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Effects of the Sequence and Pattern Unit of Bright Start on Seriational and Math Problem Solving among Kindergarten Children of Ethiopian Immigrants to Israel

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Abstract

In order to investigate the effects of cognitive early education on the seriational performance and learning effectiveness of transcultural children, 20 young Ethiopian children whose families had immigrated to Israel were given two tests of seriational thinking before and after they received mediational instruction in the Pattern and Sequence unit of Bright Start: Cognitive Curriculum for Young Children. 20 children of the same age, gender distribution, and family background had a control (non-mediational) activity. The control children performed initially at a higher level than did the cognitive education children, but the latter group closed that gap and surpassed the performance of the control children following their Bright Start experience. The authors concluded that there was evidence of cultural difference rather than cultural deprivation in this transcultural group, that their performance in seriational problem solving could be enhanced by cognitive early education, and that there was also evidence of intermediate transfer of their training in seriation.

Key words: Seriational thinking, transcultural children, cognitive education, transfer, math problem solving, cultural deprivation

A persistent question regarding cognitive education is whether or to what extent one can expect the acquisition and application of specific cognitive operations or abilities to generalize to subsequent learning. A subsidiary question concerns the range of possible generalization: Can one expect only "near" transfer, i.e., to similar content domains, or is "far" transfer possible, i.e., to tasks that require the same cognitive and metacognitive processes but that represent quite different content domains? One way to approach those questions is to assume that near transfer is an essential step, which is to say that if near transfer cannot be achieved then far transfer is automatically out of the question. In the study reported here we examined "far" and "intermediate" transfer by helping children to acquire and elaborate seriation knowledge and then testing them on seriation problem solving (near transfer) and on math problem solving that did not so obviously involve seriation problems (intermediate transfer).

A second set of questions addressed in this study is related to *transculturality* and to dynamic assessment. "Transcultural" persons are those who "are between or astride two (or more) cultures" (Haywood, 2005, p. 273). Such a transcultural situation characterizes recent Ethiopian immigrants to Israel, most of whom came from a pre-industrial society to a highly industrialized one, having only their Jewish religion and ethnicity to connect the two. Previous researchers have found evidence of cognitive developmental lacunae in immigrant children who have come from circumstances where they were less likely to have essential cognitive developmental supports (e.g., Kaniel, Tzuriel, Feuerstein, Ben Shachar, & Eitan, 1991; Tzuriel & Kaufman, 1999; Paour, Cèbe, & Haywood, 2000). The same investigators have also found evidence of significant improvement in the cognitive functioning of such children following interventions that were focused on removal of obstacles to the children's access to their own intelligence, i.e., training, even very brief training, in some basic cognitive functions.

Feuerstein, Rand, and Hoffman (1979) distinguished between *cultural difference* and *cultural deprivation*. C*ulturally different* persons may manifest certain deficient cognitive functions but are expected to overcome them readily, given mediation of fundamental metacognitive processes. In fact, quite often culturally different persons do not even require mediation of metacognitive processes as such but can improve their performance significantly with removal, by examiners, of language barriers, motivational barriers, attitudinal barriers, and "hard" knowledge barriers to effective application of their intelligence. Example: When asked how a kettle and a skillet are alike, a culturally different person might not know what a skillet is, but when that implement is defined by an examiner the person might very well be able to form the verbal abstraction "cooking utensils." The deficiency in that case would be recognized as one of knowledge rather than one of cognitive development or of ability (Haywood, 2003; Haywood, in press). Culturally deprived persons, on the other hand, are those, according to Feuerstein, whose cognitive development itself has been delayed, impaired, or fixated by lack of sufficient "mediated learning experience." In such a case, using the previous example, the performance deficiency in verbal abstracting would not be overcome by supplying the missing information (definition of the exemplars), but instead would require actual mediation of the deficient cognitive and metacognitive processes, in this case

comparison, classification, and verbal abstracting. Of the large number of immigrant children who show deficiencies in learning and adaptation to a school environment in the adoptive culture, many are characterized by cultural difference, which is overcome by fairly minimal intervention, often of the information-supplying type, whereas a second set would be characterized by cultural deprivation, requiring a more intensive, cognitively oriented, and long-term intervention.

Based upon anthropological evidence of the use of mediated learning processes among Ethiopian Jews (Rosen, 1986; Waldman, 1985), we expected that they would reveal *cultural difference* but not *cultural deprivation*. In accordance with Feuerstein's theory of Structural Cognitive Modifiability and Mediated Learning Experience (MLE) (Feuerstein, et al., 1979, 1980), this occurs because the MLE they have received prepared them to be more modifiable. C*ulturally deprived* persons, on the other hand, have relatively reduced modifiability, which is a result of insufficient mediation—i.e., insufficient "intergenerational cultural transfer" (see also Feuerstein & Feuerstein, 1991). Thus, our first expectation was that Ethiopian children would show initial low performance on abstract cognitive tests, but after a relatively short intervention using one or two units from the Bright Start they would improve their performance and narrow the gap between themselves and their Israeli-born peers. Previous findings with Ethiopian adolescents support this expectation (Kaniel, et al., 1991). We further expected that young Ethiopian immigrant children would show meaningful gains in their performance on tasks requiring seriational knowledge and skill following a period of cognitive early education focused on seriation, sequence, and pattern.

