RHYMES AND PHONEMES IN THE COMMON UNIT TASK:

REPLICATIONS AND IMPLICATIONS FOR BEGINNING READING

by

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RUNNING TITLE:

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ABSTRACT

Theorists and practitioners in the field of reading development are currently debating the importance of rhymes and phonemes in beginning reading. In a recent study, Duncan, Seymour and Hill (1997) provided evidence that explicit or meta-awareness of sound is closely linked to reading strategy. Meta-awareness was measured by asking beginning readers to identify the “common unit” shared by two spoken words. Results showed that meta-awareness of phonemes emerged prior to meta-awareness of rhyme, and that reading strategy followed a similar small-to-large progression. This study reports on a replication of the “common unit” task which includes modifications to the original procedure (randomisation of conditions, increased practice, removal of positional references from instructions). The results confirm the pattern observed in the original study. Beginning readers learning by a mixed method can identify shared phonemes but not shared rimes in the common unit task. The implications of this and similar replications are discussed.
INTRODUCTION

Questions about the size and nature of the linguistic units which are important in the early stages of learning to read have recently become a focus of debate in literacy education. A distinction has been made between so-called *large units*, often equated with the rhyming parts of words, and *small units*, which are identified with elements of speech (phonemes) that correspond to the letters of the alphabet. One influential view is that a young child's linguistic awareness naturally encompasses large units before small units, so that it makes sense to suggest that reading acquisition might beneficially follow the same large-to-small pathway (Goswami and Bryant, 1990).

At the basis of this suggestion there is a linguistic proposal that syllables have an internal hierarchical structure (Venneman, 1988). In general, a syllable must contain a vowel, referred to as the *peak*, and this may, optionally, be preceded by a consonant or consonant group, called the *onset*, and/or followed by a consonant or consonant group, known as the *coda*. The hierarchical structure arises because the peak might cohere with the onset, forming a higher-order grouping known as the *body*, or might cohere with the coda to form a structure known as the *rime*. This latter is equivalent to the sound which is shared by rhyming words, for example the /ait/ in 'white' and 'fight'. Figure 1 represents the hierarchy diagrammatically. It can be noted that onsets and codas can also be subdivided into smaller elements, called *phonemes*.

--- Figure 1 about here ---

The new version of the large-to-small hypothesis is founded on the assumptions that: (1) a special linguistic status attaches to the *onset* and *rime* segments within the syllable; and (2) the development of linguistic awareness proceeds naturally from the top to the bottom of the hierarchy - from syllables, to
onset-rimes, and eventually to phonemes (Treiman, 1987; Treiman and Zukowski, 1991). Bryant and his group in Oxford have shown that pre-readers are able to make odd-word-out judgements based on shared rimes and that a predictive correlation exists between pre-school rhyme awareness and subsequent reading (MacLean, Bryant and Bradley, 1987; Bryant, MacLean, Bradley and Crossland, 1990).

Goswami and Bryant (1990) integrated these findings with Goswami’s (1986, 1988) demonstrations that beginning readers could use rime analogies contained in clue words to help them read new words. This integration provided the basis of a causal theory of reading acquisition which emphasised the role of rhyming and analogy in the initial phase of learning (Goswami, 1993). The theory has proved influential in education and justifies the decision to place rhyming and analogy at the centre of the 1st year curriculum in the new National Literacy Framework.

**Duncan, Seymour and Hill (1997)**

In a recent paper Duncan, Seymour and Hill (1997) discussed the process of beginning reading in relation to two theoretical positions which they referred to as *large unit* theory and *small unit* theory. The large unit theory is, in essence, Goswami and Bryant's proposal that reading development starts with large units, particularly rimes, and proceeds gradually towards the mastery of the small units. The small unit theory is the converse proposal that reading begins with the small units (phonemes) and their connections with the letters of the alphabet (graphemes) and then proceeds to incorporate larger groupings, including onset and coda clusters and rimes (see Ehri, 1992, 1997). Thus, with respect to the hierarchical description of the syllable in Figure 1, small unit theory holds, in direct contradiction to large unit theory, that reading
development proceeds from the base of the hierarchy towards the top, that is, from phonemes up towards onset-rimes.

