Enhancing language and print-concept skills by using interactive storybook reading in kindergarten

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Abstract  
The effectiveness of a short interactive storybook-reading intervention programme delivered by a kindergarten teacher to develop language and print-concept skills was examined in 30 Hebrew-speaking kindergarten children exhibiting different levels of emergent literacy skills. Post-intervention, the intervention group showed a clear advantage over a control group on most measures, including vocabulary, morphology, phonological awareness and print concepts. Pre-test motivation to read was predictive of post-test performance in these same language and print-concept skills. The study suggests that a short intervention programme, using stories and embedded activities, can enhance language and print concepts in kindergarten children; and that motivation to read is equally important in the development of their language and literacy abilities.

Keywords  
Language, print concepts, motivation to read, kindergarten, intervention, storybook reading

Exposing young children to initial literacy skills using a structured and graduated programme (Marr et al., 2012) has been found to help protect them from failure to learn to read (Nicholson, 2005), and to be effective when
applied prior to entry to school (Serry and Oberklaid, 2015). Research has shown that interactive storybook reading effectively develops young children’s literacy skills (Dickinson and Tabor, 2001; Wasik and Hindman, 2011; Wolf, 2008), enriching vocabulary (Biemiller, 2001, 2006; Gonzalez et al., 2014; Wolf, 2008), awareness of word structures (Carlisle, 2010; McBride-Chang et al., 2008; Nagy et al., 2014; Perfetti, 2007) and print concepts (Lefebvre et al., 2011; Wasik and Hindman, 2011). However, interactive storybook reading by itself is not sufficient to develop literacy skills and requires instruction, accompanying activities and motivation on the part of the children (Gibbs and Nicholson, 1999; González et al., 2014; Guthrie, 2004; Lepper et al., 2005; Morgan and Fuchs, 2007; Nicholson and Ng, 2006). Most specialists agree that the quality of instruction, especially in the early grades, can be a critical factor in children’s academic success thereafter (Darling-Hammond, 1999; Marr et al., 2012; McCutchen et al., 2002; Pollard-Durodola et al., 2015). Models of interactive storybook reading are based on the assumption that an adult’s instructional expertise expands children’s literacy skills and conversational abilities beyond what they accomplish independently (McCutchen et al., 2002; Pollard-Durodola et al., 2015). We set out to confirm this assumption in a study of interactive storybook telling delivered to native Hebrew-speaking kindergarten children with and without explicit instruction, playing games and engaging in other enjoyable activities. Other factors also found to contribute to successful interactive storytelling interventions that were included in the study are detailed below.

**Interactive storybook reading: Language and print-concept skills**

In interactive storybook reading, an adult reads a story aloud, explains its content and vocabulary and integrates open-ended questions in a cycle of feedback and confirmation. Such an activity has been shown to teach children about their world through active engagement in telling and discussing the story, its characters, events and vocabulary (Pollard-Durodola et al., 2015). Not surprisingly, then, interactive storybook reading is a common and essential tool in literacy intervention programmes aimed at cultivating language and print-concept skills in kindergarten as part of a general education programme.

Most intervention studies have focused on children at literacy risk, despite the findings that both high and low literate children can benefit from such a programme (Nicholson and Ng, 2006). Aram and Biron (2004) compared two programmes for 71 Hebrew speakers aged three to five years from low
socioeconomic backgrounds in 66 sessions (20–30 minutes each), involving games and creative activities: one used children’s books to focus on the language and concepts in them, the other used letter knowledge, phonological awareness and functional writing activities. Children in both programmes performed significantly better than a control group (CG) without these activities on phonological awareness and orthographic awareness, and both improved their vocabulary and general competencies of language and listening comprehension. A later Hebrew study (Aram, 2006) compared the contributions to vocabulary and alphabetic skills of three programmes: storybook reading, alphabetic skills and a combination of the two, and found that all three groups performed better than a CG on name writing, letter knowledge and phonological awareness; the alphabetic skills group performed better than the other groups on word writing, letter knowledge and initial letter retrieval; the storybook-reading group outperformed only the CG. The combined programme produced better results than the storybook-reading programme for initial letter retrieval and book vocabulary. Another Hebrew study based on stories (Korat and Shamir, 2007) compared two programmes: a short electronic-book intervention programme and a regular joint story-reading programme, both administered in three sessions of 25–30 minutes each: both programmes improved children’s ability to understand stories and their vocabulary. Their vocabulary improvement was significantly greater than that of a CG. In other words, an intervention programme based on storytelling contributed to story understanding and vocabulary skills regardless of how it was delivered (computer vs adult). It is noteworthy that the intervention programmes in these three studies in Hebrew influenced children’s performance in only a few language and emergent literacy skills.