The first expectation, short-term gain within a testing situation, was examined by use of dynamic assessment, specifically the Children's Seriational Thinking ModifiabilityTest (Tzuriel, 1995) and the Seria-Think Instrument (Tzuriel & Kaufman, 1999). The second expectation was examined by teaching the children basic cognitive processes of seriational thinking through the use of the Sequence and Pattern (Seriation) unit of *Bright Start: Cognitive Curriculum for Young Children* (Haywood, Brooks, & Burns, 1992), with assessment of their seriational problem solving skills before and after this intervention.

Method

Sample

The sample was composed of 40 kindergarten children of Ethiopian origin living in Israel. All children were randomly drawn from 4 kindergartens located in a central region in Israel. The children were randomly assigned to experimental (n=20) and control (n=20) groups. The number of boys and girls in the experimental group was 11 and 9, respectively. The number of boys and girls in the control group was 9 and 11, respectively. The mean age in the experimental and control groups was 72.60 months (SD= 5.76) and 70.90 months (SD=5.64), respectively. The distribution of parents' years of formal education was between 3 and 6 years and was similar in both treatment groups.

Measures

The Children's Seriational Thinking Modifiability (CSTM) Test. The CSTM test is a dynamic assessment test composed of problems requiring the logical establishment of serial order of objects on cards along dimensions of size, number, and darkness. The items are constructed systematically so that each task encompasses 1 to 3 dimensions within the same set of cards. The child is required to move flexibly from one dimension to another.

The CSTM is composed of unique problems that require arrangement of stimuli on a certain continuum in the face of one or more irrelevant dimensions that are included within the same set of stimuli. The examinee is required in these problems to arrange in serial order a set of objects on one dimension (e. g., size) while "filtering out" one or more dimensions (e. g., number, darkness) contained within the same set. Each of the first three problems of the CSTM is based on only one dimension (number, size, or darkness). The child has to identify the relevant dimension and arrange the cards accordingly. Each of problems 4 to 6 is composed of two series contained within the same set of cards (number and size, number and darkness, and darkness and size). Problems 7 and 8 are composed of three dimensions within the same set of cards. An example of a problem with two dimensions (item 6) is presented in
Figure 1.

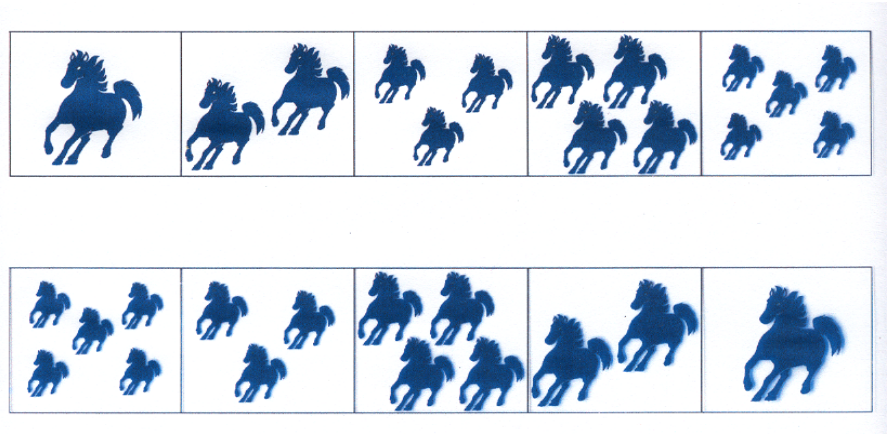

Figure 1. Problem 6 from the Children's Seriational Thinking Modifiability instrument, showing variation on two dimensions.

In item 6 (Figure 1), the examinee is required first to order a set of horses drawn on 5 cards according to one dimension (number or size). Following the first seriation the examinee is asked to rearrange the stimuli on the second dimension. This mental activity requires cognitive flexibility, because the child should make a shift in reordering the same set of stimuli and use another conceptual dimension. While ordering the horses along one dimension, number, the examinee has to avoid interference of another dimension, size. Each of the CSTM items is composed of 5 cards depicting one or more continua within the same set of cards.

The transfer phase is composed of 6 problems, each with a set of 5 cards. The transfer problems are relatively remote from the original test problems and require consideration of other dimensions than those used in the testing phase.