Duncan et al (1997) set up a series of experiments which were designed to determine whether or not the behaviour of beginning readers conformed to the predictions of large unit theory. These experiments were part of a longitudinal study of early literacy in Dundee in Scotland in which children were followed through the Nursery School (age 4 years) and then through the first two years of Primary School (age 5 and 6 years). The original sample was sub-divided into two groups of 30 children (A and B) according to the Nursery School of origin. An intervention aimed at promotion of awareness of rhyming was applied in School A. This involved a programme of pre-school activities (songs and games) which were effective in encouraging rhyming skill. At the end of the pre-school year, Group A performed significantly better than Group B on tasks of rhyme production (70% vs. 22% acceptable responses) and rhyme odd-word-out detection (91% vs. 66% correct).

Two experiments were conducted during the Primary 1 year which were intended to determine whether the initial stage of reading development followed a large unit or a small unit pathway. In the first of these, conducted after 7 months in school, the children played a game in which they attempted to read unfamiliar nonwords. Some of the nonwords shared rime segments with real words which had been taught in class. Others were not related by rime to any words which the children knew. In the second experiment, carried out after 10 months of schooling, children were shown familiar words taken from their reading schemes and were asked to mark the letters which corresponded to a sound spoken by the experimenter. The sounds were systematically selected by reference to the hierarchical structure of the syllable (Figure 1) and could be large units (bodies or rimes) or small units (onsets, peaks or
codas). Contrary to expectations, neither of the experiments produced the results predicted by the large unit theory. In Experiment 1, the expected advantage for nonwords which shared rime segments with familiar reading scheme words did not occur. In Experiment 2 the outcome was the reverse of the prediction, since children found it more difficult to mark rime segments in words they knew than smaller segments (onsets, peaks, codas). This pattern was found in Group A (the 'expert' rhymers) as well as in Group B.

Duncan et al (1997) concluded that the children in both groups were probably adopting a small unit approach in the beginning stage of reading. One obvious possibility is that this was determined by the method of teaching which was followed in Dundee. Investigations established that this was reasonably standard across schools and tended to conform to a traditional mixed regime in which a specified vocabulary is taught concurrently with the letters of the alphabet and their sounds and some basic decoding skills. The implication seemed to be that it was the method of teaching reading rather than the linguistic awareness acquired in Nursery school that decided how children developed in the beginning stage of literacy acquisition.

**Phonological common unit identification task**

In Duncan et al's (1997) study two measures of rime awareness can be contrasted. The first procedure, which was applied towards the end of the pre-school year, was a version of the odd-word-out task in which children decided, on the basis of the presence or absence of a shared rime, which of three spoken words differed in sound from the other two (e.g. hug jug net). The children demonstrated an effective awareness of rime in this situation and this was particularly true of the sample drawn from Nursery School A.
The second procedure was a 'common unit' task which was run twice during the Primary 1 year, initially after 7 months in school, and again after 10 months. On the first occasion, the children were presented with spoken word pairs, based on their reading scheme vocabularies, which shared a body (“can-cat”), or a rime (“dad-sad”), or an onset (“stop-star”), or a peak (“home-ripe”), or a coda (“look-week”). In the second study, shared onsets, codas, bodies and rimes were assessed, using word pairs which contained simple (single phoneme) or complex (consonant cluster) onsets and codas. Examples of these materials are shown in Table 1. In both experiments, children played a game in which they helped a puppet to say the common sound from the word pair. Thus, given the rime pair "paste - waste", the child should help the puppet to say "aste".

