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A JOINT INTERACTIVE STORYBOOK INTERVENTION PROGRAM FOR PRESCHOOL AND KINDERGARTEN CHILDREN

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The effectiveness of a joint interactive storybook reading program delivered by class teachers to develop literacy skills is examined in Hebrew-speaking preschool and kindergarten children. Post-intervention, both groups achieved significantly higher gains in language and print concept skills than age-matched comparison groups that did not have the intervention. However, motivation to read improved significantly more in the experimental group than the comparison group in kindergarteners. Results suggest that intervention program using stories and embedded activities can enhance language and print concepts in young children. Also, motivation to read should be part of every intervention program aimed at enhancing literacy skills.

Experience with high-quality language and literacy programs has proven important for the development of language and literacy skills in young children (Aram & Biron, 2004; Dickinson & Neuman, 2006; Kaminski, Powell-Smith, Hommel, McMahon, & Aguayo, 2014; Lonigan, 2015; Wasik & Hindman, 2011). High-quality early childhood education programs can have significant and positive impacts on the academic achievements of children at risk for later academic difficulties (Hutchinson & Clegg 2011; Justice, Meier, & Walpole, 2005; Lonigan, 2015; Nielsen & Friesen 2012), as well as of the general population of children (National Early Literacy Panel, 2008). Numerous research studies have shown that small-group intervention programs delivered to preschoolers and kindergarteners lead to improvement in numerous aspects of language and meta-cognitive abilities (Nicholson &

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Ng, 2006; Simmons et al., 2008), as well as in orthographic knowledge (Bailet, Repper, Murphy, Piasta, & Zettler-Greeley, 2013; Hilbert & Eis, 2014; Justice, Chow, Capellini, Flanigan, & Colton, 2003; Lefebvre, Trudeau, & Sutton, 2011; Ziolkowski & Goldstein, 2008). This is true even when the interventions are of relatively short duration. An early literacy intervention program may also enhance children's motivation to read, which might encourage them to read in the future (Wang & Guthrie, 2004; Wigfield & Guthrie, 1997). Yet contrary to the large number of studies documenting the importance of early literacy programs, less attention is paid to the appropriate age of intervention (Aram & Biron, 2004; Levin & Aram, 2012) and motivation to read. This study examined changes in language and literacy skills and motivation to read in preschool and kindergarten children following an intervention program designed to improve language and literacy skills.

Joint Interactive Book Reading as a Platform for Intervention

Joint interactive book reading has been identified as an important activity in developing children's literacy skills (Dickinson & Tabors, 2001; Wasik & Hindman, 2011; Wolf, 2008). Children regularly exposed to stories and to rich and complex language proved more likely to develop their vocabulary than children who are exposed to a poor literate environment (Biemiller, 2001, 2006; Gonzalez et al., 2014; Wolf, 2008), and their awareness of word structures and forms (Carlisle, 2010; McBride-Chang et al., 2008; Nagy, Carlisle & Goodwin, 2014; Perfetti, 2007) and print (Lefebvre et al., 2011; Wasik & Hindman, 2011). But joint story reading by itself is not enough to develop literacy skills: the type of instruction and the accompanying activities are also important (González et al., 2014). For instance, providing explicit instruction upon multiple exposures to a word in various forms can substantially affect learning it and its use (Biemiller & Boote, 2006; Coyne, McCoach, Loftus, Zipoli & Kapp, 2009; González et al., 2014; Lefebvre et al., 2011; Loftus, Coyne, McCoach, Zipoli, & Pullen, 2010). Using books to demonstrate conventions of print, such as direction of reading or the distinction between a word

and a sentence (Wasik & Hindman, 2011), is another activity appropriate for joint reading.

Stories can also be a useful tool to expose children to oral language as well, and to promote different aspects of children's literacy. Lefebvre et al. (2011) found that storybook reading intervention programs using explicit facilitation strategies can enhance vocabulary and print awareness among young children (mean age 4.7 years) of low income status. Likewise, Zucker, Cabell, Justice, Pentimonti, and Kaderavek (2013) found that the frequency of shared classroom reading was positively and significantly related to young children's (mean age 4.3 years) receptive vocabulary growth, as was the inclusion of extra-textual conversations around the text. Hargrave and Sénéchal (2000) found that preschool children (mean age 4.1 years) with poor expressive vocabulary skills made significantly larger gains in vocabulary in active shared book-reading situations and in a standardized expressive vocabulary assessment than children in a regular (more passive) book-reading situation.

In a similar way, stories have also been used to cultivate metacognitive skills such as phonological awareness. Ziolkowski and Goldstein (2008) found that preschool children of low-income background with language delays improved phonological awareness and showed better alliteration and initial sound fluency skills following a short (13-week) phonological awareness program embedded within repeated shared book reading.

Lately, more comprehensive programs targeted language, phonological awareness, and alphabetic skills in Hebrew and other languages. Aram and Biron (2004) compared the effectiveness of two long intervention programs (33 weeks): One used children's books to focus on language and explore major concepts raised by them, the other focused on letter knowledge, phonological awareness, and functional writing activities. Preschoolers aged 3–5 of low socio-economic background in both literacy programs performed significantly better than a control group (no intervention) on phonological awareness and orthographic awareness, and both improved their vocabulary, general competencies of language, and listening comprehension. Also, 3/4-year-olds gained as much from literacy programs as 4/5-year-olds on all the measures assessed in the program. In a later study by Aram (2006), 3/5-year-old children in three literacy programs (25 weeks)—storybook

reading, alphabetic skills, and a combination of the two—performed better than the control group on name writing, letter knowledge, and phonological awareness. There were no differences in the progress of younger vs. older children except on receptive vocabulary, in which the younger surpassed the older in all programs. The alphabetic skills group performed better than the other groups on word writing, letter knowledge, and initial letter retrieval, whereas the storybook reading group outperformed only the control group. Those in the combined program performed better on initial letter retrieval and book vocabulary than those in the storybook reading program. Lefebvre et al. (2011) found that a short storybook reading intervention program (10 weeks) using explicit facilitation strategies enhanced vocabulary, print awareness, and phonological awareness in low-income preschoolers.

