

Reading and listening comprehension development and difficulties: the contribution of vocabulary and inference making skills

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Overview

What is text comprehension?

- the process and the product.

Reading comprehension, inference making and vocabulary

- how vocabulary and inference support reading and listening comprehension,
- the role of vocabulary in inference making,
- the role of inference in vocabulary development.

Conclusions

- the dynamics of comprehension and development.

Text comprehension: the product and the process



Molly was carrying the glass of juice. She tripped on the step. Her eyes filled with tears. *"Don't worry, darling"* said Mum, and went to fetch the mop.



Text comprehension: the product and the process



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Text comprehension: the product and the process



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Text comprehension: the product and the process



Comprehension is an INTEGRATIVE process: information from different sentences is combined.

Comprehension is a CONSTRUCTIVE process: explicit information in a sentence or sentences is supplemented by world knowledge stored in long-term memory.

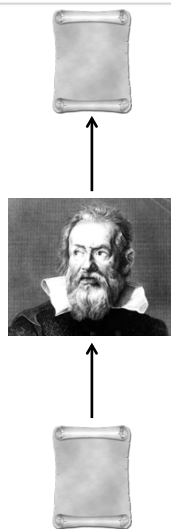
Comprehension is dependent on CONTEXT: interpretation (of words, phrases, and actions) does not occur in isolation.

Text comprehension

The product of skilled comprehension is an accurate, coherent and integrated memory-based representation of the state of affairs described in the text – a Mental Model or a Situation Model.

(Johnson-Laird, 1983; Kintsch, 1998)

A mental model is not a verbatim record: we forget the precise wording.



Galileo, the great Italian scientist, sent him a letter about it.

A letter about it was sent to Galileo, the great Italian scientist.

He sent Galileo, the great Italian scientist, a letter about it.

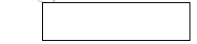
We encode and remember the state of affairs described in the text.



Three turtles rested *beside* a floating log and some fish swam beneath **them**.



Three turtles rested *beside* a floating log and some fish swam beneath **it**.



Three turtles rested *on* a floating log and some fish swam beneath **them/it**.



Summary: Text comprehension

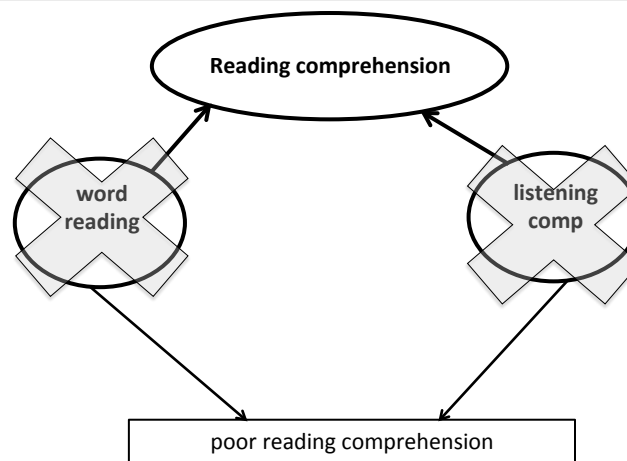


Word reading and language comprehension skills are both critical for successful reading comprehension.

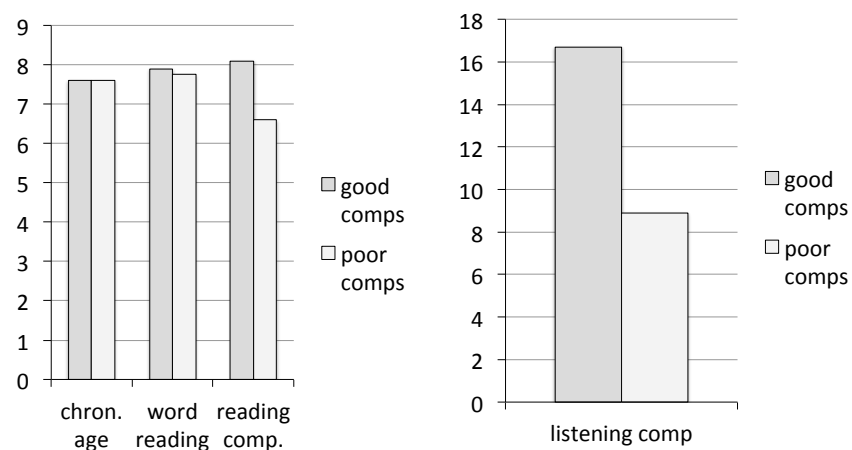
Reading and listening comprehension involve the construction of an integrated and coherent representation of a text's meaning:

- we do not remember the actual words,
- we combine the meanings of sentences,
- we draw on our background knowledge,
- our interpretation of words and phrases is guided by the context of the text.

