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The Role Of Morphology In Literacy: Evidence From The Warwick Morphology And Phonology Project

WHAT IS MORPHOLOGY?

What is morphology?
Introduction to the Warwick Morphology and Phonology Project
Using morphology in spelling in deaf children
Using morphology in spelling in OM and dyslexic children
Discussion: testing morphological spelling in deaf children

STRUCTURE

WHAT IS MORPHOLOGY?

MORPHOLOGY

Morpheme = smallest meaningful unit
E.g. [DOG][S] = 2 morphemes
noun root plural suffix

Advantages of morphological analysis:
• More direct text-to-meaning conversion
• Available regardless of oral/aural abilities

MORPHEMES VARY IN HOW PRODUCTIVE THEY ARE

ACTIVITY: SPOTTING MORPHEMES

Circle the morphemes in these words:
• Unfriendliness
• Electricity
• Patients
• Patience
• Foxes
• Slept
• Bicycle
• Rushed
• Untied
• Uniform
• Uninformed
• Wisdom
• Writer
• Trousers

Taken from Henry, M. (2010), Vocabulogic website
Types of morpheme
- Free – occurs alone
  - Often the root morpheme
- Bound – only occurs in combination
  - Suffix, prefix or infix

Types of morpheme
- Inflectional
  - Doesn’t change word class
- Boy-boys, sleep-slept
- Derivational
  - Does change word class
  - Sleep-sleepy, sleep-sleeper

Find examples of each type of morpheme on the previous page

We’re happy to use new words in morphemic compounds:
- That is ungoogleable
- She’s a Brosette
- I’m shlomped on the sofa

Or use old words in new ways
- I tweeted it
- The plebgate affair
- I unfollowed him

What word would mean:
- The study of bananas
- The philosophy of trophies
- A colour that was nearly purple
- Someone who tweets a lot
- The most shoddy work
- When your hoover explodes and spreads dirt all over your house

ADVANTAGES OF MORPHOLOGY.
- English morphology is transparent.
  - Jumped, rolled, hunted
    - Past-tense morpheme spelled [ed]
    - Pronounced /t/, /d/, /Id/.
  - Vocabulary development.
  - [rain] in [rain][s], [rain][ed], [rain][y], [rain][water]

THE WARWICK MORPHOLOGY AND PHONOLOGY PROJECT
- We know that dyslexic children have difficulties in phonological processing
- Do they show similar difficulties in morphological processing?
  - If yes, why?
  - If no, can they use morphological skills to boost their reading and spelling?
- We know that children with repeated OM have transient problems with phonological input.
  - Does this cause similar problems with phonological processing and literacy?
  - If so, could morphological awareness help these children too?
THE DESIGN

- Recruit a sample of dyslexic children, and a sample of OM children of the same age
- Recruit chronological age controls and reading age controls for both groups
- Test them on a battery of literacy, language, phonological and morphological measures
- Experimental tasks
  - Dynamic morphological and phonological tasks
  - Nonword spelling
  - Short term memory
  - Eye tracking

THE SAMPLE

36 dyslexic/poor readers, matched to 36 CA and RA controls
29 children with a history of Otitis Media, matched to 29 CA and RA controls

<table>
<thead>
<tr>
<th></th>
<th>Dyslexic</th>
<th>Dys-CA</th>
<th>Dys-RA</th>
<th>OM-CA</th>
<th>OM-RA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>109.1</td>
<td>109.1</td>
<td>87.8</td>
<td>110.4</td>
<td>110.0</td>
</tr>
<tr>
<td>Word reading age</td>
<td>86.9</td>
<td>127.7</td>
<td>88.6</td>
<td>109.7</td>
<td>125.5</td>
</tr>
<tr>
<td>Verbal IQ (T-score)</td>
<td>38.7</td>
<td>46.8</td>
<td>47.7</td>
<td>41.5</td>
<td>46.4</td>
</tr>
<tr>
<td>Nonverbal IQ (T-score)</td>
<td>45.4</td>
<td>54.4</td>
<td>52.1</td>
<td>45.2</td>
<td>52.4</td>
</tr>
</tbody>
</table>

LITERACY: CHILDREN WITH OM

- Children with a history of OM show literacy that is below controls, but as a group within the average range.
- Substantial individual variation: from 5;10 years to 12;3 years in reading age, from 6;1 years to 10;3 years in vocabulary
- Their word reading, spelling and reading comprehension are all at similar levels
- This contrasts with the dyslexic children the same age, who show weaker word reading and spelling and a similar level of reading comprehension

PHONOLOGY

For dyslexic children, lower than CA but not RA controls
For OM children: impairment (compared to both controls) on the standard phonological awareness task, but average on dynamic task

MORPHOLOGY

For dyslexic children: lower than CA but not RA controls
For OM children: no group differences for either morphological task
The OM group have normal morphological skills for their age.

