Literacy Appraisal and Action in the Early Years: A Research Literature Summary

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The following consists of a summary of a large quantity of research literature. The research literature selected was not read in full, but the abstract is provided in the section following this one (Research Literature **Survey**). The abstracts were categorised into sections (below), and a summary of the findings in each section is given. This is thus a literature survey rather than a full literature review.

Methodology

Databases searched included: Social Sciences Citation Index (SSCI), SciVerse SCOPUS, Education Resources Information Center (ERIC), Bath Information and Data Services (BIDS), Cross-Search and Amazon.co.uk.

In SSCI, the search terms entered were "reading" AND "assess*". Introducing more terms led to many more irrelevant results. Items searched were from 1970 to 2012. They were also selected by "education", "educational research", "psychology educational" and "education special" (although items principally about special needs children were excluded, as were items principally about reading in non-English-speaking countries). A total of 2311 hits emerged, all of which were examined. A total of 291 items was selected for the final survey.

In SciVerse Scopus (social sciences only, article AND review only), the terms "reading" AND "assessment" AND "kindergarten" yielded 122 hits, of which 58 items were selected. Changing kindergarten to nursery added nothing. Changing kindergarten to primary yielded 271 hits, of which 20 were selected. Changing kindergarten to elementary yielded 223 hits, of which 20 were selected. Thus a total of 98 items were selected.

In ERIC (with a different search interface), the search terms were "literacy" OR "reading" AND "assess*" AND "eviden*" OR "research" OR "data". Items were searched from 1966 to 2012. They were also selected by "journal articles, doctoral dissertations, ERIC Digests, ERIC publications, numerical/quantitative data, and research reports". Hits were examined for "early childhood education, Grade 1, kindergarten and preschool education". Items retrieved totalled 26,838. Inspection of the first 300 proved that after 230, very few were of interest (ERIC lists hits in order of relevance). Items selected totalled 58.

In Cross-search, many hits were similar to ERIC. They numbered 136, and 55 were selected. However, many of these appeared to be repeats.

In Ingenta BIDS, there were 49 hits, of which 22 were selected.

In Amazon.com/co.uk, 10 relevant books were identified. Amazon.com was not searched.

ZETOC and the Science Citation Index were also searched but nothing emerged.

Thus over all search engines/databases, a total of 534 items were selected. Of course, some of these were repeats. Repeats were weeded out as categorisation proceeded.

Categorisation

The 534 items were then divided into categories so that a short but sensible summary could be written about each category based on the abstracts. These categories emerged from a first scan of the abstracts, and were refined by repeated scanning of the abstracts. Subsequently the category headings were further analysed and some of them were amalgamated. However, a number of individual items clearly referred to more than one category – where this is the case, the item is mentioned in both. Additionally, other items may have had implications for other categories but only appear in one. The total number of items appearing in the categories was 451, but of course this included some which were repeated in more than one category.

The categories were then arranged in what seemed the most sensible order. Then they were further categorised into three main sections. The categories were:

RELIABILTY AND VALIDITY OF PREDICTION
Predictability (Including Dynamic Assessment, Gender & Age)
Head Start and Sure Start

COMPONENTS OF PRE-LITERACY AND LITERACY
Auditory Processing
Language
Letter Naming
Vocabulary
Phonology
Morphology
Memory
Reading Comprehension
Fluency
Book Availability
Drawing
Writing
Metacognition and Self-regulation
Motivation and Persistence
Self-concept
Computer Assisted Assessment

OTHER INTERVENTION
Parent Involvement
Volunteers
Paraprofessionals
Teacher Training
Reading (Read Aloud, Storybook, Dialogic Reading, Interactive Book Reading, Shared Reading, Print Reading, Fiction/Nonfiction, Narrative).
Coaching
Peer Learning
Direct Instruction
Computer Assisted Instruction
eBooks

Kinaesthetic Methods
Composite Interventions

The items categorised were mainly journal papers (and therefore peer reviewed), technical reports and doctoral theses. However, books were also searched, but these were of a more wide-ranging, generic nature, and consequently were mainly summarised in a category foregoing the rest.

SUMMARY REPORT

Books

Those books which include a description largely focus on observational assessment of young children. A number include an observation profile, with assessment items (the Sheffield profile is of particular interest). One book emphasises learning dispositions (e.g. persistence) rather than skill, which is interesting. The book by Riley also clearly includes remediation. The little book by Rasinski offers three three-minute assessments of word recognition, fluency and comprehension and this could well be useful (although the apparent absence of phonic awareness and letter naming is a pity).

