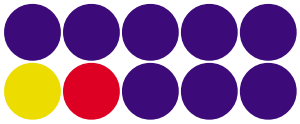

Count Me In Too

1998 Report

The Mathematical Achievement and Self-concept
of Kindergarten and Year 1 Children
A report prepared on behalf of
the NSW Department of Education & Training

by
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Count Me In Too

1998 Report

This report is the third in a series to be produced for the New South Wales Department of Education and Training as part of its ongoing monitoring and evaluation of the Count Me In Too Project. Other reports produced to date include:

1. Report of the evaluation of the Count Me In Project 1996. This report focuses on the impact of Count Me In on the professional development of teachers.
2. Report of the Count Me In Too Project 1997. This report examines the degree of agreement between teachers when judging the arithmetical ability of young children on the Schedule for Early Number Assessment (SENA), a performance-based assessment instrument used in Count Me In Too to monitor students' arithmetical abilities.

Count Me In Too

1998 Report

Contents

Executive Summary

The investigation described in this report was conducted in Terms 3 and 4 of the 1998 school year. Its aim was to evaluate the impact of Count Me In Too (CMIT) on the mathematical achievement and self-concept development of Kindergarten and Year 1 children. More specifically, it was designed to:

1. Investigate the effect of CMIT on the mathematical achievement of children with various academic abilities; and
2. Investigate the effect of CMIT on multiple dimensions of self-concept in young children with various academic abilities.

The experimental group consisted of a Kindergarten (n = 23) and a Year 1 (n = 21) class involved in the CMIT project. The control group consisted of a Kindergarten (n = 21) and a Year 1 (n = 23) class from a nearby school not involved in the CMIT project. Each child was interviewed individually on two occasions-once prior to the CMIT project beginning (May/June 1998) and once at its conclusion (November 1998). On each occasion children were administered the Self-Descriptive Questionnaire (SDQ-I) to assess their self-concept, and the Schedule for Early Number Assessment (SENA) to assess their mathematical achievement. The findings indicate that:

1. There were no differences between the experimental and control group's total SENA pre-test scores for the Kindergarten and Year 1 classes.
2. The Kindergarten control group performed significantly better than the experimental group at the pre-test phase on two early number aspects-Forward Number Word Sequences and Backward Number Word Sequences.
3. Total SENA post-test performances of the experimental group were significantly better than that of the control group for both the Kindergarten and Year 1 cohorts.
4. The experimental groups performed significantly better than the control groups on all aspects of the SENA post-test, except for Backward Number Word Sequences at the Kindergarten level.
5. Control group performances on the SENA post-test could be reliably predicted from their pre-test performances. This means that the weakest performing students at the pre-test phase continued to be the weakest students at the post-test phase-there had been little shift in the order of student achievement levels.

6. Experimental group performances on the SENA post-test could not be reliably predicted from their pre-test performances, indicating that there had been considerable shift in the order of student achievement. The weakest performing students on the SENA pre-test were not necessarily the weakest students on the SENA post-test.
7. There were no obvious relationships between students' Total self-concepts or Mathematics self-concepts and their achievement on the SENA for Kindergarten or Year 1 students.

Count Me In Too

1998 Report

The Mathematical Achievement and Self-Concept of Kindergarten and Year 1 Children

Introduction

This report presents the findings of an investigation into the Early Number Project (Count Me In Too) operating in Department of Education and Training (DET) schools throughout New South Wales in 1998. It is the third in a series of reports to be produced for DET as part of its ongoing monitoring and evaluation of Count Me In Too (CMIT). Previous reports have focused on the impact of the project on the professional development of teachers (Bobis, 1996) and on the degree of agreement between teachers when judging the arithmetical ability of children on the performance-based assessment instrument used in the CMIT project (SENA) (Bobis, 1997).

The investigation reported here was conducted in Terms 3 and 4 of the 1998 school year. Its aim was to evaluate the impact of CMIT on the mathematical achievement and self-concept development of Kindergarten and Year 1 children.

Background to the Study

Origins and Aims of Count Me In Too

In 1996 the NSW Department of School Education trialed an early number project (Count Me In) in thirteen schools throughout NSW. The project initially involved four DET mathematics consultants, over thirty-five K-2 teachers and approximately one thousand students from thirteen schools across NSW, Australia. The aim of the project was to develop the knowledge of K-2 teachers in early number with the ultimate aim of improving young children's mathematical abilities.

The project was extended in 1997 to include fifty-three DET funded schools, forty mathematics consultants and over one hundred and sixty teachers. In 1998 the project involved seventy-eight DET funded schools, two hundred and fourteen non-funded schools, over one thousand teachers and approximately twenty thousand K-2 students.

Count Me In Too employs a work-based model of professional development, with mathematics consultants working in classrooms alongside teachers. Exactly how consultants become involved varies from school to school, but basically their role is to assist teachers with the implementation of the learning framework espoused by the CMIT project. Generally, this is achieved by consultants helping teachers assess the mathematical development of children in their class, and by helping them plan and implement developmentally appropriate learning and teaching experiences.

Rationale and aims for the 1998 study

While the 1996 evaluation of Count Me In (CMI) focused mainly on the professional development aspects of the project, student progress in numerical development was also reported. Coupled with this, anecdotal evidence indicating that changes to students' affective responses towards mathematics had occurred was provided (Bobis, 1996). Teachers commented on children's improved confidence in mathematics, in other subject areas and in their general self-concept. In broad terms, the aim of the 1998 investigation was to explore these comments in more detail by exploring the impact of CMIT on the mathematical achievement and self-concept of Kindergarten and Year 1 children. More specifically, it was designed to:

1. Evaluate the effect of CMIT on the mathematical achievement of children with various academic abilities; and
2. Evaluate the effect of CMIT on multiple dimensions of self-concept in young children with various academic abilities.

Self-Concept and mathematical achievement

Self-concept is generally perceived as the image that we have of ourselves. More specifically, it has been referred to as "our attitudes, feelings and knowledge about our abilities, skills, appearance, and social acceptability" (Byrne 1984, p.429). This definition implies that self-concept is a multi-dimensional construct, and brings to light the notion of a global self-concept. A hierarchical interpretation, such as that offered by Marsh (1988) suggests that a general self-concept may consist of an academic and a non-academic self-concept. The academic self-concept may be further divided into an academic English self-concept and an academic Mathematics self-concept. Hence, the idea that an improvement in Mathematics self-concept can have an impact upon a child's global self-concept is conceivable.

Research so far indicates that gender differences are small for general self-concept, possibly due to the diversity of domains comprising a global score on any measuring instrument (for example, a Mathematics self-concept, Verbal self-concept and Physical self-concept). However, recent findings have indicated the existence of higher mathematics self-concepts for very young boys similar to those found for adolescence and adults (Marsh et al. 1991). Hence, the path to high or low self-concepts in mathematics seems to be well established before the third or fourth year of schooling and may already be too late to remediate given the resilient nature of self-concept towards change (Bobis & Cusworth, 1994). A potentially important contribution of the current investigation, is the ability to evaluate the impact on developing self-concepts of a program designed to enhance mathematics achievement in very young children of varying abilities.

Research Plan

Participants

Participants were largely from middle class families and attended one of two suburban metropolitan Sydney schools. The experimental group consisted of a Kindergarten (n = 23) and a Year 1 (n = 21) class involved in the CMIT project. The control group consisted of a Kindergarten (n = 21) and a Year 1 (n = 23) class from a nearby school not involved in the CMIT project. All teachers whose students were involved in the investigation had three or more years experience teaching in the Kindergarten to Year 2 range. While an effort was made to match the experimental and control groups as closely as possible in regard to socio-economic status, experience of classroom teachers and the like, the ultimate selection rested on each of the schools' willingness to be included in the study.

Materials and Procedure

Description of the SENA

The SENA was developed over a period of approximately five years and has been used extensively by teachers and researchers to assess the early arithmetical development of young children (Wright, 1996). It involves the presentation of 58 'tasks' or problems to a child in a one-on-one interview. The SENA assesses each child on five aspects of number development-Early Arithmetical Strategies (EAS), Forward Number Word Sequences (FNWS), Backward Number Word Sequences (BNWS), Numeral Identification (NID) and Base 10. Examples of tasks include: asking the child to say the number words from one to twenty, or given two covered collections of counters and asking the child how many in all. It is the role of the interviewer (the classroom teacher) to elicit a child's most sophisticated strategy (or EAS) and then determine where each response might be categorised within a framework of predetermined stages and levels of development (Wright, 1994b). The stages and levels of development are presented in Appendix A, Learning Framework Overview. For a more thorough description of the Learning Framework see Wright, (1994b). A copy of the SENA is provided in Appendix B.

