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Joint Storybook Reading and Joint Writing Interventions Among Low SES Israeli Preschoolers: Differential Contribution to Early Literacy

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Abstract

The study compared two interventions: one focusing on language and storybook reading and the other on alphabetic skills and writing. Seventy-one preschoolers from a low SES city in [the center of] Israel, age 3-5 (35 in the reading program and 36 in the writing program) participated in the study. Twenty-four untreated preschoolers were chosen for control purposes. The children were tested twice, at the beginning and at the end of the school year, in: alliteration, rhyming, word writing, letter knowledge, orthographic awareness, listening comprehension, receptive vocabulary (PPVT) and general knowledge (WPPSI).

The writing program involved games and activities that encouraged letter knowledge, phonological awareness, and functional writing activities. The reading program utilized 11 children's books. In each reading session, student-mediators read the book aloud twice and discussed central concepts and ideas via games, creative activities, and drama activities. Results indicated that children in the two literacy programs progressed significantly more than the control group on three out of the five early literacy measures (alliteration, rhyming, and orthographic awareness). However, the joint writing group significantly outperformed both the joint reading group and the control group on all five literacy measures (alliteration, rhyming, word writing, orthographic awareness, and letter knowledge). We also found that children as young as 3 to 4 years gained from literacy programs as much as did older children, aged 4 to 5, on all the measures assessed in our program. The younger children even gained significantly more than the older children on receptive vocabulary (PPVT).

Joint Storybook Reading and Joint Writing Interventions Among Low SES Israeli Preschoolers: Differential Contribution to Early Literacy

The present study examined the differential effects of major daily adult-child activities in promoting various skills related to early literacy among young children from a background of low socioeconomic status (SES). We questioned: What should daily literacy interactions with preschoolers emphasize to help equip them better for reading and writing acquisition when they start formal schooling two or three years later? This study compared the effects of two programs aiming to promote literacy among low SES preschool children aged 3-5. One program focused on alphabetic skills via joint writing activities; the other dealt with general competencies via joint storybook reading and linked activities.

Poverty comprises a major environmental high-risk factor that exerts a profound adverse effect on many aspects of development in ways that are not yet completely understood (Starfield, 1992). Children from low SES generally reach a lower level of literacy than their peers from middle or high SES, a discrepancy that is already salient in preschool. Research in Israel showed that preschoolers and kindergartners from lower SES lag behind their counterparts on emergent literacy measures such as recognition of environmental print, phonological awareness, letter naming, word writing, word recognition, and orientation to print (Aram & Levin, 2001; Korat, Bachar, & Snapir, in press; Levin, Korat, & Amsterdamer, 1996; Levin, Share, & Shatil, 1996). Researchers in other countries have been reported similar findings during the last three decades (e.g., Bowey, 1995; Dickinson & Snow, 1987; McCormick & Mason, 1986; Snow, Burns, & Griffin, 1998; Wells, 1985). The emergence of this link in various societies and across decades suggests multiple causes that appear difficult to counteract.

The field of early education has struggled to demonstrate conclusively the efficacy of early interventions as a means to combat the damaging effects of poverty on young children (Zigler,

2000). General consensus exists that literacy begins to emerge during infancy (Scarborough, 2002; Whitehurst & Lonigan, 2002). Evidence suggests a continuity from early literacy in preschool to literacy achievement in school (Aram & Levin, 2003; Levin, Ravid, & Rapoport, 2001; Shatil, Share, & Levin, 2000) and even to higher education (Cunningham & Stanovich, 1997).

A good start is likely to help children become active in literacy and develop efficient reading habits. Yet, minimal understanding exists concerning how classrooms and preschool teachers can support literacy emergence (Dickinson, 2002). During the last decade, changes occurred in researchers' and educators' vision of developmentally appropriate literacy practices for young children. Two shifts transpired: First, from a position that favored free natural exposure to literacy and resented any tendency to use formal teaching techniques, educators moved to a stance that recognizes the importance of direct mediation. Second, a shift occurred from emphasizing mainly general language abilities to paying more attention to alphabetic skills like letter recognition and phonemic awareness.

Promoting Early Literacy

> Zigler (2000), in a forward to a handbook on early childhood intervention, wrote (p. XII):
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> Now that we have a clearer picture of the general program efficacy, the major task is to identify which programs work better and how these results are achieved, as well as which components of programs are most essential to achieve maximum benefit. This latter question is critical, given the limited funding with which most intervention programs must be mounted and sustained.

Interventionists (educational planners, policy makers, researchers, etc.) have developed numerous programs to induce teachers of young children, especially from low SES, to promote early literacy—mainly via two means: storybook reading and alphabetic skills training.

Storybook Reading

Reading books to young children constitutes a very common adult-child early literacy activity (e.g., Sénéchal, LeFevre, Thomas, & Daley, 1998). A position paper issued by the International Reading Association and the National Association for the Education of Young Children (1998), regarding the appropriate practices for promoting literacy, declared: "The single most important activity for building these understandings and skills essential for reading success appears to be reading aloud to children" (p. 198).

Neuman (1999) described the many contributions of storybook reading to young children's literacy development. Through storybook reading, she claimed, children acquire general knowledge; learn from the stories to think beyond the immediate; and learn about written languages' rhythms and conventions. Researchers frequently link experience with shared reading to children's language development (McNeill & Fowler, 1999; Robbins & Ehri, 1994; Zevenbergen & Whitehurst, 2003).

Relevant programs have aimed to induce caregivers, especially from low SES, to read more to children and to encourage children to be more active in the process (e.g., Karweit & Wasik, 1996; Neuman, 1999; Whitehurst, Arnold, et al., 1994). These programs, conducted mostly with very young preschoolers aged 2 - 4 years, reported benefits to both children's oral language (Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994) and to children's emergent literacy skills (writing and print concepts) (Whitehurst, Epstein et al., 1994, Whitehurst et al., 1999).