RELIABILTY AND VALIDITY OF PREDICTION

The extent to which observational assessments can predict future child performance is a matter for debate. Firstly, genetic influences on reading are substantial and stable, so the amount of variance open to environmental manipulation is already limited. Phonological awareness, rapid naming, and verbal memory are particularly likely to be difficult to influence environmentally. However, vocabulary and print knowledge are more susceptible to change.

Observational assessments can give greater subtlety than tests. However, tests do not give very reliable or valid indicators of student performance, especially in kindergarten and first year, so comparison with this is hardly a recommendation. Test purporting to measure the same variable have been found not to measure the same thing. And the same test assesses different skills depending on the developmental level of the test. It is very rare for any such instrument to be found to be a good predictor in all aspects. Usually one, two or three of many more items are found to be relatively good predictors. IQ is not a good predictor. There can be considerable variation between teachers, although the task becomes easier as children progress through the years. Studies report poor rates for false positives and also for false negatives. Effect sizes are only moderate for the best of the academic variables: for social and behavioural variables they are much lower. The value of items as predictors varies with the host language – some languages favour certain aspects, others not.

Further, a child's performance will depend on how much previous nursery or playgroup experience they have. The evidence is very strong that receiving nursery education strongly positively influences child performance, detectable even when children are in secondary school. This is especially true for disadvantaged children. Month of birth is also related age-position effects. Summer born children are youngest in their year in England.

Additionally, pupil learning trajectory might not be a straightforward curve, and different features of an observational assessment will have higher or lower validity and reliability at different stages within that trajectory (although in general there is no doubt that nursery and first year are the most important).

Ability of pupil also has an effect. There are different developmental trajectories for different ability groups. Students in the average and high literacy readiness groups achieve high scores in decoding (phonics) by the end of the first grade, while students in the low readiness group do not match these scores until the third grade.

The class teacher also has an effect. A combination of student pre-test and mean of pre-test classroom is a better predictor than student pre-test alone, indicating that overall classrooms standards are important.

Other workers have included demographic and family variables. Preschool experiences and parental involvement significantly contribute to kindergarteners' reading readiness development. Socio-economic Status (SES) has an enduring effect which has been demonstrated at least to the end of primary school. Assessments attend to over-identify as at risk children from lower socioeconomic backgrounds, while under-identifying as not at risk children from higher socioeconomic backgrounds.

Where assessment is used to allocate child to different type of instruction, effects can be detrimental. For example, Lentini allocated some of her identified failers to normal classroom instruction (rather than removal for small group teaching) and later there was no difference with ordinary children.

Attention problems predicted reading achievement even after controlling for prior reading achievement, IQ, and other behavioural difficulties. Inattentive first graders with normal reading scores after kindergarten were at risk for poor reading outcomes.

Features of the physical literacy environment have little direct association with children's gains in emergent literacy.

Somewhat surprisingly, there is no evidence that observational assessment shows any gender differences.

Assessments may not be accessible for students with disabilities. Textual features may be particularly difficult for them. English Language learners present another problem.

Turning to those elements which do have adequate predictive validly for children's reading performance, it is clear that letter naming and phonological awareness are frequently found to be highly predicative of pupils' late performance. After those two come others with much less predictive value, i.e. word recognition/identification, language comprehension, rapid naming skills and phonemic decoding.

Much of the US literature has been preoccupied with a US measure, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). However, studies have found only some of the aspects of this have adequate predictive value (including letter naming and phonological awareness), and even then the effect sizes are only moderate, with a good deal of mis-prediction for English Language Learners (ELL) students.

Dynamic Assessment has generally shown promise. (This is a form of formative assessment in which the professional assists the child to varying degrees with the task in hand, and measures their response to instruction). This was true for ELL children also.

Attempts to measure social factors and learning styles have met with mixed success. However, one study identified four response types: cooperative, resistive, enthusiastic and disaffected (no differences in IQ). The cooperative group consisted of more female and Hispanic students, whereas the resistive group consisted of more male and African American students. For reading, the

cooperative and enthusiastic groups outperformed the resistive and disaffected groups. Learning styles have not accounted for much of the variance in reading performance (less than IQ).