Description of the SDQ-I

The Self-Description Questionnaire (SDQ-I) is one of three instruments designed by Marsh (1988) to measure multiple dimensions of self-concept for preadolescence. In 1991 it was modified to allow for assessing the various dimensions of self-concept for children aged 5-8 years in an individual interview situation (Marsh, Craven & Debus, 1991). The modified SDQ-I (see Appendix C) is a

Likert-type instrument, containing 64 positively worded items that are scored 1-5. Children are asked to respond verbally to the forced-choices of 'no always', 'no sometimes', 'yes sometimes' and 'yes always'. If a child indicates that they have understood an item but can not decide how to respond, the interviewer will record a response of 3, which is halfway between the responses of 'no sometimes' and 'yes sometimes'.

The SDQ-I assesses three areas of academic self-concept (Reading, Mathematics and General School self-concept scales), four areas of non-academic self-concept (Physical Ability, Physical Appearance, Peer Relationships and Parent Relationships self-concept scales) and General Self self-concept. In addition, three total scores are measured on the basis of these scales: Academic self-concept (the average of Reading, Mathematics and General School self-concept scales), Non-academic (the average of Physical Ability, Physical Appearance, Peer Relationships and Parent Relationships self-concept scales) and Total self-concept (the average of Academic and Non-academic self-concept scales). Hence, each student received eleven scores-one for each of the self-concept dimensions and three total score. The scores on the eight subscales were the algebraic sum of the individual items on each of the scales. Higher scores represent more positive self-concepts. Research by Marsh et al. (1991) found coefficient alpha estimates of reliability for the individual scales ranged from 0.72 to 0.86, and 0.93 to 0.95 for the Total score for Kindergarten and Year 1 students respectively. Items comprising each scale and their corresponding number as administered during the interview are presented in Appendix D.

Procedure

Children from both the experimental and control groups were interviewed individually on two occasions-once prior to the CMIT project beginning (May/June 1998) and once at its conclusion (November 1998). On each occasion children from the control group were administered the modified SDQ-I, and then the SENA approximately a day later. The interviewers were four experienced teachers who had been trained to administer both the SENA and SDQ-I. Children from the experimental group had the SENA administered by their class teachers as part of the normal CMIT operation. Results of their performances were obtained from class records.

SENA

The SENA took approximately 15 to 30 minutes to conduct, depending on the ability of the child being interviewed. Children with greater mathematical ability were asked to perform more difficult tasks and therefore took longer to complete the interview. Each assessment session began with a brief introduction to the nature of the tasks the child would be asked to perform. If a child became

noticeably frustrated by their inability to complete any task, they were stopped and asked to complete a task from a different section of the SENA. For example, if a child could not count five counters from a small pile of counters, they were not asked to count fourteen counters. Once it became obvious that subsequent items on the SENA were beyond the capability of a child, the interview was stopped. Research assistants attempted to elicit each child's most sophisticated strategy. If a strategy was not obvious, the assistant asked a child to explain how they found an answer. All SENA interviews were video taped and later analysed by one of the chief investigators so as to determine where each response might be categorised within a framework of predetermined stages and levels of development.

SDQ-I

The administration of the SDQ-I took approximately 30 minutes and included a short break half way. The testing session began with a brief set of instructions assuring the child of the confidentiality of his/her responses and four example items. After each example item was read, the interviewer asked the child if he/she understood the sentence. If the child indicated that they did not understand, the interviewer explained the sentence further, paraphrasing any words the child may not have understood. Once it was established that the child understood, the sentence was re-read and a response of 'yes' or 'no' was requested. If the child initially responded 'yes', the interviewer then asked the child if he/she meant 'yes always' or 'yes sometimes'. A similar procedure was followed if the child responded 'no' in the first instance. Children were encouraged to seek clarification on any item. If a child indicated that they had understood an item but could not decide how to respond, the interviewer recorded a response of 3. Children were not informed of this option.

Results and Discussion

The results and discussion are presented in three sections. The first section deals with the mathematical achievement of students in the experimental and control groups as assessed on the SENA. The second section reports the findings of the self-concept assessment at each phase of the study. The final section deals with the relationship between mathematical achievement and self-concept. Kindergarten and Year 1 results are reported separately for each of these sections.

Mathematical Achievement

Kindergarten

A total score for the SENA was calculated for each student based on the algebraic sum of the performance levels obtained on each aspect of the SENA. Overall performances on the SENA and the results on each aspect of the SENA for the Kindergarten experimental and control groups are summarised in Table 1. At the pre-test phase, the total mean scores on the SENA, indicate no significant difference between the mathematical abilities of the experimental and control groups ($t = 1.3$, $p>0.05$). However, separate two tailed t-tests on the various aspects of the SENA indicate that the control group performed significantly better than the experimental group for Forward Number Word Sequences ($t = -3.6$, $p<0.05$) and Backward Number Word Sequences ($t = -2.6$, $p<0.05$). There were no significant differences between the mean scores of boys and girls in the experimental or control groups at either the pre-test or post-test phases of the study.

At the post-test phase, the total mean scores indicate a significant difference between the performances of the two groups ($t = 3.1$, $p<0.05$). This indicates that the experimental group performed significantly better than the control group on the SENA overall. There were significant differences between the two group's mean scores for the aspects EAS ($t = 3.0$; $p<0.05$), FNWS ($t = 2.4$, $p=<0.05$), NID ($t = 3.1$, $p<0.05$) and Base 10 ($t = 2.8$, $p<0.05$), but the mean scores for BNWS were not significant ($t = 0.6$, $p>0.05$). This means that the experimental group performed significantly better than the control group at the post-test phase on every aspect except for BNWS.

It should be noted, that at the pre-test phase the control group performed significantly better than the experimental group on this aspect (as well as the FNWS aspect). While the experimental group's performance on the BNWS aspect at the post-test phase had improved beyond that of the control group, it was still not significantly better.

Table 1 *Kindergarten experimental and control group performances (means and standard deviations1) on the SENA and each aspect of the SENA pre-test and post-test*

		Experimental Group						Control Group					
		Pre-test			Post-test			Pre-test			Post-test		
Aspect		F* n=12	M** n=11	Total n=23	F n=12	M n=11	Total n=23	F n=12	M n=9	Total n=21	F n=12	M n=9	Total n=21
EAS Max=4	Mean	1.3	0.9	1.1	2.7	1.9	2.3	0.4	0.5	0.5	1.1	1.1	1.2
	SD	0.6	0.5	0.6	1.1	0.7	1.0	0.5	0.8	0.8	1.2	0.9	1.1
FNWS Max=5	Mean	2.2	1.5	1.8	4.1	4.0	4.0	2.9	2.4	2.6	3.6	3.2	3.4
	SD	1.5	0.8	1.2	1.2	1.2	1.2	0.8	1.0	0.9	1.3	0.9	0.9
BNWS Max=5	Mean	1.9	1.2	1.6	3.4	2.9	3.2	2.5	2.0	2.2	3.0	2.5	2.9
	SD	1.4	0.9	1.2	1.6	1.2	1.4	1.1	1.2	1.1	1.4	1.0	1.2
NID Max=4	Mean	1.5	1.3	1.4	2.9	2.7	2.8	1.5	0.9	1.1	2.3	1.6	1.9
	SD	0.9	0.9	0.8	1.2	0.6	0.9	1.4	0.8	0.8	0.8	0.9	1.0
Base10 Max=3	Mean	1.0	1.0	1.0	1.4	1.2	1.3	1.0	1.0	1.0	1.0	1.0	1.0
	SD	0.0	0.0	0.0	0.5	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Max=21	Mean	7.8	5.8	6.9	14.5	12.7	13.7	8.3	6.8	7.5	11.0	9.4	10.2
	SD	3.9	2.6	3.4	5.1	3.3	4.3	2.4	2.9	2.7	3.7	2.6	3.1

