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Joint Book Reading Makes for Success in Learning to Read: A Meta-Analysis on Intergenerational Transmission of Literacy

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The current review is a quantitative meta-analysis of the available empirical evidence related to parent-preschooler reading and several outcome measures. In selecting the studies to be included in this meta-analysis, we focused on studies examining the frequency of book reading to preschoolers. The results support the hypothesis that parent-preschooler reading is related to outcome measures such as language growth, emergent literacy, and reading achievement. The overall effect size of d = .59 *indicates that book reading explains about 8% of the variance in the outcome measures. The results support the hypothesis that book reading, in particular, affects acquisition of the written language register. The effect of parent-preschooler reading is not dependent on the socioeconomic status of the families or on several methodological differences between the studies. However, the effect seems to become smaller as soon as children become conventional readers and are able to read on their own.*

Interest in the ways in which parents help their children to develop the requisite language skills for reading has been growing. Many educators believe that certain practices are important for beginning readers. In many countries the importance of the family in promoting literacy is operationalized in the intergenerational nature of literacy programs (Nickse, 1990). In particular, the number and the nature of parent-child joint book reading experiences during early childhood are assumed to set the stage for future differences in academic achievement (Cochran-Smith, 1983; Mason & Allen, 1986; Teale, 1981). In line with this assumption, researchers have been exploring the process of interactive reading to trace parental

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strategies that may explain the effects of book reading on young children's growing literate orientation (Pellegrini, Brody, & Sigel, 1985; Sulzby & Teale, 1991; Whitehurst et al., 1988). While narrative reviews have led some researchers to draw conclusions, no review has made an exhaustive test of the extent to which early literacy development is indeed associated with book-reading experiences. The current review is a comprehensive examination of the available empirical evidence related to parent-preschooler reading and literacy. Since the 1950s, several studies on book reading have examined the efficacy of parent-preschooler reading in relation to reading skills, emergent literacy skills, and language growth. The current meta-analysis is an attempt to test empirical evidence regarding the importance of joint book reading as "the single most important activity for developing the knowledge required for eventual success in reading" (Commission on Reading, National Academy of Education, 1985).

Book reading might, of course, increase children's interest in reading books, provide them with factual information about the world, and make them aware of letter-sound relations. However, the interest in parents' book reading appears to be particularly inspired by the assumption that reading stimulates a literate orientation (Holdaway, 1979; Scollon & Scollon, 1981). Book reading brings young children into touch with story structures and schemes and literacy conventions which are prerequisites for understanding texts (Cochran-Smith, 1984). Reading books to children also exposes them to the written language register (Mason & Allen, 1986). Although the grammatical rules for spoken and written language are in fact the same, the use of the options that grammar offers turns out to be quite different in speaking than in writing (Tannen, 1982). The syntax of written language is more complex than that of spoken language, and a wider variety of sentence forms is used in written language.

Evidence from several studies suggests that children learn how to use and understand the written language register prior to learning the mechanical skills of encoding and decoding print. Sulzby's (1985) emergent reading scale suggests that American children internalize knowledge about the written language register long before they turn into conventional readers. Her developmental scale shows that younger and less experienced children recited books with a wording and an intonation appropriate for oral situations. Older and more experienced children used language that was worded increasingly like written language and like the text of the book itself. These results were replicated in other countries (e.g., Bus, 1991) and with bilingual Spanish-English–speaking children (Sulzby & Zecker, 1991).

Book reading may make a unique contribution to these early linguistic developments by confronting young children very intensively with the written language register. Reading books aloud exposes children to grammatical forms of written language and displays literate discourse rules for them in ways that conversation typically does not. We therefore expect that book reading, in particular, increases children's knowledge of the written language register and, as a result, their reading achievements. Hence, we expect that book reading has a stronger effect on the more proximal measures of language development than on the more distal variables such as reading achievement at preschool and school ages. For similar reasons, we also expect stronger effects on emergent literacy when tests reflect the more recent emphasis on evaluating children's familiarity with the concepts,

conventions, and purposes of written language than when they use the traditional approach of measuring basic skill components. We expect that the kind of knowledge tapped by the newer and more proximal measures is more strongly influenced by parent-preschooler shared reading (cf. Scarborough & Dobrich, 1994).

