

Mathematical Development of Children with Down Syndrome

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Project Title	A Study of the Mathematical Development of Young Children with Down Syndrome
Project Team	Dr Rhonda Faragher, Dr Jo Brady (SiMERR ACT); Associate Professor Barbara Clarke (Monash University); Dr Ann Gervasoni (ACU National)
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Funding Agency	Austalian Catholic University Mathematics and Literacy Education Flagship and SiMERR
Organisational Base	SiMERR ACT

Description

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Mathematical development (apart from aspects of counting) is uncharted territory for children with Down syndrome (DS). This project aims to support parents and teachers by developing an understanding of how primary school children with Down syndrome develop the early concepts of mathematics.

This research involves a small group of children aged between six and eleven years living in metropolitan and rural areas of ACT and NSW. Using an instrument developed from the Early Years Numeracy Interview, we have interviewed the children twice across one school year. The interviews will be analysed, comparing performance on tasks in both interviews. A workshop for parents and teachers will be conducted to present findings.

This project aimed to:

- Determine the mathematical development of primary school children with DS as measured by the adapted Early Numeracy Interview;
- Compare the development with typically developing children; and
- Determine if the instruments are useful in measuring development of children with DS.

Participants

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Twelve children completed the research study - seven male and five female. Five lived in metropolitan areas, six regional and one rural.

Findings

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The first phase of the research involved the development of a task-based interview, using the Early Numeracy Interview as a basis. A need to include more questions in some areas was determined and some of these were sourced from the Early Mathematical Understandings interview. Children with Down syndrome make interesting participants in a research study such as this. Unlike typically developing children who are often keen to show what they know, children with Down syndrome are known to use avoidant strategies. Interviewing, therefore, became an art of trying to 'trick' some of the participants into revealing what they knew or were able to do. Each interview was undertaken by the lead researcher who found herself jumping back and forwards through the tasks or adding other similar tasks (e.g. counting the number of stars on a sticker chart) to increase the likelihood of gathering data that could be trusted. Parents were also present to provide information about their view of their child's performance on the interview.

On analysis of the videotapes, the researchers believe that have found some surprising approaches taken by children who could be described as emergent counters. It would appear that some who have difficulty rote counting are able to complete tasks considered more challenging from a perspective of typical development. This appears to match the different approach to the development of reading identified for children with Down syndrome. It is our view that children with DS can be assisted to develop counting and number operations by making use of visual supports. For example, symbols for numbers (numerals) should be taught early, along with the count word. Number lines, 100 charts and other visual prompts should be used to support the development of the oral count word sequence. Operations can similarly be supported and should not be delayed while waiting for the emergence of oral counting.

Conference Presentations

- Faragher, R.M. (2007, November). Maths for children. Invited workshop presentation at the annual conference of the Down Syndrome Association of Victoria, Beechworth, Vic.
- Faragher, R.M., (2008, March). Maths and students with Down syndrome – can they do it? YES THEY CAN! Invited presentation to Down Syndrome Association of Victoria Education Seminar.
- Faragher, R., Brady, J., Clarke, B., Clarke, D., & Gervasoni, A. (2007, April). Narrowing the Gap: Empowering Teachers and Parents through understanding how children with DS develop mathematically. Paper presented at the conference of the National Centre for Science, Information and Communication Technology, and Mathematics Education for Rural and Regional Australia on addressing educational disadvantage, Armidale, NSW.
- Faragher, R., Brady, J., Clarke, B., & Gervasoni, A. (2007, November). The Mathematical Development of Young Children with Down Syndrome. Poster session presented at the Summit of the National Centre for Science, Information and Communication Technology, and Mathematics Education for Rural and Regional Australia, Canberra, Australia.
- Faragher, R. M., Clarke, B. A., Brady, J., & Gervasoni, A. (2008, August). Mathematical development of young children with Down Syndrome: The early findings (Abstract). *Journal of Intellectual Disability Research*, 52, 682.
- Faragher, R., Clarke, B., Gervasoni, A. & Brady, J. (2006, August). The Mathematical Development of Young Children with Down Syndrome. Poster session presented at the 9th World Down Syndrome Congress, Vancouver, BC, Canada.

Impact

This project has led to interesting findings in the area of counting. We are also intrigued by responses to the space questions and plan to develop these tasks further to explore an area that has received little previous research attention.

This research project has led to an invitation to present a pre-conference workshop on the mathematical development of children with DS at the International Association for the Scientific Study of Intellectual Disability – Asia Pacific Regional Congress to be held in Singapore in 2009. Research findings will also be presented at this congress.

Invitations for keynote address presentations at conferences for parents and teachers, such as the forthcoming presentation for the New South Wales Down Syndrome Association, indicate the value of this research for families and teachers of children with Down syndrome.

Related documents

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