Hilbert and Eis (2014) reported similar results with an early literacy intervention program (about 25 weeks) in regular education, which assessed the development of preschool children's (age 4–5.4 years) early literacy skills. The program was built around the reading of one of the storybooks in the regular curriculum and included activities for the teacher to complete before, during, and after reading the stories to the participants. The activities were related to print knowledge, vocabulary, phonological awareness, and narrative. The results indicated that at least in terms of emergent literacy skills, children at risk for literacy skill development can close the gap prior to the beginning of formal reading instruction. The intervention group showed significant increase in picture naming, vocabulary, and print knowledge.

Most of the intervention programs in studies to date were designed to encourage different parameters of language and early literacy skills, and only a few included morphological awareness (Apel & Diehm, 2014; Sénéchal, Pagan, Lever, & Ouellette, 2008). Researchers have recently shown increasing interest in cultivating morphological awareness among young children (Apel & Diehm, 2014; Carlisle, 1995; McBride-Chang et al., 2008), although most of them did not use joint book reading as the basis for intervention. According to these studies, morphological awareness is important in predicting and fostering children's early vocabulary learning (McBride-Chang et al., 2008) and reading acquisition (Apel & Diehm, 2014; Carlisle, 1995; Nagy et al., 2014) and is related to joint storybook reading (Sénéchal et al.,

2008). In another recent study, morphological intervention programs conducted among preschoolers and first and second graders produced heightened morphological awareness, which usually leads to better reading skills (Apel & Diehm, 2014).

Another important aspect that has received little attention and may play a central role in literacy development and children's readiness of to participate in intervention programs is motivation to read (Marinak, Malloy, Gambrell & Mazzoni, 2015). Children engage in reading activities for a variety of reasons, which can influence their reading performance (Guthrie et al., 1996; Malloy, Marinak & Gambrell, 2010; Wigfield, 1997). Some read for intrinsically motivated reasons such as their personal enjoyment, to master new material because of interest and curiosity in a subject area, or because they value reading. Others read in order to fulfill assignments or to achieve rewards or grades, thus engaging in reading for extrinsically motivated reasons (Baker & Wigfield, 1999; Ryan & Deci, 2000). Although children can be motivated for both intrinsic and extrinsic reasons, researchers suggest that intrinsic motivation is more beneficial to long-term learning (Marinak et al., 2015). Research suggests that young children who enjoy reading choose to engage in literacy tasks more often than children who do not, with the result that motivated readers become more highly skilled readers (Morgan & Fuchs, 2007), even in first grade (Wilson & Trainin, 2007).

Intrinsic reading motivation mainly comprises three subfactors in young children: (a) self-concept as reader or as having reading self-efficacy, which is the student's perception of his or her own skill as a reader; (b) the value of reading; (c) literacy out loud, which is the extent to which a student enjoys and is involved in situations of reading out loud. Children who think of themselves as "good readers" and value reading tend to participate and fully engage in reading tasks such as reading out loud (Marinak et al., 2015). Developing intrinsic reading motivation very early plays a central role in children's literacy development and in their engagement in reading activities later on at elementary school (Marinak et al., 2015; Mata, 2011). Without attention to reading motivation, some students may never reach their full literacy potential (Gambrell, 1996), and early literature-based programs may foster students' enthusiasm for books (Strickland, 2001). This is more likely to occur when the literature activities

are enjoyable (Morrow & Weinstein, 1986; Wigfield, 1997, 2010). Hence it is important not only to examine children's achievements after participating in a literacy intervention program but also to examine their intrinsic motivation to read or participate in literacy activities. Clearly, much remains to be explored concerning the relation of literature-based programs to literacy motivation (Strickland, 2001), especially in young preschool and kindergarten children (Marinak et al., 2015; Mata, 2011).

The Current Study

In spite of the importance of joint interactive storybook reading, more attention is devoted in the last decade to learning the letter names, letter-sound correspondence, and letters writing (See Israeli National Early Literacy Program [INELP], 2008). Kindergarten teachers might feel pressured to prepare the children academically for learning to read fluently in first grade and, as a consequence, might choose activities that are more didactical in nature, leaving very little room for joint interactive storybook reading and enjoyable literate activities. The danger in following this path lies in the possibility that children may develop resistance to reading acquisition. In this study, we wish to show that academic content related to reading can be taught to children following joint interactive storybook reading and enjoyable activities in their home class.

More specifically, the present study was undertaken to determine whether a short (nine week) joint interactive storybook reading intervention program emphasizing language and print concept skills delivered by homeroom teachers to Hebrew-speaking preschool and kindergarten children improved their language and print concept skills and contributed to their motivation to read. Our study included the following previously unexamined aspects of intervention studies conducted in Hebrew and in other languages:

1. Comparison of the impact of the intervention in two age groups: performance in language and print concepts following participation in an intervention program based on storybooks was assessed in preschool and kindergarten children.