The Cronbach *alpha* reliability coefficients for the pre-teaching, post-teaching, and transfer phases based on a sample of 129 kindergarten children were .87, .85, and .70 respectively (Tzuriel, 1995). Validation of CSTM has been shown in two studies carried out with different groups of disadvantaged and advantaged kindergartners (Tzuriel, 1995) and with special education kindergartners who participated in a cognitive education program (Tzuriel, 2001).

The Seria-Think Instrument. The Seria-Think Instrument (Tzuriel, 2000) is a dynamic assessment instrument aimed at assessment of some basic cognitive processes in the mathematics domain. The test is based on a variety of arithmetic skills, especially seriation and math operations. The Seria-Think Instrument was designed for first- to third-grade children, based on principles of dynamic assessment for young children (Tzuriel, 2000, 2001), but it can be used with older children who have different kinds of difficulties in mathematics learning. The problems of the instrument require cognitive functions such as planning, self-regulation, systematic exploratory behavior, and simultaneous consideration of several sources of information. The Seria-Think Instrument (see Figure 2) is composed of a wooden Block (10 x 6 x 12cm) with three rows of holes, a set of cylinders (with heights of 3, 5, 7, 9, 11, 13, and 15cm), and a measuring rod divided equally into 11 units (1 cm each).

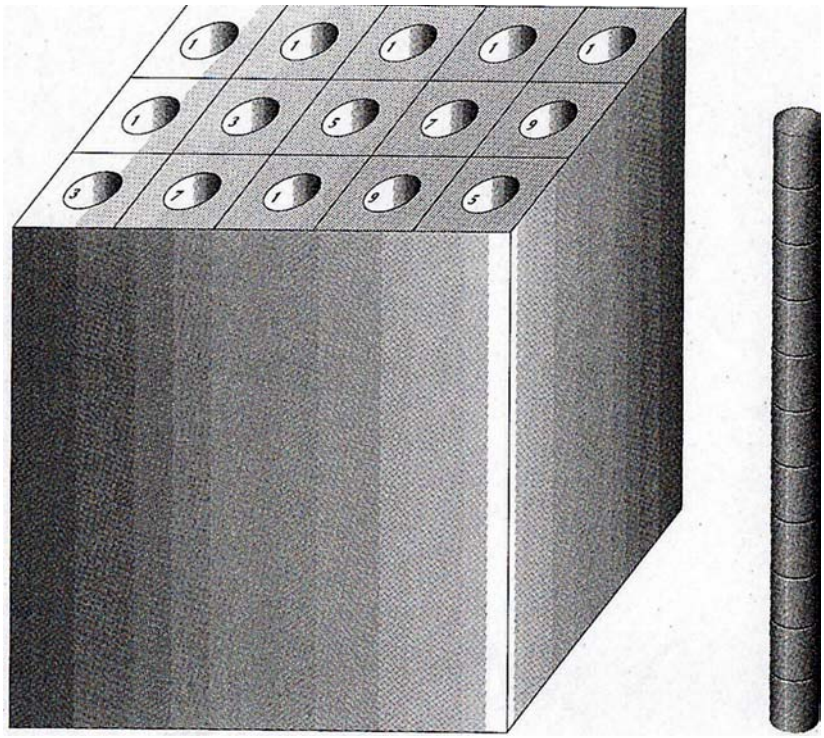

Figure 2. The Seria-Think cube, showing depth of holes in centimeters and measuring rod.

The wooden block (placed vertically) has five rows of holes, three holes in each row. The holes in the first column all have the same depth (1 cm). The depth of the holes in the second column increases progressively from top to bottom (1, 3, 5, 7, and 9 cm). The depth of the holes in the third column is similar to the second column, except that the order is mixed. The tasks in the Seria-Think involve insertion of the cylinders into the holes so as to get lines of cylinders with either equal height, regularly increasing height, or regularly decreasing height. Most of the problems are presented when the wooden block is turned vertically. The child is instructed to be careful as much as possible to insert a cylinder in a hole only once. In order to avoid trial-and-error behavior the child is encouraged to use the measuring rod as many times as he/she wishes and plan the solution. In order to solve the problems the child has first to calculate the depth of the hole and the height of the cylinder, compute the result, and compare the results not only within each hole but also between holes. It is important to emphasize here that for most holes there is no way of knowing their depth without using the measuring cylinder.

There are six problems in each of the test's phases. The focus in the teaching phase is on planning behavior (i.e., preparing the solution outside the holes before inserting the cylinders), restraint of impulsivity in data gathering, need for precision (measuring the depth of the hole), comparison of the depth of the hole to the required height, and computation of length (by subtraction) of the cylinder minus the depth of the hole. The child's responses are recorded according to three criteria: correctness of solution, efficiency as indicated by the number of insertions (few insertions for a correct answer indicate higher efficiency level), and number of measurements required for solving the problem. A derived score of number of insertions by number of measurements is also available. This score may reveal qualitative aspects about the child's patterns of dealing with the problems; for example, a child who measures only rarely and makes many unnecessary insertions might be perceived as impulsive compared with a child who makes frequent measurements but fewer insertions, the latter considered to be more reflective.