Similar results have been reported in other languages. Young children improved their phonemic awareness and developed their orthographic skills after participating in direct instructional programmes (Bailet et al., 2013; Justice et al., 2003; Nicholson and Ng, 2006; Ziolkowski and Goldstein, 2008). Simmons et al. (2008), for example, found that kindergarten children in an intensive, small-group intervention centred on phonemic awareness, phonemic decoding, word reading and spelling responded early and positively. By the end of kindergarten, their average absolute performance levels positioned them for trajectories of later reading performance that exceeded the 50th percentile on most measures, and the changes were generally sustained over time. Still other researchers (Lefebvre et al., 2011) found that a storybook-reading intervention programme delivered four times per week for 10 weeks, 20–30 minutes per session, using explicit facilitation strategies,
could enhance vocabulary, print awareness and phonological awareness in low-income family preschoolers. Likewise, Hilbert and Eis (2014) found that children aged four to five at literacy skill-development risk improved their print knowledge and vocabulary by following a regular storybook intervention programme (60 sessions, two to three lessons per week prior to the beginning of formal reading instruction). Zucker et al. (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. Hassinger-Das et al. (2016) found that four-year-old children improved their receptive and expressive vocabulary knowledge following a short intervention programme based on shared book reading and vocabulary games. Children with poor receptive vocabulary in a pretest examination showed greater improvement.

Only a few of the intervention programmes to date have included morphological awareness (Apel and Diehm, 2014; Sénéchal et al., 2008), but interest in cultivating this skill in young children is growing (Apel and Diehm, 2014; Carlisle, 1995; McBride-Chang et al., 2008). Despite evidence that morphological awareness is important in predicting and fostering children’s early vocabulary learning (McBride-Chang et al., 2008) and reading acquisition (Apel and Diehm, 2014; Carlisle, 1995; Nagy et al., 2014; Vaknin-Nusbaum et al., 2016), and is related to interactive storybook reading (Sénéchal et al., 2008; Vaknin-Nusbaum and Nevo, 2017), most interventions are not based on this activity. A recent study by Vaknin-Nusbaum and Nevo (2017) shows an impressive improvement in morphological awareness and literacy skills among preschool and kindergarten children following an interactive storybook intervention programme delivered by their home class teacher. Lyster et al. (2016) show that morphological awareness programme delivered in preschool contributed to reading skills at the end of first grade and in sixth grade. The researchers suggest that cultivating morphological awareness at a young age can have long-term effects on children’s reading skills. In light of these studies, morphological awareness was also included in our intervention.

**Interactive storybook reading: Instructor and reading motivation**

Another important component of an intervention is reported to be familiarity with the children and the professionalism of the person who delivers it (McCutchén et al., 2002). Most studies have employed outside experts or research assistants to run intervention programmes in kindergartens
(Nicholson and Ng, 2006). Aram (2006) and Vaknin-Nusbaum and Nevo (2017) presumed that children would participate more actively in a programme given by their teacher than by an outsider, and that the teacher would in all likelihood continue to apply the programme in the future. Still another benefit of homeroom teacher-administered programmes is the new strategies the teacher learns while training for and delivering the programme: how best to read stories, keep the children’s attention, increase their understanding of a story and provide language and literacy activities for use during and after reading a book. Training itself has been found to enrich interventions with multiple strategies for developing language and print-concept skills (Girolametto et al., 2007; Justice et al., 2010; Vaknin-Nusbaum and Nevo, 2017).

Motivation to read is yet another component that has received little attention and but play a central role in literacy development (Gambrell, 1996; Marinak et al., 2015). Young children who enjoy reading choose to engage in literacy tasks more often than children who do not, and as a result become more skilled (Gambrell, 1996; Morgan and Fuchs, 2007), even in first grade (Wilson and Trainin, 2007). Indeed, early literature-based programmes that foster students’ enthusiasm for books have been found to be more likely to succeed when literature activities are enjoyable (Morrow and Weinstein, 1986; Wigfield, 1997). Thus, it is important to examine children’s motivation to read or participate in literacy activities in general. Clearly, much remains to be examined regarding the relationship between literature-based programmes and literacy motivation (Strickland, 2001), especially among young children (Marinak et al., 2015; Mata, 2011). This is another component of the current study.

**The current study**

The present research sought to determine whether a short (nine-week) language and print-concept intervention, delivered by a kindergarten teacher through interactive storybook reading, could improve children’s vocabulary, morphology, phonological awareness, print-concept skills and motivation to read. Participants were native Hebrew-speaking kindergarteners who entered the programme with a diverse range of emergent literacy skills.

The study included the following hitherto less examined aspects of literacy intervention studies in Hebrew and other languages:

1. Targeting a general population and not one at risk. This is because information is sparse about the effectiveness of literacy intervention programmes in a more general population of children (Marr et al., 2012; Nicholson and Ng, 2006;
2. Cultivation of morphological awareness. This is based on the finding that inter-active storybook 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; Sénéchal et al., 2008).