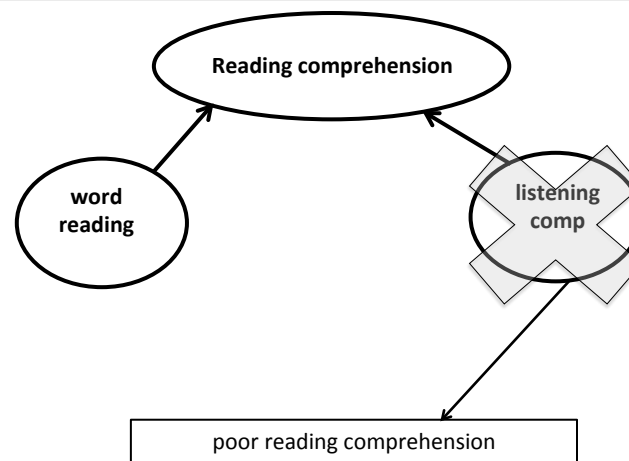
The Simple View of Reading and reading difficulties



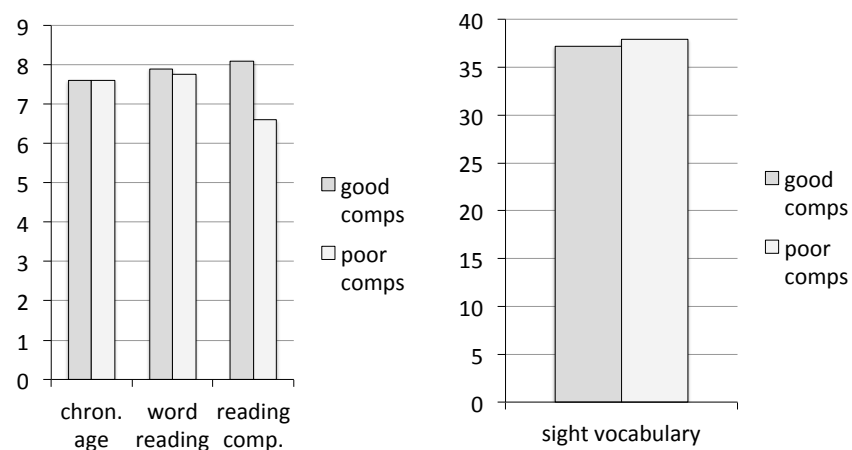
Poor comprehenders: intact word reading but poor reading & listening comprehension



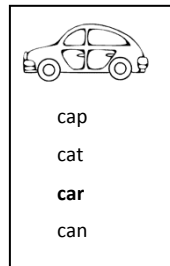
The Simple View of Reading and reading difficulties



Poor vocabulary is not always associated with poor text comprehension



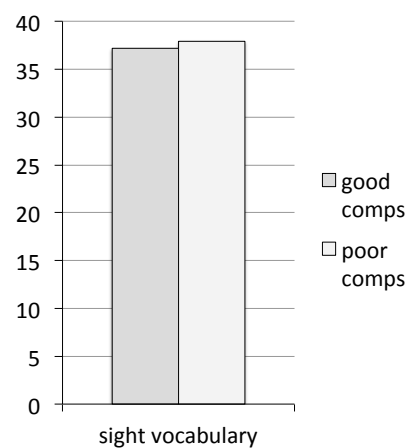
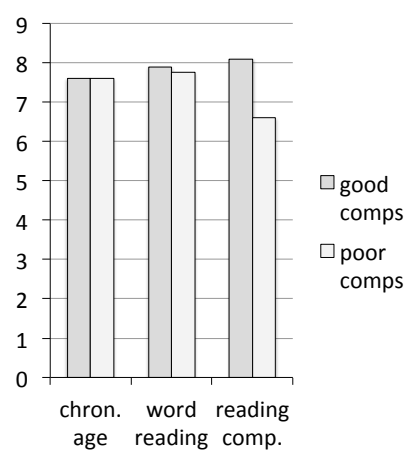
Poor vocabulary is not always associated with poor text comprehension



a different sword

weapon
practice
turn
team
spurt

Poor vocabulary is not always associated with poor text comprehension



Inference and integration

Inferences to connect ideas and to incorporate background knowledge to make sense of a text:

Debbie was going out for the afternoon with her friend Michael. By the time they got there they were very thirsty. Michael got some drink out of his bag and they shared that. The orange juice was very refreshing.

Q: Where did Michael get the orange juice from?

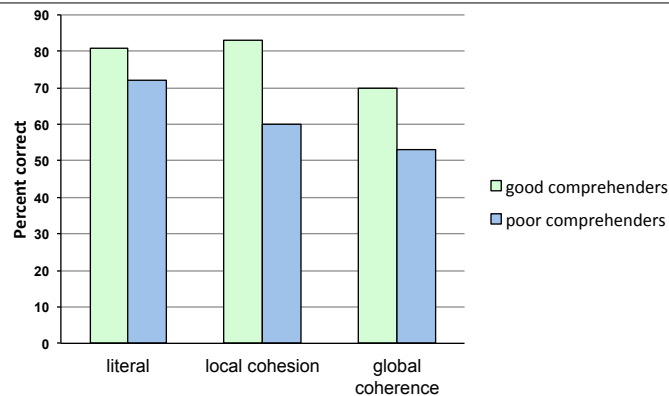
Inference and integration

Inferences to connect ideas and to incorporate background knowledge to make sense of a text:

... Debbie put on her swimming costume but the water was too cold to paddle in, so they made sandcastles instead. They played all afternoon and didn't notice how late it was. Then Debbie spotted the clock on the pier. ...