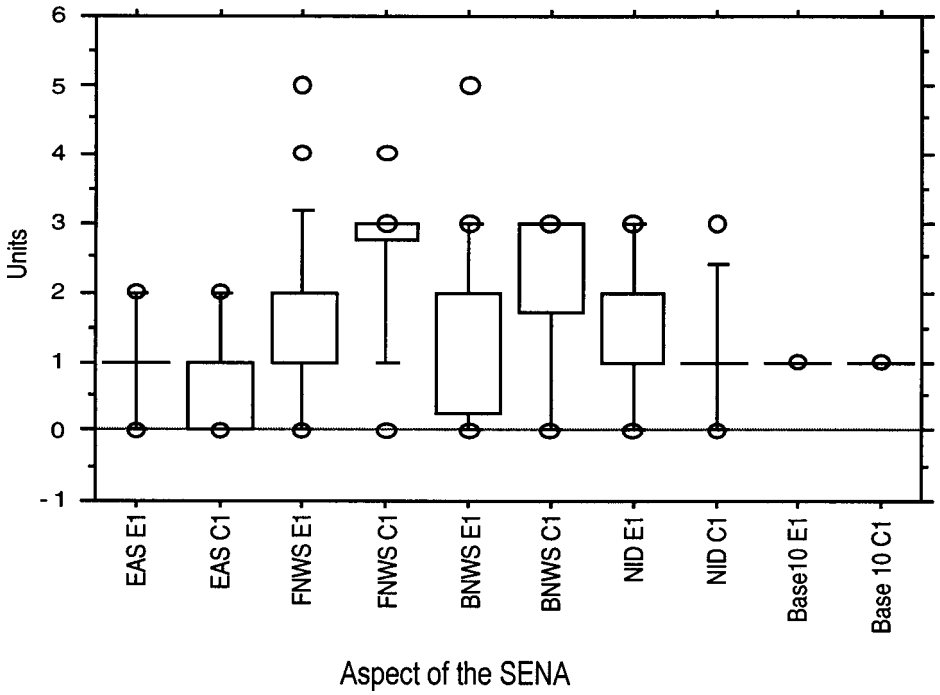
* Female ** Male

EAS Early Arithmetical Strategies
FNWS Forward Number Word Sequence
BNWS Backward Number Word Sequence
NID Numeral Identification

Box plots allow more comparisons to be made between the performances of the experimental and control groups. In particular, they provide detailed information regarding the distribution of students' performances at the pre-test and post-test phases of the study. Each box plot is composed of five horizontal lines that display the 10th, 25th, 50th, 75th and 90th percentiles of student performances. All scores above the 90th and below the 10th percentiles are plotted separately. The two horizontal lines at each end of the plot (called 'whiskers') indicate where the majority of scores lie. The further apart the whiskers, the more 'spread out' are the scores. The middle 50% of scores are between the upper and lower borders of the box. The longer the box, the more 'spread out' are the scores. The horizontal line inside the box shows the middle score (or median) if all scores were arranged in order from smallest to largest. For instance, in Graph 1, a comparison of the box plots representing performances of students in the

experimental and control groups on the Early Arithmetical Strategies aspect of the SENA (EAS E1 and EAS C1, respectively), indicate that at the pre-test phase the range of scores was the same (between Stages 0 and 2). However, the taller box for the control group means that student performances were more spread out-the majority of students performing at either Stage 0 or Stage 1. The single horizontal line in the middle of graph EAS E1 indicates that the majority of students (the middle 50%) in the experimental group performed at Stage 1.

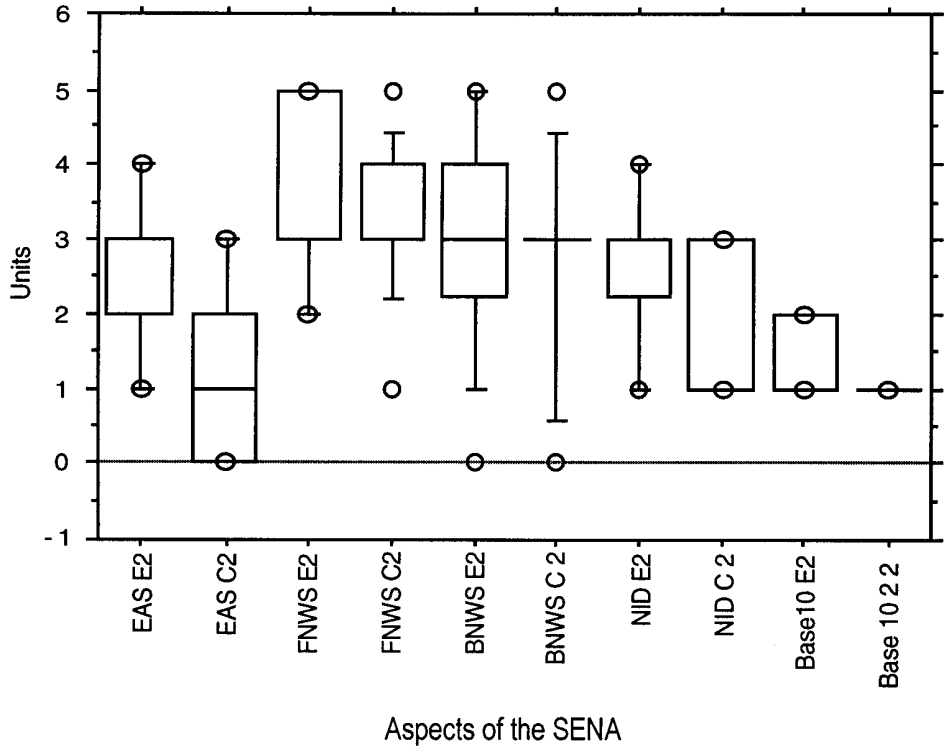
Graph 1 *Box plots of Kindergarten experimental (E) and control group (C) performances on each aspect of the SENA for the pre-test.*



* Units correspond to 'Stages' of development for EAS and 'Levels' of development for all other aspects according to the Learning Framework in Number

A comparison of the box plots for Forward and Backward Number Word Sequences for the two groups shows how the control group's performances on both these aspects (FNWS C1 and BNWS C1) tended to cluster around Level 3 for FNWS and Levels 2 and 3 for BNWS. While some students in both groups performed at Level 0 for the two aspects, students from the experimental group achieved the highest scores. However, the elongated boxes of plots FNWS E1 and BNWS E1 indicate that the majority of students in the experimental group were performing at Level 2 or lower for these two aspects at the pre-test phase.

Graph 2 *Box plots of Kindergarten experimental (E) and control group (C) performances on each aspect of the SENA for the post-test*

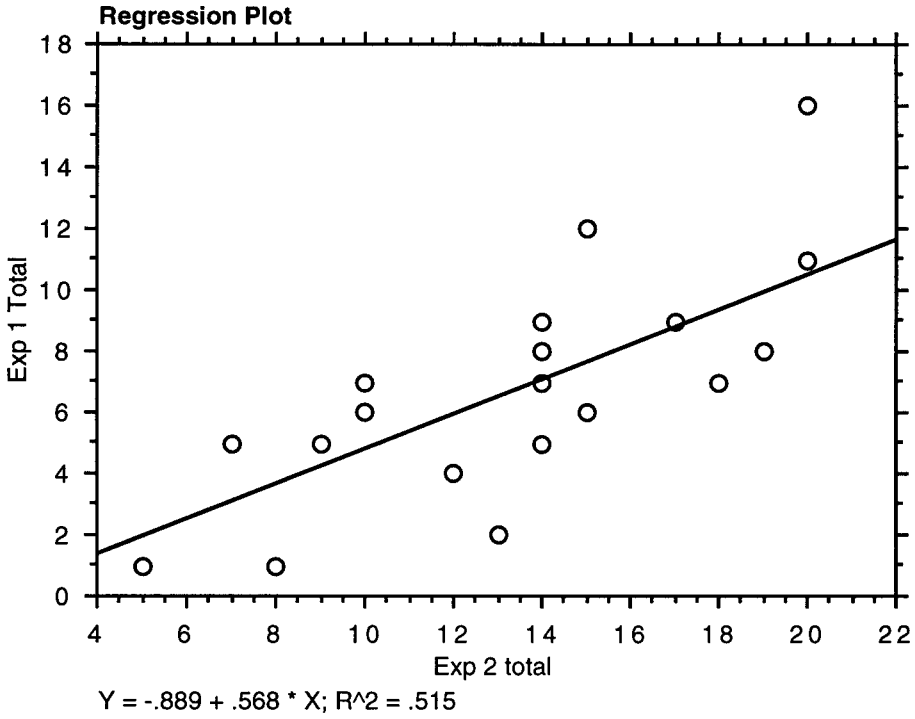


* Units correspond to 'Stages' of development for EAS and 'Levels' of development for all other aspects according to the Learning Framework in Number

In contrast, Graph 2 shows how the experimental group improved and performed significantly better than the control group on all aspects, except the BNWS aspect, of the SENA, at the post-test phase. The box plot representing the experimental group's performance on Forward Number Word Sequences (FNWS E2) indicates that the majority of students in this group were performing at Levels 3, 4 and 5. The control group, on the other hand, contained few students working beyond Level 4 on this aspect. Of particular interest, is each group's performances and subsequent advancements on the Early Arithmetical Strategies aspect (compare EAS E1 and EAS C1 on Graph 1 with EAS E2 and EAS C2 on Graph 2). While few students from the experimental group were performing beyond Stage 1 on this aspect at the pre-test phase, the distribution of scores on the post-test indicate that the middle 50 per cent of students were performing at Stages 2 and 3, with a few working at Stage 4-the upper most stage depicted on the Learning Framework for EAS. In contrast, the majority of students from the control group were performing at Stages 0, 1 and 2, with only a few students working at Stage 3 and no students working at Stage 4. Also noteworthy, is the fact that there had been no improvements in the control group's performance on the Base 10 aspect of the SENA (compare Base 10 C1 on Graph 1 and Base 10 C2 on Graph 2).