Mol, Bus, de Jong, and Smeets (2008) found in their meta-analysis that 4/5-year-old children acquired less vocabulary from interactive reading than 2/3-year-old children. The researchers postulated that older children depend less on interactive reading because they are better able to process the story and ask questions for clarification. In line with this argument, Whitehurst et al. (1988) suggested that younger children (Age 3–4) are at a more sensitive period for verbal development, thereby benefit more from literacy programs that focus on language. Accordingly, we compared preschoolers (Age 4–5) with kindergarteners (Age 5–6).

2. Targeting a normal population and not one at risk: most studies to date have focused on children at risk in developing literacy skills. Hence information is sparse on the effectiveness of these programs in a more general population of children (Marr, Algozzine, Algozzine, & Helf, 2012; National Joint Committee on Learning Disabilities, 2005; Nicholson & Ng, 2006).
3. Cultivation of morphological awareness: Sénéchal et al. (2008) found that shared reading accounted for unique variance in children's morphological knowledge after controlling for child nonverbal intelligence, parent education, and parent literacy (i.e., book exposure). Accordingly, our intervention program included morphological awareness.
4. Delivery by the homeroom teacher: Our intervention program was delivered to a general population of children by the preschool teacher and the kindergarten teacher, both part of the children's natural environment and able to continue to implement the program after the research was completed. This is in contrast to most studies to date, which were administered by researchers or researcher assistants (Nicholson & Ng, 2006).
5. Exploration of intrinsic motivation to read (self-concept as a reader, the value of reading, and literacy out loud): A decline in motivation to read can harm children's willingness to participate in literacy activities (Marinak et al., 2015; Mata, 2011), which underscores the importance of ensuring that intervention programs do not harm children's motivation to read. Accordingly, children's intrinsic motivation to engage in reading activities was evaluated after completion of the intervention.

Research Questions and Hypotheses

In accordance with the foregoing, we asked the following research questions: (a) To what extent do children who participate in the intervention program improve their language and print concept skills as compared with the comparison group? We hypothesized that teachers' talk and activities targeting vocabulary, morphological awareness, and print concept input after reading will benefit these intervention-group children in their word learning more than the comparison-group children, who were only exposed to the stories with no targeted activities; (b) Would the preschool children gain as much from language and print concept interventions as older children in kindergarten? Based on previous research in Hebrew (Aram & Biron, 2004) and on the fact the intervention program was age matched, we hypothesized that the two age groups will gain similarly from the intervention program; (c) To what extent would the intervention-group children improve their motivation to read as compared with the comparison group? Considering the high motivation to read observed among young children (Mata, 2011), we hypothesized that both groups will show high motivation to read, but motivation in the intervention group will be higher than in the comparison group due to the enjoyable activities they experienced and their gain in knowledge in language and print concepts; (c) Does reading motivation before the intervention program predict language and print concepts skills after the program? Motivated children tend to be involved and engage more in literacy activities, therefore have better chances to improve their literacy knowledge and vice versa (Marinak et al., 2015). Accordingly, we posit that pre-intervention motivation will predict children's achievements in language and print concepts at the end of the intervention.

Method

Study Design

The study used a quasi-experimental pre-post design consisting of an intervention group (IG) and a comparison group (CG). The IG was preschoolers and kindergarten children who

participated in a storybook reading intervention program that specifically targeted language (vocabulary and morphology) and print concept skills. The CG was preschoolers and kindergarten children who received the standard literacy and language programs used in preschools and kindergarten in Israel. Schools were randomly assigned as CG or IG for each grade level. Because each group came from two different classes (preschool and kindergarten), assignment was based on classes and not on individual participants. This procedure kept the classes intact in order to increase the results' external validity.

The IG consisted of preschool and kindergarten participants in the intervention program, which explicitly targeted vocabulary, morphological awareness, and print concepts based on shared reading. The CG consisted of preschool and kindergarten children who were exposed to the same shared story reading but without any special instructions for the subsequent activities.

Participants

Sixty preschool and kindergarten children participated in the study: 31 in the IG (15 preschool and 16 kindergarten children), and 29 in the CG (15 preschool and 14 kindergarten children). There were 16 girls and 14 boys in each of the preschool groups ($n = 30$, M = 4.20 years, SD = 0.48) and kindergarten groups ($n = 30$, M = 5.24 years, SD = 0.41). The children attended two different preschools and two different kindergartens in northern Israel (where preschool is designated for children aged 4 to 5 years). With parental approval, they were assessed at two time points: in January–February 2015 (Time 1), and four months later, after the intervention, in May–June 2015 (Time 2). The children were all native Hebrew speakers, had no known language or developmental problems, and were recruited from four towns in northern Israel. According to the *Statistical Abstract of Israel* (Central Bureau of Statistics, 2014), residents of these towns are mainly of middle SES. Children are assigned to a specific preschool or kindergarten according to their home address, so all children in the same neighborhood attend the same preschool or kindergarten, usually without the opportunity to choose differently. Each preschool or kindergarten is an independent unit

and located in a different town. The educational program in both preschools and kindergartens mainly focus on holidays, seasons of the year, nature, friendships, and emotional development. In addition, all preschools and kindergartens expose the children to activities involving reading and writing, such as listening to stories, copying words, writing their names, identifying their friends' names, and phonological awareness activities in the level of syllables as rhymes, word analysis, and first syllable isolation. Formal practice in reading or writing is not customary.

The preschool and kindergarten teachers were all M.Ed. students and participated in the Ministry of Education program on early literacy and interactive shared book reading. Thus, all children were exposed to shared book reading, but the IG group had a more structured program involving different literacy aspects; this are presented in the intervention section later.