Q: Where did they spend the afternoon?

Poor comprehenders make significantly fewer inferences than good comprehenders.



Vocabulary and inference both predict children's reading comprehension



Kim stopped on her way to school. In the middle of the traffic lay two children. Their bicycles had crashed into each other. Kim ran quickly to help.

She saw that no-one was hurt. The children pointed to a television camera. 'We are taking part in a road safety lesson,' they said.



Longitudinal study of young readers. At start of study children were 7 to 8 years. Assessed again one year later when 8 to 9 years, and again at 10 to 11 years.

Measures included:

- reading comprehension
- receptive vocabulary
- inference making



Oakhill & Cain (2012) *Scientific Studies of Reading*

Inference and integration

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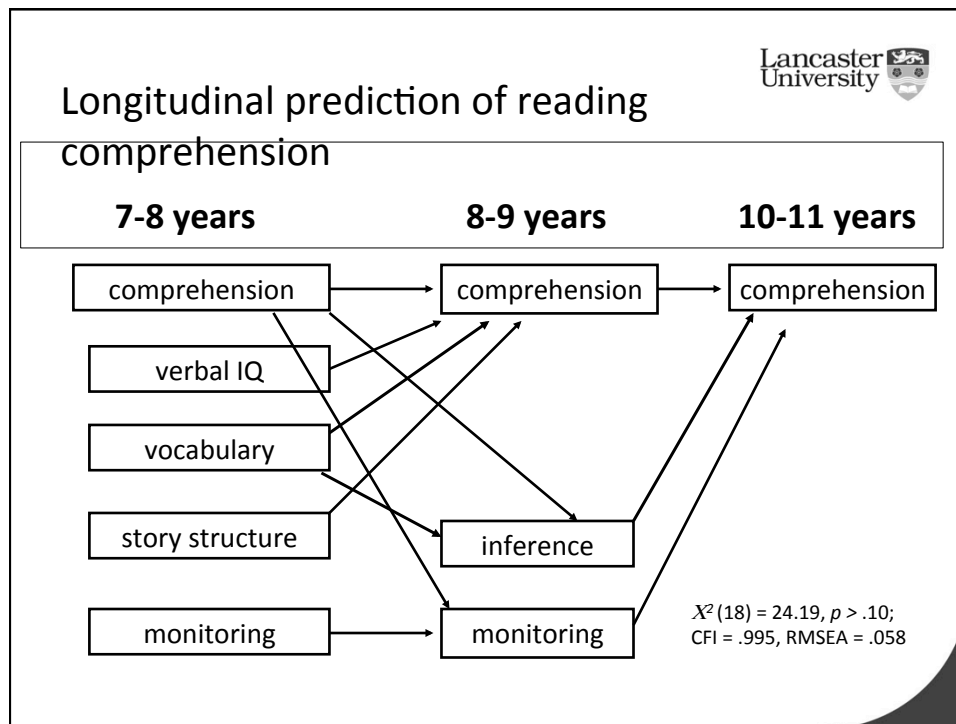
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Inference and integration

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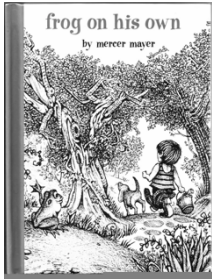
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Q: Where did they spend the afternoon?





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Early foundations of reading comprehension



Children aged 4 to 6 years told the story and then answered a series of questions to tap their ability to make inferences from the text, e.g.,

What do you think the young boy is thinking here? Why would he think that?

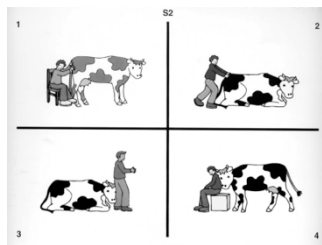



Silva & Cain (in press) *Journal of Educational Psychology*

Early foundations of reading comprehension

We examined the relations between their:

- ability to answer the inference questions
- receptive vocabulary and grammar
- reading comprehension – one year later