In addition to day care, preschool, and kindergarten interventions, libraries have also developed programs aimed to increase storybook reading in young children. These programs are designed to connect parents and caregivers of young children with local public library services (Fiore, 2002; Meyers, 2002; Oakes & Virbick, 2001; Shauck, 2002). In some libraries, workshops enrich the children's experiences with books. These studies showed that, following the programs,

parents and children visited the libraries more and shared more books with their children (Fiore, 2002).

Alphabetic Skills

Studies that examined the continuity in the transition from kindergarten to school emphasized the role of phonological awareness, letter knowledge, and linguistic knowledge in kindergarten as chief predictors of decoding accuracy, reading fluency, and reading comprehension at the beginning of school (e.g., Badian, 2001; Bowey, 1995; Catts, Fey, Zhang, & Tomblin, 2001; Chaney, 1998; Ehri, Nunes, Willows, Yaghoub-Zadeh, & Shanahan, 2001; Näslund & Schneider, 1996). Evidence supports the claim that these relations are already valid from preschool (Näslund, 1990). De-Abreu, Dourado, and Cardoso-Martins (1998) found that preschool Portuguese children who knew the names of letters could easily learn the letter sound relations in words (see also Share, in press).

Programs that focused on direct practice of alphabetic skills like phonological awareness and letter knowledge have addressed mainly kindergartners aged 5-7. Such programs demonstrated that integrating phonological awareness, alphabetic naming, and writing activities in kindergarten was very productive in low SES kindergartens (Baker & Smith, 1999; Schneider, Roth, & Ennemoser, 2000) as well as in middle SES kindergartens (Ball & Blachman, 1991; Ukrainetz, Cooney, Dyer, Kysar, & Harris, 2000). Kindergartners whose teachers learned to implement phonological and print awareness activities and who were explicitly taught segmentation and synthesis skills performed better than the control group on various measures of reading, spelling, and phonological sensitivity (O'Connor, 1999; Solity & Deavers, 1999).

We designed our study in light of the diversity in early literacy programs and the need to devise efficient early intervention programs for low SES children. Specifically, we sought more information regarding the identification of which components should be included in these interventions: Which are the more fruitful components for promoting early literacy? Moreover, we

hoped to investigate the optimal ages for introducing different literacy components into interventions.

Aram and Levin (2002) compared maternal mediation in joint writing to storybook reading in terms of their relations with emergent literacy among kindergartners in a low SES population. Joint writing was examined by assessing the nature of mother-child dyadic writing and maternal writing mediation. Storybook reading was assessed using a storybook title recognition test (Stanovich & West, 1989). The title recognition test, a proxy measure of reading frequency, assumes that mothers who read more frequently to their children will recognize more children's storybooks (Stanovich, 1993). Word writing, word recognition, phonological awareness, and orthographic awareness comprised the measure of child's literacy. Kindergarten teachers ranked the children's verbal, graphic, and mathematical abilities. Aram and Levin's findings revealed that maternal writing mediation explained added variance of word writing, word recognition, and phonological awareness, after partialling out home environment measures and the nature of storybook reading. Storybook reading explained added variance of verbal ability, beyond home environment and maternal writing mediation. The researchers concluded that mediation in joint writing is linked to reading and writing acquisition, and that joint storybook reading is related to verbal abilities.

In the present study, we compared two different interventions related respectively to joint reading and to joint writing: one focusing on language and storybook reading and the other on alphabetic skills and writing. We conducted the interventions in preschools, utilizing university students of early education as the mediators. The children who participated in the interventions were from two almanacs, aged 3 and 4. Our questions comprised:

1. What are the differential effects of promoting language and storybook reading versus enhancing alphabetic skills and writing?

2. Will the younger children in the programs, aged 3 – 4, gain as much from the literacy interventions as the older children aged 4-5? And will the greatest gains result from the same program at both age intervals?
3. Do young children (age 3-5) benefit from a writing program that includes direct phonological awareness and letter knowledge instruction?

Method

Participants

All the children enrolled in four preschools in the Jaffa township participated in the study. Jaffa is a low SES township in central Israel that is geographically adjacent and administratively affixed to the major city of Tel Aviv. Jaffa's population of some 47,000 residents is ethnically diverse, comprising native and immigrant Jews, and both Christian and Moslem Arabs. According to a recent study conducted by the Tel Aviv-Jaffa municipality (Center for Socioeconomic Research, 2000), Jaffa residents face a lack of education and health programs; a high level of violence and crime; a number of neighborhoods known for drug dealing; and a high percentage of multiproblem families who suffer from domestic violence, economic distress, poor health, single parenthood, etc. The unemployment rate is higher than the general rate in Israel, and 30.1% of Jaffa's residents regularly receive local welfare services, in comparison with 16.3% in Tel Aviv. The rate of persons per room in Jaffa (1.53) surpasses that of Tel Aviv (0.87). The rate of single mothers in Jaffa (17.7%) is higher than the general rate in Israel (10.0%).

We randomly selected four preschools to undergo the literacy interventions, out of the total of nine preschools in Jaffa. Two randomly selected preschools participated in the reading program and two in the writing program. In all, 120 children participated in the two programs (60 in each program, around 30 in each preschool). In addition, we randomly sampled a control group of 24 preschoolers who attended two of the five preschools in Jaffa that did not participate in the interventions. All the children (in the intervention and control groups) attended preschool during

2001–2002. The 144 children in the intervention and control groups included two age groups: children who had their 4th birthday during the school year (3-4 years old), and children who had their 5th birthday during the school year (4-5 years old).