Attitudinal and other aspects of a literate environment may cause differences, as well. A child who has the desire to learn to read, who is interested in literacy-related activities, and who voluntarily engages in them will—everything else being equal—elicit more or better reading by the parent. Similarly, it may be argued that reading books to young children makes an important but not indispensable contribution to their learning to read. Parents who read frequently to their children are also likely to read more themselves, have more books (including children's books) in the home, take their young children to the library, and so on. Nevertheless, it seems reasonable to assume that interest in reading is as much a prerequisite as a consequence of book reading (e.g., Bus, 1993, 1994), and that the mere presence of models and materials such as books may not stimulate children's development as effectively as parental support during book-reading activities (Sulzby & Teale, 1991).

The Study

In contrast to previous reviews (Cochran-Smith, 1983; Mason & Allen, 1986; Scarborough & Dobrich, 1994; Teale, 1981), we conducted a quantitative meta-analysis of the relation between book reading to toddlers and preschoolers at home and several outcome measures. Our meta-analysis includes a more extensive body of studies than the most recent narrative review by Scarborough and Dobrich. To the best of our knowledge, this is the first quantitative meta-analysis on joint book reading. This approach has the advantage of providing overall effect sizes, tests for the homogeneity of results, and explanations of their variation on the basis of study characteristics (Mullen, 1989; Rosenthal, 1991).

In selecting the studies to be included in this meta-analysis, we focused on studies examining the frequency of book reading to preschoolers. There was a pragmatic argument for taking the frequency of book reading, rather than the qualitative characteristics of book reading, as an independent variable: Most studies on book reading include frequency measures, and there is only a small variety in these measures. There is also, however, a more fundamental reason to focus on the frequency of book reading: The frequency of reading has been shown to be related to qualitative characteristics of book reading; many qualitative differences, such as the parents' attempts to evoke a response from the child, do not refer to differences in parental reading style but to differences in the frequency of book reading (Bus & van IJzendoorn, in press). There are, of course, differences in reading style among parents which may determine the outcome of book reading (e.g., Watson, 1989; Watson & Shapiro, 1988); however, the small number of studies on qualitative differences in book reading focused on a large variety in behavior, which makes it impossible to carry out a meta-analysis.

Searching for the effects of joint book reading, we also took into account socioeconomic status (Scarborough & Dobrich, 1994). Book reading may partly explain why communities of lower socioeconomic status and non-mainstream culture often exhibit poorer school achievement (Bus & Sulzby, in press; Feitelson, Goldstein, Iraqi, & Share, 1993). We assume that parental practices

such as joint parent-child reading, literacy excursions, book ownership, and other literacy-related activities explain not only individual differences but also group differences such as differences related to socioeconomic status. Nevertheless, through covarying socioeconomic status, we expected similar associations between joint book reading and outcome measures for lower- and middle-class samples, albeit at a different level of performance. In samples of lower socioeconomic status, however, DeBaryshe, Huntley, Daley, and Rodarmel (1992) found weaker evidence that the parents' reading practices were predictors of the child's language skills. To explain this somewhat puzzling result they suggest that many standardized tests may be less valid measures for low-income than for middle-class populations. To test this assumption, we explored the effects of socioeconomic status on the results of the studies.

Some methodological differences between the selected studies may affect the results, as well. Parental reports have most frequently been the basis for estimating the amount of shared book reading. Self-reports as a means of getting information about the book reading routines in families may be less reliable and valid than data acquired by observation. A major drawback to using parental reports is, of course, that social desirability may lead parents to exaggerate their estimates of book reading, thereby minimizing differences between families. Studies based on observation data may therefore be an important source of less biased information about the effects of reading to young children and may show stronger effects than questionnaire studies. We also expect stronger effect sizes in studies with an experimental design because experiments are designed to guarantee a greater validity of the independent variable.

Many studies measure book reading frequency but do not report on this measure separately. In those cases, book reading is part of a composite measure including other components of a literate environment. It seems plausible that parents who read frequently to their children are also likely to read more themselves, have more books (including children's books) in the home, take their young children to the library, and so on. Assuming strong correlations between book reading and these other activities and environmental characteristics, it is to be expected that the predictive value of reading frequency is at least similar to the predictive value of composite measures including other characteristics of a literate environment. Hence, we included both types of studies.

Another important difference among studies may be the children's age at which book reading data are gathered. In line with results reported by DeBaryshe (1993a), reading to preschoolers may be most important at a very young age. DeBaryshe found that the age at which children began to be read to by their parents was a particularly strong predictor of language skills. Reading to children of an early age is different from reading to older preschoolers because the very young do not yet show much interest and book orientation (Bus & van IJzendoorn, 1994; DeLoache & DeMendoza, 1987; Sénéchal & Cornell, 1993). Book reading with infants is not always rewarding because at the start they obviously are not inclined to consider a booklet as different from any other toy. Mothers often postpone book reading until their children are old enough to obviously enjoy the book reading itself. Reading to children of an early age may therefore uniquely differentiate between families who provide a less or a more stimulating reading

environment. Hence we expect stronger effects of reading to younger preschoolers than to older ones (De Groot & Bus, 1995).