--- Table 1 about here ---

The surprising outcome of Duncan et al's (1997) study was the difficulty which rhyme-aware children experienced in reporting the common rime unit. In the first study, success rates were 18% for Group A and 10% for Group B. Essentially the same outcome was obtained in the second study three months later. The graph showing these data has been reproduced in Figure 2. The right-hand panel shows the accuracy scores for retrieval of large units (bodies and rimes) containing simple or complex consonant structures. The Group A result for rimes was 14% correct, lower than their accuracy at reporting bodies. Hence, it appeared that children who were effective in making judgements about rhyme in the odd-word-out task were unable to retrieve the rime segment in the common unit task. The second feature of the results was the apparent priority accorded to small units (onsets and codas). In the first study, the overall rate of correct responses for onsets was 73%. In the second experiment, where complexity was systematically manipulated, it can be seen (Figure 2) that
Group A retrieved simple (single phoneme) onsets and codas with an accuracy of 98% and 88%, respectively, and that Group B showed a similar pattern but with a larger difference between onsets and codas. Performance was substantially weaker for complex onsets, and especially so for complex codas.

--- Figure 2 about here ---

These results can be discussed in relation to the assumptions of the large unit (rime and analogy) theory. If awareness of syllabic structures develops from the top of the hierarchy towards the bottom (Figure 1), then an obvious prediction is that children should be able to isolate and report large units (rimes) before small units (phonemes). The actual results seem to go in precisely the opposite direction, with simple (single phoneme) onsets and codas becoming available before intermediate structures (complex onsets and codas) or large units (rimes and bodies).

This outcome calls into question the assumption that there is a large-to-small unit progression in the development of linguistic awareness, and indicates that, on the contrary, the direction of development in post-literate groups may be from small units towards large units.

REPLICATION OF THE COMMON UNIT STUDY

The common unit results were debated in a symposium convened by Uta Frith at a recent meeting of the Experimental Psychology Society (Cambridge, April 1998). In the discussion, Peter Bryant drew attention to various methodological issues which, he thought, may have influenced the outcome: (1) the sessions were scheduled in a fixed order (onset, body, coda, rime) leaving open the possibility that different results might have been obtained if other orders had been used; (2) there was reference in the
practice feedback to the location of the shared sound at the "beginning" or "end" of the words which might have been interpreted as referring to initial or final phonemes and thus as encouraging small rather than large unit responses; (3) single practice items were introduced before each set of simple or complex items and it could be that a larger amount of practice and feedback would have improved the results; (4) since (most) consonants cannot be produced without the addition of a vowel (usually a schwa), there may be problems in distinguishing between small and large unit responses in some instances.

In the light of this discussion it appeared worthwhile to conduct a replication of the common unit study in which the procedures were modified with the aim of taking account of the points which had been raised.

**METHOD**

**Participants**

The participants were 30 children, 19 boys and 11 girls, all members of a first year class in a Dundee Primary school. The experiment was conducted in May 1998 when the children had been in school for about 9 months. The average age at that point was 5.8 years. Administration of the British Picture Vocabulary Scale suggested average verbal ability (mean standard score = 100.27, sd = 13.74).

Reading instruction involved the learning of a sight vocabulary of common words as well as words from a reading scheme. Letters were taught by reference to sounds (not names), mainly in the context of writing, and coverage of the whole alphabet had only just been completed when the study was carried out. The focus was on simple letter sounds in the word onset position. Rhyme emphasis was present in
the form of poems which were read to the class 2-3 times per week, often with the teacher asking the children to supply the rhyming words, which they were able to do very successfully.

Reading progress was assessed at the start of the study by administration of the British Abilities Scale (BAS) word reading subtest. The mean Reading Age for the class was 5.37 years. This was calculated by assigning a notional age of 4.9 years to 12 children who were unable to score on the BAS. Mean Reading Age for the remaining 18 children was 5.68 years. These values are somewhat lower than those reported by Duncan et al (1997) for children from a wider range of Dundee schools (6.06 years). This difference was significant (t(83) = 4.72, p < 0.001) and indicates that the new sample was less advanced in reading than the original one.