Materials

Language parameters and print concepts were chosen for the intervention because they are considered good predictors of reading acquisition (National Early Literacy Panel, 2008). Most assessments were based on Shatil (2002), a battery of tests of language and literacy abilities in Hebrew-speaking children. It was constructed on a sample of 349 children to identify those at risk for literacy difficulties. We based our vocabulary assessment on the target words from Shatil's language test. Criterion-referenced assessments rather than norm-referenced assessments were chosen as the measure of vocabulary because they are more appropriate for monitoring progress in specific areas (McCauley & Swisher, 1984).

Professionals are showing increasing interest in intervention strategies that reliably represent children's abilities to use language within developmentally appropriate and naturalistic contexts (Justice, Bowles, Pence, & Gosse, 2010). Accordingly, our entire procedure was presented individually to each child by his/her preschool or kindergarten teacher, using oral and social games that resemble the everyday life of children learning in preschool and kindergarten. The instruments are available from the first two authors.

Language Measures

VOCABULARY

A receptive vocabulary instrument, similar to those developed in other studies on vocabulary acquisition from storybooks (e.g. Lefebvre et al., 2011), was designed to measure the knowledge of three kinds of vocabulary targeted by the intervention: phrases (six); rare words (including nouns [four], verbs [four], and adjectives [six]). All the words were important for understanding the story and were evenly spread throughout the stories but were considered rare words for preschool and kindergarten children according to the IG and CG teachers. The child was orally presented with a target word and then immediately with three possible answers (correct, the opposite, wrong) in the form of pictures or verbal explanations, according to the nature of the target word. Thus concrete nouns (e.g., wheelbarrow) were presented by pictures, and abstract words (e.g., agile, daring) by verbal explanations. The child was then asked to choose among the three possible answers, and the teacher recorded the choice. Performance was scored as the number of correct answers. The maximum score was 20; the score was transformed into a percentage. The assessment yielded medium reliability, Cronbach's alpha coefficient $\alpha = 0.62$.

MORPHOLOGY

Three tasks were designed to assess the children's ability in different dimensions of the Hebrew inflection morphological rules: *inflection of verbs in future tense*, *inflection of irregular plural noun*, and *possessive inflection*. In the first, the child was asked to inflect 12 verbs from the present tense to the future tense (e.g., *hayom ani holech,* "*today I'm going*"; *machar ani*... ***elech***, "*tomorrow I'll go*"). In the second task, the child was asked to inflect 12 nouns in masculine or feminine plural. All noun inflections were irregular, such that their suffixation was not according to the grammatical rules: e.g., the feminine noun "egg" gets a masculine suffix: *beytza achat,* "one egg"; *harbe*... ***beytzim***, "many eggs." In the third task, the child was asked to inflect six nouns according to two grammatical persons: *my* and *his/her*, according to his/her gender (e.g., *Haregel sheli bemila achat*... ***ragli***, "'My foot' spoken as one word is '...'").

Each task began with two practice items in random order. The child was given each task in the form of a social game, where he or she had to win cards to finish the game; performance was scored as the number of correct answers. The maximum score was 30, and the score was transformed into a percentage. The assessment yielded medium reliability, Cronbach alpha coefficient $\alpha = 0.66$.

PRINT CONCEPTS

Wohl's Hebrew version of the Clay test from the Shatil (2002) battery, assessed five concepts of print: (a) print and picture differentiation (three questions), (b) letters and symbols differentiation (five questions), (c) onset of reading (three questions), (d) print directionality (two questions), and (e) written language units (letter, sentence and paragraph) (five questions)). Based on this, in our program, each child was given a piece of paper with five rows, each containing a different task to be completed on the paper using a whiteboard marker (e.g., circle the first letter in each word). Performance was scored as the number of correct answers. Maximum score was 18; the score was transformed into percentage. The assessment yielded reliability: Cronbach's alpha coefficient $\alpha = 0.81$.

MOTIVATION TO READ

The children's motivation to read was assessed by the Me and My Reading Profile (MMRP) (Marinak et al., 2015), a program designed for use by teachers from preschool through second grade. This 20-item multiple-choice instrument comprises three subscales: (1) five items to assess the child's self-concept as a reader; (2) ten items to assess the child's appreciation of the value of reading; (3) five items to assess literacy out loud. Two practice items acquainted the child with the format of the instrument. The Likert response scale on the MMRP consists of three choices, from one (most positive) to three (least positive). In addition, rather than numbering the items, each item was paired with an animal icon, and the teacher guided the children from item to item by placing their finger on the icon in the left-hand column as she read the MMRP aloud. Cronbach reliability analyses indicated scale alphas from 0.86 to 0.87, with all items

contributing to the overall scale reliability. The assessment yielded a high reliability Cronbach alpha coefficient ($\alpha = 0.88$). Performance was calculated according to the child's responses to all twenty sentences; the maximum score was 60.

Procedures

ASSESSMENTS

This battery contained vocabulary, morphological awareness, print concepts, and motivation to read, and was administered to all participants by three qualified research assistants, who were M.A. teachers. The test was executed one to three weeks prior to the intervention program and then again a week after the end of the program. Each child was assessed individually in two sessions of approximately 20 minutes each in a quiet corner of the preschool or kindergarten. The assessments were presented in random order.

INTERVENTION

The intervention program (see example in the Appendix) was planned by the authors of the present study, and was delivered to the children in their respective childcare center classrooms by their teachers. Prior to the intervention, all teachers who participated in the study (IG and CG) attended seven sessions (90 minutes each) of a college course entitled Emergent Literacy, a requirement for M.Ed. students. The course deals with concepts and research findings related to the following emergent literacy skills and predictors of reading acquisition: morphological awareness, print concepts, alphabetic knowledge, vocabulary growth, developmental of narrative abilities, joint story reading, and adult/child discourse. After the course ended, the IG teachers met with one of the authors for four 30-minute sessions to prepare the intervention's delivery and its games and activities. Three more meetings were held during the program, as well as a final summary/debriefing meeting when the program was completed.