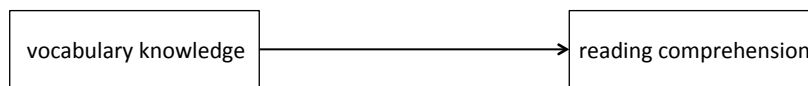


Silva & Cain (in press) *Journal of Educational Psychology*

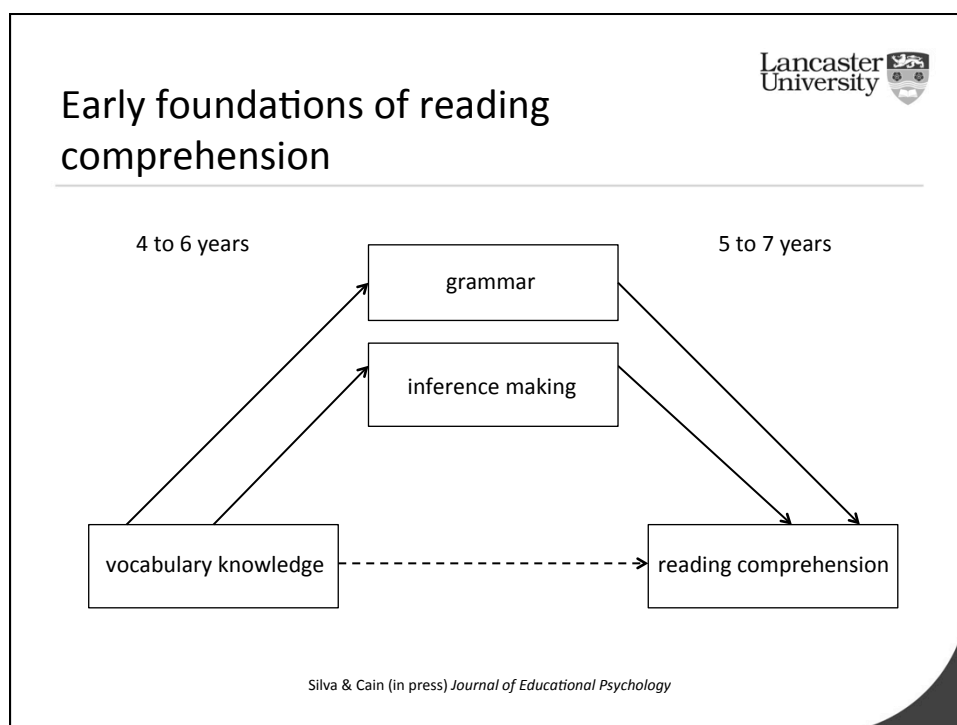
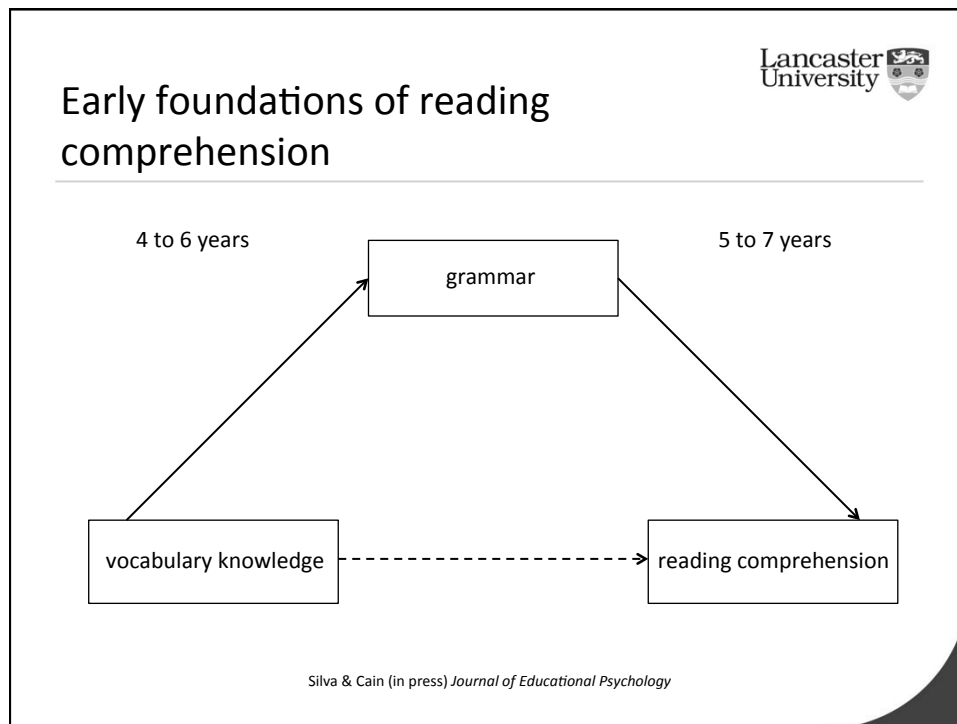
Early foundations of reading comprehension

4 to 6 years

5 to 7 years



Silva & Cain (in press) *Journal of Educational Psychology*



Vocabulary supports reading and listening comprehension: a summary

Children with reading comprehension difficulties have poor inference making skill.

Across development

- inference making supports text comprehension (both reading and listening comprehension),
- vocabulary supports text comprehension.

Knowledge of word meanings is necessary for full understanding

Angie rushed through the doors of the old brick building. She almost ran straight into a shadow gazer talking grim-faced to a blade. With a quick apology, she brushed past them and headed for the pup rounds. She had to know if things were zero delta with yesterday's first hit. After all, what looked like a soapbox derby had turned into a bounceback.

Whitney (1998) *The Psychology of Language*.

Knowledge of word meanings is necessary for full understanding

Angie rushed through the doors of the old brick building. She almost ran straight into a radiologist talking grim-faced to a surgeon. With a quick apology, she brushed past them and headed for the briefing on how the patients fared overnight. She had to know if things were unchanged with yesterday's first patient. After all, what looked like a patient going downhill fast had turned into an unexpected recovery.