Regression analysis was used to determine the relationship between individual student performances on the SENA pre-test and post-test. A simple regressional analysis using total scores on the SENA for the experimental group revealed that a linear relationship was evident, but not statistically significant ($R2 = 0.5$, $p > 0.0001$). To allow closer examination of the relationship between individual student performances, a regression plot was generated (see Graph 3).

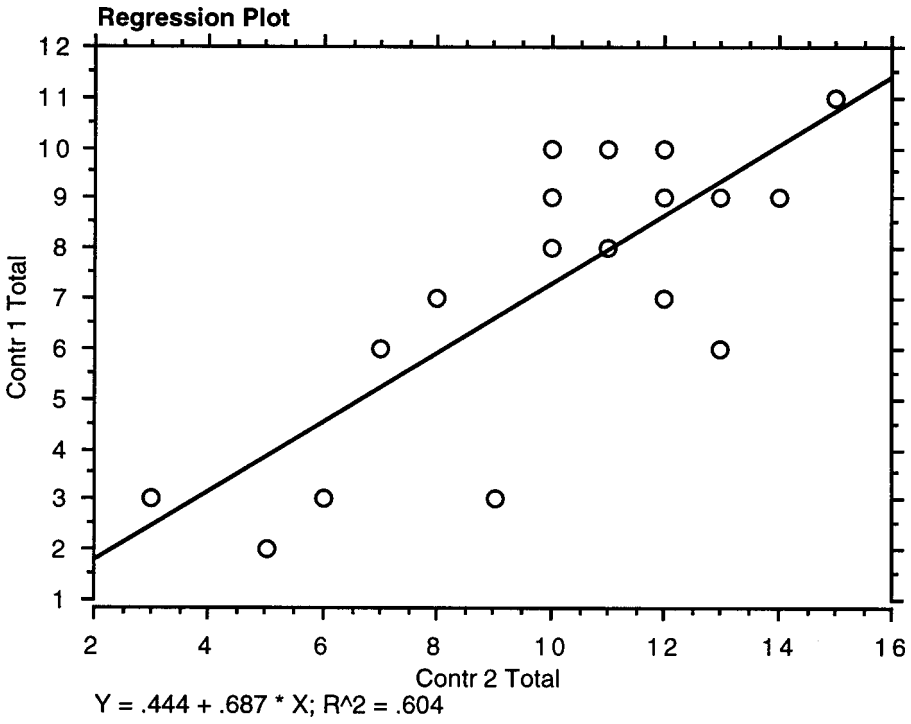
Graph 3 *Regression plot showing the relationship between student performances on the SENA at the pre-test (Exp 1 Total) and post-test (Exp 2 Total) phases for the Kindergarten experimental group*



The regression plot shows clearly that the two students at either extreme on the SENA pre-test were the same two students at either extreme on the post-test. However, there were a number of students who performed at quite low levels on the pre-test, but achieved performance scores on the post-test that were higher than students who were initially more advanced than them. Hence, it was possible for lower achieving students to 'lessen the gap' between themselves and more able students, but not with the highest achieving students.

A simple regressional analysis using total scores on the SENA for the control group revealed a linear relationship that was statistically significant ($R2 = 0.6$, $p < 0.0001$). This means that it was possible to predict, with a fairly high degree of accuracy, a student's score on the SENA at the post-test phase based on their performance on the SENA at the pre-test phase. Graph 4 illustrates how the same students performed at the lower levels at both the pre-test and post-test phases of the investigation.

Graph 4 *Regression plot showing the relationship between student performances on the SENA at the pre-test (Contr 1 Total) and post-test (Contr 2 Total) phases for the Kindergarten control group*



Year 1

Overall performances on the SENA and the results on each aspect of the SENA for the Year 1 experimental and control groups are summarised in Table 2. At the pre-test phase the total mean scores on the SENA indicate no significant difference between the performance of the experimental and control groups ($t = 1.2$, $p > 0.05$). Separate two tailed t-tests on the various aspects of the SENA indicated no significant differences between the performances of the two groups. Furthermore, there were no significant differences between the mean scores of boys and girls in the experimental group at either the pre-test or post-test phases

of the study. However, there was a significant difference between the mean scores of boys and girls for the control group at the post-test phase on the Early Arithmetical Strategies aspect of the SENA ($t = 3.3, p < 0.05$) indicating that the boys performed significantly better than the girls on this aspect.

Table 2 *Year 1 experimental and control group performances (means and standard deviations) on the SENA and each aspect of the SENA pre-test and post-test*

		Experimental Group						Control Group					
		Pre-test			Post-test			Pre-test			Post-test		
Aspect		F* n=10	M** n=13	Total n=23	F n=10	M n=13	Total n=23	F n=11	M n=12	Total n=23	F n=11	M n=12	Total n=23
EAS Max=4	Mean	1.7	2.2	2.0	3.6	3.4	3.5	1.5	1.8	1.7	2.1	2.7	2.4
	SD	0.5	1.3	1.1	0.8	1.0	0.9	0.9	1.5	1.2	1.0	1.0	1.0
FNWS Max=5	Mean	3.9	4.2	4.1	4.9	4.8	4.9	4.1	3.9	4.0	4.2	4.4	4.3
	SD	0.9	0.8	0.8	0.3	0.4	0.3	0.9	1.0	0.9	0.9	0.8	0.8
BNWS Max=5	Mean	2.9	3.8	3.4	4.7	4.3	4.5	3.0	3.3	3.1	3.3	3.9	3.7
	SD	1.1	1.1	1.2	0.7	1.0	0.8	1.2	1.1	1.1	1.4	0.9	1.2
NID Max=4	Mean	2.9	3.2	3.1	3.7	4.1	3.9	2.7	2.7	2.7	3.0	2.8	2.9
	SD	1.0	0.9	0.9	0.9	0.3	0.7	0.7	0.8	0.7	0.0	1.0	0.7
Base10 Max=3	Mean	1.2	1.6	1.4	2.0	2.2	2.1	1.2	1.3	1.3	1.2	1.6	1.4
	SD	0.4	0.7	0.6	0.7	0.7	0.7	0.6	0.8	0.7	0.6	0.9	0.7
Total Max=21	Mean	12.6	15.0	13.9	18.9	18.9	18.9	12.5	13.0	12.7	13.8	15.3	14.7
	SD	2.6	4.2	3.7	2.6	2.7	2.7	2.7	4.1	3.39	3.0	3.4	3.2

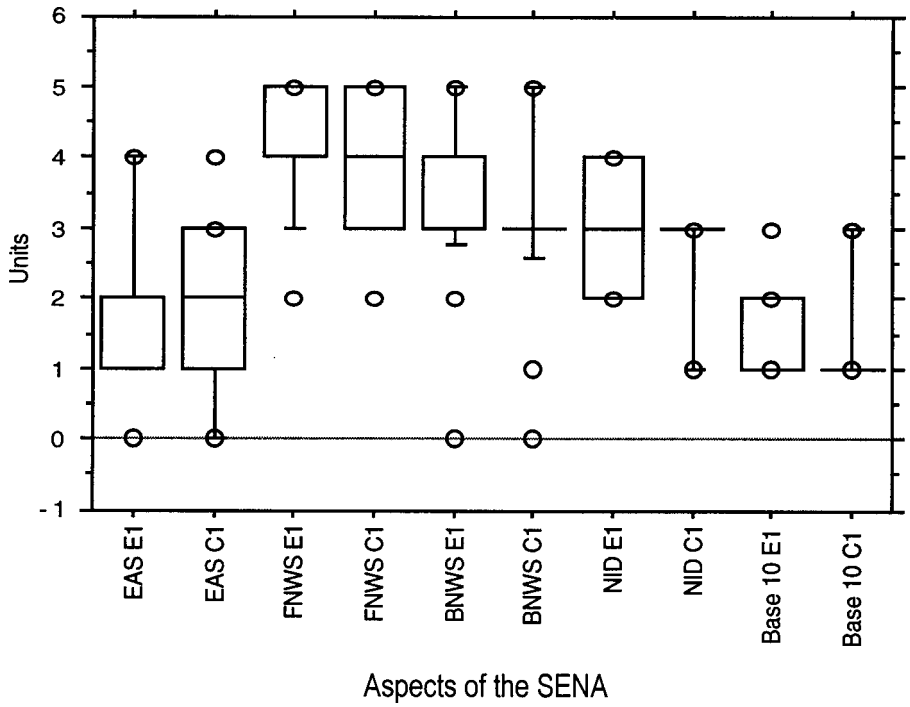
* Female ** Male

EAS Early Arithmetical Strategies
FNWS Forward Number Word Sequence
BNWS Backward Number Word Sequence
NID Numeral Identification