The program was based on three books recommended for young children by the Israeli Ministry of Education that met the following criteria: (a) suitability for the participant children's

age range, (b) inclusion of potentially new vocabulary, (c) containing a variety of sentence types including complex sentences, (d) containing complex morphological forms suitable for children at kindergarten and preschool, (e) not excessively long, thus allowing more teacher-child interactions, and (f) not previously used in the children's preschools, kindergartens and homes. The same books were used for both IG and CG.

In the IG, each of the three books was read by each teacher three times to three random groups of four to six children each. This allowed each child to participate in a total of nine sessions (spread over about two months) and to be in the same group for all nine sessions. Each lasted around 30 minutes, beginning with a joint interactive reading of the book followed by one or two related activities. The joint interactive reading strategies actively engaged the child in the storybook reading sessions through completion, recall, and open-ended WH-questions and distancing questions. This encouraged thinking beyond the book's content by making inferences about the characters' feelings, connecting the story's content to their background knowledge, giving explanations, resolving problems, and making predictions. The teachers verbally evaluated and expanded the child's response and repeated the initial question at a later point in the session to verify the new learning (Lefebvre et al., 2011; Whitehurst et al., 1988). Thus, each session contained conversation about the books that were read to the children, during which they were encouraged to ask questions and express their opinions.

In each session, before or after the storybook reading, the teachers highlighted language (vocabulary and morphology) and print concept skills through different games and activities, and encouraged the children to engage in reading activities. Vocabulary activities were conducted in the first reading session of each book for a better understanding of it and its story. The vocabulary facilitation activities targeted some six or seven words in each story, each chosen for its importance in understanding the story, even though the children were not very familiar with it. The teacher explained the words with a definition, synonym, or an opposite word (e.g., "awake is the opposite of asleep"; "treetop is the highest part of the tree"), showing a picture of the word or the object of the word, and/or miming the word (e.g., to sigh

and to be astonished), and then involved the children in a game (e.g., memory or a domino game) that contained those words. The teachers exposed and used those words in isolation and in sentences at least five times in order to help the children remember them.

Since vocabulary has a reciprocal relation with morphological awareness and, apparently, since students who show rapid growth of vocabulary knowledge demonstrate rapid growth in morphological awareness (Bowers & Kirby, 2010; Kieffer & Lesaux, 2012; Ramirez, Walton, & Roberts, 2014), morphology was the main goal of the second session of each book. In each story, the teachers used a different game that targeted one of the three inflection types—future tense, irregular plural noun, and possessive. The words for each game (around 12 words) were chosen from all three storybooks. The teachers exposed the children to each inflection type and then encouraged them to play a card-sorting game that involved that inflection.

The print concepts activities were conducted during the third session of each book and targeted eight print awareness concepts: book cover, book title, author and illustrator, print and picture differentiation, onset of reading, print directionality, written language units (letter, sentence and paragraph), and letters of the alphabet. The teachers gave explicit verbal and non-verbal cues and explanations for those print concepts (e.g., the teacher showed the book cover to the children and asked them to point to the name of the book, and to name one of the letters that appears in it). Then, the teacher used games (e.g., bingo) and songs to practice those concepts.

In the CG, the teacher read the books to the children during the morning meetings, in which all children attended as one group. These meetings, guided by the teacher, appear every day on a regular basis to conduct a social group of all the children in order to discuss subjects and stories that are of interest for the children. Each story was read three times, once a week, during three sequential weeks. The content of the other five morning meetings in each week was different and included conversations about different subjects of interest as weather, children's experiences, and holidays.

Results

The results are divided into three sections. The first section analyzes the pre-intervention differences between the two age groups (preschool and kindergarten). The second section covers the improvement in language (vocabulary and morphological awareness) and print concepts as well as in motivation to read in the two age groups (preschool and kindergarten) compared with their matching comparison groups. The third section depicts the prediction of post-intervention language and print concepts scores by pre-intervention reading motivation scores in the two age groups.

Pre-Intervention: Assessment of Language, Print Concepts and Motivation to Read across Age Groups

Since different numbers of stimuli were used in each of the language and print concept measures, all the scores were transformed to percentages. Prior to intervention, no significant differences were found between IG and CG, as determined by a series of t-tests. Significant differences were found by age group (preschool-kindergarten), likewise determined by a series of t-tests (Table 1). Motivation to read tended to be higher in preschool children than in kindergarten children, whereas the reverse tended to be the case regarding vocabulary and morphological awareness. Pre-intervention gender differences were all non-significant. In light of these pre-intervention differences, the research hypotheses were examined with adjusted residual gains of the change scores, controlling for the initial differences by age group. Group (experimental-comparison) by age group (kindergarten-preschool) analyses of variance (2×2) were conducted.