The age at which literacy skills are measured differs among studies, as well. Assuming that book reading has a unique effect, it is to be expected that preschoolers who are already ahead at the start of formal reading instruction tend to maintain their position relative to other children at school during the stage of formal reading instruction (Butler, 1988; Juel, 1988; Wells, 1986). The relative achievement distributions of children should remain fairly stable. Effects of book reading are therefore assumed to be independent of the age at which literacy skills are measured.

In our meta-analysis, we tested the following hypotheses:

1. Is there indeed a relation between parent-preschooler reading on the one hand and language growth and emergent and conventional literacy on the other hand, and how strong is the association? We expect book reading to be a predictor of language and reading skills.
2. Is parent-preschooler reading more strongly related to language growth than to reading skills? Book reading may affect children's understanding of the written language register more than it affects the mechanical skills of encoding and decoding print involved in reading.
3. Is book reading less strongly related to outcome measures in samples of lower socioeconomic status than in middle-class or mixed samples? It is hypothesized that many standardized tests used in the studies are less valid measures for low-income than for middle-class populations.
4. Does the research design affect the strength of the relation between parent-preschooler reading and outcome measures? In line with the assumption that book reading is a central activity in a literate environment, we assume that more controlled experimental studies show stronger effects.
5. Is the predictive value of reading frequency similar to the predictive value of composite measures including other characteristics of a literate environment? We assume that book reading is the central activity in families with a literate orientation and that it is the main force in preschoolers' emergent literacy development, even when the environment has several other stimulating facets.
6. Is the strength of the association between reading and linguistic development related to the age at which outcome variables are measured? We expect that preschoolers who are already ahead in linguistic knowledge maintain their position relative to other children at school.

We also expect stronger associations when tests reflect the more recent emphasis on evaluating children's familiarity with concepts, conventions, and purposes than when the study uses the more traditional "basic skill" approach. However, because few studies reflected the more recent emphasis, we were unable to test this assumption. We were also unable to compare observation and self-report studies because only a few studies gathered data on book reading with the help of observations. Wells' (1986) study, for example, is an exception, reporting elegantly acquired observation data. Furthermore, the age at which children begin to be read to by their parents may be an important factor. However, hardly any studies report on the onset of reading. The children's age at which the frequency

of book reading is measured does not seem to be a valid indicator for such differences in parental reading habits.

Method

Database

In collecting our data we used three different strategies (Mullen, 1989). First, the major databases in the fields of education and psychology—PsycLIT, ERIC, and Dissertation Abstracts International—were searched. Second, earlier review papers (Cochran-Smith, 1983; Mason & Allen, 1986; Scarborough & Dobrich, 1994; Teale, 1981) were taken as a source of data. Third, the "snowball" method was used; that is, we searched the references of the collected papers for additional titles. In all, we found 29 studies from which pertinent data could be derived. The number of unpublished papers was 5. (The inclusion of unpublished studies in meta-analyses might be important to prevent publication biases that inflate results (Rosenthal, 1991).)

The studies could be divided into two sets on the basis of the central variable: book reading. In some studies book reading was operationalized as the number of times per week that the parents read to the child. In other studies, the frequency of book reading was part of a composite variable also including other, more qualitative components of reading. Both types of studies were thought to address our major hypotheses, and we tested whether the measure for book reading—frequency or composite measure—made a difference in terms of its association with reading/language development.

The outcome measures could be divided into three categories. First, book reading was related to language measures such as the Peabody Picture Vocabulary Test and the Illinois Test of Psycholinguistic Abilities. Second, book reading was associated with reading skills. Because a standard set of measures for emergent literacy skills is still missing (but see Sulzby, 1985), we decided to combine the studies measuring literacy skills such as name writing or reading, letter naming, and phoneme blending, before school age, under the heading of *emergent literacy studies.* Third, studies on book reading that measured literacy skills during school age were combined in a set of *reading achievement studies.* We collected 16 studies on book reading and language growth, 16 studies on book reading and emergent literacy, and 9 studies on book reading and reading achievement.

