



# How children learn complex sentence structures

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# Structure

1. What are complex sentences?
2. Why are complex sentences important?
3. What do we know about children's learning?
4. How can caregivers support children to learn complex sentences?



# Part 1: What are complex sentences?



# Complex sentences...

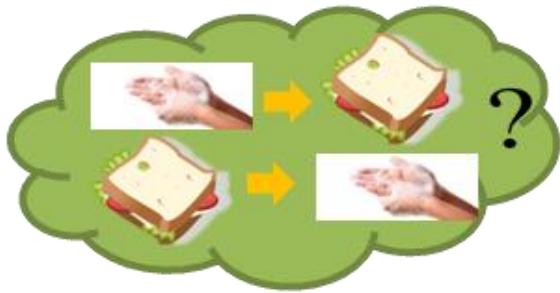


- Link ideas together:
  - Adding information: *The flowers with stripes are unusual*
  - Clarification: *You must eat the orange that I put in your bag*
  - Time: *After dinner, you can have some cake*
  - Cause: *We need our coats because it's cold*
  - Consequence: *You can join in again if you apologise,*
- Take different perspectives:
  - *I think it's raining*
  - *He thinks it's raining*



# Why are complex sentences difficult?

- Order of information in the sentence & the real world
- Before you eat your food, **wash your hands**



- Sit on the carpet after you've finished your pictures



# Why are complex sentences difficult?

- Depend on assessing what is **shared knowledge**
  - **Given** before **New**



*When you make  
the dinner,  
**don't put any  
mushrooms on!***



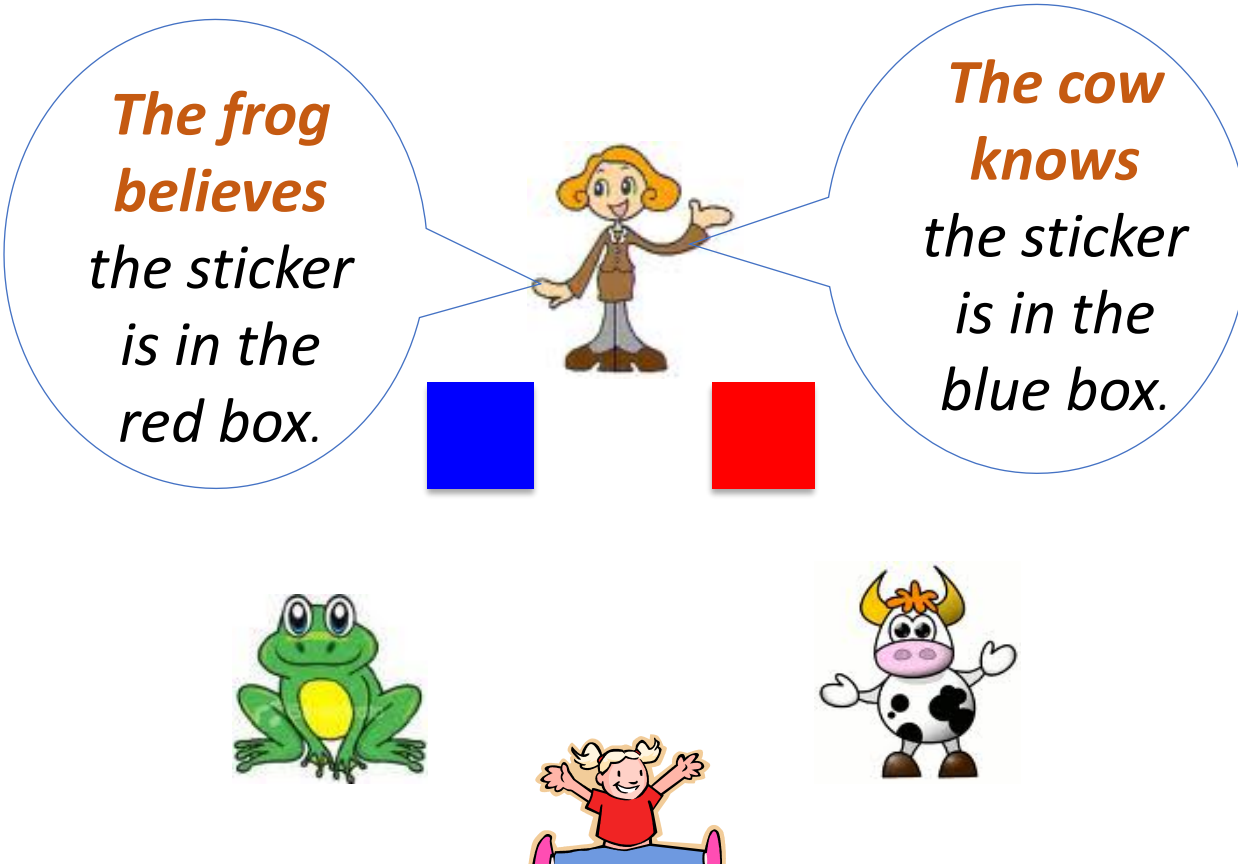
# Why are complex sentences difficult?

