# Morphological awareness and reading comprehension development: a developmental study

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# Broader remit

Are there differences between English and Chinese readers in the relative influence of morphological awareness and reading comprehension performance in their first language?

Are there differences between English and Chinese readers in the relative influence of morphological awareness and reading comprehension performance in English?

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# What is morphological awareness?

## Metalinguistic awareness

- concerns an individual's ability to reflect on and manipulate language – extends beyond language production and comprehension

## Morphology

- word structures: morphemes are the smallest meaningful units of a language *un – happi - ness*

## Morphological awareness

- the ability to analyze and manipulate the morphemic structures of words

# Different aspects of morphological awareness

## Compounding

- formation of new words by combining two root morphemes or words, e.g. *cow+boy* + *cowboy*

## Inflectional morphology

- inflections mark syntactic or semantic relations between different words in a sentence without altering the meaning of the stem, e.g., number and tense agreement: *boy + s = boys; like + ed = liked*

## Derivational morphology

- derivations usually change syntactic class and meaning, e.g., *un + happy = unhappy*

# Morphological awareness and reading

More than half of all English words are made up of more than one morpheme (Nagy & Anderson, 1984)

Morphologically complex words make up more than half of the new words that children encounter in texts (Nagy et al., 1993)

# Morphological awareness and reading

MA predicts variance in word and nonword reading

- in 6-, 7- and 8-year-olds over and above nonverbal IQ, vocabulary, and phonological awareness (Kirby et al., 2012)

MA predicts variance in reading comprehension

- in 8-year-olds over nonverbal IQ, vocabulary, and phonological awareness (Kirby et al., 2012)

MA develops with exposure to oral and written language so may have a stronger relation with reading in older children.

# Why the relationship?

## Good MA is an index of lexical quality

- morphemes have semantic, phonological, and syntactic properties: good MA is an indicator of highly specified lexical representations (e.g., Perfetti, 2007)

## MA enables accurate pronunciation and meaning retrieval

- *'ea'* in *react (re + act)* vs *reading (read + ing)*
- unfamiliar words – *lagician (lagic – ian)*

## MA supports meaning derivation

- *piglet, treelet*

# 'Spurious' reasons

Morphological awareness taps metalinguistic abilities

- phonological awareness is a critical metalinguistic skill that predicts word reading development

Morphological awareness is related to vocabulary knowledge

- vocabulary is a key predictor of reading comprehension

Morphological awareness tasks can tap memory, reasoning skills, and syntactic knowledge

- all related to reading ability

# Research questions

Is there a direct relationship between morphological awareness and reading comprehension and does the strength of this relationship depend on age?

To what extent is the relationship between morphological awareness and reading comprehension unique or mediated by the associations between MA, word reading, vocabulary, and phonological processing?

# Design

Age groups

- Year 2 (7 years), Year 5 (10 years), and Year 8 (13 years)

Measures of reading

- Reading comprehension
- Word and nonword reading

"Control" measures

- Vocabulary
- Nonverbal reasoning
- Phonological awareness

Morphological awareness

# Participants

| | Year 2 | Year 5 | Year 8 |
|---|---|---|---|
| N | 97 | 97 | 158 |
| Age | 7 years, 2 months | 9 years, 11 months | 13 years, 2 months |
| Males; females | 42; 57 | 46; 48 | 71; 85 |

# Reading comprehension

Anna was excited because she was going to a party. she went into her bedroom to put on her outfit. It had long floppy ears and a fluffy tail. She hopped up and down. Anna and her dad went to a big hall. There were red balloons on the door. Anna had a hot dog for tea.

Why was Anna excited?

What sort of party was it?