Meta-Analytic Procedures

In the present meta-analysis, the statistical tests derived from the pertinent studies were transformed into a few common metrics for effect size: Cohen's *d* or the standardized difference between the means of two groups, and Fisher's *Z.* Of course, in many cases correlations between continuous variables were the primary statistics, but Cohen's *d* can be derived from this type of statistic (Mullen, 1989). Because sample sizes were extremely divergent, we decided to weight each effect size by unit one to prevent the extremely large samples from dominating the outcome. We also tested for the influence of sample size on the effect sizes. Tests for homogeneity of study results were applied to check whether study results were sampled from different populations (Mullen, 1989). Lastly, we tried to explain the variability of effect sizes of the included studies on the basis of several predictor variables by using Mullen's (1989) approach.

Predictors

We included the following predictor or moderator variables in our meta-analyses: (a) publication year; (b) sample size; (c) publication status (published versus unpublished); (d) socioeconomic status of the sample (low SES, middle to higher SES, a mixture of low/middle/high SES); (e) design (experimental, correlational, longitudinal, retrospective); (f) measure of book reading (frequency versus composite); and (g) age of children at the time of the outcome measurement. On theoretical grounds we decided to contrast low SES with the other groups, and experimental designs with other types of designs, so as to enhance the power of these analyses. In Table 1 the characteristics of the studies involved in this meta-analysis have been presented.

The analyses were performed using Mullen's (1989) statistical package, *Advanced BASIC Meta-Analysis.* Some studies yielded more than one outcome statistic. To prevent studies with multiple measures from dominating the meta-analytic results and from inflating the number of hypothesis tests, we computed a combined effect size within a multiple study and included this combined effect size in the final meta-analysis.

Results

Book Reading and Literacy/Language Skills: Combined Effect Sizes

The effect sizes (d) for the association between book reading and overall reading language measures ranged from $d = 0.00$ (Briggs & Elkind, 1977; DeBaryshe, 1993a; Robson & Whitley, 1989) to $d = 1.51$ (Irwin, 1960). The combined effect size for all studies involved amounted to $d = 0.59$ (33 samples, including $N = 3{,}410$ subjects), which is equal to a Fisher's $Z = .29$, and comparable to a mean correlation of $r = .28$. The combined probability level was $p = 1.48\text{E}{-27}$, and it would take at least another 1,834 studies with null results to bring the combined probability level up to $p = .05$. The fail-safe number was more than 10 times the tolerance level of $5k + 10$ (where k = number of studies) as proposed by Rosenthal (1991).

Effect sizes differed for the three contributing sets of measures. The combined effect size for the studies on book reading and language skills was $d = 0.67$ (Fisher's $Z = .33$; mean $r = .32$; $N = 958$). The studies on book reading and emergent literacy yielded a combined effect size of $d = 0.58$ (Fisher's $Z = .29$; mean $r = .28$; $N = 1{,}293$). The combined effect size for the studies on book reading and reading achievement was $d = 0.55$ (Fisher's $Z = .27$; mean $r = .27$; $N = 2{,}248$). As expected, the highest effect size was derived from studies relating book reading to the proximal variable of language skills. The difference between the effect sizes of studies on language growth and the effect sizes of the other studies was, however, not significant (one-tailed probability for the focused comparison of effect sizes was $p = .08$).

Explaining the Variability of Effect Sizes

Diffuse comparisons of effect sizes showed considerable heterogeneity of study results. For the total set of studies, this comparison yielded a $\chi^2(32, N = 3{,}410) = 66.05$, $p = .0002$. Significant chi-squares were also found for the sets of studies on language skills and on emergent literacy, but not for the set of studies

TABLE 1
Characteristics of studies on book reading and literacy/language development

Study	Year	Published	*N*	SES	Age (mos.)	Design	Book reading measure	Outcome measure	Statistic	*d*
Briggs & Elkind	1977	Yes	56	Middle	65	Corr	Comp	Gates[a]	$p = .50$	.00
Crain-Thoreson & Dale	1992	Yes	25	Middle	54	Long	Comp	Print	$\beta = .30$	.63
								Phonological	$\beta = .36$	.77
								Spelling	$\beta = .11$	−.22
								PIAT[b]	$\beta = .38$	.82
								WPSSI-info[c]	$\beta = .46$	1.04
								Combined[d]		.81
Donachy	1976	Yes	64	Low	52	Exp	Comp	EPVT[e]	$t = 1.194$	.30
								Reynell comp.	$t = 1.536$	.39
								Reynell expr.	$t = .979$	.25
								Combined		.31
Donachy	1976	Yes	32	Low	40	Exp	Comp	EPVT	$t = 1.257$	.46
								Reynell comp.	$t = 2.035$	.74
								Reynell expr.	$t = 1.75$	.64
								Combined		.61
Dunn	1981	Yes	40	Middle	63	Corr	Comp	PPVT[f]	$r = .26$	.54
Mason	1980	Yes	38	Middle	54	Long	Freq	Word reading	$r = .11$	.22
Milner	1951	Yes	42	Low	85	Corr	Freq	Language *IQ* of CTMM[g]	$\chi^2 = 13.745$	1.39
Morrow	1983	Yes	116	Mixed	60	Corr	Freq	TOBE 2[h]	$\chi^2 = 37.342$	1.38
Scarborough	1989	Yes	66	Low	96	Long	Comp	Reading factor	$p = .50$	.00