Cronbach *alpha* reliabilities based on a sample of grade 1 children (n=48) in Tzuriel's (2000) study for Pre- and Post-Teaching phases, respectively, were: Number of Measurements .37 and .66, Number of Insertions .78 and .85. Cronbach alpha reliability for Number of Correct Solutions could not be computed because most subjects reached the correct solution after the process of inserting and measuring. Separate Cronbach *alpha* reliabilities were also carried out on the sample of the current study. The reliabilities for Number of Insertion were: Pre-intervention .59; Post-intervention (Pre-Teaching) .56; Post-intervention (Post-Teaching) .69. The reliability estimates for Number of Measurements were: Pre-intervention .79; Post-intervention (Pre-Teaching) .91; Post-intervention (Post-Teaching) .81. The reliability estimates for Number of Correct Solutions were: Pre-intervention .75; Post-intervention (Pre-Teaching) .70; Post-intervention (Post-Teaching) .61.

Previous findings (Tzuriel, 2000) also showed that an experimental group of children who were mediated on the Seria-Think Instrument decreased significantly their number of insertions and concurrently increased their number of measurements from Pre- to Post-

Teaching. A control group of children who received a practice manipulative phase showed almost the same pattern of response before and after the treatment. The findings also showed that both the Post-Teaching Number of Insertions score and the Post-Teaching Number of Measurements score significantly predicted math scores (as assessed by the Seria-Think Math Problems test, Tzuriel, 2000). These findings indicate that the fewer insertions and the more measurements the child used the higher was the math score.

Intervention Program

The intervention consisted of application of the Sequence and Pattern (Seriation) unit of *Bright Start: Cognitive Curriculum for Young Children* (Haywood, Brooks, & Burns, 1992; see Brooks & Haywood, 2003, for a detailed description and evaluation). This curriculum unit is a series of "small group" lessons, so called because they are delivered to groups of 3-6 children at a time. The lessons feature activities designed to promote understanding of the concepts of sequentiality, order, and the abstraction and application of rules governing events arranged in detectable and predictable sequences and patterns. In the process of teaching this content, teachers emphasize the cognitive functions of comparison, classification, ordering by rules, relating past to present experience, and spatial and temporal relations. There are 26 lessons in the unit. Figure 3 is an activity from lesson 21 of that unit. In this activity, the children's task is to discern the sequence in each row, using the first four or five frames, and extend it in the fifth or sixth frame. The use of different figures helps the children to understand that sequencing is not specific to the objects themselves.

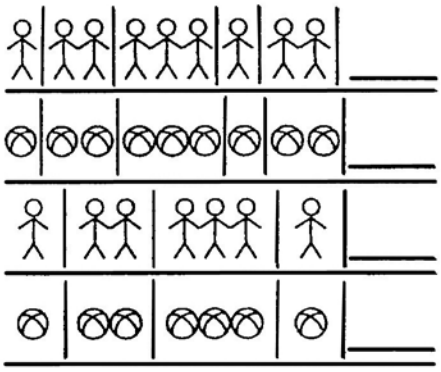

Figure 3. Example, from lesson 21, of an activity from the Sequence and Pattern unit of *Bright Start*.

The treatment was applied in 25 sessions, each of about 20 minutes, for a total intervention of 8 ½ hours. The lessons were given in small groups of five children over a period of 3 months, by four kindergarten teachers who had been trained in the use of this program.

Systematic application of *Bright Start* with kindergartners and preschool children has consistently been associated with differential increases (as compared with control groups)

in IQ (Cèbe & Paour, 2000; Dale & Cole, 1988, preschool but not kindergarten; Haywood, Brooks, and Burns, 1986; Molina & Vived, 2004; Paour, Cèbe, Lagarrigue, & Luiu, 1992; Samuels, Fagan, McKenzie, & Killip, 1988;) task-intrinsic motivation (e.g., Paour, Cèbe, Lagarrigue, & Luiu , 1992; Tzuriel, Kaniel, Zeliger, Friedman, & Haywood, 1998), abstract reasoning and cognitive development (Tzuriel et al., 1998; Tzuriel, Kaniel, Kanner, & Haywood, 1999; Vanden-Wijngaert, 1991; Warnez, 1991), cognitive modifiability, i.e., ability to benefit from teaching/mediation (Tzuriel, Kaniel, Zeliger, Friedman, and Haywood, 1998) and subsequent school achievement, especially in reading, mathematics, and language (Paour, Cèbe, Lagarrigue, & Luiu, 1993; Cèbe & Paour, 2000; Tzuriel et al., 1999). Although some of the 7 curriculum units of Bright Start have been used in isolation for research purposes (e.g., Paour et al., 1992, used only Self Regulation and Comparison), the Sequence and Pattern (Seriation) unit has been applied previously only in the context of the whole curriculum; thus, this study is also a test of the ability of a single curriculum unit to produce cognitive developmental or performance improvement.