At the post-test phase the total mean scores on the SENA indicate a significant difference between the mathematical abilities of the experimental and control groups ($t = 6.3, p<0.0001$). Separate two tailed t-tests on the various aspects of the SENA indicate significant differences between the performances of the two groups on each aspect (EAS, $t = 4.7, p < 0.001$; FNWS, $t = 3.2, p < 0.05$; BNWS, $t = 3.6, p < 0.05$; NID, $t = 4.9, p<0.0001$; Base 10, $t = 3.7; p < 0.05$). This means that the experimental group performed significantly better than the control group on the SENA as a whole and on each aspect of the SENA.

Graph 5 presents box plots for the experimental and control groups performances on each aspect of the SENA at the pre-test phase. Graph 6 presents the results for each group at the post-test phase.

Graph 5 *Box plots of Year 1 experimental (E) and control group (C) performances on each aspect of the SENA for the pre-test*

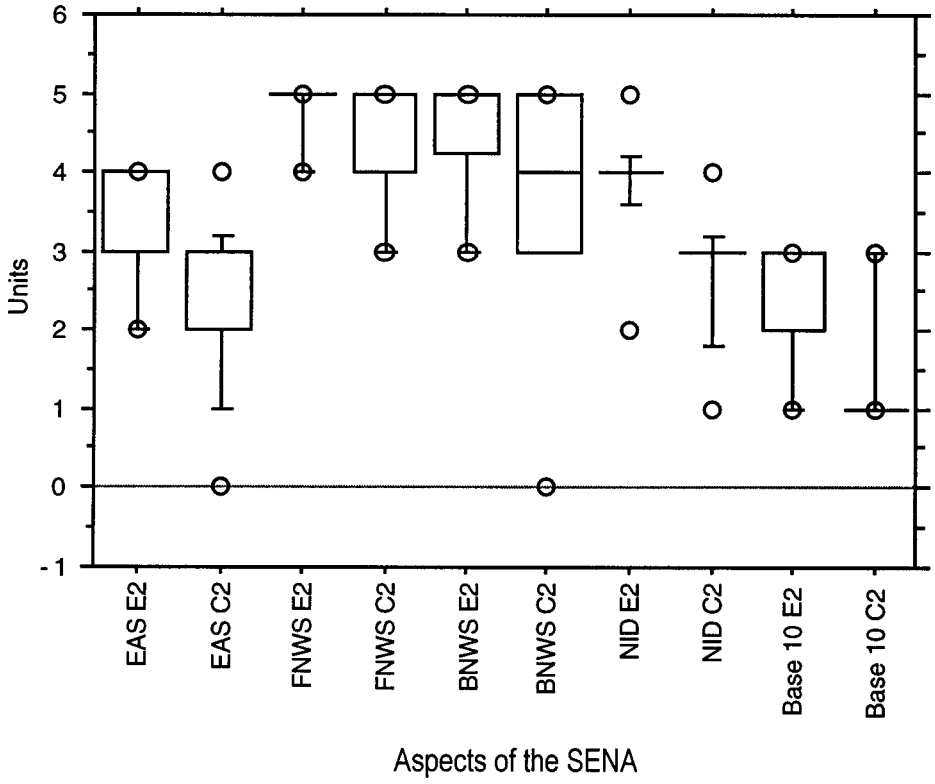


* Units correspond to Stages of development for EAS and Levels of development according to the Learning Framework in Early Number for all other aspects

An advantage of using box plots to represent the results is the ability to obtain information 'at a glance' about the full range of academic abilities. For instance, it is evident from Graph 5 that the two groups were performing at similar levels for each of the five aspects at the pre-test phase. Of particular interest are the plots representing each group's performances on the Early Arithmetical Strategies aspect of the SENA (EAS E1 and EAS C1 on Graph 5 and EAS E2 and EAS C2 on Graph 6). It is apparent that control group performances were fairly evenly distributed between Stages 1, 2 and 3 at the pre-test phase, while the largest proportion of students from the experimental group performed at Stages 1 and 2, with few students performing beyond Stage 2. The box plot EAS C2 indicates that while the majority of the lower achieving students (those at Stages 1 and 0 at the pre-test phase) had advanced to Stages 2 and 3, very few high performing students (those at Stage 3 at the pre-test phase) had progressed beyond their initial performances. In contrast, EAS E2 shows that the majority of students from the experimental group were performing at Stages 3 and 4 and that there were no students performing at Stages 0 or 1 at the post-test phase. Furthermore, a comparison of box plots EAS E2 and EAS C2 on Graph 6 reveals that the bottom 25 per cent of students from the experimental group were performing at the same level as the more able students from the control group on the SENA post-test. A possible explanation for the lack of improvement on this aspect for the control group lies in the fact that EAS, or early arithmetical strategies, such as counting-on and

counting-back, are not closely related to Syllabus content (they are thinking strategies or processes which children use to solve computational problems) as other aspects, such as Forward and Backward Number Word Sequences, Numeral Identification and Base 10. While most students develop arithmetical strategies without the explicit instruction that occurs in CMIT, many continue to use inefficient strategies (e.g. counting on fingers) well into upper primary and even adulthood. Results from this study indicate that, with explicit teaching, all students can learn to use more efficient arithmetical strategies and that they can do so as early as Kindergarten and Year 1.

Graph 6 *Box plots of Year 1 experimental (E) and control group (C) performances on each aspect of the SENA for the post-test*



* Units correspond to Stages of development for EAS and Levels of development according to the Learning Framework in Early Number for all other aspects

It is also apparent from Graph 6 that the performances of students from both groups were less 'spread out' at the post-test phase. This is particularly evident for the experimental group. While box plots reveal how children of various academic abilities performed at each phase of the study, caution needs to be exercised when interpreting the plots for the more able students in Year 1. For example, box plot BNWS E2 (Graph 6) looks as if the majority of the Year 1 students from the experimental group were all performing at the same level (Level 5). In reality, this may not be the case, since Level 5 is the upper limit described on the Learning Framework for these aspects and many able students could probably perform at even more advanced levels if the framework were extended. In

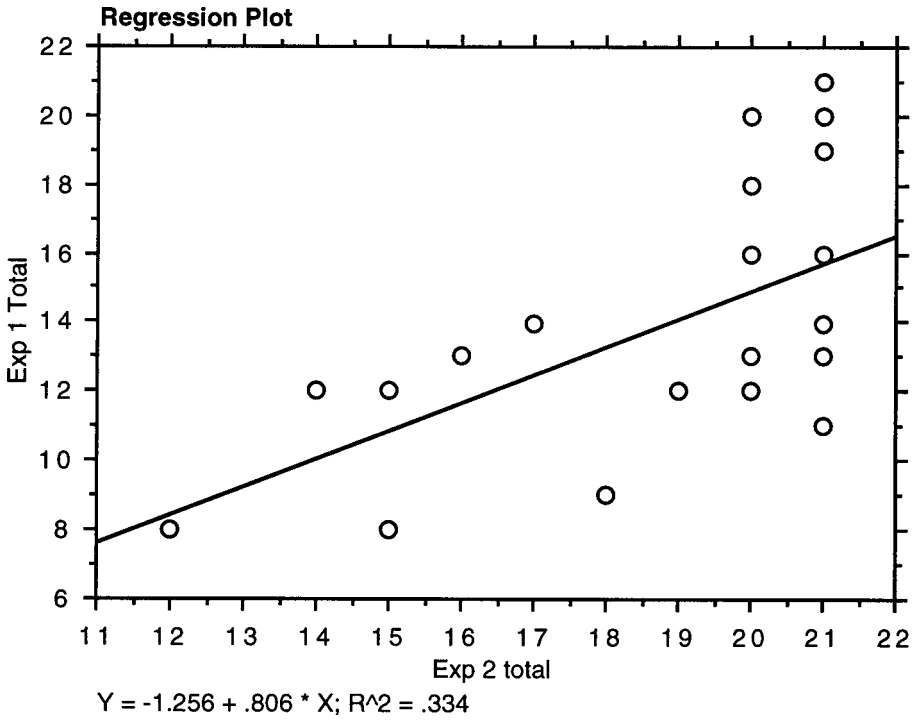
other cases, such as for the box plot EAS C2 (Graph 6), where students have not reached the upper level of the framework, it is clear as to how students of various abilities performed in relation to each other.