A final question is whether teachers pay any attention to the assessment results? Happily, one study found that low levels of academic pre-skills in kindergarten classrooms in the fall predicted high classroom quality in the classrooms later on.

Head Start and Sure Start

Head Start is a very wide-spread programme in the US for disadvantaged early years children. British Sure Start evaluations are also mentioned in this section. However, much of the literature gives description but little evaluation. One study found that children's vocabulary and letter-word identification abilities were improved by Head Start (although affected by maternal education and the child's gender and age). Another study found that while Head Start children score higher than their same-age peers when compared to non-Head Start children from the same socio-economic status, there was still a gap between Head Start children and their peers in schools with higher social economic standing. A review by the What Works Clearinghouse looked at follow-up at the end of the year and was not optimistic. While Head Start children did a little better than ordinary children, the difference did not reach statistical significance. This was true for 3-yesr-olds and 4-year-olds.

COMPONENTS OF PRE-LITERACY AND LITERACY

Auditory Processing

There is some evidence that auditory perception is important in children who are later diagnosed as dyslexic. However, a review by Kavale indicated that much of the variance in auditory and visual perception were accounted for by IQ, and that perceptual processes no longer need to be considered primary factors in predicting reading ability

Language

In one study, language intervention in pre-school had no effects at follow-up. In another, kindergartners with poor language did poorly at reading, but this relationship was mediated by phonological awareness. Children's oral narratives did not predict their reading competence at age 6. The Language Development Rating Scale was not a good predictor of reading in Hang Kong. One study examined teacher language as a predictor of children's reading and found that it did indeed predict reading competence.

Letter Naming

Letter naming is one of (if not the) strongest predictor of reading and spelling performance. Phonological and rapid naming tests each predicted unique variance in reading attainment. Two studies indicated that alphabet knowledge contributed unique variance to reading ability over and above that accounted for by phonemic awareness ability, but that the reverse was not the case. Letter names and sounds (and upper and lower case) were not as disparate as is often thought, and should be regarded as a single variable. The amount of specific instructional content from the

teacher, as well as how this instruction was implemented, was related to students' letter knowledge and phonological awareness skill growth. Training in letter naming was not effective at follow-up.

Vocabulary

A number of studies of vocabulary found that letter naming (not vocabulary) was the better predictor. One study found phonological awareness was a better predictor. However, some studies did find vocabulary was a good predictor, better than nonsense words. One study found vocabulary a good predictor at grade 6 but not grade 1. In a training study, pupils reviving more instruction showed better vocabulary scores. Pupils with poor word recognition tended to be stable in that tendency over time. Environmental print may be used directly when parents and educators use it to scaffold the learning of emergent literacy skills.

Phonology

There are far more studies in phonology than any other area. It is difficult to see why this area is more popular than Letter Naming, for instance. There are two major reviews of this field. Bus found that the combined effect sizes for phonological awareness and reading were d = 0.73 and d = 0.70 respectively. Programs combining phonological and letter training were more effective than purely phonological training. In sum, phonological awareness is an important but not a sufficient condition for early reading. Ehri's revealed that the impact of phonic analysis (PA) instruction on helping children acquire PA was large and statistically significant (effect size = 0.86). PA instruction exerted a moderate, statistically significant impact oil reading (d = 0.53) and spelling (d = 0.59).

However, a number of studies indicate that phonemic awareness loses its predictive power as children grow older, although one study does track its significance through to the end of primary school. Training can increase phonological awareness and reading ability. Three phonological awareness tasks, Invented Spelling, Categorization, and Blending, were the most predictive of standardized reading measures obtained at the end of first grade. Performance on dynamic phoneme segmentation was the best predictor of end-of-year reading scores and of growth in phonemic awareness. Results provided support for an ordering of tasks by difficulty, or age of mastery, as follows: rhyme, alliteration, blending, segmentation, manipulation. Another study found Segmentation the most sensitive task. Children's rhyme sensitivity may be influenced by engagement in word games and book interactions that foster knowledge of linguistic routines containing rhyme. Poorer responders need more intensive instruction to show continuous growth.

Morphology

A morpheme is the smallest meaningful unit in a language. Morphology is consequently the study of how these "units of meaning" combine to form words. Morphology was found important with young Chinese-speaking ELL children. Morphological skill was found important for a culturally diverse group of participants. Children with Speech Sound Disorder scored significantly lower than did their counterparts on the morphological awareness measures. However, no studies have investigated morphological ability in normal children.