Scarborough et al.	1991	Yes	56	Middle	84	Long	Freq	Not reported	$\chi^2 = 6.389^{i}$	.72
									$\chi^2 = 2.416^{j}$	.42
									$\chi^2 = .014^{k}$	.03
									$\chi^2 = 2.021^{l}$	.39
									$\chi^2 = 1.505^{m}$	.33
								Combined		.38
Share et al.	1984	Yes	479	Mixed	72	Long	Freq	Composite reading achievement	$r = .26$	.54
					84			Composite reading-spelling achievement	$r = .21$	.43
								Combined		.48
Thomas	1984	Yes	56	Middle	54	Retro	Comp	Woodcock	$\chi^2 = 4.082^{n}$	.56
									$\chi^2 = .583^{o}$	.21
									$\chi^2 = .487^{p}$	.19
								Combined		.32
Rowe	1991	Yes	1368	Mixed	66	Corr	Comp	Primary Reading Survey Test	$\beta = .278$	.58
McCormick & Mason	1986	Yes	45	Low	74	Exp	Freq	Story/letters/spelling/word identification	$r = .40$	.87
McCormick & Mason	1986	Yes	53	Low	68	Exp	Freq	Story	$p = .001$	.94
								Letters	$t = 1.03$	.29
								Spelling	$t = .666$	.19
								Word identification	$t = .276$	.08
								Combined		.37

TABLE 1 (*continued*)

Study	Year	Published	*N*	SES	Age (mos.)	Design	Book reading measure	Outcome measure	Statistic	*d*
Wells	1985	Yes	32	Mixed	60	Long	Freq	Knowledge of literacy	$p = .025$	.74
			32		85			Reading comprehension	$p = .05$	.61
			125		42			Teacher assessment of oral language	$r = .36$	.77
								Combined		.66
Durkin	1966	Yes	60	Mixed	72	Retro	Freq	Two-step test[q]	$p = .0024$[r]	.78
Miller[s]	1969	Yes	17	Low	60	Long	Comp	Metrop. Readiness	$r = .39$	.85
					68			Stanford Achievement	$r = .50$	1.15
								Combined		.98
Miller[t]	1969	Yes	18	Middle	60	Long	Comp	Metrop. Readiness	$r = .48$	1.09
					68			Stanford Achievement	$r = .34$	.72
								Combined		.90
Miller[u]	1969	Yes	16	Middle	60	Long	Comp	Metrop. Readiness	$r = .57$	1.39
					68			Stanford Achievement	$r = .24$	.49
								Combined		.93
Walker & Kuerbitz	1979	Yes	36	Mixed	72	Retro	Freq	Stanford Achievement	$t = 1.72$	.59

Mason & Dunning	1986	Yes	100	Middle	60	Long	Freq	Decoding	$r = .38$	.82
								Env. Print labeling	$r = .21$	.43
					66			Decoding	$r = .28$	.58
								Env. Print labeling	$r = .37$	.80
					72			Decoding	$r = .28$	.58
					78			Decoding	$r = .06$	.12
								Reading/listening comprehension	$r = .25$	.52
					60			Language understanding	$r = .39$	.85
								Oral language ability	$r = .13$	.26
								Combined		.53
Swinson	1985	Yes	25	Low	42	Exp	Freq	Write name	$p = .23^{v}$	$.30^{v}$
								Read name		
								Letter		
								Copy sentence		
								Word matching		
Phillips et al.	1990	Yes	165	Mixed	60	Exp	Freq	Circus	$\beta = .035$	.07
								Metrop. Readiness	$p = .05$	.26
								Combined		.16
Robson & Whitley	1989	Yes	40	Low	60	Corr	Freq	Infant Reading Test	$p = .5$	.00
Irwin	1960	Yes	34	Low	21; 6	Exp	Comp	Phoneme frequency	$t = 4.26$	1.51
Highberger & Brooks	1973	Yes	80	Low	69	Exp	Comp	PPVT	$t = 5.166$	1.17
DeBaryshe	1993a	Yes	41	Middle	26	Corr	Freq	Reynell Dev. Language Scales (rec. & expr.)	$r = .00$	.00