While the clustering of performance scores may be a result of students from both groups reaching the upper limit of levels on the Learning Framework for aspects such as Forward and Backward Number Word Sequences, it cannot explain the smaller variation in performances on Numeral Identification and Base 10 aspects where there were still higher levels to which students could advance. For example, a comparison of box plots NID E1 on Graph 5 and NID E2 on Graph 6 illustrates how performances of students from the experimental group were distributed between Levels 2, 3 and 4 at the pre-test phase, but at the post-test phase almost all the students performed at Level 4.

Regression analysis was used to determine the relationship between individual student performances on the SENA pre-test and post-test. A simple regressional analysis using total scores on the SENA for the Year 1 experimental group revealed that a linear relationship was not statistically significant ($R^2 = 0.3$, $p > 0.0001$). This means that student performances on the SENA post-test could not be reliably predicted from pre-test performances. Graph 7 illustrates how even students who attained quite low scores on the SENA pre-test were among some of the highest achieving students on the SENA post-test. This finding is interesting because anecdotal comments from CMIT teachers in a previous investigation indicated that they considered the program to have actually "widened the gap" between the less able students and other students (Bobis, 1996, p.7). While this perception might be true for a few students performing at the lowest levels on the Learning Framework, it does not hold for all cases in the present sample.

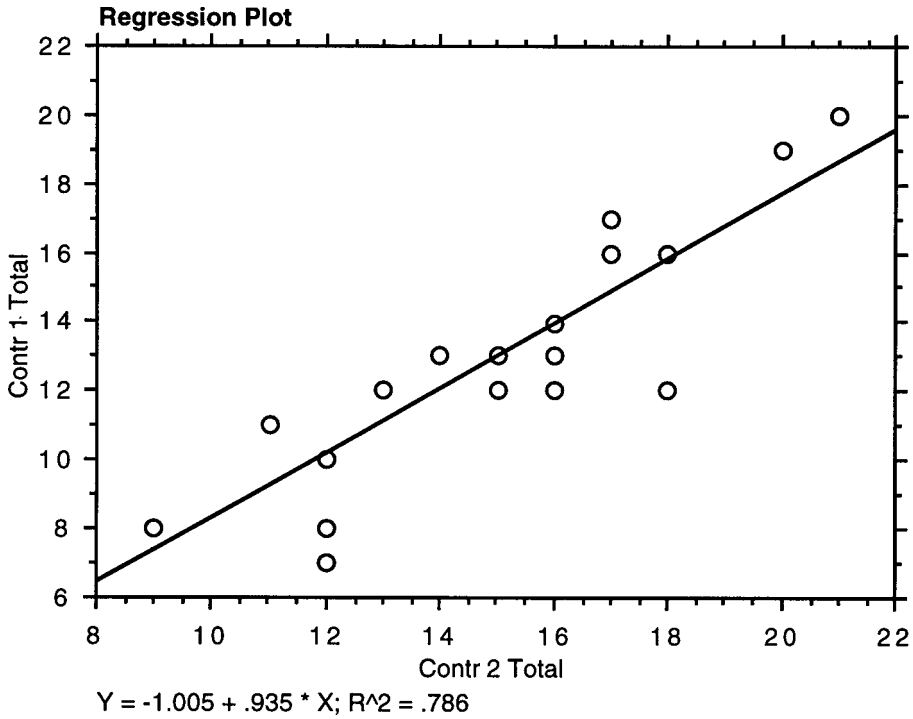
Also of note, is the clustering of performances towards the right-hand side of the graph. This indicates that many students had reached the upper limits of the Learning Framework and could possibly be performing at more advanced levels.

Graph 7 *Regression plot showing the relationship between student performances on the SENA at the pre-test (Exp 1 Total) and post-test (Exp 2 Total) phases for the Year 1 experimental group*



A simple regressional analysis using total scores on the SENA for the Year 1 control group revealed that a linear relationship was clearly evident ($R^2 = 0.8, p < 0.0001$). This means that students' performances on the SENA post-test could quite reliably be predicted from their performances on the SENA pre-test. While post-test results indicate that students had generally improved, there were no great advancements as was evident with the poorer achieving students in the experimental group. In contrast to Graph 7, scores do not cluster towards the right-hand side of the graph. This indicates that few students from the control group had reached the upper limits on all aspects of the SENA.

Graph 8 *Regression plot showing the relationship between student performances on the SENA at the pre-test (Contr 1 Total) and post-test (Contr 2 Total) phases for the Year 1 control group*



Self-Concept

Kindergarten

Table 3 presents Kindergarten experimental and control group means and standard deviations for each sub-scale and total scores of the SDQ-I at the pre-test and post-test phases. At the pre-test phase the total mean scores for Non-academic, Academic and Total self-concept scales indicate no significant differences between the self-concept of the experimental and control group ($t = -0.2$, $p > 0.05$; $t = -1.2$, $p > 0.05$; $t = -0.9$, $p > 0.05$ respectively). This means that the two groups possessed similar levels of self-concept at the start of the investigation. Separate two tailed t-tests on each of the eight sub-scales indicated no significant differences between the mean scores of the two groups or between the mean scores of boys and girls in either group at the pre-test phase of the study.

At the post-test phase there were significant differences between the mean scores of the two groups on the Academic scale ($t = -3.3$, $p < 0.05$) and the Total self-concept scale ($t = -2.8$, $p < 0.05$) indicating that the control group scored more positively than the experimental group. While mean differences for the Mathematics scale ($t = -2.1$, $p = 0.054$) and the General Self scale ($t = -2.0$, $p = 0.057$) also favoured the control group, they were slightly short of being significant at the 0.05 level. The mean differences on all other sub-scales did not differ significantly for the two groups.

Table 3 *Kindergarten experimental and control group means and standard deviations for each scale and Total score on the SDQ-I at the pre-test and post-test phases*

Scale		Experimental Group		Control Group	
		Pre-test n=23	Post-test n=21	Pre-test n=23	Post-test n=21
Physical Ability	Mean	36.0	36.4	35.1	36.9
	SD	2.9	3.2	3.1	3.7
Physical Appearance	Mean	34.5	33.1	35.4	35.9
	SD	5.3	5.2	4.0	3.2
Peer Relationships	Mean	34.0	33.5	35.1	36.7
	SD	4.6	3.6	4.1	3.6
Parent Relationship	Mean	35.7	35.3	36.5	37.6
	SD	3.8	4.3	3.7	1.8
Reading	Mean	32.9	34.6	35.8	37.5
	SD	5.7	5.4	4.7	2.6
Mathematics	Mean	35.2	34.2	35.3	37.6
	SD	4.1	6.8	3.3	1.7
General Self	Mean	34.4	34.3	35.9	37.1
	SD	3.5	4.5	2.2	2.3
General School	Mean	35.4	34.9	36.2	37.6
	SD	3.9	5.3	4.2	2.9
Total scores					
Non-academic	Mean	35.1	34.6	35.5	36.8
	SD	3.1	3.2	2.7	2.4
Academic	Mean	34.5	34.5	35.8	37.6
	SD	3.6	0.8	3.5	2.1
Total	Mean	34.8	34.4	35.7	37.2
	SD	2.7	2.6	2.5	2.14

The pre-test and post-test means of each sub-scale and total scores for the experimental group were compared to determine if the self-concept of Kindergarten children as measured by the SDQ-I had changed. There were no significant differences between the mean scores at the pre-test and post-test phases. Similar analysis for the control group found a significant difference between the mean scores on the Academic

scale (t = 2.3, p < 0.05), the Total scale (t = -4.3, p <0.05) and the Mathematics scale (t = 3.4, p < 0.05). There were no significant differences between the means on any other scale. This indicates that students from the control group scored more positively at the post-test phase on the Mathematics and Academic sub-scales than they did at the pre-test phase. However, their overall self-concept was significantly less positive at the post-test phase. It must be noted that the Academic scale incorporates the Mathematics sub-scale, and is therefore logical to assume that a significant change in one will have an impact on the other. The fact that the control group's performances improved significantly on the post-test for some scales, particularly on the Mathematics sub-scale, is of interest. Given each group's performances on the SENA post-test, one would expect that the experimental group's Mathematics self-concept would improve more than that of the control group. While further investigation is necessary to explain this finding, it is obvious that factors not accounted for in this study were operating.

