The Influence of Language on Theory of Mind: A Training Study

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Theory of Mind

- Capacity to attribute mental states
- Crucial changes occur around age 4
  - Accurately interpret the contents of other peoples minds
  - Understand that the mind is a representational system that does not always reflect reality

Why does this change occur?

- Performance based approaches:
  - Development of Theory of Mind is the result of other more general cognitive changes
    - Nativist Modular Theories
    - Executive Function Theories

- The Theory Theory
  - Cognitive development is conceived in terms of theory formation

Jill de Villiers

- Does the emergence of false-belief understanding depend on the child’s mastery of grammar of sentential complements?
- Tested 28 children aged 3-5 on language tasks and false belief tasks
Jill de Villiers

- de Villiers concluded that language is a necessary precursor for theory of mind.
- She also concluded that specifically sentential complements are necessary for acquisition of theory of mind.
- However, de Villiers research questions used mental state verbs which could have affected the outcome.

Goals of the Study

- To investigate further whether sentential complements are an important influence on Theory of Mind.
- To compare language training on sentential complements to more direct training on theory of mind.
- Test specificity of linguistic instruction.

Sentential Complements

- Allow for the embedding of tensed propositions under a main verb (argument).

Method

- 72 children recruited from preschools.
- All native speakers of English from diverse racial and socio-economic backgrounds.
- Twelve children were eliminated after pretests.
- Remaining children were all between 36 and 58 months (3 and 4 years 8 months).
Method

- The remaining children were randomly split into three groups
  - False Belief Group
  - Sentential Complements Group
  - Relative Clauses Group

- Children attended two training sessions within one week of each other with four trials at each session

False Belief Group

- In each trial, an experimenter enacted a location change story

- Children were asked to predict where the main character would look for the object

- Incorrect responses were given corrective feedback and a re-enactment

- Correct responses were confirmed

- Note: No mental state verbs were used

Sentential Complements Group

- In each trial, children were told a story where boy did some action to a Sesame Street character and said that he did it to another

- Children were asked what the boy said

- Incorrect responses were given corrective feedback and a re-enactment

- Correct responses were confirmed

Relative Clauses Group

- In each trial, a scene was acted out with identical twins and a Sesame Street character. The character carried out different actions to each twin

- Children were asked which twin received a specific action

- Incorrect responses were given corrective feedback and a re-enactment

- Correct responses were confirmed
Post-Tests

- Children were post-tested 3-5 days after their last training session

- Theory of Mind
  - Children were given a location change false-belief task, an unexpected contents false-belief task, and an appearance-reality task
  - Children were asked two questions about each task
  - The location change task also included a justification task which was scored separately

- Sentential Complements
  - Children were told 6 stories in which one character tells Mickey Mouse one thing but does something else
  - Children were asked what the character said

- Relative Clauses
  - Children were told 6 stories accompanied by drawings where Minnie Mouse does different actions to two nearly identical objects
  - Children were asked which object Minnie did one of the actions to

Results

Effects of Training

- Children trained in sentential complements gained theory of mind, but children trained in theory of mind did not gain sentential complements
- Children trained in relative clauses gained neither sentential complements or theory of mind
- This proves the hypothesis that sentential complements are unique in their influence on theory of mind
Results

- The false belief group supports the theory, but the sentential complements group data does not support this theory.

- The sentential complement data supports the executive function theory, but the false belief data does not support this theory.

- This means that neither theory is sufficient.

Results

- Training was used to facilitate or trigger the development of theory of mind, so the results would not be the same in younger children.

- Study is limited by the fact that there was no follow-up to see if theory of mind concepts were maintained over time.

An Interesting Note

- The children that were trained in false belief also gained theory of mind proving that sentential complements are not necessary to acquiring theory of mind.