For the present evaluation study, we randomly sampled 76 out of the 120 children (38 in each intervention). The mean age in months was $M = 46.05$, $SD = 4.78$ for the joint writing group; $M = 45.19$, $SD = 6.51$ for the joint reading group; and $M = 45.48$, $SD = 5.90$ for the control group. Criteria for inclusion in the evaluation study comprised Hebrew language sufficient fluency and teacher's assessment that the child had no special needs. The children sampled for evaluation included native Hebrew speakers (83.3%) and immigrants from the former Soviet Union who spoke Hebrew but for whom Russian was their mother tongue (16.7%). We did not include Arabic-speaking children (approximately 2.5% of the children in each preschool) in the evaluation study because the student-mediators did not speak Arabic and the children, especially at the beginning of the year, could not communicate in Hebrew.

Intervention Programs

We initiated the two programs in early November, two months after the school year began, to provide the children with time to adapt to their preschool context, teacher, and friends. The two programs were concrete, realistic, and maintained challenging goals (see Gersten & Brengelman, 1996; Marks & Gersten, 1998). Sessions followed a cumulative, developmental curricular progression.

In each program, one student-mediator worked with small groups of 4-6 children for 20 to 30 minute sessions twice weekly at the preschool. In all, each child participated in approximately 66 sessions. Other early interventions demonstrated the effectiveness of small-group tutoring (Lauren & Allen, 1999). The teacher and the student-mediator together devised the groups' composition based mainly on the teacher's emergent literacy evaluation of the children and the results of the literacy pretests (see below).

During the school year, the four student-mediators underwent intensive training at Tel Aviv University for the role of student-mediators. Each pair of student-mediators working on the same type of program (either joint reading or joint writing) attended separate 1-hour weekly meetings with the coordinator. In these meetings, the student-mediators learned the principles as well as the pedagogy of their particular program (joint reading or joint writing). Teachers' intensive training constitutes an important component in early interventions (Lauren & Allen, 1999). Research has shown students to be useful in promoting kindergartners' literacy (Ukrainetz et al., 2000). Unlike preschool teachers who may be distracted by their full daily workload and may find it difficult to maintain sessions' succession, student-mediators would enter the preschools specifically for the purpose of mediating this intervention and would be available to meet consistently with each child twice weekly. The interventions' coordinator visited the preschools regularly to provide teachers and student-mediators with frequent opportunities to discuss their negative and positive reactions to the early literacy practices (see Baker & Smith, 1999).

The teachers and the student-mediators attended monthly meetings in their preschools with the first author, a university faculty member. In these meetings, teachers learned about literacy development and received information about the upcoming small-group sessions for their preschoolers that month. These meetings aimed to enhance teachers' awareness about the program's ongoing goals and to encourage teachers to integrate literacy-related experiences into their activities with their entire preschool class.

The programs enlisted parents' involvement via two special events during the year, one a month after the program's onset and one towards the end of the year. In the joint reading program, the two parent-child activities included a storyteller. For example, at the first event, the children were involved with the storyteller while the first author separately presented the program to the parents, describing the contribution of storybook reading and explicating how to help children become more active in joint storybook reading. In the joint writing program, the two parent-child

events included writing activities. For example, at the first event, the teacher and the student-mediator involved the children in writing while the first author separately presented the program to the parents, explicating the development of early writing and encouraging parents to exploit opportunities for joint writing.

To deepen each program's effectiveness, the teacher and student-mediator assigned a section of the preschool classroom to literacy. This area included a board on which to hang children's products, a table for books or games, and relevant materials. We bought children storybooks to the two preschools in the Joint reading program and games for rhyming, alliteration and letter knowledge to the two preschools in the Joint writing program.

Hebrew is the common language for communication in the Israeli Jewish school system. Both intervention programs used Hebrew for communication, and the children's books and writing experiences were all in Hebrew. The Russian-speaking children were less exposed to Hebrew, including Hebrew literature, in their homes; yet they attended Hebrew-speaking schools, so for them literacy programs in Hebrew were essential. We assumed that Arabic-speaking children would benefit from participation in these Hebrew-speaking interventions as well. Yaden et al. (2000) reported that Spanish-speaking 4-year-olds benefited from an English literacy intervention and that a transfer of early literacy awareness occurred from English to Spanish.

Promoting Alphabetic Skills: Joint Writing Program

The writing program involved games and activities that encouraged letter knowledge, phonological awareness, and functional writing activities with children aged 3-5. Research has indicated that the combination of phonological awareness with letter knowledge training surpasses separate training in these competencies for at-risk kindergartners (Schneider et al., 2000). Student-mediators introduced all of the activities within a developmentally appropriate environment, beginning with the familiar and creating a context linking alphabetic knowledge with writing (Wasik, 2001). Children were first taught to recognize their written name and the written names of

their friends (Adams, 1990; Share & Stanovich, 1995). Gradually, they were explicitly taught letter-name and letter-sound correspondences, word segmentation, and merging skills using mostly the children's names and the names of their friends as words for practice. We utilized explicit teaching and practice of the alphabet and phonological awareness, with the hope that the clear benefits of such programs for older children (Solity, 1996; Solity & Deavers, 1999) would emerge for the younger preschoolers as well. Since the younger children may have had difficulties writing with a pencil especially at the beginning of the year, we encouraged all the children in the program to practice writing and forming letter shapes in diverse ways: using seals, stickers, magnetized letters, newspaper cuttings, pencils, and crayons. The demands from the children regarding letter shapes and spelling were developmentally appropriate. Many children printed numerous letters unrecognizably and employed invented spelling in their writing.

In the joint writing program, children learned to recognize that a spoken word consists of smaller components such as syllables and phonemes and that these units can be manipulated (Lombardino, Bedford, Fortier, Carter, & Brandi, 1997). When children made attempts to spell, the student-mediators guided them to break the words into sub-syllables and later on into phonemic segments and then to select the alphabetic symbol that corresponds to each sound segment.