Memory

The evidence on the importance of memory is mixed, but this may be because of the way researchers have tried to measure memory. Some studies find and effect, while others do not. Working memory predicted unique variance in reading comprehension after word reading ability and vocabulary and verbal ability controls. Measures of working memory predicted specific and significant amounts of variance in reading and spelling achievement. Both verbal and visual short term memory in kindergarten were significantly correlated to later decoding skill, but visual memory was more predictive. Reading skills are mainly predicted by phonological memory measured at the end of first grade. On the other hand, phonological memory had only a weak effect on phonological awareness at preschool age and a weak indirect effect on grade 1 word recognition. Phonological memory did not directly affect reading comprehension. Regression analyses revealed that not all of the short term memory tests were significant predictors of reading.

Reading Comprehension

Surprisingly, there is relatively little research on reading comprehension. Two studies point up the strong relationship between listening comprehension and reading comprehension, as well as the effects of both upon reading comprehension. Other studies highlight the importance of visual comprehension of pictures and its relationship to reading comprehension.

Fluency

The term Fluency is used in the literature to refer to a multitude of constructs, as well as its more usual use with reference to Reading Fluency. Results are mixed. One study found oral reading fluency (ORF) was "reasonably" accurate at identifying children reading below the twenty-fifth percentile. Another found that the relation between oral reading fluency and reading comprehension varied as a function of students' oral reading fluency and that different score types had varying predictive validity for year-end reading comprehension. A third demonstrated the superiority of word identification fluency over nonsense word fluency. However, a fourth found that oral reading fluency, although a separate construct from word reading accuracy, was not uniquely related to reading comprehension after accounting for the effects of word reading and semantic knowledge.

Book Availability

This might seem an odd variable to find in this report, but access to books could have a significant influence on reading. The volume of books available in a school is a function of the importance accorded to this over the years, and variable. Even if numbers of books are adequate, is the ration of fiction to non-fiction appropriate? And does the school have a loan scheme which makes it easy for pupils to check out books? Neumann developed a programme to flood 330 child care centres with books (and provide 10 hours of training to staff). Children in the intervention group scored statistically significantly higher than the control group on four of six assessment measures, with gains still evident 6 months later in kindergarten. In another study, emergent readers appeared to demonstrate genre preferences (preferred modem and traditional fantasy over realistic fiction, informational and alphabet-number books). Additionally children selected familiar books more often and that especially in the case of kindergartners, familiarity influences reselection.

Drawing

Only one study focused on drawing, a marked change from years ago when drawings were considered a major indicator of developmental maturity. Results of drawing predicted a child's success in mathematics and language at the end of first grade better than teacher reports and the results of individual tests.

Writing

Reading performance and visuo-spatial memory skills are crucial to children's' writing performance. Child skills were measured at school entry and those variables found significantly associated with writing included vocabulary score, pre-reading skills and proficiency in writing name. The only variable that maintained its significant relationship to writing at 7 years was home writing. Another study found that maternal writing mediation accounted for enhanced development in later years in reading and writing. By contrast, core language abilities, pre-reading skills, and maternal education at preschool significantly predicted the level of writing in Grades 3-5, but only core language abilities and pre-reading skills significantly predicted the rate of growth in writing. Children with weaker oral language skills lag behind their peers with stronger oral language skills in terms of their writing-related skills. Automaticity in name writing parallels control of the alphabet and recognition of several sight words – although of course this does not mean that name writing has a causal connection to these desirable events. Training in writing improved writing but had no transfer effect to reading.

Metacognition and Self-regulation

One study found that the individualisation of pupil learning led to greater self-regulation which in turn led to greater academic development, but this effect was only present for students with weaker initial self-regulation. Another found that although phonemic awareness retained its prominence as a predictor of early reading skills, metasyntactic ability often accounted for significant variance. The application of learning styles to the teaching of reading is critiqued in light of four factors: (a) inability to adequately assess learning styles, (b) failure to acknowledge the necessity of phonics instruction for beginning readers, (c) failure to consider the nature of reading disabilities, and (d) lack of convincing research. This critique suggests that the use of learning styles to prescribe methods of reading instruction must be viewed with scepticism.