- Depend on adopting other people's **perspectives** and knowledge of **mental state terms**

**Find the sticker!**

*The frog believes the sticker is in the red box.*

*The cow knows the sticker is in the blue box.*



The diagram shows a woman in a brown suit standing between a blue square and a red square. Two speech bubbles point to her: the left one says "The frog believes the sticker is in the red box." and the right one says "The cow knows the sticker is in the blue box." Below the woman are three cartoon characters: a green frog, a girl in a red shirt and blue pants, and a black and white cow.



## Part 2: Why are complex sentences important?





# Conversational narratives



- Refer to past, present & future
- Explicit links between events and referents
- Sequencing of events
  - When James and I went to the park, there were lots of ducks splashing around. **He** was scared of **them** (refers back to established person/event) so we decided to visit his Nana **instead** (linking cause and consequence)
- Essential for reasoning and negotiation skills, constructing narrative, scientific explanation, academic language.

# Decontextualized talk



Language removed from the 'here and now'

- Causal explanations (*Because, that's why, If...*)
- Pretend play (*I'll be the shopkeeper...*)
- Narrative (past – *Remember when...* or future – *Maybe we could...*)

(Snow, 1990)

Children's use of **decontextualized talk** at 2.5yrs predicts later academic language ability at age 12yrs (Uccelli et al., 2018)

# Part 3: What do we know about children's learning?



# Study 1: Adverbial sentences

- **Main clause** + **adverbial (subordinate) clause**
- Express a specific relationship between two (or more) situations:

| Situation A                | Situation B                    | Relationship |
|----------------------------|--------------------------------|--------------|
| After I put the kettle on  | I ate a piece of toast.        | Temporal     |
| The girl patted the horse  | before she jumped the gate     | Temporal     |
| The cup broke              | because it fell off the table. | Causal       |
| If you don't pay the money | I'll turn you in.              | Conditional  |

De Ruiter, L., Theakston, A., Brandt, S., & Lieven, E. (2018). Iconicity affects children's comprehension of complex sentences: the role of semantics, clause order, input and individual differences. *Cognition*, 171, 202-224.

<https://doi.org/10.1016/j.cognition.2017.10.015>

# What affects children's understanding?

- Order of mention (iconicity)?
- Syntactic structure (is main– adverbial clause order easier)?



De Ruiter, L., Theakston, A., Brandt, S., & Lieven, E. (2018). Iconicity affects children's comprehension of complex sentences: the role of semantics, clause order, input and individual differences. *Cognition*, 171, 202-224.

<https://doi.org/10.1016/j.cognition.2017.10.015>



# Iconicity (order of mention)



**clause order**

After I put the  
kettle on

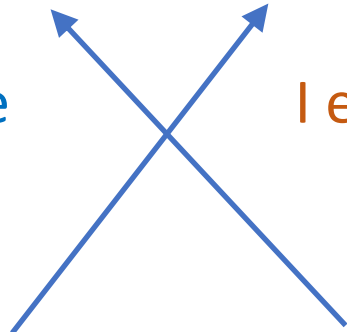
I eat a piece of  
toast

**Iconic**

I eat a piece of  
toast

After I put the  
kettle on

**Non-iconic**





# Iconic clause orders

## MAIN

- He plays his big drum

## ADVERBIAL (subordinate)

- *After* she paints the old fence
- *Because* he sees the snowman
- *If* she presses the button

## ADVERBIAL (subordinate)

*before* he reads his new book.