Materials

Four types of common unit were assessed (onsets, codas, bodies, and rimes). For each condition there were 6 practice items and 8 experimental items divided equally between simple and complex structures. Duncan et al’s (1997) word pairs were used for the replication apart from one pair from the complex body condition (‘twin’-‘twig’) which was replaced by the pair ‘stole’-‘stone’ in order to remove possible ambiguity in distinguishing between the body response /twi/ and the onset response /twə/. A complete listing of the materials is provided in the Appendix.

Procedure

The children were tested individually in a quiet area adjacent to their classroom. There were four sessions, one for each block, each scheduled on a different day and lasting

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1 /ə/ represents schwa.
about 5-10 minutes. All 24 possible sequences of the 4 conditions were used such that each order was followed by at least one child and by no more than two children. At the start of each session the experimenter introduced a puppet character and demonstrated the way in which the puppet liked to say the parts of words which sounded the same. The child then played the game with three practice word pairs. Correct responses were praised and errors were pointed out with emphasis on the common sound and the desired response. The 4 experimental trials for items containing simple consonants were presented. The child was told that the part the puppet wanted would now be slightly bigger and three practice items containing complex consonants were introduced with feedback. The 4 experimental trials for the complex items were then given. Throughout testing, the question put to the child was: "Which bit sounds the same in ....?" No reference was made to positional concepts, such as "start", "beginning" or "end".

Scoring

The responses given by each child were transcribed in a phonetic code as they occurred. Small unit consonant responses were equated with "letter sounds", usually the consonant plus a schwa (e.g. /bɒ/), although some consonants (/fl/, /l/, /ml/, /nl/, /tr/, /sl/, /z/) were commonly produced without a following schwa. No ambiguity in distinguishing between these small unit responses and large unit responses (bodies and rimes) was encountered. Responses were scored as correct if they corresponded to the shared segment of sound in the word pairs.

RESULTS
The main data consisted of the numbers of correct responses made to simple and complex items in the onset, body, rime and coda conditions. These scores were converted to percentages. Figure 3 illustrates the results.

--- Figure 3 about here ---

The issue to be considered is whether the replication has broadly reproduced the results of the original study despite the changes of procedure. In making this comparison we need to bear in mind that this sample was slightly less advanced in reading than the one originally tested.

Inspection of the data indicates that the children were most accurate in isolating simple onsets but had difficulty in reporting common rimes (66% vs. 15%). Hence, although the general level of success is lower than in the original study, the basic finding of a priority of small units (initial phonemes) over large units (rimes) has been replicated. An analysis of variance was carried out with Units (onset, body, rime, coda) and Complexity (simple, complex) as factors. There were significant main effects of Units (F(3, 87) = 10.83, p < 0.001) and Complexity (F(1, 29) = 21.19, p < 0.001) and an interaction between these factors (F(3, 87) = 7.00, p < 0.001). Post hoc Newman-Keuls tests suggested that complexity did not affect performance on the large units (bodies and rimes) but was associated with a reduction in accuracy for the small units (onsets and codas). Simple onsets were identified more accurately than simple codas, bodies and rimes.

The low scores for rimes reflect an inability on the part of the majority of children to produce any acceptable responses. The number of children scoring zero was 24 for simple rimes and 26 for complex rimes. This contrasts with the results for simple onsets (only 5 children with a score of zero). In order to gain a clearer understanding of the basis of the difficulty it is instructive to examine the error
responses. Duncan et al (1997) found that their Group A children tended to reduce simple and complex rimes to final consonants, while Group B, who were thought to be less advanced in alphabetic decoding, showed a more diffuse pattern. Table 2 reports the outcome of a similar analysis of error responses in the replication. A distinction is made between unsegmented responses (refusals and repetitions of the words), which averaged 30% of all errors, and segmented responses in which parts of one or both stimulus words were uttered. As children who made errors on simple onsets and codas tended to make unsegmented responses, these conditions were not included in the Table.