Whitney (1998) *The Psychology of Language*.

Vocabulary may play a specific role in inference making

Text to word integration (Perfetti et al, 2008)

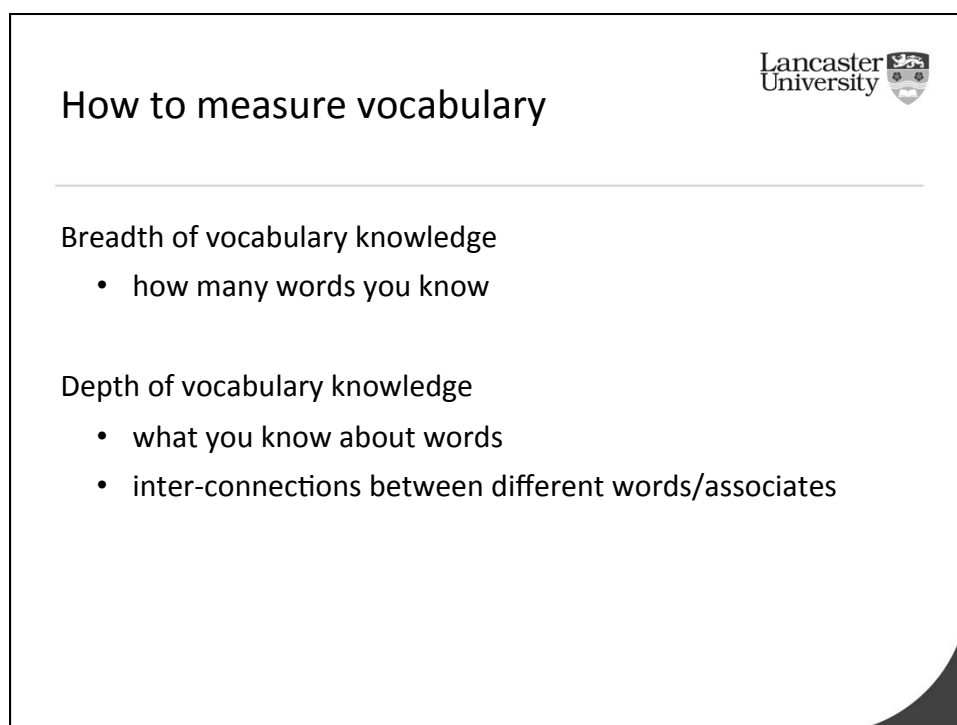
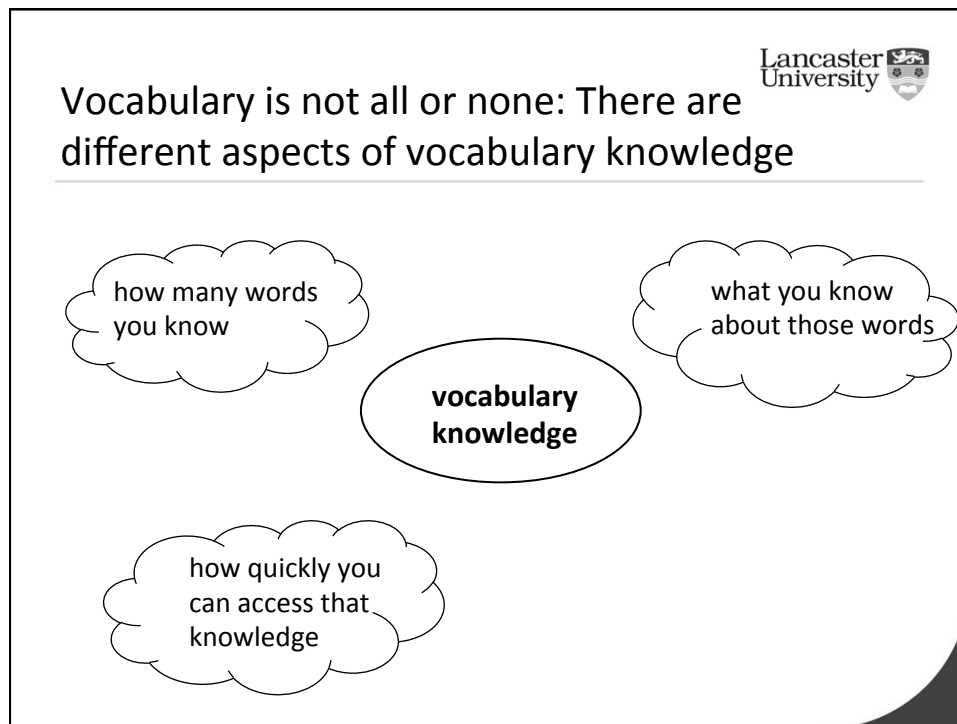
Allen's baby became violently ill, so Allen got the baby in the car and ~~rushed off to the hospital~~.

Allen's baby became violently ill, so Allen got the baby in the car and rushed off to the emergency room.