3. Delivery by the homeroom teacher. In contrast to most studies to date, which were administered by researchers or research assistants (Nicholson and Ng, 2006), our intervention programme was delivered by a kindergarten teacher, who was part of the children’s natural environment and thus positioned to continue to implement the programme after the present research was completed.

4. Exploration of motivation to read. 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 programmes do not harm children’s motivation to read. Therefore, children’s motivation to engage in reading activities was evaluated after completion of the intervention.

Research questions and hypotheses

The following research questions were asked:

1. To what extent do children in the intervention programme improve their language (vocabulary, morphology and phonological awareness) and print-concept skills as compared with a CG? We hypothesized that children who participate in the intervention programme will improve their literacy skills to a greater extent than the CG because of the explicit instruction that will be given to the children by the intervention group (IG) teacher (explanation, games and activities).

2. To what extent do children in the intervention programme improve their motivation to read compared with a CG? We hypothesized that improvement in motivation to read would be higher in the IG than in the CG thanks to the accompanying enjoyable activities (mostly games) in the former.

3. Does reading motivation at the beginning of the school year predict language and print-concept skills at the end of the school year? Previous studies have found that motivated children tended to be more involved and engaged in literacy activities, therefore they had better chances of improving their literacy knowledge, and vice versa (Marinak et al., 2015). We hypothesized that motivation at the beginning of the school year would predict children’s achievements in language and print concepts at the end of the year in both the intervention and control groups.
**Method**

**Study design**

The study used a quasi-experimental pre–post design consisting of an IG and a CG. The IG comprised kindergarteners who participated in an interactive storybook-reading intervention programme that explicitly targeted language (morphology, vocabulary and phonological awareness) and print-concept skills. The CG comprised kindergarteners who received the standard kindergarten literacy and language programme. By the flip of a coin, a kindergarten was assigned to the IG or the CG.

**Participants**

Thirty Hebrew-speaking children, 15 in the IG and 15 in the CG (seven boys and eight girls in each group), attending different kindergartens in two towns in northern Israel, were enrolled in the study with parental approval. They were tested at two time points: in January–February 2015 (time 1), and four months later, after the intervention, in May–June 2015 (time 2). At time 1, the mean age of the children was five years and three months (standard deviation \(SD = 0.41\)), with no group difference (\(t(28) = 0.49, p = .631\)).

The children were all native Hebrew speakers with no known language or developmental problems. According to the Israel Central Bureau of Statistics (2014), residents of these towns are mainly of middle socio-economic status. In both towns, children are assigned to a specific kindergarten according to home address, usually without the possibility to choose differently. Each kindergarten is an independent unit and both are obliged to adhere to the curriculum of the Israel Ministry of Education.

Both kindergarten teachers held M.Ed. degrees and had 10 years of experience as kindergarten teachers. Children in both groups were exposed to interactive storybook reading, but the IG group received more explicit instruction that involved literacy aspects, as detailed in the Procedures Intervention section below.

**Material**

Language parameters and print concepts were chosen based on their acceptance as good predictors of reading acquisition (National Early Literacy Panel, 2008, a committee of the Israel Ministry of Education composed of educators...
and academics), and these were administered to each child individually. Most tests were adapted from the Shatil (2002) language battery and emergent literacy abilities for Hebrew-speaking children, which was constructed based on a sample of 349 children and is used to identify children at literacy risk. The vocabulary test was built on the target words from the intervention programme; thus, a criterion-referenced test rather than a norm-referenced test was chosen as the measure of vocabulary for its suitability to monitor progress in a specific area (McCauley and Swisher, 1984). Because professionals today seek intervention strategies that reliably represent children’s ability to use language in developmentally appropriate and naturalistic contexts (Justice et al., 2010), the entire procedure was presented to the children through oral and social games that resemble daily-life learning in 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 knowledge of three kinds of vocabulary words targeted by the intervention: six phrases, eight rare words (four nouns and four verbs) and six adjectives. All the words were important for understanding the story, but were considered rare for kindergarten children according to the IG and CG teachers, as well as three experts in early literacy (two M.A. kindergarten teachers and one speech and language pathologist). The teacher orally presented a target word to the child, followed immediately by 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. sail) were presented by pictures and abstract words (e.g. wretched) by verbal explanations. The child was then asked to choose the correct answer from three possible answers, and the teacher recorded the choice. For example, the teacher said the word pikchit ‘wise’ and then the three possible answers tipsha ‘stupid’, eranit ‘alert’ and chachama ‘smart’. Performance was scored as the number of correct answers. The maximum score was 20; the score was calculated as a percentage. The assessment yielded medium reliability: Cronbach’s $\alpha = .62$.