Procedure

All children received the *Children's Seriation Thinking Modifiability* test and the *Seria-Think instrument* pre-teaching phase, i.e., in a "static" (non-dynamic) mode, before the intervention and the post-teaching test (also static) after the intervention.

Results

Number of Insertions, Number of Measurements, and Performance Scores on the Seria-Think Instrument

There were three dependent measures related to the Seria-Think instrument: number of insertions, number of measurements, and performance score (number of correct solutions). Pre-intervention and post-intervention scores are shown in Table 1.

Table 1:
Means and Standard Deviations of the Number of Insertions, Number of Measurements, and Performance (Number of Correct Solutions) Scores on the Seria-Think Instrument in the Experimental and Control Groups Before and After the Intervention

		Experimental Condition	Control Condition
Number of Insertions			
Pre	M	7.87	6.40
	SD	3.90	2.92
Post	M	5.48	5.28
	SD	1.23	2.51
Number of Measurements			
Pre	M	.37	.87
	SD	1.06	1.27
Post	M	1.25	1.49
	SD	1.94	1.25
Performance			
Pre	M	.51	1.13
	SD	.60	.91
Post	M	2.38	1.46
	SD	.59	.67

A repeated measures multivariate analysis of variance (MANOVA) was carried out on each of the Seria-Think dimensions (number of insertions, number of measurements, and performance). The combined summary table of these analyses for all three scores is presented as Table 2.

Table 2:
Repeated Measures ANOVA's of Number of Insertions, Number of Measurements, and Performance on the Seria-Think Instrument by Treatment by Time

		Number of Insertions		Number of Measurements		Performance	
Source of Variation	df	MS	F	MS	F	MS	F
Treatment (A)	1	13.89	1.59	2.69	1.02	.45	.63
Error	38	8.75		2.62		.72	
Time (B)	1	61.25	8.69**	11.25	7.96**	24.20	88.67***
A X B	1	8.02	1.14	.22	.22	12.01	44.02***
Error	38	7.05		1.41		.27	

As can be seen in Table 2, the only significant treatment by time interaction was for performance score. This interaction is depicted in Figure 4.

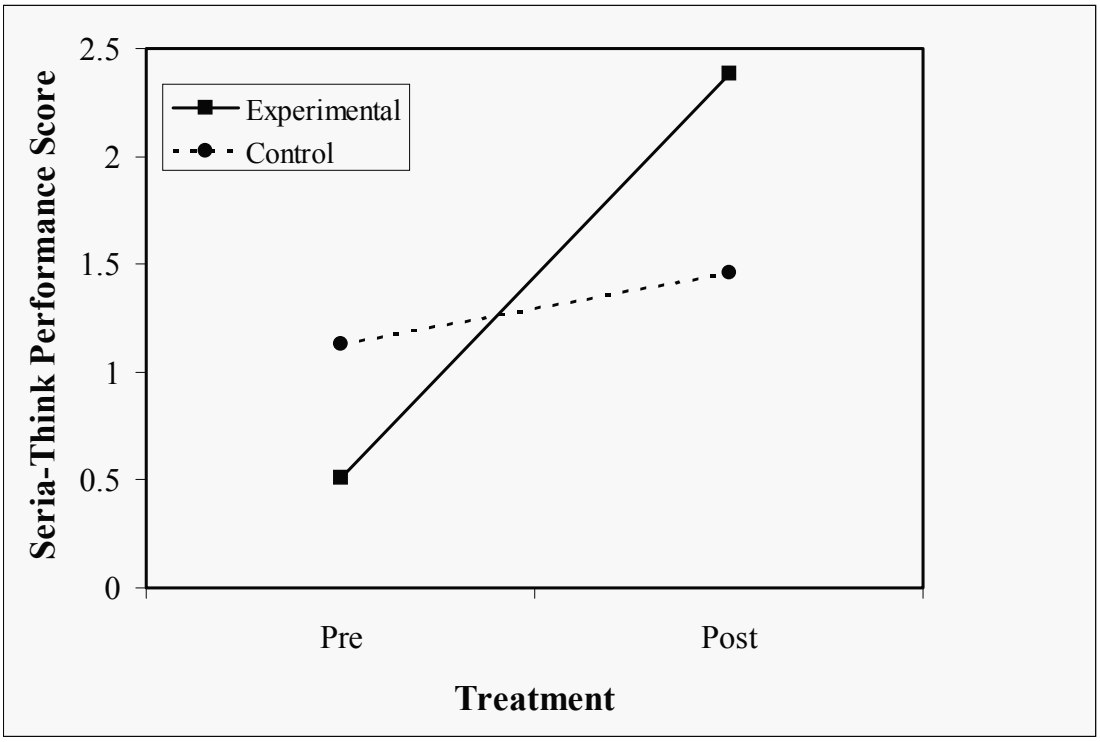

Figure 4. Seria-Think Pre- and Post-Intervention Performance Scores of the Experimental and Control Groups.