## MAIN

she hoovers the house.

he opens the door.

she hears the doorbell.

# Design

- Sentence types tested:
  - 4 types of adverbial (*after, before, because, if*)
  - 2 different clause orders (*main-adv, adv-main*)
- Participants:
  - 38 children aged 3.5 to 4.5 years
  - 34 children aged 4.5 to 5.5 years

De Ruiter, L., Theakston, A., Brandt, S., & Lieven, E. (2018). Iconicity affects children's comprehension of complex sentences: the role of semantics, clause order, input and individual differences. *Cognition*, 171, 202-224.

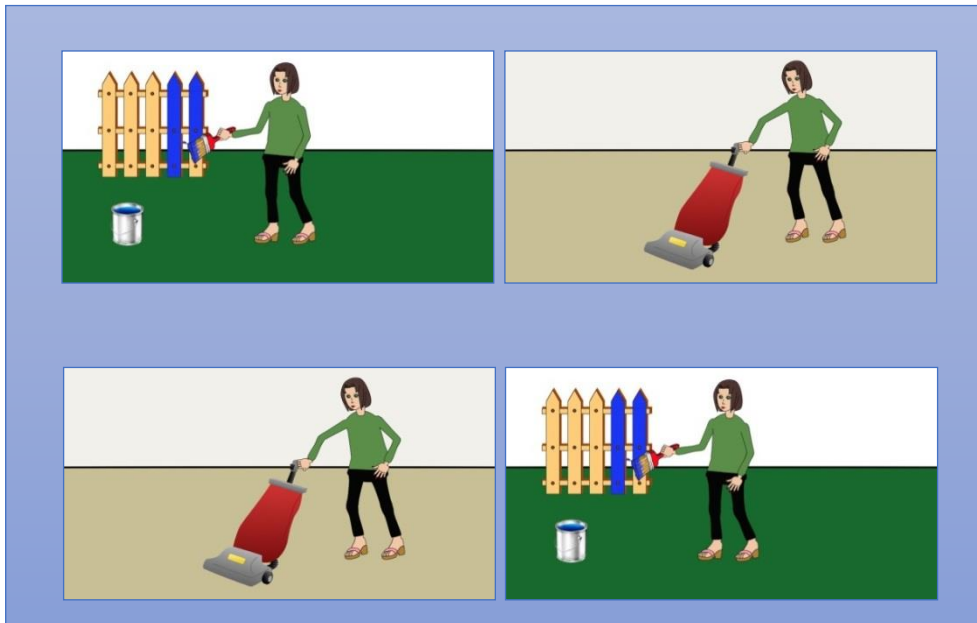
<https://doi.org/10.1016/j.cognition.2017.10.015>