**Morphology.** Five subtasks assessed the child’s ability on different dimensions of the morphological rules of Hebrew inflection; subtasks were determined to be
appropriate to the child’s developmental age in previous developmental studies (Berman, 1984; Berman and Dromi, 1984; Clark and Berman, 1984), and according to the Education Ministry’s expected language achievements (Israeli Joint Committee on Foundation of Early Reading and Writing, 2007): inflection of verbs in the future tense; inflection of irregular plural nouns; possessive inflection; plural inflection of feminine verbs; construct formations. In the inflection of verbs in the future tense task, 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 ilech ‘tomorrow I’ll go’). In the inflection of irregular plural nouns task, the child was asked to inflect 12 nouns in the plural. All noun inflections were irregular, so their suffixation was not according to grammatical rules (e.g. the feminine noun ‘egg’ gets a masculine suffix: beytza achat ‘one egg’, harbe... beytzim ‘many eggs’). In the possessive inflection task, the child was asked to inflect six nouns according to two grammatical persons – my and his or her, according to his or her gender (e.g. Haregel sheli bemila achat... ragli ‘My foot in one word is...’). In the inflection of feminine verbs in the plural task, the child was asked to inflect 12 verbs from singular feminine to plural feminine (e.g. hayalda mistakelet ‘the girl is looking’, hayeladot... mistaklot ‘the girls are looking’). Each item in these four subtests was presented to the child in the context of a phrase that the child had to complete. In the construct formation task, the child was asked to choose the correct form of two possible given forms presented orally (e.g. bubat niyar/beit bubut ‘paper doll/dolls’ house’). The child was asked to choose the correct answer, and the adult wrote down the answer chosen.

Each of the five subtasks began with one practice item. The order of the items in each subtest was randomly assigned. All tasks were presented to the child through a social game in which he or she had to earn cards to finish the game. Performance was scored as the number of correct answers, and the maximum score in the morphology test was 54. The test yielded high reliability: Cronbach’s $\alpha = .86$.

**Phonological awareness.** This test was an initial syllable and phoneme matching task, beginning with two practice items. The child was presented with a book of seven pages with a picture in the middle of each page marked out by a red frame surrounded by seven different pictures. At least two pictures on the page began with the same syllable as the picture in the middle, and one or two other pictures began with the same phoneme as the picture’s initial phoneme. The child was asked to circle all the pictures that began with the same sound
as the picture in the middle of the page. For example, the picture in the middle was of a balloon ‘balloon’, and the seven pictures around it were baiet ‘house’, banana ‘banana’, berez ‘tap’, buba ‘dall’, gezer ‘carrot’, degel ‘flag’, matana ‘present’. The total number of correct answers was 24. Performance was scored as the number of correct answers. The test yielded high reliability: Cronbach’s $\alpha = .90$.

**Print concepts.** Wohl’s Hebrew version of the Clay test from the Shatil (2002) battery assessed five print concepts: (1) print and picture differentiation (three questions), (2) letter and symbol differentiation (five questions), (3) onset of reading (three questions), (4) print directionality (two questions) and (5) written language units (letter, sentence, paragraph; five questions). Each child was given a piece of laminated paper with five rows of items on it, each row containing a different task to be marked on the paper with a whiteboard marker (e.g. circle the letters, circle the first word in the sentence and circle the longest word). Performance was scored as the number of correct answers. The maximum score was 18; the score was calculated as a percentage. The assessment yielded high reliability: Cronbach’s $\alpha = .81$.

**Motivation to read.** The children’s motivation to read was assessed by the Me and My Reading Profile (MMRP; Marinak et al., 2015), an assessment tool designed for kindergarten through to second-grade teachers. This 20-item multiple-choice instrument has three subscales: five items that assess the child’s self-concept as a reader, ten that assess the child’s appreciation of the value of reading and five that assess literacy out loud. The teacher read each statement to the child followed by three possible answers, and the child was asked to circle the choice that represented his feelings and thoughts about the statement. Two practice items acquainted the children with the instrument’s format. The Likert response scale for the MMRP, which consists of three choices ranging from most positive to least positive (Rea and Parker, 2012), was modified for our purposes. Rather than each item being numbered, it was paired with an animal icon, and the teacher guided the child from item to item by placing her finger on the icon in the left-hand column as she read the MMRP aloud. Cronbach’s reliability analyses indicated scale alphas from .86 to .87 with all items contributing to overall scale reliability. The test yielded high reliability: Cronbach’s $\alpha = .93$. Performance was calculated according to the child’s responses to all 20 sentences; the maximum score was 60.
Procedures

Assessments. The battery of tests assessing language skills, emergent literacy and motivation to read was administered to all participants by two research assistants who were teachers with an MA degree. Each child was tested individually in two sessions of approximately 20 minutes each in a quiet corner of the kindergarten, one to three weeks before and after the intervention. The tests were presented in random order.