Promoting General Competencies: Joint Reading Program

The reading program utilized 11 children books. Experts on children's literature recommended these books as high-quality children's literature. Each book served as the center base for about six sessions. The student-mediators introduced each book to the children by its name and the names of the author and illustrator. Children were encouraged to predict alternative ideas from the illustrations and the name of the book (Neuman, 1999). In each session, student-mediators read the book aloud twice and discussed central concepts and ideas via games (like cards and matching activities), creative activities (like drawing and clay), and drama activities. The subjects discussed were developmentally appropriate and close to the children's world (e.g., family, fears, friends,

animals). To expand children's vocabulary, student-mediators introduced words from the stories and discussed them broadly (Robbins & Ehri, 1994). Children were invited to be very active before, during, and after the storytelling. The student-mediators employed some dialogic reading techniques, such as to praise and encourage, repeat, ask open-ended questions and expand what the child says (Whitehurst & Lonigan, 1998).

Literacy Assessment Measures

In line with our conceptualization of children's early literacy development as a multifaceted domain, we selected the following tasks as pretest and posttest measures to assess a wide range of skills:

1. *Phonological awareness.* Two tests developed for the present study served as measures of *phonological awareness*: one referring to *alliteration* and the other to *rhymes*. Each included ten 2-syllable word pairs. Evidence has suggested that sensitivity to rhyme and alliteration is a relatively early development that may emerge among 3- to 5-year-old children, as in our programs (Goswami & Bryant, 1990). On the *alliteration test*, we asked children if the first syllable of a word resembled or differed from the first syllable of its paired word. On the *rhyming test,* we asked the same question with reference to word pairs' final syllables. Prior to testing, the experimentor presented two sample pairs and provided corrective feedback with explanation. The mean correct answers in percentages, on each of the two tests, served as the total *phonological awareness* score.

2. Word writing. The child wrote two pairs of words. The two words in each pair differed in their phonological length but did not differ clearly in the size of their referents. The words were: g*ɛzɛr – mɛlafɛfon* 'carrot – cucumber' and *dag- tarnɛgol* 'fish – rooster.' We scored each written word on a writing scale developed by Levin and Bus (in press) for children younger than 4;5. The scale comprised three sequential general schemes: graphic, writing-like, and symbolic. We classified each written product into one of the schemes and scored it accordingly. The graphic scheme reflected the development of graphic control ranging from scribbles (0) to good forms (2).

The writing-like scheme, scored 3-8, reflected the number of writing-like features. The symbolic writing scheme ranged from using numbers or random letters (9) to conventional spelling (13). The mean score of the four words, in percentages, served as the *word writing* score.

3. Letter name knowledge. We asked the child to name 8 printed letters, each presented on a separate card in large print (200 Times New Roman). The Hebrew alphabet includes 27 letters. The 8 letters chosen were found to be among the easiest to recognize for children in the 3-5 year age range (Levin, Patel, Margalit, & Barad, 2002). Percentage of correctly-named letters served as the *letter name knowledge* score.

4. Orthographic awareness. We adapted to Hebrew a test developed by Olson, Kliegl, Davidson, and Foltz (1985). The test included 10 pairs of graphic items comprising one printed word and one non-word that included a mixture of Latin and Hebrew letters, numerals, or illegal repetition of letters. We asked children to select the printed word and to explain their decision. They received two scores: on *word selection* and on *explanation*. The *word selection* score consisted of the percentage of items correctly selected. We scored explanations along a 3-point scale as follows: an egocentric explanation (e.g., "Because I know it") scored 1; an incorrect explanation that referred to language (e.g., pointing to a single letter B and saying it was a word "Because I see the letter B") scored 2; and a correct explanation (e.g., "This is not a word in Hebrew because it has English in it") scored 3. The mean score, in percentages, served as the *explanation* score.

5. Listening comprehension. The children heard twice a short story (88 words) about a boy and his dog (taken from Shatil et al., 2000). Eight informative questions followed the story. We scored each of the child's eight answers as correct or incorrect, and the percentage of correct answers served as the *listening comprehension* score.

6. *Receptive vocabulary.* We examined children's *receptive vocabulary* using the Peabody Picture Vocabulary Test (PPVT). The child must select one picture, out of four, depicting a spoken

word. We used Solberg and Nevo's (1979) scoring system, which is an adaptation and of the PPVT to Hebrew. Each correct response added one point. We presented the *receptive vocabulary* score in percentages.

7. *General knowledge*. We used the first 14 questions from the general knowledge subscale of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) adapted to Hebrew (Liblich, 1979). According to standardized procedures, each item could be scored 0 or 1, yielding a maximal score of 14. The percentage of correct responses served as the *general knowledge* score.

Procedure

We tested the intervention group children at two intervals: pretest at the beginning (October) of the school year, and posttest at the year's end (June). The measures included tests of alliteration, rhyming, word writing, letter naming, orthographic awareness, listening comprehension, vocabulary (PPVT), and general knowledge (WPPSI subscale). We administered pretests to 76 children (38 children in each of the two intervention programs) but only 71 of these children completed the posttest measures (36 children in the joint writing program and 35 in joint reading). Four children moved with their families out of town and left their preschools, and one child was hospitalized at the time of the posttest.

We tested the control group (n = 24) at the same two intervals but only on part of the battery (alliteration, rhyming, word writing, orthographic awareness, and listening comprehension) due to a shortage in financial resources. Thus, the control group did not complete measures of letter naming, vocabulary, or general knowledge. The children where assessed individually in the preschool in a quiet room.