# Design

- Forced-choice picture selection task



- Instruction: *Touch the matching story after the beep!*

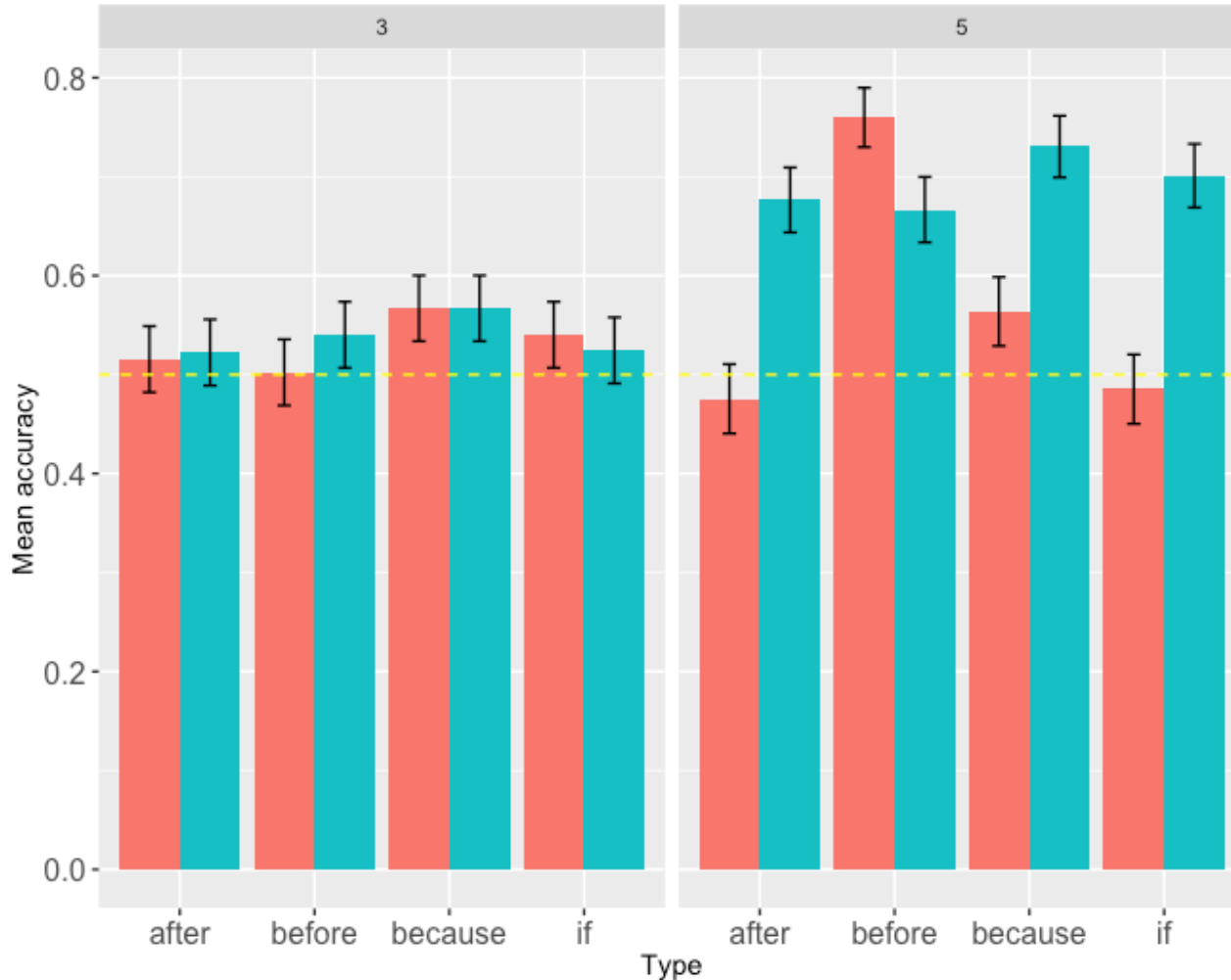


*She hoovers the house after she paints the old fence*



# Results

Mean accuracy by type, clause order, and age group



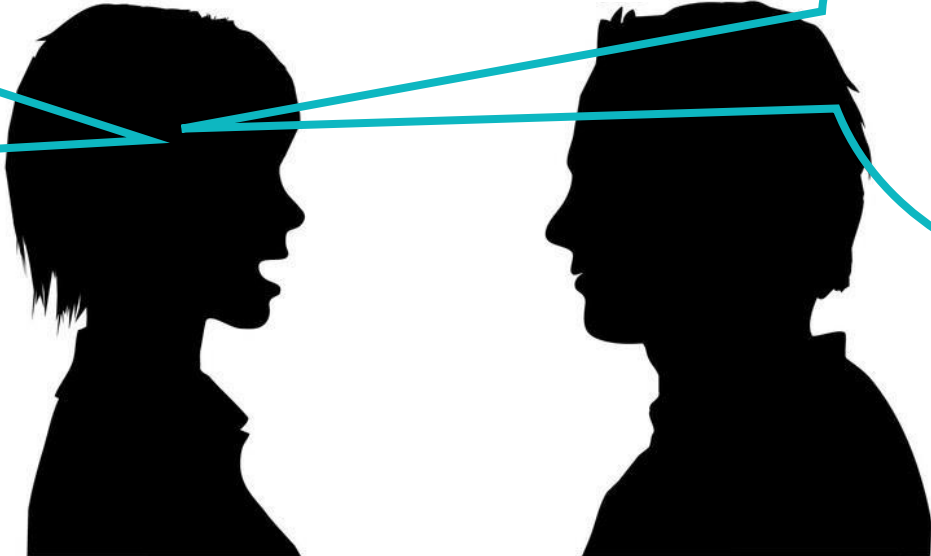
- ▶ **Before** better than all other types
- ▶ **Sub-main** better than main-sub (but interaction with type)



