**0347**

# Wake up, sleepyhead?Investigating a sleeper effect in an early mathematics intervention

Nick Dowrick, Victoria Jackson
*Edge Hill University, Lancashire, United Kingdom*

## Background

The Every Child Counts (ECC) initiative is run by a partnership of the Every Child a Chance Trust, a northwestern University, the National Strategies, and the Department for Children, Schools and Families (DCSF). It aims to enable the lowest-attaining Year 2 children in mathematics to make greater progress towards expected levels of attainment and to achieve National Curriculum level 2 or better by the end of Key Stage 1. ECC addresses a growing awareness that some children need early and intensive support in order to maximise their progress and close attainment gaps (Williams, 2008), and an increasing interest in the nature of effective mathematics intervention.

To achieve its aim of enabling progress for the lowest-attaining children in mathematics, ECC is developing the Numbers Count numeracy intervention (Dunn et al., 2010). Numbers Count was first introduced in schools in 2008 and is now delivered to over 8,000 children in 700 schools. In each school, four 6 or 7 year-old children who are low-attainers in mathematics are supported each term so that by the end of the year 12 children have received 30 minutes of individual, daily support for approximately 12 weeks each.

While there has recently been increasing research into the difficulties that some young children experience with mathematics (Berch et al. 2007, Gervasoni & Sullivan 2008), relatively little attention has been paid to mathematics interventions. Dowker (2004, 2008) has shown that they can be highly effective in helping low attaining children to make progress and has identified particular components of mathematics that are susceptible to intervention, but has also reported that little is yet known about the ways in which children make progress.

At the 2009 BERA conference, the authors presented a paper on the learning pathways that children followed as they progressed from the start to the end of the intervention. A ‘sleeper effect' was suggested, whereby children who made slow initial progress appeared to have made as much as or more progress than others by the end of the intervention. This year's paper presents the results of follow-up research into this phenomenon, both within the timescale of the intervention and in the 6 months after children had completed it.

## Research Questions

It was decided not to attempt to test or measure changes in children's attainment at short intervals along their journeys, because of the difficulty of defining exactly when learning has taken place (Houssart, 2004). Instead, 200 intervention teachers kept weekly logs of children's progress during the intervention, both in attitudes to mathematics and in mathematical attainment. As noted by Smith, Duncan & Marshall (2005) the majority of research addresses teachers' perspectives on children's learning rather than children's own perceptions of their learning. 30 intervention teachers and 30 class teachers were also interviewed about children's progress during and after the intervention. In order to obtain the children's perspective, 30 children were interviewed with their parents.

## Methods

A triangulation approach was employed within an interpretivist methodology, using a combination of qualitative and quantitative data collection tools. Initially, the results of numeracy test scores were collected from the entire population of 8,000 children undertaking Numbers Count, when they entered and exited from the intervention and three and six months later. While test scores alone provide only a vague description of children's performance (Dowker, 2004) their analysis provided an initial

suggestion of a relationship between initial and subsequent progress that could be both tested and interpreted through smaller-scale qualitative data.

**Frame**

A triangulation approach was employed within an interpretivist methodology, using a combination of qualitative and quantitative data collection tools. Initially, the results of numeracy test scores were collected from the entire population of 8,000 children undertaking Numbers Count, when they entered and exited from the intervention and three and six months later. While test scores alone provide only a vague description of children's performance (Dowker, 2004) their analysis provided an initial suggestion of a relationship between initial and subsequent progress that could be both tested and interpreted through smaller-scale qualitative data.

**Research findings**

Preliminary findings revealed that children's attitudes to mathematics tended to improve from the start of the intervention, closely followed by progress in mathematical attainment. While most children made steady progress in mathematical attainment throughout the intervention, 25% of them made a relatively slow start followed by steady progress thereafter. However, this group's overall progress by the end of the intervention was at least as great as those children who had made a faster start. Teachers attributed this to the time spent addressing fundamental misconceptions and to establishing a positive ethos at the start of the programme.

The children who made the least progress during the intervention made substantially more progress in the 3 months after completing it then those children who had made stronger progress. A similar, yet weaker, relationship was apparent 6 months after completion. The reasons for this will be discussed in the paper.

The combination of these findings confirms the previous indications of a sleeper effect in Numbers Count, which has implications both for the implementation of the intervention and for the evaluation of its outcomes.