Results

The results are presented in four parts. First, we present the description of children's early literacy achievements (pretest and posttest) and the correlations among them. Second, we display the two treatments' effects by comparing the progress of the children in the writing program, the

reading program, and the control group. Third, we compare the gains obtained by the two age groups (3-4 and 4-5 years old). Finally, we compare the literacy achievements of the younger intervention participants at the posttest interval (June 2002) with those of the older participants at the pretest interval (November 2001). This analysis may indicate if the younger children's starting point prior to their second year of preschool surpassed that of their older cohort, due to participation in our early literacy programs.

Literacy Achievements: Pretest Versus Posttest

Table 1 presents the ranges, means, standard deviations, and reliabilities (Cronbach α) of all the pretest and posttest measures. Results indicate that our sample exhibited sufficient variance in all the emergent literacy measures at the pretest and the posttest intervals. In measures of phonological awareness (alliteration, rhyming) and orthographic awareness, children could answer by guessing, and pretest outcomes indicate that children did guess and performed around the chance level. However, posttest outcomes reveal mean performance above the chance level.

Low reliability emerged between the items of alliteration and rhyming in the pretest, mainly due to guessing; yet, their posttest reliability is sufficient. The significant correlations between these two phonological awareness measures at the pr test and the posttest (r = .27, p < .005 and r = .58, p < .001 respectively) attest to the measures' internal validity.

Table 2 shows the intercorrelations among literacy measures at the pretest interval. The two general measures – receptive vocabulary (PPVT) and general knowledge (WPPSI) – each correlated significantly with all of the other early literacy basic skills but one (receptive vocabulary did not correlate significantly with alliteration). This finding is interesting because it differs from findings based on older children, which showed that literacy measures intercorrelated between themselves but not with general knowledge (e.g., Shatil & Share, in press).

The intercorrelations among literacy measures at the posttest interval, presented in Table 3, reveal almost across-the-board significant correlations. Rhyming and word writing correlated

significantly with all the other early literacy measures. The posttest results (Table 3) evidence more significant intercorrelations than do the pretest results (Table 2).

Performance Progress: Comparing the Three Conditions

To determine the deferential effects of the two treatments, we compared the children's progress in the joint writing program, the joint reading program, and the control group (see Table 4). We conducted two-way 2 X 3 (Time: pretest/posttest X Program: joint reading/joint writing/control) analyses of variance (ANOVAs) on the five measures with data available for all three groups (alliteration, rhyming, word writing, orthographic awareness, and listening comprehension). For the remaining three literacy measures, we had data available only for the two intervention groups; therefore, we conducted two-way 2 X 2 ANOVAs (Time: pretest/posttest X Program: joint reading/joint writing) on letter knowledge, receptive vocabulary (PPVT), and general knowledge (WPPSI).

Out of the total variance, we first examined pretest scores to determine whether or not initial differences existed between the intervention groups and the control group. According to Bonferroni's post hoc tests, no significant differences emerged between the three groups on alliteration, rhyming, word writing, or orthographic awareness at the pretest interval. Moreover, no significant differences emerged between the joint writing and joint reading groups on pretest letter knowledge. On pretest listening comprehension, the joint reading group scored significantly higher than the joint writing group ($p < 0.05$), but not higher than the control group. On the pretest receptive vocabulary measure (PPVT), again the joint reading group scored significantly higher than the joint writing group ($p < 0.05$). On the pretest general knowledge measure (WPPSI), the joint writing group significantly outperformed the joint reading group ($p<0.05$).

As to the progress made by children in the two programs and the control group during the intervention year, Table 4 presents the main effect of time for all the measures across the intervention and control groups. All the children developed from the pretest at the beginning of the

year (November) to the posttest at the end of the year (June) in the assessed measures. Yet, Table 4 also shows interactions between time and group for alliteration, rhyming, word writing, orthography, and letter knowledge.

A post-hoc Bonferroni test revealed the source of each of these interactions. On rhyming, only the two intervention groups made significant progress over the year. The gain demonstrated by the children in the two intervention groups (joint writing and joint reading) was significantly higher than that demonstrated by the control group. Nevertheless, the joint writing group progressed significantly more than the joint reading group. Similar trends emerged for the alliteration scores. The control group showed no significant gain, and the two intervention groups' scores were significantly higher than the control group on the posttest. Nevertheless, the joint writing group significantly outperformed the joint reading group.

On word writing, only the joint writing program group progressed significantly from pretest to posttest. The gain made by this group surpassed that of the joint reading and the control groups. On orthographic awareness, the two intervention groups progressed significantly, but the control group did not. Again here, the joint writing group significantly outperformed the joint reading group.

On letter knowledge, without data for the control group, we compared only the two interventions. The joint writing group evidenced significant progress, whereas the joint reading group did not. Recall that the pretest letter knowledge scores did not differ for the two groups; however, at the posttest interval, the joint writing group scores were significantly higher than those of the joint reading group.

In sum, the two literacy programs significantly promoted the children on various alphabetic skills when compared to the control group; however, the joint writing program promoted children more than did the joint reading program. On the more general competencies, no differences emerged between the three groups; they all progressed significantly from pretest to posttest.

Progress as a Function of Age: 3-4 Versus 4-5 Year Olds

We divided the sample comprising the two literacy programs into two age groups: children aged 47 months (n = 40) and children aged 47 months (n = 31) in November, at the beginning of the literacy programs. The younger group were entering their first school year in the preschool, whereas the older group were entering their second year. We conducted two-way 2 X 2 ANOVAs (Time: pretest/posttest X Age group: younger/older) on alliteration, rhyming, word writing, letter knowledge, orthographic awareness, listening comprehension, receptive vocabulary (PPVT), and general knowledge (WPPSI).

Table 5 reveals the main effect of time for all the measures across the age groups. All the children, regardless of their age group, progressed from the pretest to the posttest on all the assessed measures. Yet, Table 5 also shows an interaction between time and age for receptive vocabulary (PPVT). A post-hoc Bonferroni test revealed the source of this interaction. The two age groups developed throughout the programs, but the younger group made significantly greater progress in comparison with the older group.

