

# Talking and Working Together to Solve Problems: A Microgenetic Analysis of Children's Talk During Groupwork

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## Why Explore Children's Talk During Problem-Solving?

Self-explanation has been shown to support conceptual and procedural knowledge, and precedes increase in knowledge.

Longitudinal group studies have shown that increased self-explanation or critical challenge (exploratory talk) can increase problem-solving competency (Mercer & Sams, 2006; Rojas-Drummond et al, 2003).

Less is known about the extent to which children of different abilities benefit from talking in groups when problem-solving, or how certain talk strategies are taken up over time as children tackle a series of problems.

This information could lead to better differentiation of strategies for children engaging in group work.

## Microgenetic approach (Siegler & Crowley, 1991)

- Observations span a period of rapidly changing competence
- Density of observations are high relative to the rate of change
- Observed behaviours are intensively analysed with the goal of identifying the processes that give rise to developmental change

## What was done?

- Case study design using microgenetic methodology comprising six problem-solving sessions at weekly intervals.
- Year 5 children from 3 different class groups organised into groups of three based on individual performance on the Matrices subtest of the British Ability Scales 3.
- Talk of 10 groups recorded, transcribed and coded as the children worked together to solve a set Raven's Matrices problems each week.
- Talk coded as Cumulative, Disputational, Incipient Exploratory and Elaborate Exploratory.

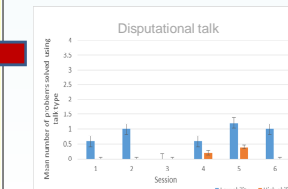
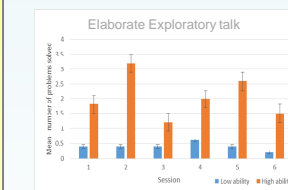
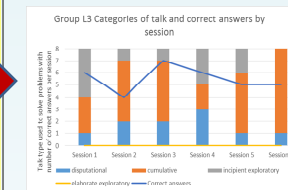
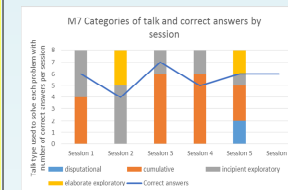
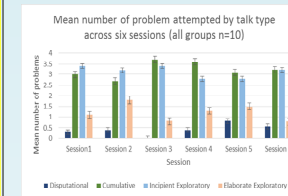
## Theoretical propositions

- P1. The level of exploratory talk will increase over the six sessions as the group solve a series of problems.
- P2. There will be a jump in problems correctly solved (+3) where the group has used high levels of exploratory talk in the previous session.
- P3. There will be a difference in the levels of exploratory talk used by the groups when examined on the basis of their task-specific ability.

## Implications for EP practice

EPs can have a role in training school staff to provide continuous scaffolding and modelling of how to use talk effectively when working with groups. This will be most important when working with less able pupils and therefore the training should be targeted for staff likely to be most involved with these children, i.e. teaching assistants and support staff.

## What was found?



P1 The level of exploratory talk did not significantly change over the course of the study. Predominant talk types used were Cumulative and Incipient Exploratory.

P2 One group did show the expected pattern of talk in relation to a jump in number of problems correctly solved. Pattern matching logic was used to identify replicating/contrasting cases, of which one contrasting case was found.

P3 There was a difference between Low Ability (n=5) and High Ability groups (n=5) with Low Ability groups using less Elaborate Exploratory Talk and more Disputational Talk than High Ability groups.

## References:

- Mercer, N., & Sams, C. (2006) Teaching children to use language to solve Maths problems. *Language & Education* 20(6), 507-528;
- Rojas-Drummond, S., Pérez, V., Vélez, M., Gómez, L., & Mendoza, A. (2003). Talking for reasoning among Mexican primary school children. *Learning and Instruction*, 13(6), 653-670
- Siegler, R., & Crowley, K. (1991). The microgenetic method: A direct means for studying cognitive development. *The American Psychologist*, 46(6), 606-620