Post-hoc analyses revealed that the experimental group improved significantly from pre- to post-intervention ($t_{(19)}$=9.62, p<.001) whereas the control group showed less but significant improvement ($t_{(19)}$=2.52, p<.05). Comparison of groups before and after the intervention showed that while the experimental group was significantly lower than the control group before the intervention ($t_{(38)}$=2.57, p<.05), after the intervention it was higher than in the control group ($t_{(38)}$=4.63, p<.001).

Seriation Scores on the Children's Seriational Thinking Modifiability Test

The CSTM scores are divided into test scores and transfer scores. The means and standard deviations of the three CSTM test scores, Number, Size, and Darkness, are presented in Table 3.

Table 3:
Means and Standard Deviations on Number, Size, and Darkness of the Children's Seriational Thinking Modifiability (CSTM) Pre- and Post-Intervention Scores in the Experimental and Control Groups

Dimension			Experimental	Control
Number	Pre	M	2.59	2.53
		SD	0.62	0.90
	Post	M	2.70	2.50
		SD	0.41	0.76
Size	Pre	M	1.03	1.06
		SD	0.47	0.70
	Post	M	1.50	1.20
		SD	0.70	0.55
Darkness	Pre	M	0.63	0.94
		SD	0.89	0.70
	Post	M	1.55	1.23
		SD	1.02	0.70

Repeated measures MANOVA of Treatment by Time by Experimental Condition (2 x 3 x 2) was carried out with the three dimensions of number, size, and darkness as dependent variables. The findings revealed a significant main effect of Time, $F_{(3, 36)}=10.92$, $p< .0001$, indicating higher post- than pre-intervention scores. Univariate analyses showed that the significant improvement was contributed mainly by the dimensions of darkness, $F_{(3, 36)}=22.09$, $p< .0001$, and number, $F_{(3, 36)}=9.96$, $p< .01$. The main effect was modified, however, by a significant Treatment by Time interaction, $F_{(3, 36)}=3.59$, $p< .05$. Univariate analyses showed that the interaction effect was due mainly to the dimension of darkness, $F_{(3, 36)}=5.99$, $p< .05$, indicating greater improvement in the experimental group than in the control group. This interaction is depicted in Figure 5.