TABLE 1 (*continued*)

Study	Year	Published	*N*	SES	Age (mos.)	Design	Book reading measure	Outcome measure	Statistic	*d*
Lonigan	1993	No	45	Low	44	Exp	Comp	PPVT	$p = .5$	.00
								ITPA[w]	$p = .002$	.95
								Combined		.46
DeBaryshe et al.	1991	No	28	Middle	32	Corr	Comp	PPVT	$r = .43$	.95
								EOWPVT[x]	$r = .41$	.90
								ITPA	$r = .26$	.54
								Combined		.79
Hale & Windecker	1993	No	21	Mixed	57	Corr	Freq	PPVT	$r = .52$	1.22
DeBaryshe	1993b	No	60	Low	48	Corr	Comp	PPVT	$\beta = .24$[v]	.49[v]
								EOWPVT		
								ITPA		
DeBaryshe et al.	1992	No	56	Low	42	Corr	Comp	PPVT	$\beta = .03$[v]	.00[v]
								EOWPVT		
								ITPA		

Note. Age = age of children at the time of outcome measurement. Corr = correlational; Long = longitudinal; Exp = experimental; Retro = retrospective; Comp = composite; Freq = frequency.

[a] Gates-MacGinitie Reading Tests

[b] Peabody Individual Achievement Test

[c] Wechsler Preschool and Primary Scales of Intelligence, Revised, Information subtest

[d] Effect size of the combined tests

[e] English Picture Vocabulary Test

[f] Peabody Picture Vocabulary Test

[g] California Test of Mental Maturity

[h] TOBE 2 Reading Readiness Test

[i] Frequency of book reading by father at 24 months
[j] Frequency of book reading by mother at 30 months
[k] Frequency of book reading by mother at 36 months
[l] Frequency of book reading by mother at 42 months
[m] Frequency of book reading by mother at 48 months
[n] Book reading at 2 yrs
[o] Book reading at 3 yrs
[p] Book reading at 4 yrs
[q] Step 1: nonstandardized word test; Step 2: Gates Primary Word Recognition and Primary Paragraph Reading tests
[r] Exact Fisher test
[s] Lower-class sample
[t] Middle-class sample
[u] Upper-middle-class sample
[v] Combined statistics. For individual tests, no relevant statistics were available.
[w] Verbal expressive subscale of the Illinois Test of Psycholinguistic Abilities
[x] Expressive One Word Picture Vocabulary Test

on reading achievement. The variability of effect sizes warranted a search for factors predicting or explaining this heterogeneity (Mullen, 1989).

The contrasts between studies on low-SES families and studies on middle-/high-/mixed-SES groups did not appear to be significant in any of the sets of studies. Whether the studies were experimental or correlational/longitudinal/retrospective did not make any difference, either. The more controlled experiments did not yield substantially larger effect sizes than the less controlled alternative approaches. Whether book reading was measured as a frequency or as a composite variable did not influence the size of the effects across studies. The age of the children at the time of the literacy skills measurement, however, appeared to explain at least some variation of effect sizes in the set of studies on book reading and reading achievement. The effect sizes were greater in younger samples.

In meta-analyses, it is common to test the relation between formal characteristics of study reports such as publication year, sample size, and publication status on the one hand, and effect sizes of the studies on the other hand. As can be derived from Table 2, publication status did not influence effect size; unpublished reports did not yield significantly lower effect sizes than published reports. Sample size showed a significant relation to effect size only in the set of studies on language skills: smaller samples yielded larger effect sizes, which might indicate a publication bias against small samples yielding small effect sizes (Rosenthal, 1991). This effect, however, is restricted to a rather small and homogeneous set of studies on language skills. Publication year did show a consistent relation with effect sizes across (sets of) studies: older studies showed larger effect sizes than more recent studies.

Conclusions

Family literacy has become a movement in countries such as the United States and the Netherlands, with many family literacy programs in libraries, adult literacy centers, community agencies, preschools, and elementary schools (Nickse, 1990).