# Word and nonword reading

Sight word reading

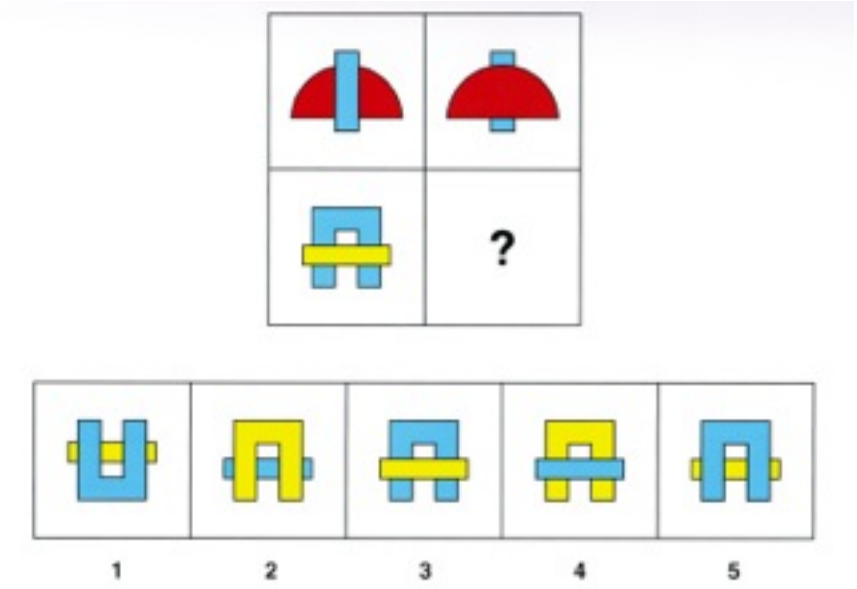
- is
- up
- cat
- ....
- inside
- plane
- pretty
- ...
- prairie
- limousine
- valentine
- ...

Phonological decoding

- ip
- ga
- ko
- ....
- meest
- shlee
- guddy
- ...
- fornalask
- fermabalt
- crendidmoke
- ...

# Vocabulary

# Reasoning



# Phonological awareness

## Elision task

[Say 'cowgirl'. Now say 'cowgirl' without saying 'girl'.]

Say 'cup'. Now say 'cup' without saying /k/.

Say 'strain'. Now say 'strain' without saying /r/.

# How to assess morphological awareness

## Judgement tasks

*Which is a better name for something that is full of sugar? Full-sugar or sugar-full?* (compound task)

Participant required to make a decision but does not need to manipulate the structure of the word.

## Analogy-based production tasks

*Someone who uses their left hand is called left-handed. What is the name for someone who uses their left elbow?* (compound task)

Participant needs to apply knowledge of morphological rules to produce response.

# How to assess morphological awareness

## Judgement tasks – select correct response

*Inflections:* To *play*. Yesterday, Ross *plays / playing / played* in the sand.

*Derivations:* The *ploor*. Matt liked being a *plooring / ploority / ploorist.*

## Production tasks – word analogy task

*Inflections:* Smile: smiled :: plitch : *plitched*

*Derivations:* Library: librarian :: magic: *magician*

# Morphological awareness tasks

Our morphological awareness tasks were sensitive to developmental differences.