To further understand the receptive vocabulary outcomes, we performed a series of t tests to compare the children's mean scores to the Israeli PPVT norms for these age groups at the pretest and the posttest. Table 6 shows that at the pretest the children (both older and younger) in the two intervention groups scored significantly lower than the norm. At the posttest, only the older children scored significantly lower than the norm. The younger children in both interventions progressed sufficiently to reach the norm by the posttest.

Will the Younger Children Begin Preschool Next Year More Advanced?

Using the aforementioned method for dividing the intervention groups into two groups (i.e., above/below 47 months in November 2001), we compared the younger children's end-of-year, post-intervention literacy achievements (June 2002) with the older children’s initial literacy achievements before participation in the literacy programs (November 2001). In doing so, we

compared a group of preschoolers who participated in the programs to a group of children from the same preschools who were at the time on average 4 months older and had not yet participated in such programs. We assumed that this analysis would provide information on the programs' efficacy. We performed two-way 2 X 2 ANOVAs (Age group: younger posttest/older pretest X Program: joint reading/joint writing) on alliteration, rhyming, word writing, letter knowledge, orthographic awareness, listening comprehension, receptive vocabulary (PPVT), and general knowledge (WPPSI).

Table 7 shows the significant main effects of age for alliteration, rhyming, and letter knowledge, indicating that the younger children performed significantly higher after the intervention compared to their older peers' performance prior to the program. Yet, Table 7 also shows significant interactions between age and group for alliteration, rhyming, word writing, orthography, and letter knowledge. Post-hoc Bonferroni tests revealed the source of each of these interactions. On each of these measures in the joint writing group, the younger children (after the program) outscored their peers (before the program) who were 4 months older. On each of these measures in the joint reading group, the younger children (after the program) reached the level of their older peers (before the program), despite the 4 months age gap. On the three other general measures (listening comprehension, PPVT, and WPPSI), in both the writing and reading groups, the younger children reached the level of their older peers (before the program), despite the 4 months age gap. Considering that, in comparison to the older children, the younger children have 4 more months in which to show further development before the opening of the coming school year, we can conclude that both groups made meaningful progress from November to June.

Discussion

The present study examined the effects of two programs aiming to promote early literacy among young children (ages 3 to 5) from low SES families. The two programs emphasized different aspects of literacy: One program focused on alphabetic skills and joint writing and the

other on language and joint storybook reading. Results indicated that children in the two literacy programs progressed significantly more than the control group on three out of the five early literacy measures (rhyming, alliteration, and orthography). However, the joint writing group significantly outperformed both the joint reading group and the control group on all five literacy measures (alliteration, rhyming, word writing, orthographic awareness, and letter knowledge). We also found that children as young as 3 to 4 years gained from literacy programs as much as did older children aged 4 to 5 on all the measures assessed in our program. The younger children even gained significantly more than the older children on receptive vocabulary (PPVT). Moreover, the younger children in our programs will begin the next academic year from a more advanced position than their older peers began the passing year, and this particularly holds true for the children in the joint writing program.

Joint Writing Versus Joint Reading Early Literacy Programs

In contrast to the wide agreement on the prominent role of joint storybook reading in promoting literacy, we found that another activity – joint writing – is even more fruitful in enhancing the basic literacy skills immanent to the acquisition of reading and writing. Interestingly, beyond promoting early basic alphabetic skills, the joint writing activities in our study also promoted more general literacy aspects like vocabulary, general knowledge, and listening comprehension.

Our findings are in line with Aram and Levin's (2002) results that showed that the volume of joint storybook reading, assessed by storybook title recognition (Stanovich & West, 1989), predicted early literacy (word reading and writing, phonological awareness, orthographic awareness, and language ability) beyond home environment measures. Yet, the only measure that joint storybook reading predicted beyond joint writing comprised language ability. On the other hand, the nature of joint writing predicted word writing and reading as well as phonological and orthographic awareness beyond home environment measures and joint reading.

The relative advantages of the writing program deserve explanation. When studying parental storybook reading, researchers have concluded its direct influence on pre-readers' oral vocabulary development but not on their acquisition of early alphabetic skills (Evans, Shaw, & Bell, 2000; Frijters, Barron, & Brunello, 2000). Joint writing activities, we claim, render an influence on both written language knowledge as well as oral vocabulary development. Writing constitutes a multidimensional activity that includes meaning-focused and language-focused processes. These processes encompass contemplating the meaning to be conveyed, composing the text, and respecting the linguistic register and genre elements. Writing also includes code-focused processes consisting of spelling words, leaving spaces between them, and using punctuation marks. In the joint writing group, we focused on phonology, letter knowledge, and the grapho-phonemic code as well as the context of writing and its meaning in everyday life. These activities together promote different aspects of literacy, general aspects like language and specific aspects like word writing.

Which Skills and Competencies Should Be Promoted at What Age?

In this study, we found that children as young as 3 years old benefited significantly from the literacy programs in preschool. Most programs that have targeted this age group focused on general language skills and highlighted the benefit of joint reading programs for this age group (e.g., Whitehurst & Lonigan, 1998, 2002). Our findings for the joint reading program support this stance. Yet, we found that promotion of specific alphabetic skills, like phonological awareness and letter knowledge via joint writing activities, is even more fruitful at this young age. Such an intervention emerged as effective not only on phonological awareness, writing, and orthographic awareness but even on the more general competencies of language, general knowledge, and listening comprehension. These findings hold particular implications for the young low SES population. Evidence suggests that children who start school behind their counterparts on alphabetic skills are likely to stay behind, especially if from low SES (Whitehurst & Lonigan, 2002). We uphold that

literacy programs incorporating writing activities may potentially promote these alphabetic skills for preschoolers as young as 3 years of age, and probably may modify the trajectory of their school success a few years later.