Year 1

Table 4 presents Year 1 experimental and control group means and standard deviations for each sub-scale of the SDQ-I at the pre-test and post-test phases. At the pre-test phase the total mean scores for Academic and Total self-concept scales showed significant differences between the self-concept scores of the two groups (t = -2.9, p>0.05; t = -2.6, p > 0.05 respectively), indicating that the control group scored more positively on these two scales. Separate two tailed t-tests on each of the eight sub-scales indicated significant differences between the mean scores of the two groups for the Peer Relationships scale (t = -2.1, p < 0.05), Mathematics scale (t = - 2.5, p < 0.05) and General School scale (t = -3.5, p < 0.05) also favouring the control group. Hence, the Year 1 students from the control group possessed more positive self-concepts at the start of the investigation-including Mathematics self-concept. There were no significant differences between the mean scores of boys and girls on any scale from either group at the pre-test or post-test phases of the study.

At the post-test phase there continued to be significant differences between the mean scores of the two groups on the Non-academic sub-scale (t = -2.4, p < 0.05), Academic sub-scale (t = -3.0, p < 0.05), Total Self-concept scale (t = -3.0, p < 0.05), General School sub-scale (t = -3.2, p < 0.05), Mathematics sub-scale (t = -2.8, p < 0.05) and Peer Relationship sub-scale (t = -2.4, p < 0.05). In addition, there were significant differences between the mean scores of the two groups on the Parent Relationships sub-scale (t = -2.5, p < 0.05) and General Self sub-scale (t = -3.2, p < 0.05) indicating that the control group scored more positively than the experimental group on each of these sub-scales.

The pre-test and post-test means of each sub-scale and total scores for the experimental group were compared to determine if the self-concept of Year 1 children as measured by the SDQ-I had changed significantly over the period in which this investigation was conducted. A significant difference between the mean scores on the Parent Relationships sub-scale ($t=2.8, p < 0.05$) indicated that the experimental group scored more positively on this scale at the pre-test phase. There were no significant differences between mean scores at the pre-test and post-test phases on any other scale.

Similar analysis for the control group found no significant differences between the mean scores on any sub-scale or on the Total scale. This means that there had been little change in the self-concept of Year 1 children in the control and experimental groups for the duration of this investigation-a period of approximately six months.

Table 4 *Year 1 experimental and control group means and standard deviations for each scale of the SDQI at the pre-test and post-test phases*

		Experimental Group		Control Group	
		Pre-test	Post-test	Pre-test	Post-test
Scale		Total n=21	Total n=21	Total n=25	Total n=22
Physical Ability	Mean	34.0	34.9	36.2	36.1
	SD	4.3	3.9	5.7	3.8
Physical Appearance)	Mean	34.1	33.2	36.5	35.2
	SD	3.8	4.0	5.5	3.8
Peer Relationships	Mean	33.6	33.5	36.5	35.3
	SD	4.7	3.6	4.1	5.1
Parent Relationship	Mean	35.9	35.3	37.2	36.6
	SD	3.3	4.3	3.3	4.1
Reading	Mean	35.7	34.6	37.1	37.2
	SD	4.5	5.4	4.6	3.1
Mathematics	Mean	35.2	34.2	37.1	37.3
	SD	4.0	6.8	5.2	3.7
General Self	Mean	35.0	33.2	37.0	36.5
	SD	4.6	4.5	3.8	2.1
General School	Mean	34.5	34.8	37.3	36.8
	SD	3.6	5.3	4.1	2.3
Total scores					
Nonacademic	Mean	34.4	33.3	36.6	35.8
	SD	3.3	3.3	4.1	3.6
Academic	Mean	35.1	34.4	37.2	37.1
	SD	3.0	3.7	4.4	2.4
Total	Mean	34.7	33.8	36.9	36.5
	SD	2.7	3.0	4.1	2.5

Mathematical Achievement and Self-concept Interrelationships

Kindergarten

Regression analysis was used to determine the relationship between student performances on the SENA and their Total self-concept and Mathematics self-concept as measured by the SDQ-I. Simple regressional analysis using total scores on the SENA and Total self-concept scores on the SDQ-I revealed that a linear relationship was not evident at the pre-test phase for either the experimental group ($R2 = 0.04$, $p > 0.0001$) or control group ($R^2 = 0.01$, $p > 0.0001$). Similarly, analysis of post-test mean scores revealed no linear relationship for either group ($R^2 = 0.22$, $p > 0.0001$; $R2 = 0.17$, $p > 0.0001$ respectively).

Analysis using total scores on the SENA and scores on the Mathematics self-concept scale of the SDQ-I indicated that there were no linear relationships between the scores of the experimental or control group at either the pre-test ($R^2 = 0.07$, $p > 0.0001$; $R^2 = 0.00$, $p > 0.0001$ respectively) or post-test ($R^2 = 0.20$, $p > 0.0001$; $R^2 = 0.00$, $p > 0.0001$ respectively) phases of the study. Hence, Kindergarten students' performances on the SENA could not be used reliably to predict their scores on either the Total Self-concept scale or the Mathematics self-concept scale of the SDQ-I.

Year 1

Analysis of mean scores on the SENA and SDQ-I for the experimental and control groups revealed no linear relationships at the pre-test phase ($R^2 = 0.03$, $p > 0.0001$; $R^2 = 0.01$, $p > 0.0001$ respectively) or post-test phase ($R^2 = 0.03$, $p > 0.0001$; $R^2 = 0.02$, $p > 0.0001$). Analysis using total scores on the SENA and scores on the Mathematics self-concept scale of the SDQ-I indicated that there were no linear relationships between the scores of the experimental or control group at either the pre-test ($R^2 = 0.05$, $p > 0.0001$; $R^2 = 0.00$, $p > 0.0001$ respectively) or post-test ($R^2 = 0.02$, $p > 0.0001$; $R^2 = 0.02$, $p > 0.0001$ respectively) phases of the study. This means that the Year 1 students' performances on the SENA could not be used reliably to predict their scores on either the Total Self-concept scale or the Mathematics self-concept scale of the SDQ-I.

Summary and Conclusion

An aim of this investigation was to evaluate the impact of CMIT on the mathematical achievement of Kindergarten and Year 1 children. The study found that there were no significant differences on total SENA performances, between the two Kindergarten and two Year 1 groups at the pre-test phase. This indicates that they were well matched in mathematical ability. Although the Kindergarten control group performed significantly better at this phase on the individual aspects of Forward and Backward Number Word Sequences, this advantage was not maintained at the post-test phase.

The significant advances made by the Kindergarten and Year 1 experimental groups on all aspects of the SENA are clear evidence of the positive impact Count Me In Too can have on the mathematical ability of children involved in the program. The suggestion that the experimental group may have been unfairly advantaged because the SENA contained tasks requiring skills emphasised by the CMIT program and thus were able to 'practise' them before the post-test phase, is not a viable explanation for the results. Aspects, such as Forward and Backward Number Word Sequences, Numeral Identification and Base 10, are included in the NSW Mathematics Syllabus (Department of Education, 1989) and should therefore be emphasised in all K-2 classrooms and not just ones in which CMIT is operating. Also implausible, is the suggestion that CMIT classrooms devote more time towards the teaching of number and forgo work on the measurement and space strands. Teachers involved in CMIT are required to fulfil Syllabus requirements across all the strands.

An obvious limitation of the study is the small sample size. Future investigations that incorporate larger samples should endeavour to make comparisons between schools with populations drawn from a range of socio-economic and ethnic backgrounds, and from rural and metropolitan schools. While the current study included children mostly from middle-class backgrounds, the findings cannot be extrapolated to the general population without further investigation. It would also be beneficial to monitor the progress of children on a longitudinal basis, say over a period of one or two years. In this way, it might be possible to determine if CMIT gives children a 'head start' in mathematics that continues on their upper primary years.

Another limitation of the present study was the fact that many students, particularly in the experimental group, reached the upper limits of many number aspects being assessed by the SENA. Thus their true mathematical abilities were not reflected in this study. Suggestions to overcome this limitation include: (a) modifying the SENA to contain more challenging items for students of higher ability, or (b) to use a second assessment instrument.

A second aim of this investigation was to evaluate the impact of CMIT on the self-concept development of Kindergarten and Year 1 children. It was found that students' performances on the SENA could not be used reliably to predict their scores on either the Total Self-concept scale or the Mathematics self-concept scale of the SDQ-I. It was also found that Kindergarten and Year 1 control groups possessed more positive self-concepts on a range of dimensions at the post-test phase, including the Mathematics sub-scale. This finding was of interest given the fact that the experimental groups performed significantly better than the control groups on the SENA post-test. It is obvious that many factors, other than just performances on a mathematics assessment instrument, influence the development of students' self-concepts. While beyond the scope of this initial investigation, it is an important avenue for further study.