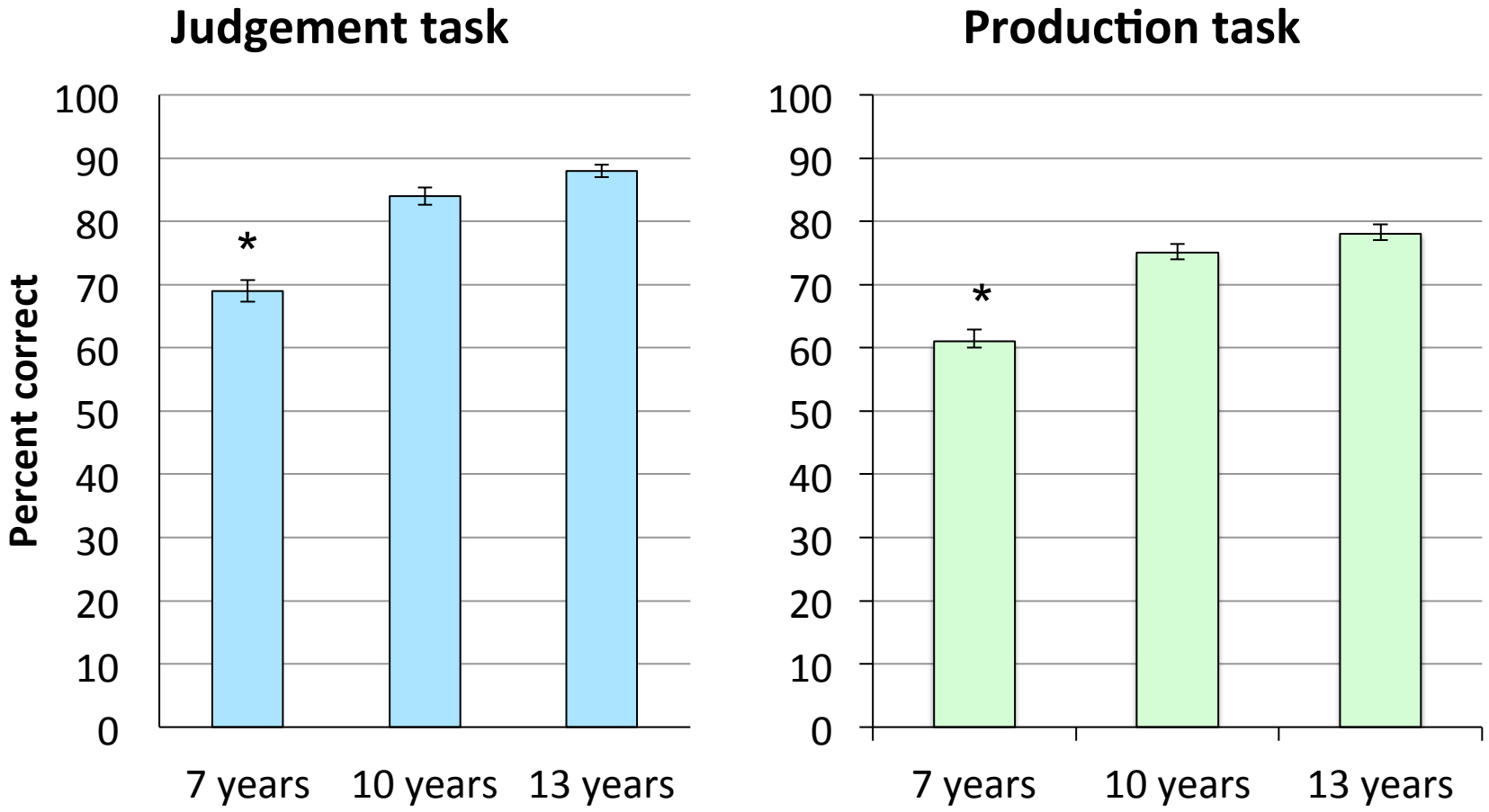
Compounds > Inflections > Derivations

In line with acquisition (e.g. Tyler & Nagy, 1986)