Motivation and Persistence

Measures of negative emotionality and activity level were correlated with reading. Persistence played a significant role in accounting for reading progress. For children with lower intelligence only, persistence significantly predicted reading achievement. Persistence measured in kindergarten was a significant predictor of the growth rate of reading ability for children from kindergarten through third grade. In another study, low teacher stress and high classroom organization predicted high learning motivation in children and the children's learning motivation contributed to their level of phonological awareness. Considering motivation only, kindergarten children were assessed during the course of a year and a slight decrease in reading attitudes was found.

Self-concept

Considering the importance of self-confidence for all learning tasks, it is surprising that this section holds only one study. Children with negative academic self-concepts (ASCs) performed poorly on reading-related tasks and reported more negative reading self-concepts than did children with positive or typical ASCs.

Computer Assisted Assessment

There is some empirical research providing evidence that computer-based testing (CBT) is appropriate for use with typically developing children under the age of six. Children were administered paper-and-pencil (PPT) and CBT versions of a rhyme awareness scale. Preschool and kindergarten children needed help with the CBT. Difficulties were related to using the mouse and following directions. About 12% of the kindergarteners needed adult support to finish the CBT, compared to nearly half of the pre-schoolers. Children of all ages reported enjoying using the computer and doing the rhyming tasks. A UK study with 5-7-year-olds involved a pair of tests assessing early reading delivered by computer, the test items including phonological segmentation, rhyming and word recognition. The strengths and weaknesses in early reading skills implied by the resultant profiles provided for teachers in an online reporting package together with indicators for the next steps in teaching.

A US study contrasted Dynamic Indicators of Basic Early Literacy Skills (DIBELS), STAR Early Literacy (SEL), Group Reading Assessment and Diagnostic Evaluation (GRADE), and the Texas Primary Reading Inventory (TPRI), all delivered on computer. For all components, correlations among relevant subtests were high and comparable. STAR Early Literacy was the most cost-effective measure among those studied. In a study of Grades 1-10, when minimum implementation quality criteria were met, the positive effect of computerized assessment was higher in the earlier grades and for lower achievement students. Implementation quality tended to decline at grade levels. With higher implementation quality, reading achievement gains were higher for students of all levels of achievement and across all grades, but especially in the higher grades. Very high gains and effect sizes were evident with very high implementation quality, particularly in Grades 1 - 4. In a final study, no significant gender differences were found on any of the test modules, although females did outperform males on a conventional spelling test. While no gender differences were found on the computerised versions, there were significant differences on the paper versions of the reading and spelling modules favouring females. In a third part of the study, there were no significant differences on the computerised modules, but girls performed significantly higher than boys on the paper version of the spelling module.

OTHER INTERVENTION

Parent Involvement

A surprisingly large number of studies emerged in this area and almost all of them were positive about the effects of parents helping at home. In a review, 51 studies of parental involvement programmes were associated with higher academic achievement by 0.3 of a standard deviation unit. In another review, an effect size of +0.55 was obtained. Most studies involved reading. Studies in this area can be categorised into those which showed a change in parental knowledge, those which

showed a change in parental behaviour, and those which showed a change in consequent child behaviour or performance. The vast majority of studies are in the last category.

Knowledge

Mothers' perceptions of children's reading ability in kindergarten were associated with children's later self-perceptions of reading ability and academic achievement.

Parent Behaviour

Degree of caregiver involvement, rate of language interactions, and participation in early literacy activities were related to early literacy and language skills. Older children produced significantly more requests with fathers than with mothers but significantly more assertions with mothers than with fathers. There was a wide variety in frequency of book reading among fathers. Fathers were more likely to read to their children frequently if they spoke English at home, had a high school education, and if their children had better language skills.

Child Behaviour and Performance

Infants' responses gain significance through responding to books with the mother, and eventually through evoking responses and pointing by the mother. Parent-child reading interaction was a significant predictor of children's receptive vocabulary, story and print concepts and general emergent literacy skills. Parents' instructional and social-emotional quality had an effect on reading comprehension, but not on word decoding. Four parents out of eight provided substantial word-level support, and the children who received this support made fewer repeated reading errors. All participants made substantially fewer reading errors during the intervention, demonstrated decreased errors and significant fluency gains and improved on an independent reading measure. Interactive storybook reading improved less for older than younger children, whereas writing mediation improved more for older than younger children. Students who received greater parent-tutoring support achieved significantly higher grades in reading, spelling, and mathematics than did less supported children. The number of books and the amount of time children read and/or were read to significantly increased, especially for boys. Children's receptive language test performance increased. Parent-child reading was related to Grade 1 vocabulary. In paired reading, children's reading accuracy and rate increased. In addition, students and parents gave favourable treatment acceptability ratings.