Treatment Effects: Comparison of the Progress of Preschool and Kindergarten Children in Language, Print Concepts and Motivation to Read

Table 2 presents the means and standard deviations for the study variables (pre-, post-, and gain scores) by group, time, and age

TABLE 1 Means, Standard Deviations and t-Tests for Pre-Intervention Differences by Age Group ($n = 60$)

	PreschoolM (SD) ($n = 30$)	Kindergarten M (SD) ($n = 30$)	*T*
Vocabulary	31.21 (17.00)	68.33 (12.26)	$t(58) = 9.70^{***}$
Morphological awareness	44.63 (20.91)	60.19 (15.72)	$t(58) = 3.07^{**}$
Print concepts	77.89 (12.77)	77.04 (15.21)	$t(58) = 0.24$
Motivation to read	2.32 (0.31)	2.11 (0.37)	$t(58) = -2.48^{*}$

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

group. The residual gain scores were computed from regression analyses, controlling for differences in the pre-intervention scores. Thus, they do not represent raw change scores. Group and age group differences were examined with these gain scores, in a series of analyses of variance (Table 3). Post hoc analyses for the significant interactions were examined with estimated marginal means (Table 3).

The results revealed a significant group difference in vocabulary, morphological awareness, and print concept variables, while the group-by-age group interactions were non-significant. Thus, the increase in the experimental group was significantly greater than in the comparison group, beyond age group. In addition, the two age groups in the experimental group showed similar gains in vocabulary, morphological awareness, and print concepts. However, a significant group-by-age group interaction was found for motivation to read: the gain in the kindergarten experimental group was significantly greater than in the kindergarten comparison group. No difference was found in the change between the preschool experimental and comparison groups.

Prediction: Reading Motivation as a Predictor of Post-Intervention Achievement in Both Age Groups

Table 4 summarizes the relationships between reading motivation and language and print concept skills by age group and time. All correlations for preschool children were non-significant, while all correlations for kindergarten children were positive and significant. In other words, in kindergarten, higher

TABLE 2 Means and Standard Deviations for the Study Variables by Group, Time, and Age Group ($n = 60$)

	Preschool						Kindergarten					
	Experiment ($n = 15$)			Comparison ($n = 15$)			Experiment ($n = 15$)			Comparison ($n = 15$)		
	Pre *M* (*SD*)	Post *M* (*SD*)	Gain *M* (*SD*)	Pre *M* (*SD*)	Post *M* (*SD*)	Gain *M* (*SD*)	Pre *M* (*SD*)	Post *M* (*SD*)	Gain *M* (*SD*)	Pre *M* (*SD*)	Post *M* (*SD*)	Gain *M* (*SD*)
Vocabulary	25.85 (12.39)	65.63 (24.11)	0.53 (1.35)	37.34 (19.79)	54.22 (23.62)	−0.59 (1.01)	66.97 (8.14)	90.00 (7.33)	0.41 (0.30)	69.70 (15.53)	77.88 (14.15)	−0.42 (0.33)
Morphological Awareness	48.96 (28.27)	67.71 (16.51)	0.20 (0.81)	39.68 (14.10)	44.84 (21.29)	−0.90 (1.33)	60.37 (14.22)	82.96 (8.26)	0.67 (0.45)	60.00 (17.59)	72.22 (17.94)	−0.05 (0.51)
Print concepts	77.30 (10.82)	89.14 (13.52)	0.47 (0.97)	78.57 (15.10)	75.94 (11.63)	−0.55 (0.94)	70.37 (17.02)	84.81 (14.16)	0.32 (0.75)	83.70 (9.73)	80.74 (14.22)	−0.31 (0.99)
Motivation to read	2.35 (0.27)	2.45 (0.39)	−0.44 (1.17)	2.29 (0.36)	2.62 (0.31)	0.11 (1.08)	2.11 (0.40)	2.71 (0.28)	0.73 (0.41)	2.10 (0.34)	2.44 (0.22)	−0.22 (0.39)

TABLE 3 *F* Values for Significant Effects and Interaction Effects by Group and Age Group ($n = 60$)

	Group	Group x age group	Interaction effects	
			Preschool	Kindergarten
	$F(1, 56)$ (η^2)	$F(1, 56)$ (η^2)	$F(1, 56)$ (η^2)	$F(1, 56)$ (η^2)
Vocabulary	18.33*** (0.247)	0.41 (0.007)	–	–
Morphological Awareness	17.75*** (0.241)	0.77 (0.014)	–	–
Print concepts	12.10*** (0.178)	0.67 (0.012)	–	–
Motivation to read	0.83 (0.015)	11.77** (0.176)	3.12 (0.054)	9.59** (0.149)

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

motivation to read was related to higher scores for vocabulary, morphological awareness, and print concepts, at each time point; that is, the greater the increase in motivation to read in kindergarten, the greater the increase in language and print concept skills.

Finally, multiple hierarchical regressions were conducted to examine the extent pre-intervention reading motivation predicted post-intervention language and print concept skills. Age group and intervention group were entered as control variables at Step 1, and pre-intervention reading motivation at Step 2 (Table 5). Pre-intervention reading motivation was found

TABLE 4 Correlations Between Reading Motivation and Language and Print Concept Skills, by Age Group and Time (Pre-Intervention [T1] and Post-Intervention [T2]) ($n = 60$)

	Motivation to Read					
	Preschool ($n = 30$)			Kindergarten ($n = 30$)		
	T1	T2	Gain	T1	T2	Gain
Vocabulary	0.02	0.16	−0.06	0.47^{**}	0.61^{***}	0.74^{***}
Morphological awareness	0.21	0.28	−0.14	0.44^{*}	0.54^{**}	0.52^{***}
Print concepts	0.05	0.09	−0.12	0.50^{**}	0.71^{***}	0.51^{**}

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

TABLE 5 Multiple Regressions Predicting Post-Intervention Language and Print Concepts with Pre-Intervention Reading Motivation ($n = 60$)

	Vocabulary β	Morphological awareness β	Print concepts β
Age group	0.61^{***}	0.61^{***}	0.16
Intervention group	0.25	0.38^{***}	0.28
Motivation to read	0.24	0.34	0.52^{***}
Adj. R^2	0.37	0.47	0.30
$F(3, 56)$	12.56^{***}	18.80^{***}	10.08^{***}

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

predictive of post-intervention language and print concept skills, beyond age group and intervention group. Higher initial reading motivation was predictive of higher vocabulary, morphological awareness, and print concepts, beyond age group and intervention group. Two-way interactions (age group by pre-intervention reading motivation and intervention group by pre-intervention reading motivation) and a three-way interaction (age group by intervention group by pre-intervention reading motivation) were non-significant.