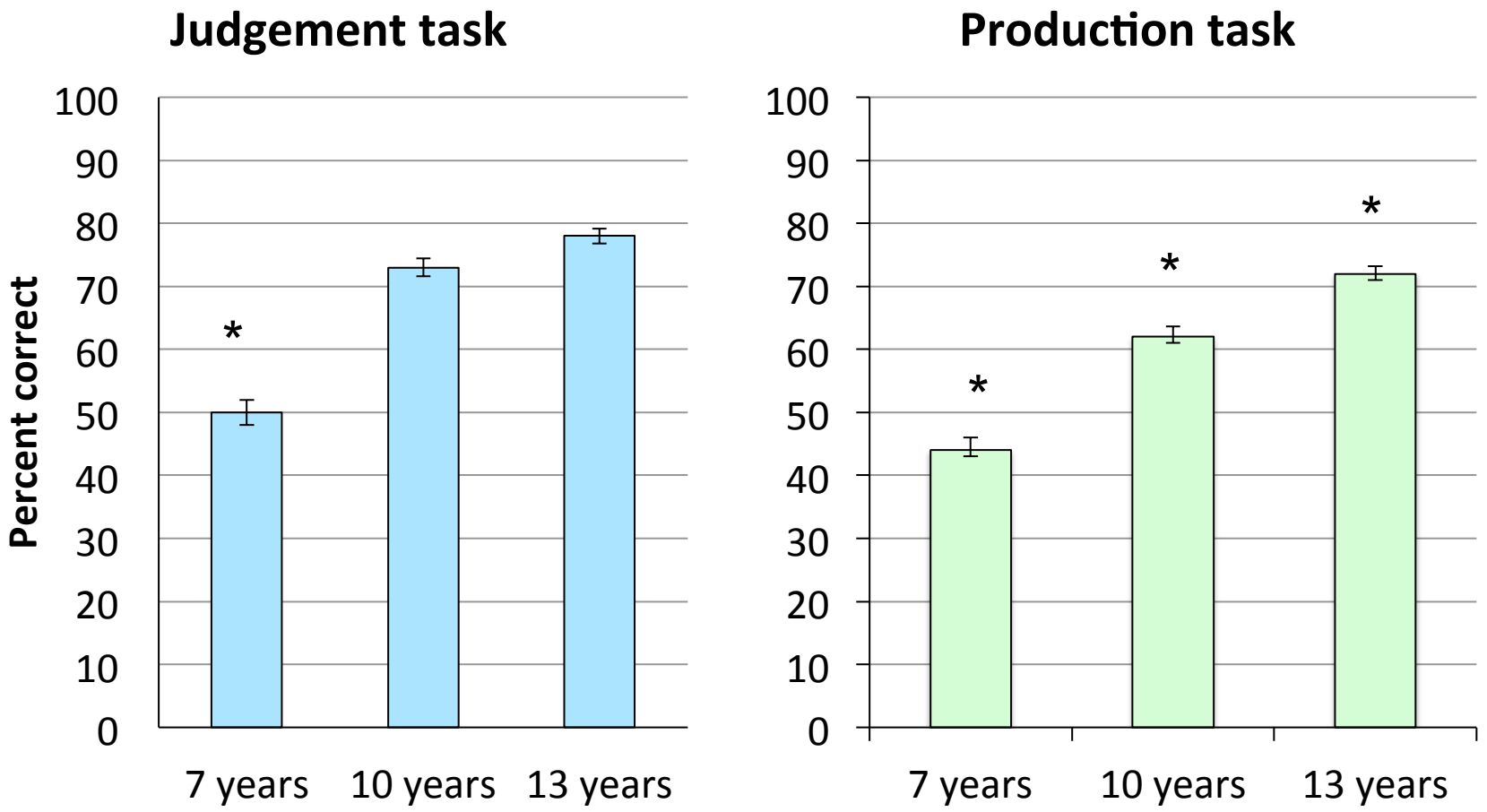
Performance amongst different tasks was related – more strongly in the youngest age group.

# Age improvements in compounding

# Age improvements in inflections



# Age improvements in derivations



# The strength of the relations between the MA measures reduces with increasing age

Strength of the relations between derivations and inflections stronger than with compounds.

Relations stronger for younger (lower diagonal – Year 2) than older (upper diagonal – Year 8)