In summary, the main findings of this investigation are:

1. There were no differences between the experimental and control group's total SENA pre-test scores for the Kindergarten and Year 1 classes.
2. The Kindergarten control group performed significantly better than the experimental group at the pre-test phase on two early number aspects-Forward Number Word Sequences and Backward Number Word Sequences.
3. Total SENA post-test performances of the experimental groups were significantly better for both the Kindergarten and Year 1 cohorts.
4. The experimental groups performed significantly better than the control groups on all aspects of the SENA post-test, except for Backward Number Word Sequences at the Kindergarten level.
5. Control group performances on the SENA post-test could be reliably predicted from their pre-test performances. This means that the weakest performing students at the pre-test phase continued to be the weakest students at the post-test phase-there had been little shift in the order of student achievement levels.
6. Experimental group performances on the SENA post-test could not be reliably predicted from their pre-test performances, indicating that there had been considerable shift in the order of student achievement. The weakest performing students on the SENA pre-test were not necessarily the weakest students on the SENA post-test.
7. There were no obvious relationships between students' Total self-concepts or Mathematics self-concepts and their achievement on the SENA for Kindergarten or Year 1 students.

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Appendix A

Overview of the Learning Framework

Appendix B

Schedule for Early Number Assessment (SENA)

Appendix C

SDQI

INSTRUCTIONS TO CHILDREN (Read by research assistant):

This is a chance to help me find out how you feel. It is not a test. There are no right or wrong answers and everyone will have different answers.

I will ask you a question and then ask you to tell me how you feel by stating 'yes' or 'no'. Be sure your answers show how you feel about yourself. We will not show your answers to anyone.

Before we start let's try a few examples. I will read you a sentence and you will tell me how you feel by saying yes or no. I will also tell you how a friend called Bob answered each of these examples.

Some sentences you may not understand. If you do not understand a sentence or a word in a sentence say, 'I don't know what that means'.

EXAMPLES:

1. I like to read comic books.

Ask the child if he/she understands the sentence. Repeat the sentence. Ask the child to say *yes* or *no*. Probe the child's response: (yes *sometimes* or yes *always*, no *sometimes* or no *always*).

(Bob answered 'yes always' to this question as he really likes to read comic books whenever he can).

2. In general, I am neat and tidy.

Ask the child if he/she understands the sentence. Repeat the sentence. Ask the child to say yes or no. Probe the child's response.

(Bob answered 'sometimes yes' sometimes as he is at most times very neat and tidy but not always).

3. I like to paint.

Ask the child if he/she understands the sentence. Repeat the sentence. Ask the child to say yes or no. Probe the child's response.

(Bob answered 'sometimes no' as most times he does not like to paint but not always).

4. I am good at drawing

Ask the child if he/she understands the sentence. Repeat the sentence. Ask the child to say yes or no. Probe the child's response.

(Bob answered yes always to this question as he thinks he is really good at drawing).

ID	Surname	Christian Name	Gender	Grade	School	Class	Age	DOB

No always	No sometimes	Child understands sentence but does not state yes or no	Yes sometimes	Yes always
1	2	3	4	5

Ask child if he/ she understands sentence *repeat sentence

___ 1. I can run fast.
___ 2. I am good looking.
___ 3. I have lots of friends.
___ 4. My parents **understand** me. **(Know me if they don't understand)**
___ 5. I do well in reading.
___ 6. Work with numbers is easy for me. **(explain work with numbers means maths)**
___ 7. I'm good at school work.
___ 8. I do lots of **important** things. **(Special if they don't understand)**
___ 9. I like to run and play hard.
___ 10. I like the way I look.
___ 11. I make friends easily.
___ 12. I like my parents.
___ 13. I like reading.
___ 14. I look forward to working with numbers. **(explain work with numbers means maths)**
___ 15. I enjoy doing school work.
___ 16. I like being the way I am.
___ 17. Other kids think I am good looking.
___ 18. Other kids want me to be their friend.
___ 19. My parents and I spend a lot of time togetl
___ 20. I enjoy doing work in reading.
___ 21. I learn things quickly in work with numbe
___ 22. I am interested in all school work.
___ 23. A lot of things about me are good.
___ 24. I can run a long way without stopping.
___ 25. I have a good looking body.
___ 26. I have more friends than most other kids.
___ 27. My parents are easy to talk to.
___ 28. Work in reading is easy for me.
___ 29. I like mathematics.
___ 30. I look forward to all school work
___ 31. I'm as good as most other people.
___ 32. I am a good athlete. **(Athlete means good at sports)**

** GIVE CHILD A BREAK

No always	No sometimes	Child understands sentence but does not state yes or no	Yes sometimes	Yes always
1	2	3	4	5

___ 33. I enjoy sports and games.

___ 34. I have a nice looking face.

___ 35. I get along with other kids easily.

___ 36. My parents like me.

___ 37. I'm good at reading.

__ 38. I do well on work with numbers.

___ 39. I do well at school.

___ 40. I have lots of things to be proud of.

___ 41. I have good muscles.

___ 42. I am a nice looking person.

___ 43. I am easy to like.

___ 44. If I have kids I would bring them up the same way my parents raised me.

___ 45. I am interested in reading.

___ 46. I am interested in mathematics.

___ 47. I learn things quickly in all school work.

___ 48. I can do things as well as most people.

___ 49. I am good at sports.

___ 50. I'm better looking than most of my friends

___ 51. I am popular with kids of my own age. ***(Popular means* liked by kids)**

___ 52. I get along well with my parents.

___ 53. I look forward to reading.

___ 54. I'm good at mathematics.

___ 55. All school work is easy for me.

___ 56. Other people think I am a good person.

___ 57. I'm good at throwing a ball.

___ 58. I have nice features like nose, and eyes, hair.

___ 59. Most other kids like me.

___ 60. My parents and I have a lot of fun togethe

___ 61. I learn things quickly in reading.

___ 62. I enjoy doing work in mathematics.

___ 63. I like all school work.

___ 64. When I do something, I do it well.

N.B. STATE THE PROBE (ie sometimes or always) FOR EVERY RESPONSE EVEN WHEN A SPECIFIC RESPONSE IS STATED BY THE CHILD.

Appendix D

SDQ Interview Key

Physical Ability
1. I can run fast.
9. I like to run and play hard.
24. I can run a long way without stopping.
32. I am a good athlete.
33. I enjoy sports and games.
41. I have good muscles.
49. I am good at sports.
57. I'm good at throwing a ball.

Physical Appearance
2. I am good looking. (Change: to 'pretty' or 'hansom')
10. I like the way I look.
17. Other kids think I am good looking.
25. I have a good looking body.
34. I have a nice looking face.
42. I am a nice looking person.
50. I'm better looking than most of my friends.
58. I have nice features like nose, and eyes, and hair.

Peer Relationships
3. I have lots of friends.
11. I make friends easily.
18. Other kids want me to be their friend.
26. I have more friends than most other kids.
35. I get along with other kids easily.
43. I am easy to like.
51. I am popular with kids of my own age.
59. Most other kids like me.

Parent Relationships
4. My parents understand me.
12. I like my parents.
19. My parents and I spend a lot of time together.
27. My parents are easy to talk to.
36. My parents like me.
44. If I have kids I would bring them up the same way my parents raised me.
52. I get along well with my parents.
60. My parents and I have a lot of fun together.

Reading
5. I do well in reading.
13. I like reading.
20. I enjoy doing work in reading.
28. Work in reading is easy for me
37. I'm good at reading.
45. I am interested in reading.
53. I look forward to reading.
61. I learn things quickly in reading.

Mathematics
6. Work with numbers is easy for me
14. I look forward to working with numbers.
21. I learn things quickly in work with numbers.
29. I like mathematics
38. I do well on work with numbers.
46. I am interested in mathematics.
54. I'm good at mathematics
62. I enjoy doing work in mathematics.

General Self
8. I do lots of important things.
16. I like being the way I am.
23. A lot of things about me are good.
31. I'm as good as most other people.
40. I have lots of things to be proud of.
48. I can do things as well as most people.
56. Other people think I am a good person.
64. When I do something, I do it well.

General School
7. I'm good at school work.
15. I enjoy doing school work.
22. I am interested in all school work.
30. I look forward to all school work
39. I do well at school.
47. I learn things quickly in all school work.
55. All school work is easy for me.
63. I like all school work.