- ▶ **Iconic** orders better than non-iconic ones

# Does context help?

- Most of the time, we don't hear isolated sentences.
- **Information structure** – what is 'given' (already established) information, and what is new
  - “Given before New” easier to process?



I need to  
**go to the  
post  
office.**

Before I go to  
the post  
office, I need  
to go to the  
bank, though.

# Study 2: Adding context

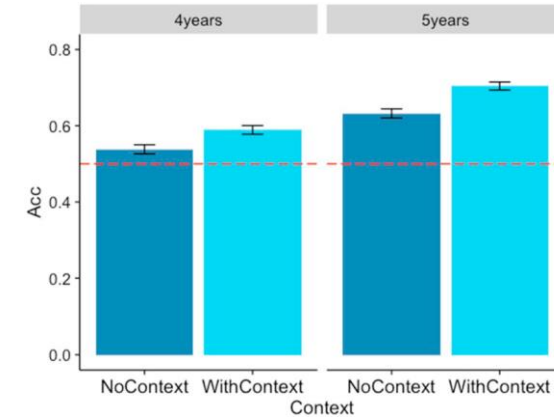
Touch the matching story after the beep!

4yr & 5yr olds



Tom drinks some water.

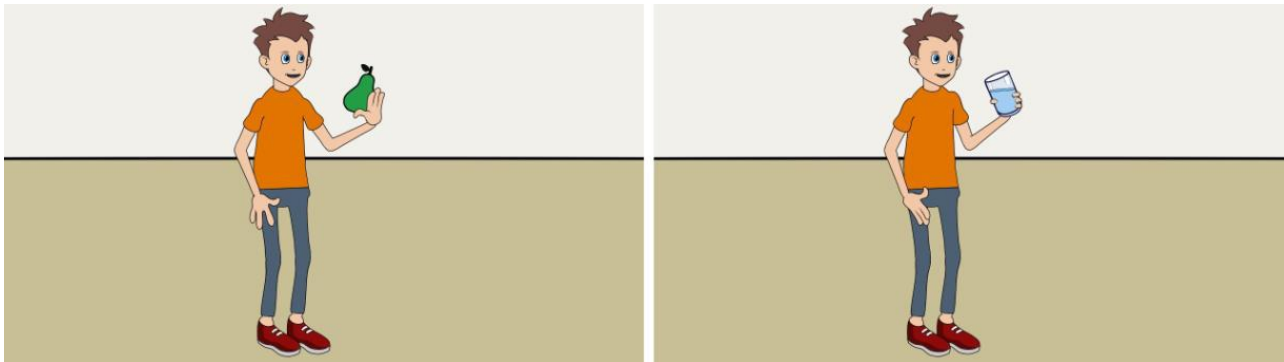
He drinks some water after he eats a green pear.