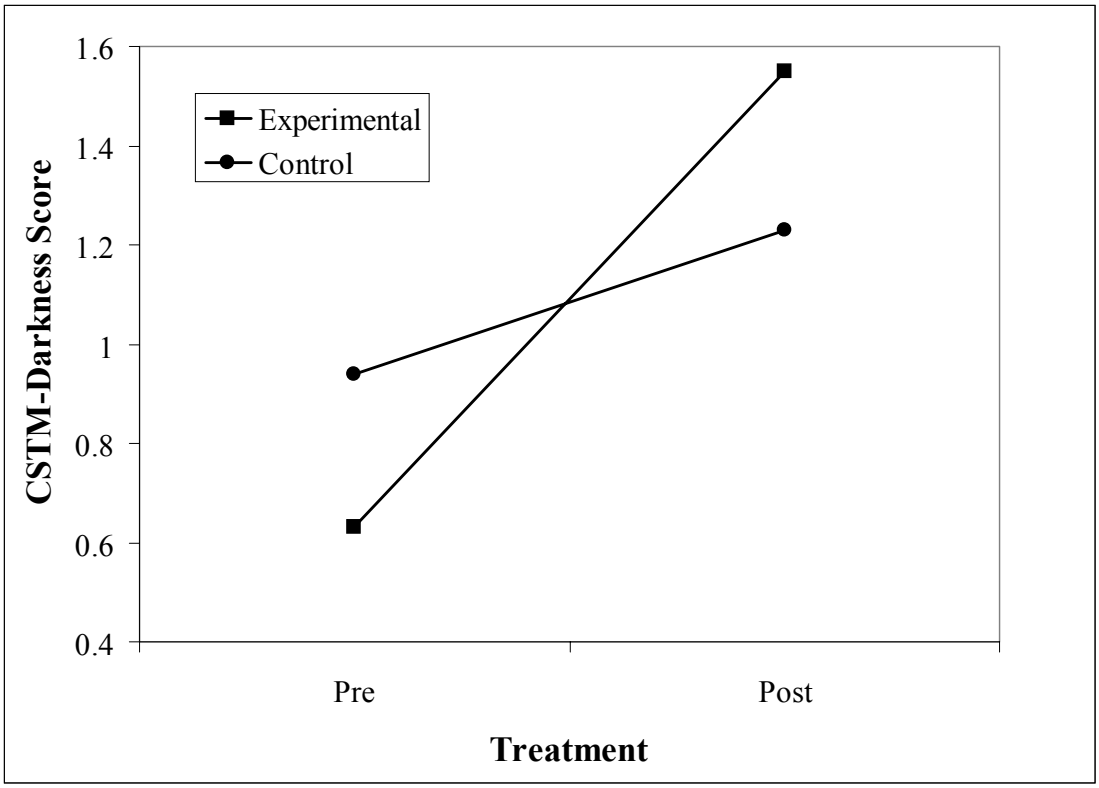

Figure 5: Pre- and Post-Intervention Darkness Score on the CSTM in the Experimental and Control Groups.

Figure 5 shows that the change slope for the experimental group is steeper than for the control group, i.e., the participants who received the training increased more than did those in the control group. Post-hoc analyses revealed that both the experimental group ($t_{(19)}$=3.88, p<.001) and the control group ($t_{(19)}$=2.90, p<.01) improved significantly from pre- to post-intervention. Comparison of groups before and after the intervention showed that the experimental group scored at about the same level as did the control group before ($t_{(38)}$=1.98, ns) and after the intervention ($t_{(38)}$=1.33, ns), although it is the change slope in the two groups that is of interest rather than their absolute levels of before and after performance. The significant interaction derives from the difference in rate of improvement of both groups—the experimental children showing a higher rate than the control children.

The CSTM transfer scores were analyzed by a MANOVA of treatment with the six items of the transfer subscale as dependent variables. The findings showed a significant main effect for treatment, F(6, 33)=3.40, p<.01, indicating higher scores in the experimental than in the control group. Univariate analyses showed that one problem contributed significantly to the overall difference—the cube problem.

Discussion

Three principal questions were posed and addressed in this study: (a) Would these transcultural children show evidence of either *cultural difference* or *cultural deprivation*?

(b) Would cognitive and metacognitive training, through the use of the Bright Start unit on Pattern and Sequence: Seriation, lead to improved performance? (c) Would the learning the children did in the seriation training show near or intermediate transfer?
Although the criterion instruments used in this study were both dynamic assessment instruments, i.e., not normative tests, we can say with assurance that the performance of the transcultural children in these samples was appreciably lower than is typically found in native Israeli children (see, e.g., Tzuriel & Kaufman, 1999). What that fact tells us is that the children showed evidence of either cultural difference or cultural deprivation, but further data would be needed to distinguish between these two conditions. Essentially, cultural deprivation would be indicated if the children had required a long period of intensive mediation of basic cognitive operations in order to show improved performance, whereas cultural difference would be indicated if their performance improved appreciably following relatively minimal intervention. The intervention in this study consisted of a total of only 8.5 hours of mediational teaching focused on seriational processes. We conclude that the substantial improvement in the children's performance on some of the measures suggests cultural difference rather than cultural deprivation, and further suggests the potential for even greater improvement given a longer and more intense intervention—but of course that prediction cannot be confirmed in the present study.

With respect to the second question, the Bright Start intervention did indeed lead to improved performance, but that finding was somewhat ambiguous because it was not shown across all of the scores derived from the two tests. One problem arose from the fact that the performance of the control children was initially higher than was that of the experimental children, forcing a search for a cross-over interaction, which is always difficult to detect statistically because of high levels of within-groups variance. Another problem is that the different scores, e.g., number of insertions, number of measurements, and total number of correct solutions, are not statistically independent; in fact, one would expect them to be correlated with each other, both because all three are based on the performance of the same children and because on theoretical grounds one expects the best "correct solutions" scores to be associated with a relatively large number of measurements and a relatively small number of insertions. In light of the observed data and of these limitations, we can say that there is some support for the expectation of performance improvement following mediational teaching of seriation.

The question of transfer is a more difficult one. Certainly, the data clearly indicate near transfer. The children were taught a curriculum unit on Pattern and Sequence, using content and examples that were quite different from those used in criterion testing, and the cognitive teaching/learning was associated with improved performance. Thus, learning to distinguish seriational patterns of stick figures or circles was effective in enhancing the children's performance when they were required to arrange cylinders in particular orders (equal height, steadily increasing height, or steadily decreasing height). Intermediate or far transfer (there being no known criteria for estimating the distance of transfer) would be suggested by superior performance of the experimental group children on the transfer task, which was a series of math problems derived from the Children's Seriational Thinking Modifiability (CSTM) instrument. That instrument yielded 6

scores, which were combined in a multivariate analysis of variance. That MANOVA showed a main effect of experimental condition; i.e., superior performance by the children who had experienced cognitive education in the Pattern and Sequence unit of Bright Start. Even so, it was one of the scores, that based on the Cube problem, that was principally responsible for their superior performance. Thus, the data strongly suggest intermediate transfer of the cognitive teaching/learning, but they do leave some unresolved ambiguity on that question.