They have some difficulties in phonological awareness, but they respond well to increased levels of instruction (in contrast to the dyslexics).

- Could be a problem of measurement?
- Could be due to past difficulties vs. present difficulties?

**SUMMING UP MORPHOLOGY & PHONOLOGY**

**PLURAL SPELLING**


**ENGLISH PLURAL SPELLING**

<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>Spelling rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>Cat</td>
<td>Cats</td>
</tr>
<tr>
<td></td>
<td>Dog</td>
<td>Dogs</td>
</tr>
<tr>
<td></td>
<td>Horse</td>
<td>Horses</td>
</tr>
<tr>
<td>Semi-regular</td>
<td>Fox</td>
<td>Foxes</td>
</tr>
<tr>
<td></td>
<td>Baby</td>
<td>Babies</td>
</tr>
<tr>
<td></td>
<td>Knife</td>
<td>Knives</td>
</tr>
<tr>
<td>Irregular</td>
<td>Mouse</td>
<td>Mice</td>
</tr>
<tr>
<td></td>
<td>Foot</td>
<td>Feet</td>
</tr>
<tr>
<td></td>
<td>Scissors</td>
<td>Scissors</td>
</tr>
</tbody>
</table>

Correct spelling requires phonology morphology.

**PLURAL DEVELOPMENT IN SPEECH**

- U-shaped learning (Marcus, 1995).
- Initially good at few
- Over-generalise regular rules \( \rightarrow \) “fishes”
- Learn exceptions.
- What happens in spelling?

**HYPOTHESES**

- Profoundly deaf children
- Less phonology?
- More visual-orthographic?
- More morphology?

**PARTICIPANTS**

<table>
<thead>
<tr>
<th></th>
<th>Profoundly deaf</th>
<th>Hearing difficulties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing</td>
<td>Prelingually severe hearing loss (mean BEA 103dB)</td>
<td>No reported hearing difficulties</td>
</tr>
<tr>
<td>Communication</td>
<td>Preferred language BSL</td>
<td>Mono-lingual English speakers</td>
</tr>
<tr>
<td>Reading-age</td>
<td>Mean 7.5 years (range 6.0 - &gt;11)</td>
<td>Mean 7.9 years (range 6.2 - &gt;11)</td>
</tr>
<tr>
<td>Chronological-age</td>
<td>Mean 13.10 yrs (range 11.1-15.8)</td>
<td>Mean 8.0 years (range 6.5-11.2)</td>
</tr>
</tbody>
</table>
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RESULTS

ERRORS

Deaf children’s spellings
- Morphological
- 77% singular+<s~es>
- Singular +(other) suffixes
  - *babyer, *boxer, *boxing, *bused, etc

RA matched hearing children
- phonological/ morpho-phonological
- 62% singular+<s~es>
- Phonological
  - *box’s, *boxes, *bus’s, *busses, etc

PLURAL NONWORDS

Unexpected spellings ("errors"):
- Deaf: morphological
  - 46% singular+<s>
  - Real English suffixes
- Hearing: phonological/ morpho-phonological
  - 33% singular+<s>

CONCLUSION

Accuracy appropriate for reading-age
Less influence of speech and phonology
Worse at exceptions
Fewer phonological errors
Not just missing final s
Greater influence of morphology
Productive spelling not just visual memory
Root+suffix
Representations of productive suffix
Incomplete knowledge

USING MORPHOLOGY TO SPELL NEW WORDS

Breadmore, H.L. & Carroll (in prep.)
The two girls dack in the park, one has to go home so the other girl _________ alone.

The man tried to kice the bird. It could be kiced. It was __________________.

She wouldn't jorse it with him. There was not point having the __________________.
Inflectional morphology is easier than derivational morphology
- But also less useful - less productive
OM children look similar to RA controls on accuracy and use of root morpheme
OM children use morphology more than dyslexic children of the same age

CONCLUSIONS

OM children look similar to RA controls on accuracy and use of root morpheme
OM children use morphology more than dyslexic children of the same age

TAKE HOME MESSAGES

Children with OM show a wide range of reading outcomes, with some quite highly impaired
Morphology is a relative strength in both deaf and OM children
Dynamic phonological and morphological tasks may provide more sensitive measures
Both can use morphological knowledge in spelling productively
- Can be positive or negative
How can we ensure deaf children use morphology successfully?
- Both rules and exceptions

FUTURE DIRECTIONS

We’re going to analyse the short-term memory and eye tracking tasks in more detail, as well as the nonword spelling
We’re following up these groups longitudinally to see how well they progress
We’re carrying out a similar project with severely/profoundly deaf students

ERRORS CONTAINING ROOT MORPHEME

OM RA CA
Dyslexia RA CA