Discussion

The first question asked in our study concerned the extent the intervention group participants improved their language and print concept skills as against the comparison group. The nine-week intervention program, replete with stories, games, and oral activities, yielded significant improvements in vocabulary, morphological awareness, and print concept skills in preschool and kindergarten children alike. While both IG and CG raised their achievements over time on most measures, IG children evinced significantly greater improvement in vocabulary, morphology, and print concepts than corresponding CG children.

The results are in line with other storybook intervention studies conducted in Hebrew for the same or similar purposes (Aram, 2006; Aram & Biron, 2004; Cohen-Mimran, Reznik-Nevet & Korona-Gaon, 2016) and in other languages (e.g., González et al., 2014; Hilbert & Eis, 2014; Lefebvre et al., 2011). Vocabulary is one of the skills most affected by joint interactive storybook

intervention programs (Biemiller, 2001, 2006; González et al., 2014; Hargrave & Sénéchal, 2000; Wolf, 2008) and is also related to morphological awareness (Sénéchal et al., 2008). Increasing vocabulary knowledge (Wolf, 2008) and morphological awareness (Apel & Diehm, 2014; McBride-Chang et al., 2008) at these young ages proved effective even later for the development of reading abilities in elementary school students: written texts tend to use words with complicated morphology, and morphological knowledge correlates with vocabulary growth and the ability to understand and learn new words (Carlisle, 2010; Wolf, 2008). Following their participation in the intervention program, children in this study developed their morphological awareness more rapidly, as was the case in previous research (Apel & Diehm, 2014). Although most research on morphological awareness in young children has not used joint book reading as the basis for intervention, our results show that children's storybooks are particularly appropriate for developing these linguistic abilities at all ages but more especially at young ages. Our finding of improvement in print concepts following the intervention is also in line with previous outcomes (Lefebvre et al., 2011; Wasik & Hindman, 2011).

This study also demonstrated that a general population of children can benefit from an intervention program delivered in small groups, as was shown by Nicholson and Ng (2006), and not only selected groups such as children at risk (Coyne, Simmons, Kame'enui, & Stoolmiller, 2004; Justice et al., 2003; Schneider, Roth, & Ennemoser, 2000) and low-income children (Aram, 2006; Aram & Biron, 2004; Hilbert & Eis, 2014; Lefebvre et al., 2011; Ziolkowski & Goldstein, 2008).

The second question was whether preschool children will gain as much from a language and literacy intervention program as kindergarten children. Our preschool children improve their language and print concept skills just as much as our kindergarten children after the intervention. Both groups exhibited the same increase in vocabulary, morphological awareness, and print concepts. The impact of such an intervention may weaken as children reach a conventional reading level and are able to read independently (Bus, van IJzendoorn & Pellegrini, 1995). Accordingly, it is important to expose children to such intervention programs as early as possible in order to prevent later deficits in

language and literacy skills that can lead to later deficits in learning to read and write (Hirsch, 2006; Wolf, 2008). These results are in line with Aram and Biron's (2004), who found that children as young as 3–4 years gained as much from literacy programs as older children aged 4–5 years. In contrast, Mol et al. (2008) found that 4/5-year-old children gain less in vocabulary acquisition from interactive reading than 2/3-year-olds, a discrepancy due perhaps to the fact that the younger group in our study was closer in age to these researchers' older group. To sum up the results of the above studies, it is reasonable to suggest that literacy intervention programs should be embedded already in the preschool curriculum.

In contrast to the similar performance of the preschool and kindergarten children on the linguistic and literacy assessments, the two age groups scored differently on the motivation to read measure prior to intervention program. Unexpectedly, children at kindergarten achieved significantly lower scores in the motivation to read measure than preschool children in both IG and CG. Perhaps this can be explained by the fact that Hebrew-speaking children begin formal learning of reading and writing in first grade, but kindergarten teachers begin to engage them in early literacy activities as part of the curriculum. It is possible that at kindergarten these children began to feel the pressure of learning to read and write and reacted by being less motivated to engage in activities involving those skills and therefore reported less motivation to read. Children in preschool are clearly not expected to read or write, and this frees them to be enthusiastic about the new experience, which is seen as a rise in the motivation to read. The high scores in motivation to read are consistent with previous research conducted in young children (Mata, 2011).

The third question centered on the extent children who participated in the intervention program improved their motivation to read as compared with the comparison group. After the intervention program—and not wholly in line with our hypothesis—only the kindergarten children, and not the preschoolers, improved significantly in motivation to read. On this measure, the IG at kindergarten improved significantly more than the CG, an improvement we attribute to the joint-reading intervention program. We conclude from these findings that joint reading of

books, and playing games that entail written material in a pleasant and fun way, increases the kindergarten children's motivation to read.

Different results were obtained regarding the preschoolers, who gained similar scores in motivation to read pre- and post-intervention in both the IG and CG. Perhaps because the motivation to read was already relatively high in preschool before the intervention, the improvement that followed it was not significant. Another explanation for this lack of differences in motivation to read may be that the intervention program was not designed specifically for reading motivation but to cultivate literacy skills in an enjoyable manner. This might suggest that more attention should be paid to children's preference of stories and literacy activities to increase their reading motivation and their willingness to engage in reading activities (Marinak et al., 2015).