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Résumé

Effets de l'Unité « Séquence et Patron » du Programme Bright Start sur la Résolution des Problèmes Sériationels et Mathématiques chez Jeunes Enfants Éthiopiens Immigrants en Israël

Nous avons administré deux tests traitant de la pensée sériationnelle à 20 jeunes enfants éthiopiens dont les parents ont immigré en Israël, avant et après qu'ils aient reçu une formation médiationnelle en lien avec l'unité de patron et de séquence du programme *Bright Start : Programme d'éducation cognitive pour jeunes enfants*, dans le but d'évaluer les effets de l'entraînement cognitif sur la performance sériationnelle et l'efficacité au niveau de l'apprentissage chez les enfants transculturels. Vingt enfants ayant le même âge, la même distribution en ce qui concerne le sexe, les mêmes variables familiales ont participé à une activité contrôle (non-médiationnelle). Les enfants contrôles ont performé à un niveau supérieur au début par rapport aux enfants ayant suivi la formation cognitive. Toutefois, ce dernier groupe s'est rapproché et même devancé la performance du groupe contrôle après l'expérience de *Bright Start*. Les auteurs concluent que les enfants transculturels sont caracterisé par « différences culturelles » plutôt qu'une « privation culturelle » et que la performance du groupe entraîné pourrait être améliorée par une formation cognitive à l'age préscolaire. Il semble y avoir d'evidence de transfert intermédiaire de leur formation en sériation.

Resumen

Efectos de las Unidades "Secuencias y Clasificaciones" del Programa Bright Start sobre la Resolución de Problemas Matemáticos y Seriales en una muestra de niños de Preescolar que habían emigrado de Etiopía a Israel

Con el fin de investigar los efectos de la educación cognitiva temprana sobre las tareas seriales y la efectividad del aprendizaje de niños transculturales, a 20 niños etiopes cuyas familias habían emigrado a Israel se les pasó dos tests de pensamiento serial antes y después de haber recibido instrucción mediacional correspondiente a dos unidades del Programa Bright Start (Secuencias y Clasificaciones): Curriculum Cognitivo para niños pequeños. A otros 20 niños de semejante edad, distribución de género y antecedentes familiares se les aplicaron otras actividades de control (enseñanza no mediacional). Los niños del grupo control mostraron inicialmente unos resultados superiores a los del grupo que iba a ser sometido a enseñanza mediacional, pero los sujetos de

este segundo grupo sobrepasaron los resultados del grupo control después de haberle pasado las unidades del Programa Bright Start. Los autores concluyen que hay evidencia de diferencia cultural más que de deprivación cultural en este grupo transcultural, que sus diferencias en los resultados de la resolución de problemas seriales podrían ser mejoradas a través de una educación cognitiva temprana y también se evidenció la inmediata transferencia de su entrenamiento a otras actividades de seriación.

Zusammengassung

Auswirkungen der Folgen und Mustereinheit des Bright Start Programms auf das Lösen von Folgen- und Mathematikaufgaben bei Kindergartenkindern äthiopischer Immigranten nach Israel

Untersucht wurden die Effekte kognitiver Früherziehung auf die Leistung bei Folgeaufgaben und auf die Lerneffektivität transkultureller Kinder. Zwanzig jungen äthiopischen Kindern, deren Familien nach Israel immigriert waren, wurden zwei Tests zum seriellen Denken gegeben bevor und nachdem sie vermittelnde Instruktionen in der Muster- und Folgeeinheit von Bright Start (kognitives Curriculum für junge Kinder) bekamen. Weitere 20 Kinder mit gleichem Alter, Geschlechtsverteilung und familiärem Hintergrund bekamen eine nicht-mediationale Kontrollaktivität. Die Kontrollgruppe zeigte anfangs ein höheres Leistungsniveau als die Kinder der kognitiven Erziehungsgruppe, jedoch schloss letztere Gruppe auf und überholte die Kontrollgruppe nach Beendigung der Bright Start Intervention. Die Autoren folgerten, dass in dieser transkulturellen Gruppe eher kulturelle Differenz als kulturelle Deprivation vorgelegen hatte, dass deren Leistung im seriellen Problemlösen durch kognitive Früherziehung gefördert werden konnte und dass es auch Evidenz gab für einen zwischenzeitlichen Transfer des seriellen Trainings.