Intervention. The intervention programme was planned by the study authors and delivered to the children by their teachers in their kindergarten classrooms. Prior to the intervention, the teachers attended seven sessions (90 minutes each) of a required college course for M.Ed. students entitled emergent literacy. The course deals with concepts and research findings related to emergent literacy and predictors of reading acquisition: phonological awareness, morphological awareness, print concepts, alphabetic knowledge, vocabulary growth, development of narrative abilities, joint-story reading and adult–child conversations. One of the authors met with each IG teacher for four 60-minute sessions to prepare delivery of the intervention. During those meetings, the author explained the programme in detail, including the activities and games, such as sorting cards. For example, in one game, the child was asked to match two picture cards that shared the same initial syllable. In another game, the child was asked to choose the correct plural picture card of a singular noun, and to name it (for more details, see examples in Appendix 1). Three more meetings were held during the programme, and a summary meeting took place when it was completed.

Three books recommended for young children by the Israel Ministry of Education were chosen: The Elephant Wanted to Be the Best (Kor, 1993), BrownStripe (Cohen-Asif, 1980) and The Gruffalo (Donaldson, 2000). These books were considered to have the following qualities: (a) suitability for the age range of the children participating in the study; (b) potentially new vocabulary; (c) variety of sentence types including complex sentences; (d) complex morphological forms suitable for kindergarten and preschool children; (e) not too long, so as to allow more teacher–child interactions and (f) not previously used in their preschools and kindergartens. All three books were used for both the IG and the CG.

In the IG, each book was read by the teacher three times to each of three random groups of four to six children each. This system was followed in view
of the proven effectiveness of working in small groups (Marr et al., 2012). Thus, each child participated in nine sessions (spread over about two months), but not necessarily in the same group in each session. A session lasted around 30 minutes and contained interactive book reading that included strategies that actively engaged the child through completion, recall and open-ended WH (what, who, when, where and why) questions and distancing questions. This kind of reading encouraged thinking beyond the book’s content by making inferences about the characters’ feelings, connecting the story’s content to the child’s own knowledge, giving explanations, resolving problems and making predictions. The teacher verbally evaluated and expanded the child’s response and repeated the initial question at a later point in the session to verify new learning (Lefebvre et al., 2011; Whitehurst et al., 1988). Before and/or after storybook reading, the teacher introduced games and activities relevant to the book’s language (vocabulary, morphology, phonological awareness) and print-concept skills and encouraged the children to engage in reading activities.

The vocabulary facilitation activities targeted six or seven rare words from each story, chosen for their importance for understanding the story, even though the children were not very familiar with them. The teacher meticulously explained the words, using a definition, a synonym or an opposite word (e.g. ‘unkemptly and sloppy is the opposite of dandy’, ‘to weep means to cry with sound and to sob continuously’), 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). The teacher then engaged the children in a game (e.g. memory or a domino game) that contained these words. She singled out these words in isolation and in sentences at least five times to help the children remember them. Vocabulary activities were conducted mainly in the first reading session of each book to foster a better understanding of the story. The vocabulary-targeted words were used in two subsequent sessions on that book on morphological awareness, phonological awareness and print-concept games and activities.

Morphological awareness activities were the main focus of the second reading session for each book. Vocabulary has a reciprocal relation with morphological awareness, and apparently students who show rapid growth in vocabulary knowledge demonstrate rapid growth in morphological awareness too (Bowers and Kirby, 2010; Kieffer and Lesaux, 2012; Ramirez et al., 2014). Three morphological concepts were targeted: future tense, irregular plural nouns and possessive. The teacher exposed the children to each inflection
type (e.g. When I wear this shirt it is קולטסאטי ‘my shirt’, now when he wears the shirt it is... קולטסאטו ‘his shirt’) and then encouraged the children to play a card-sorting game involving this inflection and to use words from the three storybooks (around 12 words).

Print-concept activities were conducted during the first and third sessions for 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, paragraph) and letters of the alphabet. The teacher gave explicit verbal and non-verbal cues and explanations of those print concepts (e.g. showing the children the book cover and asking them to point to the name of the author or to count the number of words in the title of the book). Then the teacher used games (e.g. bingo) and songs to practise those concepts.

The phonological awareness activities were conducted during the third session for each book and targeted two phonological skills: segmentation and initial syllable naming. The teacher explained those concepts (e.g. it is possible to divide the word קדב ‘dog’ into two syllables קד-ב, as well as into smaller segments קד-ב). Social activities such as memory games and dominoes, or physical activities such as jumping games, served for practising these concepts.

In the CG, the teacher read to the entire kindergarten class each of the three books three times, once a week, for three consecutive weeks during morning meetings. Under her guidance, subjects and stories from the books that interested the children were discussed. The content of all other weekly morning meetings consisted of conversations about other subjects, such as the weather, the children’s experiences and holidays.