# Study 2: Information structure

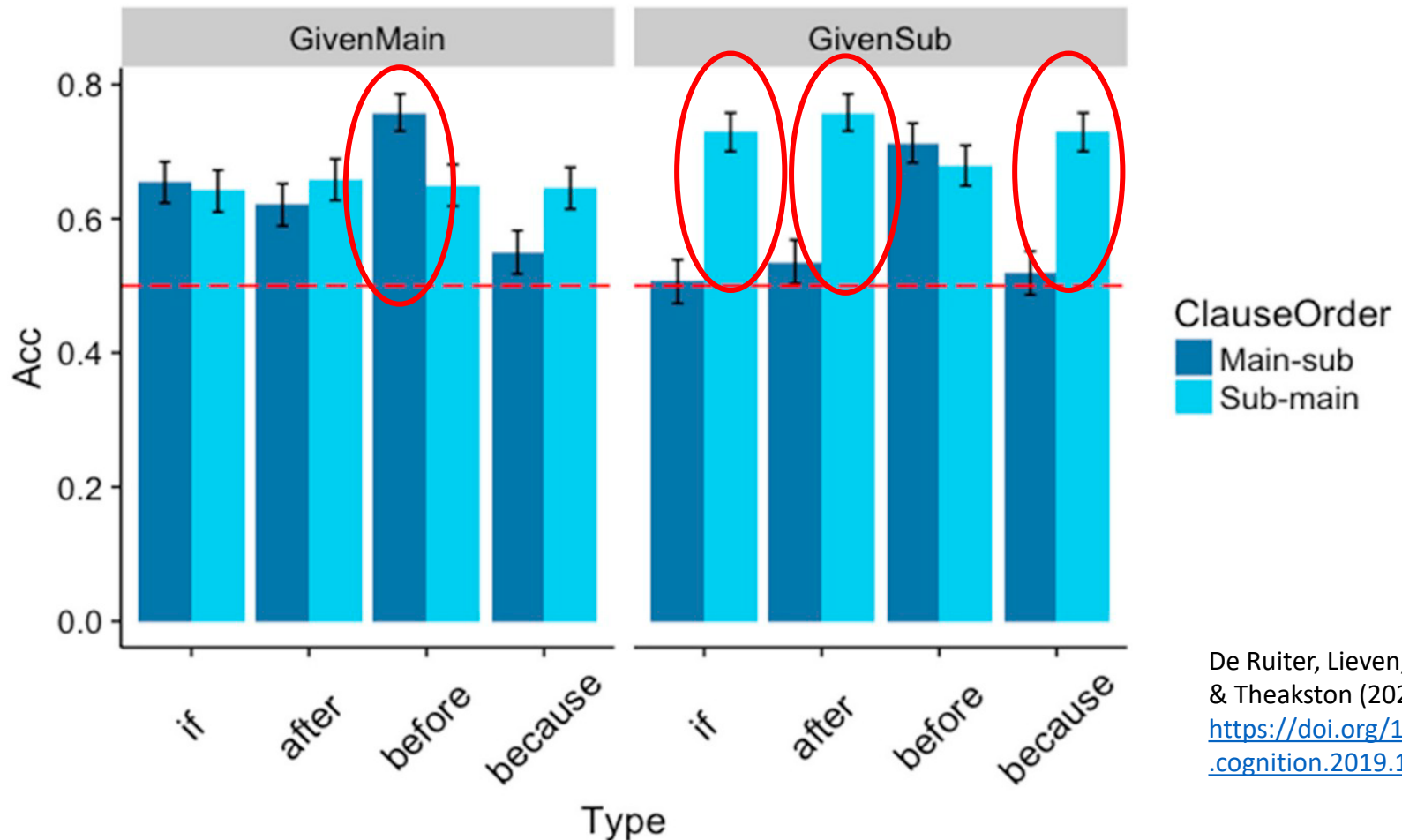
- Does information structure (Given–before–New) affect children’s understanding?
- **Tom eats a green pear.** (Given information)  
After he eats a green pear, he drinks some water. (Given-New)
- **Tom drinks some water.** (Given information)  
After he eats a green pear, he drinks some water. (New-Given)



Tom eats a green pear. (Given information)

He eats a green pear before he drinks some water (GivenMain-NewSub)

After he eats a green pear he drinks some water. (GivenSub-NewMain)



De Ruiter, Lieven, Brandt, & Theakston (2020).

<https://doi.org/10.1016/j.cognition.2019.104130>

Effect of iconicity – but mainly when Given-New order of information

# Study 3: Links to social & emotional development



- Complement clauses are used to discuss your own and others' thoughts and beliefs
- Examples:
  - *I think it's raining*
  - *I know the coat's in the cupboard*
  - *He believes it's raining*
  - *She knows the dog ran away*
- How does use of complement clauses relate to children's understanding of others' beliefs?