Volunteers

Results for volunteers are mixed. In a review, there were eight experimental studies, of which seven were RCTs. Four of the trials showed a positive outcome, while three showed a negative effect and the remaining study was equivocal. Overall there was an effect size of 0.19, which was not statistically significant. Volunteering appeared to have a small effect on reading outcomes. In one study, the treatment group outperformed the control group on all reading, decoding, spelling and segmenting, and writing measures, with effect sizes averaging .21, .35, .37, and .19, respectively. In another study, assessment immediately after the intervention, and 3 years Inter, indicated that children receiving the volunteer intervention failed to make greater progress than same-school controls.

Paraprofessionals

By comparison, results for paraprofessionals are more positive. Results showed encouraging growth in reading skills for all student age groups compared to the rest of the class. The Education Assistants responded well to the initial and on-going training processes, refining their teaching skills and the intervention over the period. Another study explored whether the effects of interventions delivered by classroom assistants (CAs) were still evident at the end of the first phase of schooling, 16 months after the early intervention finished. Gains in reading delivered following early phonic reading interventions delivered by CAs were maintained for many children. In a third study, results showed test gains with large effect sizes for treatment students.

Teacher Training

There are many reports of teacher in-service training having evidenced effects on pupil performance. However, in this area implementation integrity is an even bigger issue than in other areas. This finding does not mean that all teacher training is effective, only that teacher training done the way the project team did it can be successful. Also, some of these studies report many outcomes, and it is possible that outcomes which did not reach significance were not mentioned.

A small number of studies reported changes in teacher knowledge (a very weak outcome variable). A large number of studies reported changes in teacher behaviour (a stronger outcome variable). Slightly fewer studies reported changes in child behaviour and performance (the strongest outcome variable). This is an interesting contrast to the studies of parental involvement (above), where far more of the studies reported effects on child behaviour and performance.

Teacher Behaviour

Regarding changes in teacher behaviour, Slavin's review concluded that **instructional process** programs designed to change daily teaching practices have substantially greater research support than programs that focus on curriculum or technology alone.

Child Behaviour and Performance

Regarding changes in child behaviour and performance: effects on reading and spelling, literacy skills, word-reading but not phonological awareness, knowledge of the alphabet, emergent writing and word identification but not oral language, receptive vocabulary and phonological sensitivity but equivalent alphabet learning, and student engagement in academic activities and positive behaviours. One study was not significant for effects of professional development across child outcomes and classroom measures.

Reading
(Read Aloud, Storybook, Dialogic Reading, Interactive Book Reading, Shared Reading, Print Reading, Fiction/Nonfiction, Narrative).

The idea of resolving reading problems by having children read may or may not seem obvious, but a number of projects have tried different ways of having children read more. That this is important is demonstrated by a study that showed that students read orally for just over 1 minute during their reading instruction lessons, with approximately equal time spent reading sounds, words, or connected text. Thus giving children opportunities for extended practice is important. However, it is

also important that this practice is at the right level of challenge, and that preferably children interact with another person who can guide them through the material or discuss it with them. A number of the studies reported below have implications for peer learning (and could equally appear in that section) and non-fiction reading.

A number of studies report improved pupil performance from such extra reading practice. A meta-analysis on the effects of storybook read-aloud interventions for children ages 3 to 8 showed significant, positive effects on children's language, phonological awareness, print concepts, comprehension, and vocabulary outcomes. In guided reading groups pairs of students worked together and showed overall reading growth, with marked growth in letter recognition and beginning sounds. Children in the programs progressed significantly more on phonological awareness and orthographic awareness. The joint writing group performed significantly better on phonological awareness, word writing, orthographic awareness, and letter knowledge. Children's readings information books contained far greater use of information book language. Students made significantly more progress across a range of early reading measures. Both speech sound accuracy and vocabulary predicted unique variance in phonological awareness. More strategies were used to construct the meaning of the nonfiction text. A moderate effect size was found for oral language skills. The intervention benefited children's comprehension of narratives in the picture-viewing modality as well as narrative meaning-making in listening comprehension and oral production modalities. Understanding and recall of main narrative elements improved, as did inference-making skills. There was an increase in the length of time students silently read to themselves as a result of daily teacher read-alouds. Children significantly increased their language comprehension and expression when listening to stories read aloud, either at home or at school.