Both the IG and the CG also followed the formal curriculum for kindergarteners, which centres on holidays, the seasons, nature, friendship and emotional development. Formal practice in reading or writing is not customary.

**Results**

Since the number of stimuli in each of the language and print-concept measures varied, all scores were calculated as percentages. Pre-intervention differences by group were evaluated by a series of t-tests, and Bonferroni adjustment for multiple comparisons was employed. No significant pre-study group differences were detected. The research hypotheses were examined with $2 \times 2$ repeated-measures analyses of variance.
Pre-intervention gender differences, evaluated by a series of t-tests, were all non-significant. Pearson correlations of the pre-intervention variables with age were non-significant, ranging from $r = -0.31$ (p = 0.094) to $r = 0.30$ (p = 0.109), except correlations with motivation to read: $r = 0.47$ (p = 0.010; using Bonferroni adjustment for multiple comparisons). Thus, gender was not used as a control variable and age was used as a control variable for motivation to read.

Time and group differences, examined by a series of repeated-measures analyses of variance, are presented in Table 1. The results show significant time effects and significant time-by-group interaction effects in all variables. Post hoc analyses for significant interactions were examined by estimated marginal means, and these are presented in Table 2. The analyses yielded results as follows.

All language measures (vocabulary, morphology and phonological awareness) increased significantly by the end of the intervention in both groups, but the increase was significantly higher in the IG than in the CG (as shown in the effect-size values). Print concepts increased significantly in the IG, while no change was noted in the CG. Motivation to read increased significantly in both groups, but the increase was significantly greater in the IG.

### Table 1. Means, standard deviations and F values for the study variables by group and time (N = 30).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention group</th>
<th>Control group</th>
<th>Time</th>
<th>Group</th>
<th>Time × Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre M (SD)</td>
<td>Pre M (SD)</td>
<td>Post M (SD)</td>
<td>Post M (SD)</td>
<td>F(1, 28) (η²)</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>66.97 (8.14)</td>
<td>69.70 (15.53)</td>
<td>90.00 (7.33)</td>
<td>77.88 (14.15)</td>
<td>265.22*** (.905)</td>
</tr>
<tr>
<td>Morphology</td>
<td>65.33 (11.74)</td>
<td>64.44 (17.17)</td>
<td>86.44 (6.95)</td>
<td>76.67 (15.99)</td>
<td>176.97*** (.863)</td>
</tr>
<tr>
<td>Phonological awareness</td>
<td>66.94 (17.14)</td>
<td>65.00 (11.33)</td>
<td>87.22 (12.35)</td>
<td>74.17 (9.21)</td>
<td>81.84*** (.745)</td>
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<tr>
<td>Print concepts</td>
<td>2.11 (0.40)</td>
<td>2.10 (0.34)</td>
<td>2.71 (0.28)</td>
<td>2.44 (0.22)</td>
<td>8.17** (.232)</td>
</tr>
<tr>
<td>Motivation to read</td>
<td>2.11 (0.40)</td>
<td>2.10 (0.34)</td>
<td>2.71 (0.28)</td>
<td>2.44 (0.22)</td>
<td>8.17** (.232)</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.
To examine the relation between reading motivation and language and print-concept skills, change scores were first defined as adjusted residual gains, controlling for pre-test scores. The relationship was examined with partial correlations, controlling for children’s ages, as presented in Table 3. All correlations were positive and significant, demonstrating that greater motivation to read was associated with higher scores for vocabulary, morphology, phonological awareness and print concepts at each time point, as well as with change scores. In other words, the greater the increase in motivation

<table>
<thead>
<tr>
<th>Variable</th>
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<tbody>
<tr>
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<td>$F(1, 28)$</td>
<td>$F(1, 28)$</td>
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<tr>
<td></td>
<td>($\eta^2$)</td>
<td>($\eta^2$)</td>
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<tr>
<td>Vocabulary</td>
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<td>36.45***</td>
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<td>(.566)</td>
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<td>Morphology</td>
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<td></td>
<td>(.835)</td>
<td>(.630)</td>
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<tr>
<td>Phonological awareness</td>
<td>77.63***</td>
<td>15.86***</td>
</tr>
<tr>
<td></td>
<td>(.735)</td>
<td>(.362)</td>
</tr>
<tr>
<td>Print concepts</td>
<td>23.02***</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>(.451)</td>
<td>(.033)</td>
</tr>
<tr>
<td>Motivation to read</td>
<td>202.75***</td>
<td>63.10***</td>
</tr>
<tr>
<td></td>
<td>(.882)</td>
<td>(.700)</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.

Table 3. Partial correlations between reading motivation and language and emergent literacy total scores, by time (N = 30).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Motivation to read</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.47*</td>
</tr>
<tr>
<td>Morphology</td>
<td>.40*</td>
</tr>
<tr>
<td>Phonological awareness</td>
<td>.52**</td>
</tr>
<tr>
<td>Print concepts</td>
<td>.43*</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.
to read, the greater the increase in vocabulary, morphology, phonological awareness and print concepts.