Allen's baby became violently ill, so Allen got the baby in the car and rushed off.

The hospital had a long waiting line.

Adult less-skilled comprehenders were slower or less effective at linking words to previous text.



Breadth of vocabulary knowledge



Depth of knowledge

Definitions and similarities


- definitions of words of increasing complexity, e.g. alphabet, island, precise
- Similarities: how are wheel and ball the same?
- Similarities: how are piano and guitar the same?
- taps richness of knowledge – what you know about words



Semantic fluency

- name as many things you can eat in 60 seconds, etc.
- taps interconnections between words




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Is vocabulary more important for some aspects of comprehension than others?

Breadth of knowledge

- BPVS – Receptive vocabulary




Participants were aged 10 to 11 years. We examined the relations between their:


- ability to answer questions tapping different aspects of text,
- breadth of vocabulary knowledge,
- depth of vocabulary knowledge

Depth of knowledge

- WISC – word definitions and similarities



Cain & Oakhill (in press) *L'Année Psychologique*

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Is vocabulary more important for some aspects of comprehension than others?

Memory for facts in the text



- "Debbie was sopping wet. She left a puddle of water in the kitchen by the fridge where she had been standing."
- *Where was the puddle of water?*

Local cohesion inferences

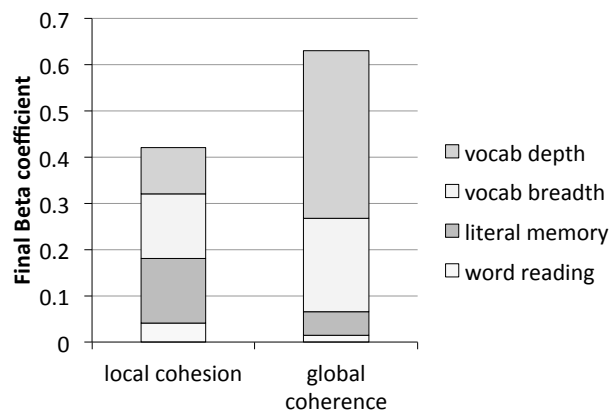
- "Mum looked for the cleaning equipment. She found the mop and bucket in the cupboard under the stairs."
- *Where did mum look for the cleaning equipment?*

Global coherence inferences

- "Jake watched a small creature close to the pond.It hopped into the water and swam away."
- *What sort of creature did Jake try to feed?*

Vocabulary is more important for some aspects of comprehension than others



Cain & Oakhill (in press) *L'Année Psychologique*

Vocabulary supports inference making: a summary

Some inferences rely on vocabulary or general knowledge.

Individual differences in vocabulary predict children's inference making ability.

Different aspects of vocabulary knowledge need to be considered:

- *depth of knowledge* is particularly important

How reading comprehension supports vocabulary development

Lisa was reading *The Butterfly Lion* by Michael Morpurgo (p. 12). She read slowly: "*She scrutinised me from under the shadow of her dripping straw hat.*" She did not get it. What did *scrutinised* mean? Lisa took a chance and read on "*She had piercing dark eyes that I did not want to look at.*" Oh, so this woman stared in a piercing manner! Lisa had learned something about a new word.

Oakhill, Cain, & Elbro (2014) *Understanding and teaching reading comprehension: A handbook*

How reading comprehension supports vocabulary development

Written text is an important source of vocabulary acquisition once children become fluent readers
(Cunningham & Stanovich, 1998; Nagy & Scott, 2000)

- Reading can provide instances to acquire, refine and consolidate vocabulary knowledge through inference from context.
- Print affords more learning opportunities than spoken language.

Written text is lexically rich!

	rank of median word	number of rare words per 1000
<i>Printed texts</i>		
Books for adults	1058	52.7
Books for children	627	30.9
Books for preschoolers	578	16.3
<i>Adult speech</i>		
Expert witness testimony (such as that used in court)	1008	28.4
College graduates talking with friends, spouses etc.	496	17.4

Written text is lexically rich!

display	infinite	portray
exposure	literal	provoke
gravity	luxury	reluctantly

Participants



	vocabulary	word reading	reading comprehension
Good comprehenders	108.6	10 years, 9 months	10 years, 8 months
Poor comprehenders	106.3	10 years, 10 months	8 years, 1 month
Weak vocabulary and poor comprehension	100.2	10 years, 9 months	7 years, 9 months

How to assess vocabulary learning by inference



Lucy was taking her dog, Ben, to the park. First, she had to find Ben's wut.

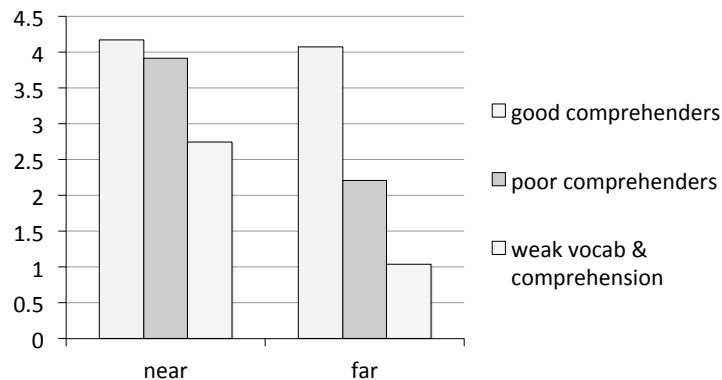
** near – clues immediately after novel word*

Clues: Dad suggested taking a football, but that was not quite right. The football was too big to play catch with and it had lost its bounce.