# Methods

- Longitudinal study
- 48 2-3yr old children (M=36 months) at T1
- 45 children retested 6 months later at T2 (M=42 months)
- Does ability to use complement clauses predict later ability to reason about others' beliefs?
- Does ability to reason about others' beliefs predict later ability to use complement clauses?

# Complement clauses task

| Repetition                              | Comprehension   |
|---|---|
| Jean hoped that the tea was hot.        | Jack hoped that the cat was sweet. Then he stroked it.<br>What did Jack hope?             |
| You know the boy has a drum             | Nick found a rope, but he shouted that he found a snake.<br>What did Nick shout?          |
| Dan pretended that he brushed his hair. | Pam saw that her dad picked flowers. Then she found a vase for them.<br>What did Pam see? |
| I think the monkey likes the fruit      | Claire met a girl, but she pretended that she met a queen.<br>What did Claire pretend?    |

Boeg Thomsen, D., Theakston, A., Kandemirci, B., & Brandt, S. (2021). Do complement clauses really support false-belief reasoning? A longitudinal study with English-speaking 2- to 3-year-olds. *Developmental Psychology*, 57(8), 1210–1227.

<https://doi.org/10.1037/dev0001012>

# Complement Clauses - Repetition task



1

Jean hoped that the tea was hot



# Complement Clauses - Comprehension task



Nick found a rope, but he shouted that he found a snake.

What did Nick shout?

# False belief tasks

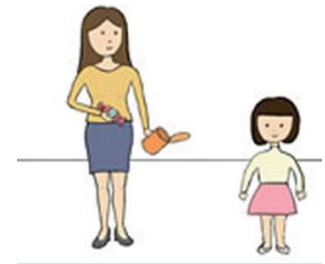


## Unseen Location Change

- Child watches puppet place teddy bear in a toy box then leave the room.
- A second puppet enters the room and moves the teddy bear into a bag.
- Child asked where first puppet will look for their teddy bear

## Unexpected Contents

- Child finds a sweets in a pencil case
- Sweets returned to the pencil case
- Child asked what another child who hasn't looked will think is in the pencil case



## Unexpected Identity

- Child sees pen in shape of flower
- Asked to point to the 'flower'
- Then demonstrate true function (by drawing with it)
- Child asked what another child, who hasn't seen this before, will think it is.



# Results

- Early ability with complement clauses predicts later ability to reason about beliefs

AND

- Early ability to reason about beliefs predicts later use of complement clauses
- Bidirectional influence – language helps reasoning, and reasoning helps language

# Summary – child studies

- Ability to use complex sentences impacted by:
  - Mapping of sentence to order of events in the real world
  - Discourse context
  - Information structure (given before new)
  - Socio-cognitive development
- Implication – lots of experience needed with complex sentences used in ongoing conversation to learn different aspects of use

# Part 4: How can caregivers support children to learn complex sentences?



# Practitioner advice RADLD YouTube



- “It’s really important to **keep what you say to a minimum** and make sure you’re only saying the things that are really important for the child to understand. Sometimes we use a lot of unnecessary language which can then be very confusing for the child”

<https://www.youtube.com/watch?v=2yPR1UUtjec>

- “...for teachers... think about the way they present a task and really break it down into very small stages and build the task up so you give them one instruction, get them to complete that... **don’t put all the instructions together**”
- “Children with (DLD) can be helped by us speaking in very short sentences... Teachers should try and use simple sentences with very simple grammar to help children understand and be aware of words like *before* and *after* which are very confusing. **So rather than say ‘before you put your pencils away give me your books’ say ‘give me your books, then put your pencils away’**”

<https://www.youtube.com/watch?v=MNf-VHzCIPE>





## In contrast: What do caregivers say to their 3-4 year olds?

Well **when** we got back to the car after our walk, your shoes were so dirty that we took them off **before** you go in the car