Finally, multiple hierarchical regressions were performed to examine the extent to which pre-test language and print-concept skills predicted post-test reading motivation, and the extent to which pre-test reading motivation predicted post-test language and print-concept skills. In both cases, age was entered as a control variable. The regression predicting post-test reading motivation with vocabulary, morphology, phonological awareness and print concepts proved non-significant ($F(5, 24) = 2.55, p = .055$), and none of the predictors (except age) were significant. Hence post-test reading motivation was not predicted by pre-test language and print-concept skills. However, pre-test reading motivation was found to be predictive of post-test language and print-concept skills (Table 4). Greater initial reading motivation was predictive of higher vocabulary, morphology, phonological awareness and print concepts at post-test.

**Discussion**

The results of this study provide evidence that a short language and print-concept intervention programme delivered by a kindergarten teacher using interactive storybook reading and accompanying activities enhanced language and print-concept skills in kindergarteners. In agreement with our first hypothesis, the IG children, who received explicit instruction, exhibited a more rapid improvement in vocabulary, morphology, phonological awareness and print concepts than the CG children. Although the literacy achievements of both groups rose over time, the IG scored higher on all measures. The results are in line with other intervention studies conducted in Hebrew.
for the same or similar purposes (Aram, 2006; Aram and Biron, 2004; Vaknin-Nusbaum and Nevo, 2017) and in other languages (Bailet et al., 2013; Coyne et al., 2004, 2009; Hilbert and Eis, 2014; Justice et al., 2003; Nicholson and NG, 2006; Schneider et al., 2000; Ziolkowski and Goldstein, 2008).

Our findings show that interactive storybook reading and activities can also serve as a tool to develop morphological knowledge, in line with evidence that morphological knowledge can predict literacy achievements (Nagy et al., 2014; Vaknin-Nusbaum et al., 2016) and improve them in different types of readers (Goodwin and Ahn, 2010, 2013; Nagy et al., 2014). The greater gains by our IG than their CG counterparts on most morphological measures (verb inflections, possessive inflections, construct formation) are in line with the findings of Apel and Diehm (2013), who examined the efficacy of a morphological intervention programme on the morphological knowledge and reading skills of kindergarteners through to second graders from low socioeconomic homes. All children in that study who received the intervention showed statistically significant gains in morphological knowledge, with large effect sizes on most measures. Because 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), children’s storybooks may be particularly appropriate for developing these linguistic abilities at a young age. It is also reasonable to assume that the various linguistic areas chosen for the current intervention programme connect bidirectionally and contribute to their mutual development.

Our IG children also appeared to transfer some of the knowledge they gained (phonological awareness, morphological knowledge and print concepts) to words that did not appear in the storybooks but were presented in pre- and post-tests. These results are consistent with Lefebvre et al.’s (2011) finding that explicit strategies incorporated into interactive storybook reading enhanced language and emergent literacy skills in French in low-income children of average age 4.7 years. The use of interactive storybook reading has also been found to be a useful instrument to cultivate children’s phonological awareness (Lefebvre et al., 2011; Ziolkowski and Goldstein, 2008), alphabet knowledge and vocabulary skills (Aram, 2006; Lefebvre et al., 2011).

Presumably, the greater achievements of the IG were due to the instruction and exposure to materials (activities and games) received by the teacher and delivered to the children. This is in line with McCutchen et al.’s (2002) findings suggesting that deepening teachers’ literacy instruction knowledge can inspire them to use that knowledge to change classroom practice, which can in turn improve student learning. The literacy improvements seen in our
IG were probably also influenced by the fact that the programme was delivered by their kindergarten teacher after specific training and not by an outside expert or research assistant. According to Girolametto and co-workers (2007) and Justice and co-workers (2007), training kindergarten educators to deliver intervention programmes is a natural way to facilitate children’s emergent literacy in a familiar environment, and this leads to more promising outcomes when they cover multiple strategies for developing language and print-concept skills. Having the children’s teacher carry out the intervention after suitable training might help to circumvent the phenomenon of in-service educators ‘encouraging’ children to participate more actively in a programme. An additional benefit is the likelihood that the teacher will continue to use the strategy for years to come.

Our study has demonstrated that the general population of children can also benefit from participating in an intervention programme delivered in small groups, as shown by Nicholson and Ng (2006), and not just children at literacy risk (Coyne et al., 2004, 2009; Justice et al., 2003; Schneider et al., 2000; Vaknin-Nusbaum and Nevo, 2017) and children from low-income families (Aram, 2006; Aram and Biron, 2004; Hilbert and Eis, 2014; Lefebvre et al., 2011; Zilowski and Goldstein, 2008) – the subject of most intervention studies to date.