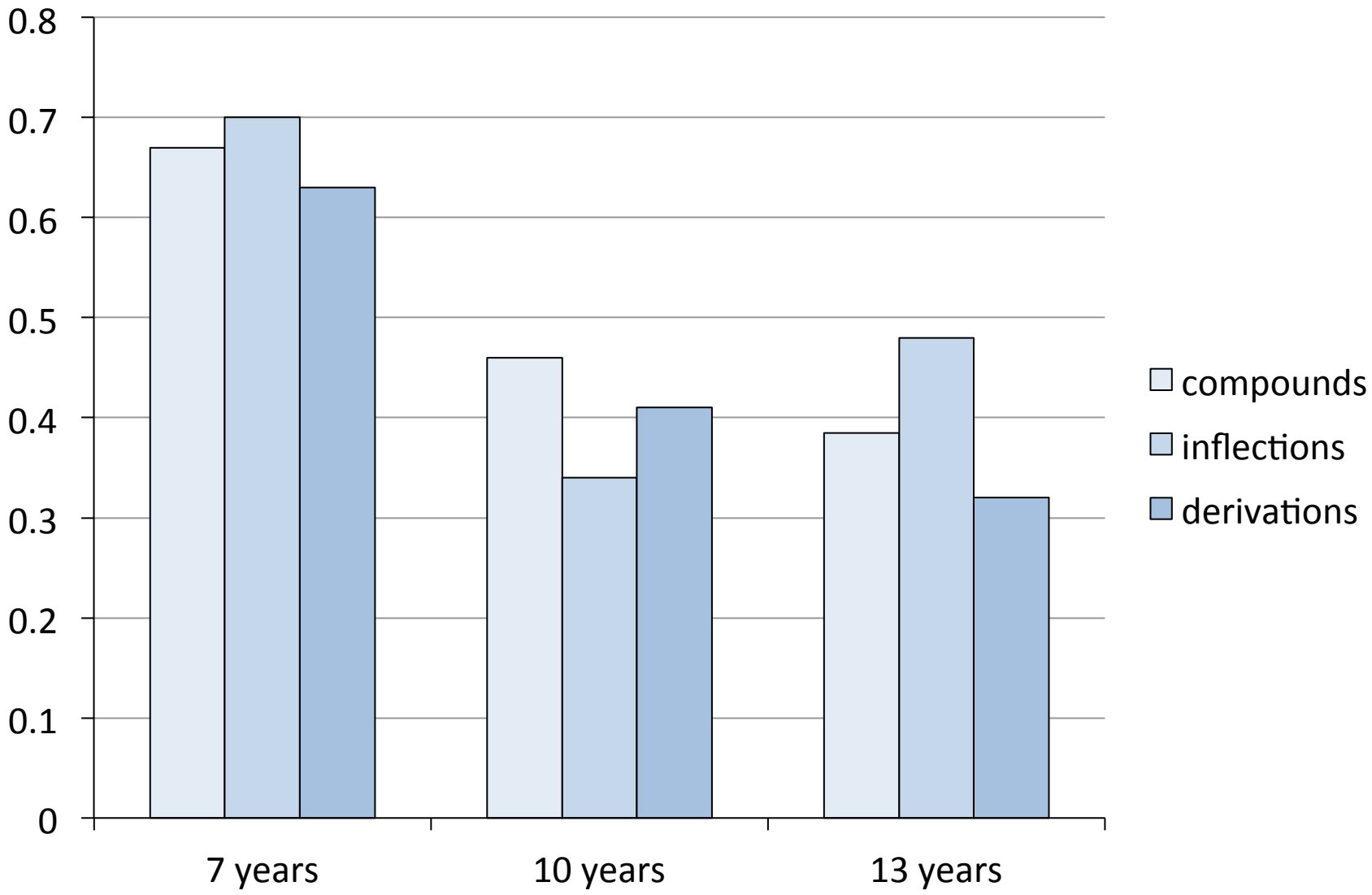
| | compound | derivations | inflections |
|---|---|---|---|
| compound | - | **.47** | **.53** |
| derivations | **.63** | - | **.68** |
| inflections | **.70** | **.78** | - |

