

DOES "PURE" PHONEMIC AWARENESS TRAINING AFFECT READING COMPREHENSION?¹

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Summary.—The six studies found concerning the effect of pure phonemic awareness training (without phonics) on reading comprehension gave a positive but modest overall effect size in favor of phonemic awareness training. Four studies had small samples, two showed no or very small effect sizes, and one inconsistent results. Three involved languages other than English. Such results do not support the popular movement for universal phonemic awareness training.

The National Reading Panel (7) concluded that phonemic awareness training has a positive effect on reading ability, reporting an effect size of .32 for tests of reading comprehension. Of the studies included by the National Reading Panel, several combined phonemic awareness training with instruction in phonics. As the Panel has pointed out, phonics instruction may contribute to the influence of phonemic awareness training on reading comprehension, as those who have had more phonics instruction show modest, short-term advantages on tests of reading comprehension. It is thus essential to assess whether "pure" (no phonics) phonemic awareness training has an effect on reading comprehension.

Table 1 presents studies of the effects of pure phonemic awareness training on tests of reading comprehension. Studies were obtained in several ways. Linnea Ehri graciously provided me with a list of the nine studies (18 comparisons) on which the National Reading Panel based its conclusions. Also, an extensive survey of phonemic awareness training (8) was consulted, and several scholars active in this area also provided help in locating studies.²

Effect sizes were calculated by subtracting the posttest mean of the comparison group from the posttest mean of the experimental group and dividing the result by the pooled standard deviation (10), except for the work by Bradley and Bryant (1). For this study, *F* ratios were converted to effect sizes (4). There were no obvious differences in pretest scores of the subjects in the studies reviewed here, except for the one by Lie (6) in which the group trained on initial, final, and medial sounds in that order ("posi-

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TABLE 1
EFFECT SIZES FOR STUDIES ASSESSING "PURE" PHONEMIC AWARENESS TRAINING

Study	n exp/con	Duration	Control Group	Effect Size/Significance		
				First Test	Delayed Test	Interval
Bradley & Bryant (1983)	13/26	2 yr.	Conceptual training	.54/hs		
Bradley & Bryant (1983)	13/13		No training	.96/.05		
Hatcher, Helm, & Ellis (1964)	30/31	20 wk.	Regular	.08/ns	.11/ns	9 mo.
Defior & Tudela (1994)	9/12	6 mo.	Manipulation	.05/ns	.00/ns	2 mo.
Defior & Tudela (1994)	9/12		Classification	.13/ns	.13/ns	
Weiner (1994)						
Low Achievers	5/13	6 wk.	Regular instruction	-.41/ns		
Middle Achievers	5/13		Regular instruction	.40/ns		
Lie (1991)						
Positional	45/51	4 mo.	Neutral activities	.21/ns	.33/ns	1.5 yr.
Sequential	51/51		Neutral activities	.62/.05	.41/.10	
Kozminsky & Kozminsky (1995)	15/15	8 mo.	General enrichment	.59/.05	.61/.05	3 yr.
Kozminsky & Kozminsky (1995)	15/17		Unseen	.50/.05	.79/.05	

Note.—First test was given immediately after training except for Kozminsky and Kozminsky (1-yr. delay) and Lie (1-semester delay). Interval is the time between end of training and administration of the delayed test; Manipulation was cutting, coloring, etc.; positional refers to training on initial, final, medial sounds; sequential refers to training on sounds as they appear in sequential order; "unseen" means the investigators did not inspect comparison group treatment; and *n* = sample size of experimental group/control group.

itional" phonemic awareness training) had slightly higher letter knowledge scores than controls on the pretest.

The average effect size for all 11 comparisons, using the most-delayed test from each group, was .35, very similar to the Panel's figure. Use of the first posttest gave similar results. The highest effect sizes were from studies with small sample sizes and with comparison groups who received no training of any kind (the second study in Bradley and Bryant, 1) or whose comparison groups were not observed by the experimenters, the second study in Kozminsky and Kozminsky, 5). If we consider these two comparisons to be outliers and omit them from the analysis, the average effect size drops to .23.³ The effect size for all 11 comparisons was significantly different from

³The National Reading Panel reported somewhat larger effect sizes for Defior and Tudela (2), .05 and .14 for comparison with one comparison group ("manipulation") and .29 and .18 for comparison with the "classification" comparison group. Their result was based on an average of scores on three tests: a cloze test in which subjects completed sentences filling in a single word, a test in which subjects had to "complete or choose a drawing following written sen-

zero (95% confidence interval = .13 to .57). Omitting the two outlier studies, the 95% confidence interval for the remaining nine comparisons narrowly escaped zero (.01 to .45).

Before concluding that there is a modest but significant effect for pure phonemic awareness training on reading comprehension, the following should be considered. Only six studies and 11 comparisons were found. Three involved languages other than English [Hebrew (5), Spanish (2), and Norwegian (6)]. Only one of the six studies (5) yielded substantial effect sizes as well as statistically significant results for all comparisons. Two studies showed very low or zero effect sizes (2, 3), and another reported highly inconsistent results (9). Sample sizes were very small in four of the six studies (1, 2, 5, 9). The only study showing a clear training effect with English-speaking children (1) utilized only 13 children in the trained group, and results were statistically significant for only one comparison.

Because training studies are crucial in establishing causality and because studies using "pure" phonemic awareness training constitute the most valid tests of the efficacy of phonemic awareness training, one must conclude that the research does not provide a suitable basis for drawing conclusions about the necessity of phonemic awareness training for English-speaking children.

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tences" (p. 307), and a more typical reading comprehension test with passages and comprehension questions. The figure in Table 1 is based on the third test only. Using the Panel's effect sizes, however, does not significantly change the overall results.