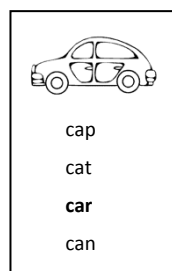
** far – condition, clues came after filler text:*

Filler: She searched all the rooms in the house, even the kitchen. During her hunt, she found all sorts of things....

Poor comprehenders inferred fewer words in the far condition, and those with weak vocabulary skills were poor in general



Does reading comprehension influence growth in vocabulary knowledge?



We examined vocabulary development in children with good and poor reading comprehension aged 7 to 8 years:

- receptive vocabulary
- sight vocabulary

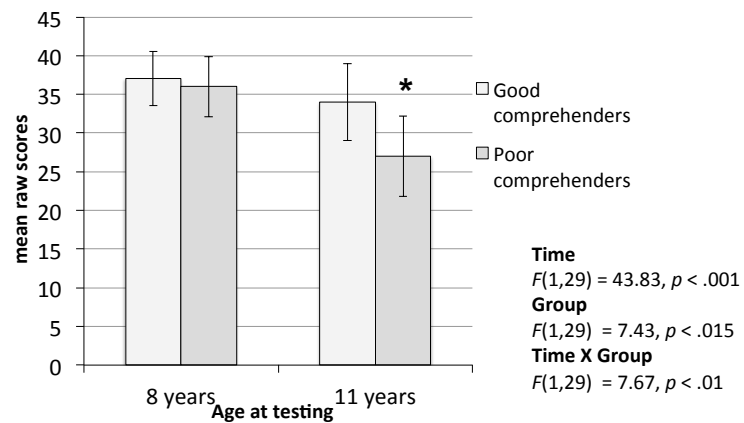
a different sword

weapon
practice
turn
team
spurt

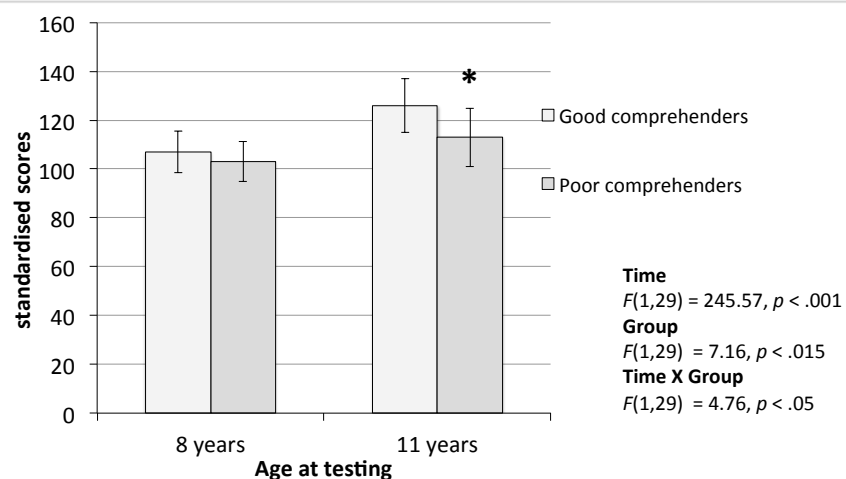


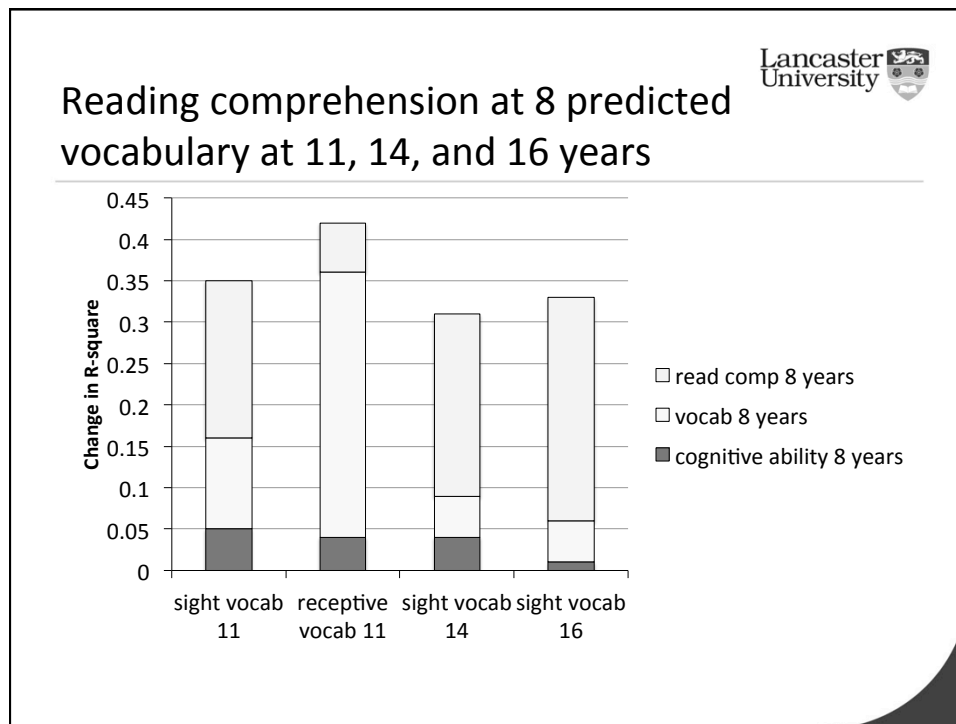
Cain & Oakhill (2011) *Journal of Learning Disabilities*