# Research questions

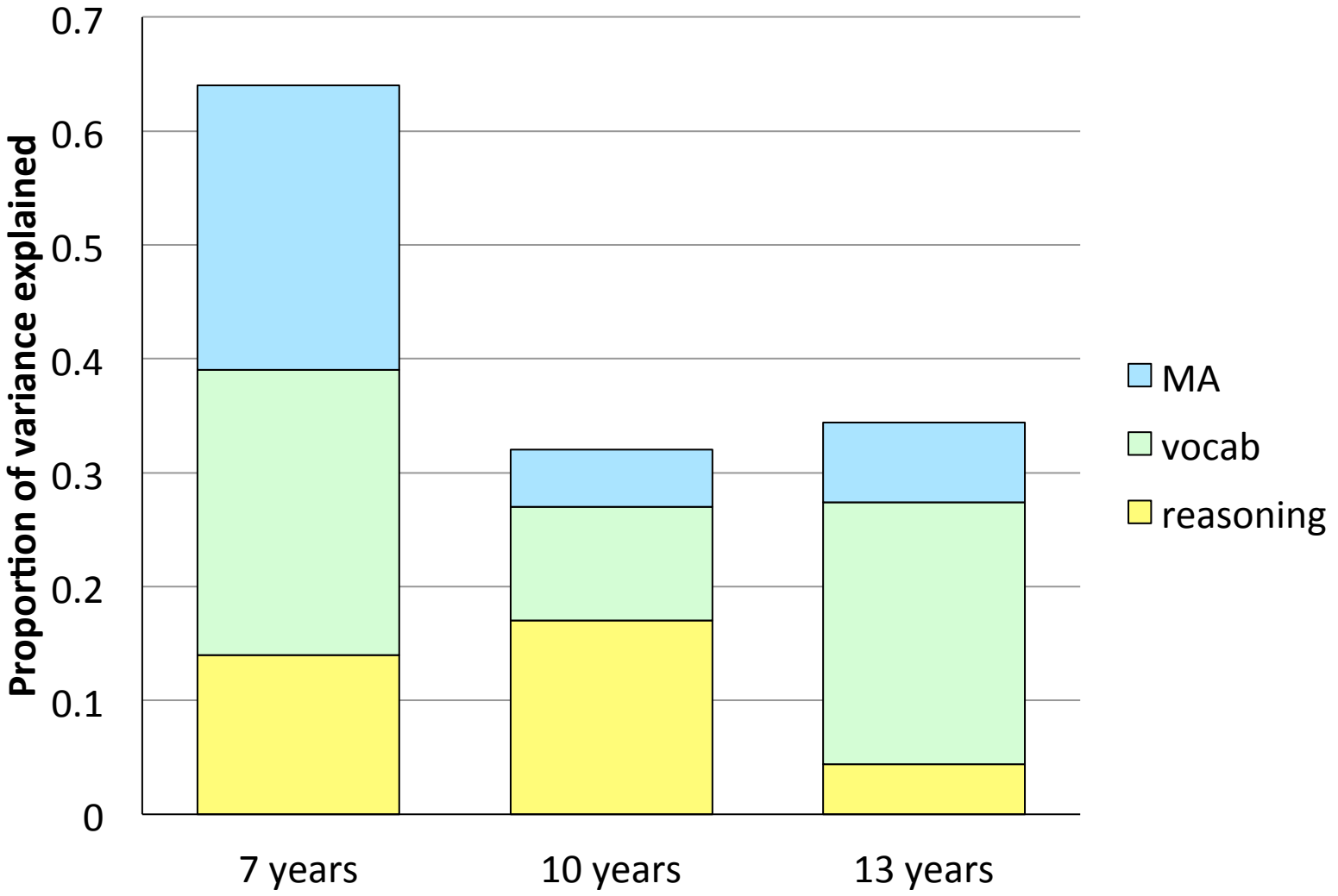
Is there a direct relationship between morphological awareness and reading comprehension and does the strength of this relationship depend on age?

To what extent is the relationship between morphological awareness and reading comprehension unique or mediated by the associations between MA, word reading, vocabulary, and phonological processing?

# Correlations with reading comprehension



# Prediction of reading comprehension



# Summary

Morphological awareness predicted unique variance in reading comprehension for all age groups after controlling for age, reasoning, and vocabulary.

Surprisingly, the proportion of variance explained in reading comprehension decreased with age.....