Coaching

"Coaching" is a relatively new expression in the teaching of reading, but may be taken to mean either individual or small-group instruction separate from normal whole-class instruction. Some 40 years ago there was a considerable literature in the UK finding that "remedial" groups were not effective, which led to the disbandment of many of them. It is interesting to see a somewhat similar idea now resurfacing with a different name.

However, there is some evidence that this can work. More individualized instruction yielded higher gains in reading skills (Effect Size = 0.52). Small group teaching over nine weeks gave significant treatment effects on two of four outcome variables (rhyming and alliteration). Supplemental small-group reading instruction was effective for English Language Learners and Learning Disability students. Small group and individual teaching children made significantly more progress on measures of letter knowledge, single word reading, and phoneme awareness. However, there was no difference in dosage effects and one-quarter of the children did not respond to this intervention. In one-on-one sessions there were significant kindergarten gains for initial word identification but no significant gains in first grade.

Peer Learning

Firstly, the peer culture in the classroom has significant effects on learning. The ability level of the peers in a child's classroom has direct and positive effects on the child's cognitive skills, pre-reading skills, and expressive language skills after controlling for preschool resources, family characteristics, and the child's skills at the beginning of preschool. Peer learning programmes try to capitalise on these effects. Peer learning may seem improbable with such young children, but actually is quite

widely implemented. It can operate on a cross-age basis (older pupils tutoring younger pupils) or a same-age basis (more able pupils within the same class tutoring less able pupils).

Twenty teachers implemented a peer tutoring program for 15 weeks. Irrespective of type of measure and type of learner, students in peer tutoring classrooms demonstrated greater reading progress. Fourteen pre-schoolers engaged in buddy reading. Opportunities to use and learn words occurred when children provided exposures to vocabulary words or clarified concept knowledge for their buddy. In follow-up in sixth grade, Class Wide Peer Tutoring (CWPT) indicated a significant advantage in growth in reading, language, mathematics and science and social studies subscales not previously assessed. Students in "PALS" classrooms alternately take on the role of tutor and tutee to read aloud, listen to their partner read, and provide feedback during various structured activities. Students learn these strategies: passage reading with partners, paragraph "shrinking" (or describing the main idea), and prediction relay (predicting what is likely to happen next in the passage). PALS students outgrew contrast students on reading comprehension,

Direct Instruction

Direct Instruction is a highly structured and scripted form of teaching, usually operated in small groups. It has positive evaluation results, but is not favoured by many teachers because of its limitations on teacher initiative. There are also questions about the sustainability of gains. Development of word recognition (WR) showed the pupils in the experimental group to outperform those in the control group. However, this effect attenuated over time with better performance by the control group on the last measurement occasion. Students receiving the direct instruction curriculum intervention met or outperformed their control at-risk and norm-referencing peers on all three reading measures.

Computer Assisted Instruction

Computer Assisted Instruction (CAI) can be implemented with young pupils. Of course, CAI can be of many different types, so results are strongly connected to nature of implementation. Both computer-assisted intervention groups showed improved word recognition compared to the control group. CAI supplemented a phonics-based reading curriculum for pre-schoolers and kindergartners, providing exercises in phonological awareness and basic phonics skills. The treatment group made significantly greater gains than controls. The intervention showed significant immediate effects on rhyming and grapheme knowledge but not phonemic segmentation or auditory blending. In the first grade, retention effects were demonstrated after four months of formal reading education. In an intervention focused on spelling, reading from the computer screen, copying from the screen, and writing from memory after presentation on the screen were compared. Copying words from the screen resulted in significantly fewer spelling errors. All three forms of practice improved the accuracy and fluency of reading.

e-books

The term e-books covers a variety of methods, from books read on electronic readers by older pupils to interactive storybooks for younger pupils in which they can click to obtain a definition of a word, learn something more about a particular character or object, or indeed select different branches for the story to follow. Reading the e-book with adult assistance supported the children's phonological awareness and emergent word writing more significantly than reading the e-book without support. Significantly greater gains in word recognition and enjoyment of instruction were found following the e-book. The findings indicated improved performance by both experimental groups. Groups of 5-yesr-old and 6-yesr-old pupils showed equivalent gains from pre- to post-test. However, there was no effect on attitudes.