Motivation to acquire reading proved to be another important aspect of children’s active participation in the intervention programme. In line with our second hypothesis, motivation to read improved in the IG and the CG alike. Apparently, involvement in literacy activities that include storybook reading is essential for developing reading motivation. However, when a literacy programme is delivered in a more explicit and enjoyable way, the motivation to read is boosted even more. It is noteworthy that a byproduct of our intervention programme, which was aimed at cultivating language and print concepts, was an increase in the motivation to read. This is crucial since greater motivation to read might lead children to engage more often in literacy tasks (Gambrell, 1996; Marinak et al., 2015), result in higher literacy achievements (Morgan and Fuchs, 2007) and in the long run promote the development of reading and comprehension skills (Marinak et al., 2015).

In line with our third hypothesis, greater initial motivation to acquire reading (pre-test) predicted higher achievements in vocabulary, morphology, phonological awareness and print concepts at post-test. This finding is in line with evidence that motivated readers are more likely to become skilled readers (Morgan and Fuchs, 2007; Wilson and Trainin, 2007). These findings underscore the need to assess motivation to read as one of the important aspects of
any literacy intervention programme, to ensure children will continue to participate in literacy activities.

**Limitations**

Some important limitations of the study should be noted. First, only two classes, one intervention and one control, participated in the study, limiting generalizations of the results. Consequently, more research is needed across a broader range of populations to examine whether these findings hold for different kindergartens, languages and orthographies. Secondly, the intervention and control groups were from different kindergartens with different teachers, which might have introduced a confounder. Although the results are promising, longitudinal studies are needed to examine children’s reading skills as an outcome of participating in a short intervention programme in kindergarten. For now, it is unclear whether the effects of the programme will endure, or even intensify, as the children get older.

**Conclusions**

An intervention programme to improve language and print concepts based on interactive storybook reading offers an effective way to develop kindergarteners’ language skills (oral and written) in Hebrew. In addition, morphological knowledge and motivation to acquire reading play an important part in the development of language skills, and should be embedded in intervention programmes aimed at cultivating language. The role of narrative skills in language intervention programmes should also be taken into consideration. The data from this study also indicate that teachers can promote children’s language and print-concept abilities and increase their chances of acquiring reading successfully prior to the start of formal reading instruction. Such programmes should be expanded to accommodate broader populations of children – not only those with reading difficulties and those who enter preschool with poor literacy skills. While our results are promising, longitudinal studies are needed to examine children’s long-range reading skills and motivation to read as outcomes of participating in an interactive storybook reading intervention programme in kindergarten.

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References


**Appendix 1**

Content of the three shared story sessions of the story The Gruffalo (Donaldson, 2000): Examples of joint activities

<table>
<thead>
<tr>
<th>Number of session and language skill</th>
<th>Time of delivery</th>
<th>Examples</th>
</tr>
</thead>
</table>
| First session – print concepts and vocabulary | Before reading | T: Who can tell me where the title of the book is?  
T: Very good. How about the author’s name?  
T: The name of the story [in Hebrew] is The Dandiest Giant in the World. What does it mean to be dandy?  
T: To be ‘dandy’ means that you care about your clothes, that you have fancy clothes and are elegantly dressed.  
T: I want to show you how I look when I’m ‘impressed’ [the teacher acts out the word ‘impressed’].  |
|                                     | After reading    | T: Why do you think the giant gave his new clothes to the animals that he met?  
T: Do you think the giant acted wisely when he gave his clothes to the animals?  
T: I’ll show you four pictures. When I pronounce the word “dandy” please point to the picture that describes that word.  
T: I’ll place on the table seven cards that represent the new words we’ve learned and say them aloud. Let’s see if you can match the pictures to the target words. |

(continued)
<table>
<thead>
<tr>
<th>Number of session and language skill</th>
<th>Time of delivery</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Second session**<br>morphological awareness | After reading | **T:** We’re going to play a game with a ball. I’m going to roll the ball to you and say a verb in the present tense. You’ll roll the ball back to me and say the verb in the future tense. For example, when I roll the ball I say *natan* ‘give’, and when you roll it back you say *yiten* ‘will give’.  
**T:** We’re going to play a memory card game with objects in the singular and the plural. For example, the picture *na’al* ‘a shoe’ matches the picture *na’alayim* ‘shoes’. |
| **Third session – print concepts and phonological awareness** | After the third reading | **T:** Can someone show me the first word on this page?  
**T:** How many words can you count on that page?  
**T:** We are going to play a game with parts of words. We have here a board with a path. The giant needs to go from the shop to his house. We also have a pile of pictures of things that we saw in the book. The giant advances along the path according to the number of segments in the word. For example, if you get the picture of *mifras* ‘a sail’ you can divide it into *mi-fra-s* and your giant will advance four steps. |