TABLE 2
Probabilities of associations between predictors and effect sizes of bookreading

	p			
Predictor	Reading achievement	Emergent literacy	Language skills	Overall
Publication year	.06	.04	.001	.0003
Sample size	.40	.32	.007	.22
Publication status	—	—	.28	.48
SES	.50	.22	.33	.47
Design	—	.18	.50	.34
Book reading measure	.41	.33	.34	.39
Age at outcome measurement	.03	.09	.11	.49
Number of subjects (*N*)[1]	2,248	1,293	958	3,410
Effect Size (*d*)	.55	.58	.67	.59

Note. Probabilities are one-tailed. Dashes indicate no variation in the predictor.
[1] Some studies provided data for several outcome measures.

While programs vary considerably in scope and intensity, all recognize the importance of the family in promoting literacy, and all recognize the intergenerational nature of literacy programs. The present meta-analysis is an attempt to test the basic assumption of many programs that parent-child interaction around books is important in promoting a literate orientation. Our analysis provides a clear and affirmative answer to the question of whether or not storybook reading is one of the most important activities for developing the knowledge required for eventual success in reading (Commission on Reading, National Academy of Education, 1985). In contrast to a recent narrative review of research on storybook reading (Scarborough & Dobrich, 1994), our quantitative results give straightforward support for family literacy programs and the need to further explore the aspects of shared reading that are most beneficial. The results of the current meta-analysis support the hypothesis that parent-preschooler book reading is related to outcome measures such as language growth, emergent literacy, and reading achievement. There are hardly any studies with negative effects, indicating that book reading has a positive effect on outcome measures. The overall effect size of $d = 0.59$ indicates that book reading explains about 8% of the variance in the outcome measures. According to Cohen's (1977) criteria, this is between a medium ($d = 0.50$) and a strong ($d = 0.80$) effect size. The strength of the association between book reading and literacy/language skills is somewhat greater than the influence of one of the most powerful predictors of reading problems, namely, the nonword reading deficit. In an earlier meta-analysis we found the nonword reading deficit to explain about 6% of the differences between normal and disabled readers ($d = 0.48$; van IJzendoorn & Bus, 1994).

Scarborough and Dobrich (1994) report a relation between book reading and reading achievement, but they do not conclude that book reading is associated with emergent literacy and language growth. They describe a variety of results for effects of book reading on the latter measures. We included eight more studies than did Scarborough and Dobrich, but this difference cannot explain the contrasting conclusions. The contrast between our conclusions and those of Scarborough and Dobrich emphasizes the advantage of a quantitative meta-analysis that takes the accumulation of trends into account. In the area of book reading, the sample sizes are mostly small and effects have to be substantial to reveal significant statistics. By simply counting the number of significant results, reviewers may seriously underestimate the overall effect (Rosenthal, 1991).

The effect sizes vary from $d = 0.67$ for language skills to $d = 0.55$ for reading skills and $d = 0.58$ for emergent literacy. The effects tend to be strongest for language skills, which is in accordance with our assumption that book reading experiences are particularly effective in familiarizing children with the written language register (Holdaway, 1979; Tannen, 1982). More focused studies using Sulzby's (1985) emergent reading scale are needed to further explore specific effects of parent-preschooler reading.

The effect of the frequency of parent-preschooler book reading is not dependent on the socioeconomic status of the families. DeBaryshe et al.'s (1992) assumption that many current language tests are invalid for measuring effects of book reading with children from lower-class families is therefore not supported. Even in lower-class families with (on average) low levels of literacy, book reading frequency affects children's literacy skills. This result is in accordance with the assumption

that book reading is not just a minor part of a literate environment but rather a main condition for developing the knowledge necessary for eventual success in reading acquisition. Even in families with few other incentives to become literate, the frequency of book reading causes an effect. This result supports the movement in several countries to start family literacy programs that aim to stimulate parent-preschooler reading, particularly in low–socioeconomic status families.

The studies in our database varied from correlational and retrospective to longitudinal and experimental designs, with more or less confounding factors. We expected stronger effect sizes in studies with an experimental design because experiments are designed to guarantee a greater validity of the independent variable. The results do not support this assumption, probably because even in the experimental studies on book reading the validity of the independent variable is sometimes less than optimal. However, it may also indicate that the results are robust against variations in the research design. Furthermore, we expected that self-report is a less reliable indicator of behavior because idiosyncratic interpretations of the questions as well as social desirability may affect the answers. However, it was not possible to test this effect on the results of the studies. In almost all studies the frequency of book reading was determined by questionnaires filled out by parents. The only exception was Wells (1986), who reported observation data gathered with the help of a microphone fixed onto the children's clothes. Better designed studies are required to further explore the strength of the effect of parent-preschooler book reading on literacy/language skills, and to gain more insight into the process of intergenerational transmission of (il)literacy.