The fourth research question was whether reading motivation before the intervention program predicts language and print concept skills after it. The connections between language, literacy, and motivation to read were unexpected. The correlation between motivation to read and language and print concept skills at both time points (pre- and post-intervention) were significant at kindergarten but not at preschool. Thus, the motivation to read at preschool depends less on the children's achievements on different measures (morphological awareness, vocabulary, and print concepts), while at kindergarten, higher motivation to read is related to higher scores on language and print concepts as well as gains in morphological awareness, vocabulary, and print concepts. These results are in line with findings among elementary schoolchildren that the connection between motivation to read and reading achievements increases as the child gets older (Wigfield, 1997).

Furthermore, motivation to read turned out to be an important aspect of children's language and literacy skills. Thus, higher initial reading motivation was predictive of higher morphological awareness, vocabulary, and print concepts, beyond age group. Pre-intervention reading motivation predicted 24–34% of the variance in post-intervention language and literacy skills, beyond age group. These data dovetail with studies showing that high motivation to read is related to children's choice to engage in literacy tasks more often (Morgan & Fuchs, 2007), and motivated

readers are more likely to become skilled readers (Morgan & Fuchs, 2007; Wilson & Trainin, 2007).

An important aspect of the intervention program was its delivery by the children's teachers after undergoing training and not by an outside expert or research assistant. Every teacher can benefit from training in new strategies, such as shared reading with students (Kefeli & Bayraktar, 2014). Such training should include explanations of how to read the stories, keep the children's attention, increase their understanding of the story, and provide language and literacy activities for use during and after reading the book. In addition to providing familiar surroundings in which to facilitate children's emergent literacy, the training itself enriches the intervention with multiple strategies for developing language and print concept skills (Girolametto, Weitzman, Lefebvre, & Greenberg, 2007; Justice et al. 2010). Moreover, it is more likely that the children will actively participate in a program given by their teacher than by an outsider. Last but not least, an additional benefit of employing the kindergarten and preschool teachers is the likelihood that they will continue to educate children using the program for many more years, as opposed to an expert or research assistant who leaves the system after the end of the program (Aram, 2006).

Some important limitations of the study must be noted. First, in the present study only four classes participated: two preschools (IG and CG) and two kindergartens (IG and CG). As a result, generalizing the study results to other populations of preschools and kindergartens may be difficult. More research is needed across a broader range of populations in order to examine whether these findings hold for different preschools and kindergartens, languages, and orthographies. Secondly, the experimental and comparison groups were from different preschools and kindergartens, and the teachers were different. Although the intervention program was very detailed and should have been the same in both classes, it was conducted by different people. Thirdly, although the results are promising, longitudinal studies are needed to examine children's reading skills as an outcome of participating in the short intervention program at kindergarten and preschool. For now, it is unclear whether the effects of the program remain, or even increase, as the children get older. Fourthly, in the current study, teacher

and condition are confounded. It is recommended that future studies use several teachers per condition to enable a statistical solution of this limitation.

Regardless of these limitations, our findings on the contribution of a short joint interactive storybook intervention program to the development of preschool and kindergarten children's language and literacy skills and their motivation to read are quite noteworthy. The finding that motivation to read, which plays such an important part in the development of language and literacy skills, decreases from preschool to kindergarten argues strongly for introducing intervention programs into the curriculum at the youngest age possible, before the connection between language and literacy skills and motivation is established in the children's perceptions. Higher motivation in preschool might increase the overall reading motivation and potentially offset the decline in kindergarten. The findings of this study also point to the benefits of early intervention programs for normative populations of school children and not just those who enter preschool with reading difficulties or poor literacy skills. All children can benefit from the strategies of intervention programs like the one described here.

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Appendix

Content of the Nine Shared Story Sessions

The following storybooks were used in the intervention programs: *The Elephant Wanted to be the Best* (Kor, 1993), *BrownStripe* (Cohen-Asif, 1980), and *The Gruffalo* (Donaldson, 2000).

Table: Examples of joint activities followed the story: *The Elephant Wanted to be the Best*

	Time of delivery	Examples
Vocabulary	Before the shared reading	T: Look at the picture, what do you think the word "trunk" means? T: The "trunk" is the nose of the elephant. T: I want to show you how I look when I'm "impressed" (the teacher acts out the word "impressed").
	After the shared reading	T: Why do you think the elephant felt "lonely"? T: I'll show you four pictures. When I pronounce the word "dandy" please point to the picture that describes the word. T: I'll place on the table seven cards that represent the new words we've learned and I'll pronounce their words. Let's see if you can match the pictures to the target words.
Morphological awareness	Before the shared reading	T: The bird is painting the elephant blue now. Later she'll fly off to get the red paint. What is she going to do with the red paint? (She'll paint the elephant). T: The bird has a paintbrush, and the birds have many... (paintbrushes).
	After the shared reading	T: We're going to play a game with a ball. I'm going to roll the ball to you and to say a verb in the present tense. Then you'll roll the ball back to me and say the verb in the future tense. T: We're going to play a memory cards

(*Continued on next page*)

	Time of delivery	Examples
		game with objects in singular and plural. For example, the picture of "a color" matches the picture of "colors."
Print concepts	Before the shared reading	T: Who can tell me where the title of the book is? T: Very good. How about the author's name?
	After the shared reading	T: Can someone show me the first word in this page? T: How many words you can count in that page?