Kinaesthetic Methods

At one time kinaesthetic methods were a standard recommendation for children with reading difficulty, but this has now fallen away, and there is only one study in this section. The effects of Traditional versus Tactual/Kinaesthetic versus Interactive Whiteboard instruction on short- and long-term word-recall and attitude-test scores of primary students were studied. There were significantly higher short- and long-term word-recall scores when students were instructed through Tactual/Kinaesthetic instructional methods over the Traditional or Interactive Whiteboard approaches.

Composite Interventions

This section includes a number of papers which give no outcome data. The positive findings mentioned are thus highly specific to the form of intervention described. Low levels of academic pre-skills in kindergarten classrooms in the fall predicted high classroom quality in the classrooms later on, i.e. teachers were adapting instructional practices. A large and significant difference was found in favour of the Voyager students. Effect sizes of the program ranged from 0.23 to 1.32 in seven test instruments. For the Early Steps intervention, results at the end of Grade 1 and at the beginning of Grade 2 indicate that the experimental group performed statistically significantly better than the control group on all variables assessed. In particular, the children with the lowest pre-test levels, the very high-risk children, benefit most from the intervention. For the PaveD intervention, the programme participants benefited in early literacy and decoding skills when compared to controls. The Bright Start intervention was evaluated - children in the experimental group improved their performance on different cognitive tasks and showed more task-intrinsic motivation and metacognitive behaviour than did those in the comparison group. In the Early Reading Intervention (ERI), results showed word attack and letter word identification gains with large effect sizes for treatment students.

CONCLUSION

Letter naming and phonological awareness are highly predicative of pupils' late performance. Word recognition/identification, language comprehension, rapid naming skills and phonemic decoding are somewhat less predictive but might still have value. Any observational assessment should include all six of these items.

Considering the other areas listed in the Components of Pre-literacy and Literacy section, we can obviously reinforce the inclusion of Phonology and Letter Naming. To this we should add Motivation and Persistence and Computer Assisted Assessment, which were well supported from the research. We could also possibly add Book Availability and Writing (less well supported).

Considering the areas listed in the Other Interventions section we can add the following evidence-based aspects: Parental Involvement, Paraprofessionals, Teacher Training, Reading, Coaching, Peer Learning, Direct Instruction, Computer Assisted Instruction, e-books and Composite Interventions.

This then gives us a list that looks like this:

COMPONENTS OF PRE-LITERACY AND LITERACY

1. Letter naming
2. Phonological awareness
3. Word recognition
4. Language comprehension
5. Rapid naming skills
6. Phonemic decoding
7. Motivation and Persistence
8. Computer Assisted Assessment
9. Book Availability
10. Writing

OTHER INTERVENTIONS

1. Parental Involvement
2. Paraprofessionals
3. Teacher Training
4. Reading
5. Coaching
6. Peer Learning
7. Direct Instruction
8. Computer Assisted Instruction
9. e-books
10. Composite Interventions (only some, and these may not be available in the UK)

An observational checklist for teachers could include the first 10 items (a practically small number), which have obvious implications for teacher action. In addition, the remaining 10 Other Intervention items could be included as reminders to teachers of what can be done (and is evidence-based). Obviously the order of these items would need to be rearranged to make sense to teachers.

Of course, teachers looking at an erratic profile of skills for a child will be unsure about whether they are supposed to remediate the weaknesses or help the child deploy their strengths to circumnavigate their problems – or both.

However, given the uncertainty surrounding the use of such observational assessments, it is suggested that such an assessment needs to be coupled with other measures, in order that triangulation can potentially occur.

Clearly, teachers require forms of assessment which are very quick to administer and score and lead obviously to teaching action. Consequently two brief forms of onward assessment are suggested.

The first is a test of letter naming and phonemic awareness which is administered by the teacher herself. This should be along the lines of the "three-minute tests" advocated by Rasinski, but focusing on other abilities than his tests. The abilities focused on should be letter naming, phonemic awareness and word recognition.

The second is a longer form of assessment which is computer administered, but with such young children needing supervision by a classroom assistant, whose activity will nonetheless by highly scaffolded by the computer. Although a number of possible tests present themselves, the issue of cost-effective use of time is important here, and consequently the Star Test of Early Literacy is suggested. This is computer scored, thus saving scoring time and enhancing reliability.

One other resource which may be of use is the "Early Learning Skills Analysis" (a book by M. Ainscow and D. Tweddle, published by David Fulton, London, in 1984). This includes analyses in a great many areas, but including analyses in language and reading.