Well **when** we've put hot water in there to make hot tea we must keep it in the middle of the table, **because if** it falls on the floor I'll be very very upset

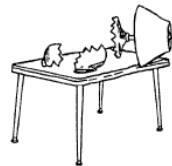
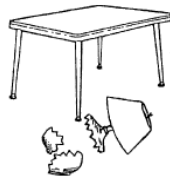
**Because if** it was going past Mummy's house **before** Mummy had left her house to go to the platform, **then either** Mummy's running very very late and she would've missed the train anyway, **or** the train's going past too early



Daddy went to work just **before...** just **after** you got out of bed

# Hearing complex sentences

- Greater exposure to complex (multiclausal) sentences and rare words at **3yrs** of age leads to better understanding and greater use at **4yrs** of age
- Measured for both parental input, and teacher input (in USA)
  - e.g. He went to the shops and bought some milk



The lamp broke because it fell off the table

# Expanding and recasting

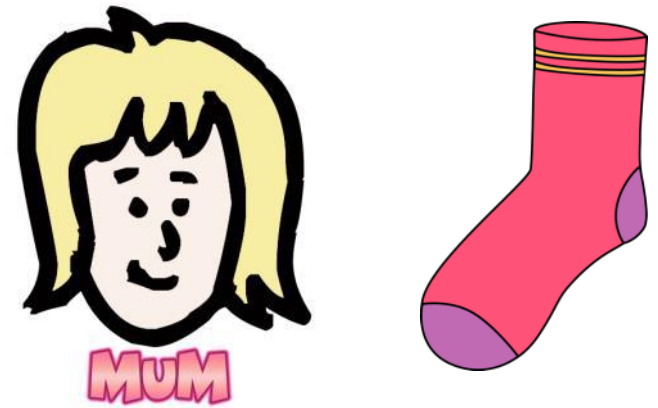
Early child speech often described as **Telegraphic** because it includes only content words (Mummy, Sock)

- Mummy sock
- Adam kick ball

Some parents respond to Telegraphic speech by expanding, recasting or filling in the gaps

- Yes. Mummy's putting your socks on, isn't she?
- Is Adam going to kick the ball?

Has positive impact on grammatical development (Cleave, Becker, Curran, Owen Van Horne & Fey, 2015)



# Asking questions



- Wh-questions in caregiver speech (*Where, why, how, when, who, what*) promote children's language because they prompt for a more complex verbal response from the child than qus requiring only *yes* or *no* answer.
- High frequency of wh-qus positively associated with children's:
  - comprehension & production of questions
  - vocabulary size (at age 2-3yrs)
  - narrative skills
  - verbal reasoning ability (at 3yrs)

**References:** Goodwin et al., 2014; Rowland et al., 2003; Blake et al., 2006; Rowe et al., 2017; McCabe & Peterson, 1991

# Decontextualized talk



- Language removed from the ‘here and now’ (Snow, 1990)
- Occurs more often during:
  - shared mealtimes (Aukrust & Snow, 1998)
  - shared book-reading contexts (that themselves promote complex language use – Noble & Cameron-Faulkner, 2018)
- Caregiver use of **decontextualized language** predicts:
  - Vocabulary growth from 3-5 years (Rowe, 2012)
  - Narrative/grammar skills at school entry (Demir et al., 2015)
  - Children’s own use of decontextualized talk (Demir et al., 2015)

# Having conversations



- Caregivers who engage in **more conversations** (not just more talk) with 4-6yr olds have children with **stronger language skills** (Romeo et al., 2018)
- Bidirectional spirals of influence – talking about **mental states**, and using **complex sentences** with young children develops their understanding of both language and belief reasoning, which feed into each other

# You can help (by supporting caregivers to):

- Use **complex sentences** – the more children hear, the more they understand (book reading is great!)
- Talk about the **past and future** (decontextualized talk)
- Engage in extended episodes of **pretend play** with children
- Talk about how you and others **think and feel** – children who hear lots of ‘mental state’ talk seem better at using and understanding mental state terms
- Provide lots of opportunities for **extended conversation** to encourage **reasoning skills**



# Thank you – any questions?

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