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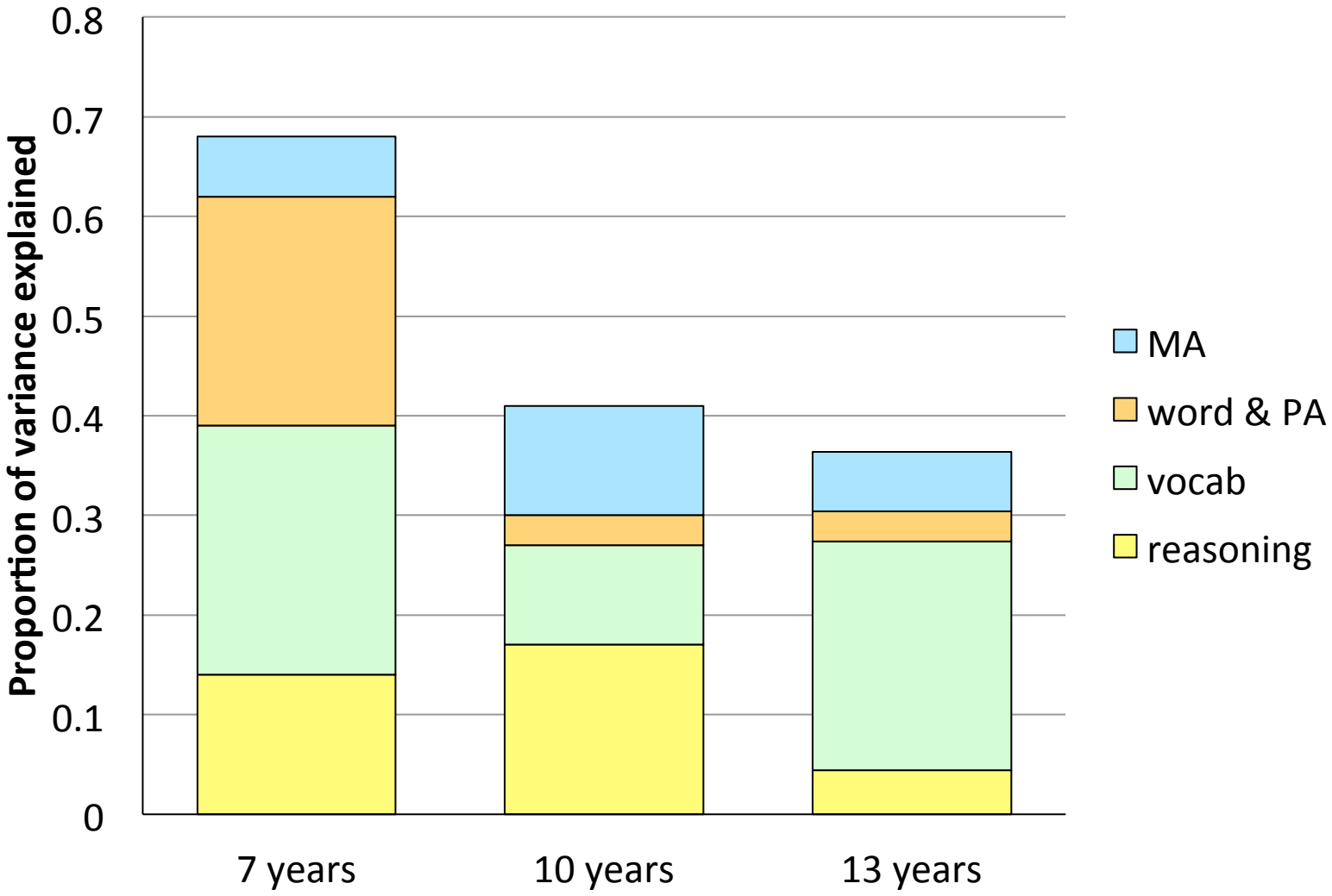
# Year 2 & Year 8

| | comp | vocab | nonword | word | PA | MA |
|---|---|---|---|---|---|---|
| comprehension | - | .518 | **.347** | **.412** | .350 | .484 |
| vocabulary | .562 | - | .325 | .335 | .288 | .448 |
| nonword reading | **.467** | .276 | - | .766 | .625 | **.541** |
| word reading | **.622** | .292 | .846 | - | .408 | **.449** |
| phonological awareness | .503 | .322 | .608 | .629 | - | .488 |
| morphological awareness | .744 | .506 | **.630** | **.709** | .636 | - |

# Prediction of reading comprehension



# Summary

Morphological awareness predicted unique variance in reading comprehension for all age groups after controlling for age, reasoning, and vocabulary.

Surprisingly, the proportion of variance explained in reading comprehension decreased with age.....

...but was largely explained by the variance shared with word reading for the younger children.

# Conclusions and implications

Reading comprehension is determined by a range of skills, including morphological awareness, across a large age range.

In contrast to previous research, the contribution of MA did not significantly increase with age.

But clearly the relationship between MA and reading comprehension was largely mediated by word reading in the younger children.

# Conclusions and implications

Why did we not find an increasing relation with age?

- use of items that were within 'age of acquisition'
- controls for vocabulary, reasoning, and use of syntax and memory to perform our tasks
- use of a range of aspects of morphology and also items for each aspect
- use of novel words, as well as real words
- reading comprehension measures?

Thank you

As the results unfold:

http://www.psych.lancs.ac.uk/esrc-morphology/

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