Good reading comprehenders had higher sight vocabulary scores 3 years later



Good reading comprehenders had higher receptive vocabulary scores 3 years later





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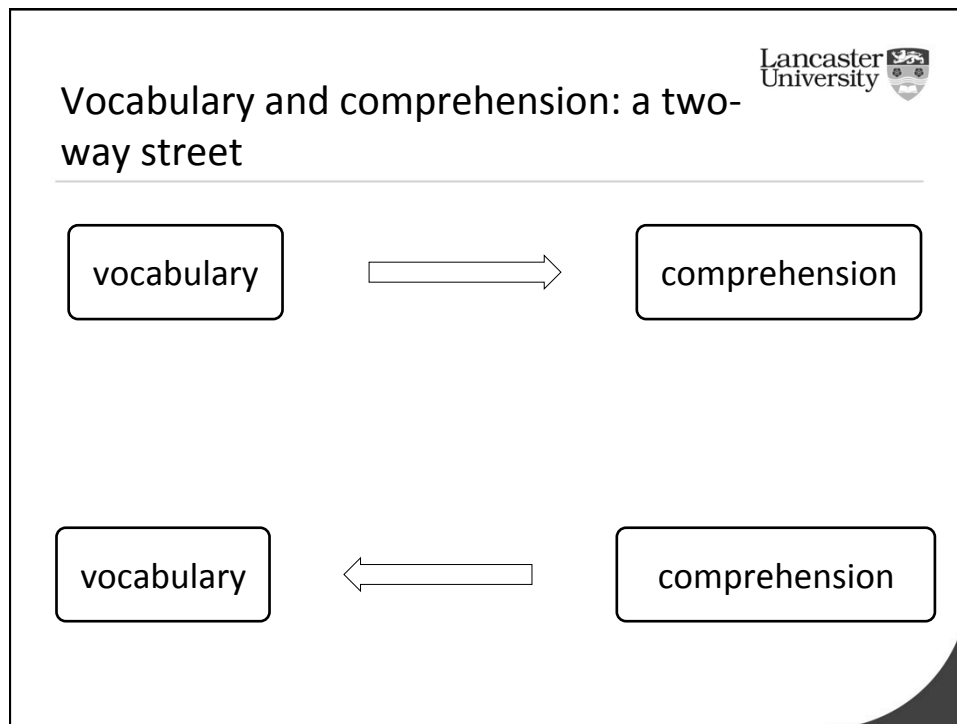
Comprehension supports vocabulary: a summary


Children with better reading comprehension scores:

- are better at deriving the meanings of unfamiliar words from context than poor comprehenders,
- show greater vocabulary growth than their peers.

Reading comprehension skills are predictive of growth in:

- receptive and sight vocabulary.



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Vocabulary supports comprehension

Good vocabulary knowledge does not *guarantee* good comprehension, but children with better vocabulary:

- have better reading comprehension outcomes longitudinally, and are better at making inferences to make sense of text.

Different aspects of vocabulary knowledge support inference making:

- vocabulary is predictive of local cohesion and global coherence inferences in general,
- but *depth of knowledge* is particularly important for global coherence inferences.

Comprehension supports vocabulary



Children with better reading comprehension scores:

- are better at deriving the meanings of unfamiliar words from context than poor comprehenders,
- show greater growth in both sight and receptive vocabulary.

Reading comprehension skills are predictive of growth in:

- receptive and sight vocabulary.

Conclusions



Success in literacy is strongly associated with an individual's vocabulary knowledge.

Vocabulary and reading comprehension are correlated:

- knowledge of individual word meanings is required to understand connected text that uses these words,
- better readers have more opportunities to learn words,
- there may be common skills underpinning both vocabulary learning and reading.

Conclusions

The relation between reading comprehension and vocabulary flows in **both** directions:

- knowing the meanings of words is crucial for good comprehension,
- and text comprehension and, in particular, skills such as inference, support vocabulary learning.

Vocabulary knowledge is not all-or-none:

- knowledge of the relations between words may be most important, for developing good inference skills.

When we teach vocabulary, we need to teach more than just definitions of words in isolation.

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