conclusion

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

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