Early literacy interventions for preschoolers usually focus on exposure to print or to storybook reading and refrain from mediating phonological awareness, letter knowledge, and grapho-phonemic skills (e.g., Karweit & Wasik, 1996; Neuman, 1999; Whitehurst, Arnold et al., 1994). The reason might be that educators view activities oriented toward alphabetic skills as Inappropriate for children in the age range of 3 to 5 years. The importance of sensitivity and adjustment to children's level of development has been demonstrated consistently in studies of language acquisition (Reese, 1995) and in studies of "reading books aloud" to young children (Pellegrini, Perlumtter, Galda, & Brody, 1990). Maternal book reading episodes for 3 year olds differ from book reading for 1 year olds (Heath, 1983; Ninio, 1980; Teale & Sulzby, 1986). Similarly, mothers of 5-year-old children pay more attention to reading aspects, whereas mothers of 1 to 3 year olds emphasize narration (Bus & van IJzendoorn, 1988). Programs targeting different ages must be developmentally adapted. Byrne and Fielding-Barnsley (1995) demonstrated that phonological awareness and letter knowledge could be promoted in preschool by means of games. Both the writing and the reading program in the present study were developmentally appropriate in their content, materials, and demands from the children. Moreover the student-mediators used suitable pedagogical procedures.

Sylva, Hurry, Mirelman, Burrell, and Riley (1999) found that a direct literacy teaching method in reception (age 4-5) was more beneficial in promoting children's later achievements in first grade than was an indirect literacy exposure method. The student-mediators in the present study consistently used direct teaching methods camouflaged as games.

Interestingly, the vocabulary of the younger group (3-4 year olds) progressed more during the year than did the older group's (4-5 year olds). This outcome supports Whitehurst et al.'s (1999)

finding that dialogic reading programs are more productive for preschoolers than for kindergartners. Younger children, they claimed, are at a more sensitive period for verbal development and thereby benefit more from literacy programs that focus on language.

What characteristics depict a successful intervention program for children from low SES? It should certainly begin at a young age. Age-appropriate efforts aimed toward prevention should begin during preschool years (Strickland, 2002). Which components should be incorporated? A wide range of literacy skills and competencies may be emphasized: language development, understanding the functions of print, print awareness, concept about print, literacy as a source of enjoyment, understanding about stories and their structure, expediency with books, knowledge of the alphabet, phonemic awareness, opportunities to write, and so on.

Scarborough (2002) asserted that the stronger predictors of reading acquisition—the only ones proved causally related to learning to read—comprise phonological awareness and letter knowledge. Nevertheless, when she recommended candidates for appropriate literacy interventions, Scarborough included the more general components of print concept and language skills. Further research should examine the relative contribution of these different aspects of literacy and the optimal combinations between them. The meaningful results found in favor of the writing program demonstrate once again the unique importance of alphabetic skills even at this young age; indeed, such intervention promises to be very effective for promoting young low SES children's literacy, deserving continued empirical scrutiny.

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Table 1

Child's Literacy Measures at the Pretest and Posttest Intervals:

Means, Standard Deviations, Ranges in Percentages, and Reliabilities

Variable	Min	Max	*M*	*SD*	α
Pretest (N=76)					
Alliteration	20.00	90.00	53.41	15.44	.21
Rhyming	10.00	100.00	53.51	17.07	.26
Word writing	0.00	66.67	32.77	19.40	.94
Letter knowledge	0.00	75.00	8.93	15.42	.70
Orthographic awareness	10.00	100.00	54.47	21.12	.50
Listening comprehension	14.29	100.00	64.19	26.67	.59
Receptive vocabulary (PPVT)	18.18	81.82	54.01	14.41	.70
General knowledge (WPPSI)	15.38	92.31	56.58	21.96	.77
Posttest (N=71)					
Alliteration	30.00	100.00	70.26	19.22	.56
Rhyming	20.00	100.00	77.67	20.58	.70
Word writing	0.00	95.83	49.47	26.87	.96
Letter knowledge	0.00	100.00	42.43	34.49	.87
Orthographic awareness	10.00	100.00	72.54	23.34	.74
Listening comprehension	28.57	100.00	82.09	21.56	.66
Receptive vocabulary (PPVT)	32.73	89.09	66.11	11.61	.84
General knowledge (WPPSI)	15.38	100.00	76.70	19.02	.76

Table 2

Correlations Between Literacy Measures at the Pretest Interval (N = 76)

	Alliteration	Rhyming	Word writing	Letter knowledge	Orthographic awareness	Listening comprehension	Receptive vocabulary (PPVT)
Alliteration	---						
Rhyming	.30**	---					
Word writing	.11	.13	---				
Letter knowledge	.07	.12	.20	---			
Orthographic awareness	-.07	.14	.24*	.12	---		
Listening comprehension	.22*	.20	.24*	.17	.36**	---	
Receptive vocabulary (PPVT)	.18	.25*	.53***	.31**	.24*	.53***	---
General knowledge (WPPSI)	.31**	.23*	.37***	.43***	.21^	.48***	.58***

*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; ^ $p < 0.07$.