Effects are similar whether the frequency of reading is measured or some composite measure is used. This result supports our hypothesis that book reading is part of a whole range of characteristics which are all indicative of a literate environment, and that book reading is a central aspect. Without parental support, books are only partly accessible to young children who are not yet conventional readers. The other characteristics of a literate environment, however, may be indispensable as well. Parents who themselves do not enjoy reading may be unable to support their children's interest in reading, and parents with a low level of literacy are unable to make a book comprehensible to an emergent reader. However, further research is warranted to test these assumptions.

The minor differences between results for emergent reading and reading skills are in accordance with the theory that preschoolers who are already ahead in literacy proficiency maintain their position relative to other children. However, we did find some effects of the age at which reading achievement is measured. When children are older at the final time of measurement, the effects of book reading are weaker. Apparently, the effects of book reading are not restricted to the preschool period but they gradually weaken as children become conventional readers. This may mean that the school environment or independent reading by the child may compensate for a lack of family reading experiences (Cunningham & Stanovich, 1991). However, book reading seems to make the start at school easier. This is particularly important for children from low–socioeconomic status families. We expect that the age effect of the reading measures is weaker for children from lower-class families because these children are less stimulated to read independently, and therefore less likely to compensate in this way for a lack

of parent-preschooler book reading, than are children from middle-class families. Because only two studies with achievement as an outcome measure concerned children from lower-class families, it was not possible to test this hypothesis.

Our meta-analysis shows a consistent effect of publication year on the results of the studies. Studies published earlier show stronger effects of parent-preschooler reading. This effect is often found in meta-analyses (Mullen, 1989), and it can be explained by the fact that the pioneering studies attract attention and replication efforts only if they show very promising (i.e., strong) results. The influence of publication year on study results is, however, not in accordance with our expectation that more recent emergent literacy tests focusing on reading concepts and conventions are more valid measures than the more traditional basic skills tests. Assuming that recent tests are more suitable to tracing the effects of parent-preschooler book reading, we would expect that recent studies have stronger effects. However, we have to take into account the fact that only a few studies have used the more recent emergent literacy tests.

Smaller samples appeared to yield larger effect sizes. Again, this effect is often found in meta-analyses and should be interpreted as a warning that the file drawers of researchers might contain unpublished studies on small samples with null results (Rosenthal, 1991). In our case, the problem of the publication bias becomes less important if we take into account the fail-safe number of 1,834 studies with null results that would be necessary to diminish the probability of an association between book reading and literacy/language skills to insignificance. The unpublished studies that we were able to include did not show discrepant results.

This study shows that book reading is effective and that the strength of the relation between parent-preschooler reading and outcome measures is comparable to the nonword effect on reading problems. Hence, book reading is as strong a predictor of reading achievement as is phonemic awareness. The available data on book reading support intergenerational literacy programs intended to stimulate parent-preschooler reading in order to better prepare young children for beginning reading instruction. The results also tend to support the hypothesis that book reading particularly affects acquisition of the written language register, a prerequisite for reading comprehension. Furthermore, this meta-analysis shows that the effect of book reading is not restricted to children of preschool age. However, the effect seems to become smaller as soon as children become conventional readers and are able to read on their own. Our data, therefore, particularly support the assumption that parent-preschooler reading is a necessary preparation for beginning reading instruction at school. We speculate that the effects of book reading are not age-dependent in lower-class families in which incentives to read independently are lacking. Unfortunately, we were unable to test this assumption. The fact that the results of studies using a composite measure of book reading are similar to the results of studies using a frequency measure emphasizes the idea that interactive reading is a central aspect of a literate environment.

In spite of the accumulated evidence, we take the position that more and better research is needed to determine the conditions under which storybook reading is most beneficial. At this point, we do not want to conclude that parent-preschooler reading should be encouraged unconditionally. In earlier studies we demonstrated that in insecure parent-child dyads the parent is less sensitive to the needs and

problems of the child and that, in those cases, the pleasure of sharing a book might be low (Bus & van IJzendoorn, 1988, 1992, 1994, in press). Under these circumstances, this type of book reading may affect the child's emergent literacy skills and interests negatively; because the reading situation is unpleasant and the interaction is not very effective, encouraging book reading without helping the participants to change their reading habits might have a counterproductive effect (Bus, 1993, 1994).

In sum, the present results confirm the idea of intergenerational transmission of literacy and support intergenerational programs focusing on parent-preschooler reading. Studying the process of intergenerational transmission of literacy through book reading may provide more accurate guidance to parents and preschool educators regarding the conditions that best foster preparedness for reading achievement in the early school years and beyond.

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