Table 3

Correlations Between Literacy Measures at the Posttest Interval (N = 71)

	Alliteration	Rhyming	Word writing	Letter knowledge	Orthographic awareness	Listening comprehension	Receptive vocabulary (PPVT)
Alliteration	---						
Rhyming	.53***	---					
Word writing	.33**	.47***	---				
Letter knowledge	.38**	.46***	.49***	---			
Orthographic awareness	.28*	.47***	.44***	.47***	---		
Listening comprehension	.41**	.45***	.33**	.13	.28*	---	
Receptive vocabulary (PPVT)	.18	.26*	.33**	-.15	.13	.49***	---
General knowledge (WPPSI)	.44**	.51***	.43***	.25*	.17	.59***	.58***

*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 4

Comparing Growth in Literacy Measures Across Groups

	Pretest *M (SD)* *N* = 95			Posttest *M (SD)* *N* = 95				
Variables	Reading *n* = 35	Writing *n* = 36	Control *n* = 24	Reading *n* = 35	Writing *n* = 36	Control *n* = 24	*F* (Time)	*F* (Time X Program)
Alliteration	55.94 (14.25)	55.06 (16.28)	61.66 (23.53)	63.62 (20.12)	77.38 (15.35)	54.58 (22.26)	11.12***	10.16***
Rhyming	56.86 (17.45)	51.35 (17.35)	53.75 (22.42)	72.86 (22.57)	83.78 (14.60)	64.58 (24.31)	88.60***	10.05***
Word Writing	32.38 (21.47)	33.33 (18.67)	28.62 (19.77)	42.32 (32)	56.41 (29.00)	38.45 (23.00)	37.47***	3.94*
Letter knowledge[a]	10.29 (16.71)	7.99 (15.57)		18.38 (25.23)	66.32 (24.06)		136.60***	78.17***
Orthographic awareness	54.41 (22.32)	53.71 (19.87)	50.00 (21.41)	66.76 (25.31)	78.00 (20.83)	44.4 (23.11)	11.29***	7.48***
Listening comprehension	70.59 (25.83)	59.13 (27.56)	63.69 (22.68)	83.61 (22.83)	82.14 (18.82)	89.88 (17.61)	60.52***	2.24
Receptive vocabulary[a]	57.58 (13.21)	50.71 (15.50)		70.56 (10.26)	61.67 (11.30)		94.26***	0.67
General knowledge[a]	53.38 (24.40)	60.22 (19.07)		76.69 (21.46)	78.24 (15.77)		102.79***	1.68

*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

[a] The control group was not assessed on these measures.

Table 5

Comparing Growth in Literacy Measures for Younger (<47 Months) and Older (>47 Months) Children

	Pretest *M (SD)* *N* = 71		Posttest *M (SD)* *N* = 71		ANOVA	
Variable	Younger *n* = 40	Older *n* = 31	Younger *n* = 40	Older *n* = 31	*F* (Time)	*F* (Time X Age)
Alliteration	53.65 (15.29)	54.48 (15.94)	65.87 (19.46)	76.21 (16.78)	39.04***	3.06
Rhyming	50.75 (17.91)	58.67 (20.30)	73.25 (19.13)	85.33 (18.14)	89.13***	0.64
Word writing	23.70 (16.28)	46.08 (17.76)	40.03 (27.89)	62.36 (20.13)	34.51***	0.00
Letter knowledge	6.25 (10.96)	13.84 (21.07)	35.00 (33.87)	54.46 (33.20)	65.96***	1.93
Orthographic awareness	49.47 (15.76)	57.59 (24.44)	65.53 (23.68)	81.03 (21.77)	29.60***	1.04
Listening comprehension	60.71 (28.16)	69.38 (25.41)	77.50 (24.61)	90.31 (10.33)	35.26***	0.42
Receptive vocabulary (PPVT)	50.1 (14.93)	60.30 (11.90)	65.00 (11.97)	68.18 (11.21)	90.30***	8.10**
General knowledge (WPPSI)	51.48 (22.68)	65.53 (18.77)	72.58 (20.02)	83.48 (14.73)	89.09***	0.58

*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 6

Comparing PPVT Scores of Younger and Older Children to Israeli Norms at the Pretest and Posttest

Group	Age group		Pretest	*t*	Posttest	*t*
Joint reading	Younger	*M (SD)*	28.72 (6.02)	-2.60*	37.88 (4.19)	1.10
		Norm	32.42		36.8	
	Older	*M (SD)*	34.58 (7.15)	-5.46***	39.72 (6.80)	-3.57**
		Norm	43.54		45.44	
Joint writing	Younger	*M (SD)*	26.27 (7.91)	-3.01**	33.50 (6.77)	-1.69
		Norm	32.42		36.8	
	Older	*M (SD)*	30.05 (8.11)	-7.80***	34.36 (6.28)	-8.29***
		Norm	43.54		45.44	

Table 7

Comparing Younger Children's Posttests to Older Children's Pretests

	Joint reading *M (SD)* *N* =37		Joint writing *M (SD)* *N* = 34		ANOVA	
Variable	Younger *N* = 22	Older *N* = 15	Younger *N* = 18	Older *N* = 16	*F* (Age)	*F* (Age X Program)
Alliteration	57.42 (17.27)	55.33 (18.07)	74.53 (18.47)	54.38 (13.65)	7.56**	5.01*
Rhyming	63.18 (21.02)	62.67 (21.20)	82.11 (15.12)	54.38 (18.61)	9.60**	8.91**
Word writing	33.05 (22.46)	50.69 (16.94)	48.55 (31.97)	39.52 (17.93)	0.59	5.63*
Letter knowledge	10.23 (18.35)	15.18 (21.47)	65.28 (21.25)	12.50 (19.90)	24.09***	35.09***
Orthographic awareness	59.09 (22.23)	66.67 (28.45)	74.44 (20.21)	50.63 (17.31)	2.23	8.33**
Listening comprehension	77.92 (25.98)	76.53 (22.14)	76.98 (23.57)	62.50 (25.49)	1.78	1.21
Receptive vocabulary (PPVT)	68.18 (10.08)	64.73 (10.93)	61.11 (13.20)	56.25 (11.20)	2.33	0.07
General knowledge (WPPSI)	68.53 (24.31)	65.93 (18.53)	75.64 (14.27)	64.90 (19.66)	1.91	0.71

Note. In November 2001, younger children were < 47 mo. and older children were > 47 mo.

*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$