--- Table 2 about here ---

The segmented responses to complex onsets and simple bodies were most commonly single initial consonants though more consonant clusters were produced in the complex body condition. This reflects a pattern of reduction of larger shared segments to smaller ones which was found in the original study. In the rime conditions the same orientation towards small segments at the beginning of one or other of the words occurred. The most common error responses were initial consonants or bodies. A similar bias was found in the complex coda conditions, although the shared final phoneme or rime of one of the words was occasionally given. This suggests that, at this early stage of reading development, awareness of speech segments was focused on the beginnings of words and that children were poor at isolating or reporting the shared parts of rhyming words.

**SUMMARY OF REPLICATION**
The replication has confirmed the basic results of Duncan et al's (1997) common unit task. The original results appear not to be specific to features of the methodology, such as the order of presentation of the conditions, the use of positional terms such as "beginning" or "end", the amount of practice which is given, or difficulties in scoring the responses. Hence, we think that the results, together with those of Duncan et al (1997), can be accepted as an accurate portrayal of a small-to-large unit progression which characterises the development of phonological awareness in beginning readers who learn by a mixed method. One observation is that the exclusion of "beginning" and "end" references from the feedback on practice items was unhelpful when explaining the task to children and may have contributed to the low frequency of reports of end segments in the rime and coda conditions. Hence, it would probably be sensible to retain the positional reference in the feedback given to children in future studies.

OTHER REPLICATIONS

There have been a few other replications of the common unit experiment which make it possible to consider longer term developmental trends and the impact of teaching methods.

Duncan, Seymour and Hill (submitted)

Duncan et al re-administered the common unit task (Expt. 3B, Duncan et al, 1997) to their original sample in March of the Primary 2 year. Figure 4 shows the outcome (combined across Groups A and B) and includes the Primary 1 data for comparison. It can be seen that the overall pattern remained the same. Simple initial and final consonants were retrieved with almost perfect accuracy and retained an advantage
over the large units (bodies and rimes) and complex onsets and codas. Complex codas remained especially difficult to access. The principal change during the year was a gain in accessibility of the large units. This affected bodies and rimes to an approximately equal degree, though bodies continued to be somewhat better reported than rimes.

--- Figure 4 about here ---

**Duncan and Seymour (in preparation)**

In a cross-sectional study, Duncan and Seymour tested common unit identification by Nursery, Primary 1, 2 and 3 groups (N=162) in Dundee schools. The sample included children from lower socio-economic circumstances. Simple and complex onsets, bodies, rimes and codas were tested but the procedure differed from Duncan et al’s (1997) study in that: (1) the stimuli were nonwords; and (2) the order of conditions was randomised.

The results have been summarised in Figure 5. In order to show the relationship with Reading Age, separate plots are given for nonreaders and for readers with Reading Ages of 5, 6, 7 and 8 years. Nonreaders could not perform the task for large or small units. Ability to isolate simple onsets appeared as soon as reading skill emerged and continued to improve until a ceiling was reached at a Reading Age of 7.5 years. In contrast, rimes could not be retrieved until a Reading Age of 7.5 years had been achieved. By 8.5 years accuracy at identifying both bodies and rimes was at a similarly high level (approximately 65%).

--- Figure 5 about here ---

**Bolik, Johnston, Fletcher-Flinn, Arrow and Rix-Trott (submitted)**
Bolik et al applied a common unit task to Primary 2 children in schools located in Fife in Scotland and in Auckland in New Zealand. The procedure was similar to Duncan et al's (1997) Expt. 3B but with a longer practice session and different experimental items. The schools reflected a range of teaching methods. In New Zealand, instruction concentrated exclusively on reading words in context and letters were introduced only in relation to the children's attempts at creative spelling. In Fife, the children received 10 weeks of synthetic phonics (Lloyd, 1992) in Primary 1 involving intensive instruction in simple and complex letter-sound correspondences (Johnston and Watson, 1997), after which they reverted to a standard mixed regime of sight word and letter-sound learning.

The results were very similar to Duncan et al's findings and appeared to be approximately the same for the contrasting teaching regimes. This study gives a preliminary indication that the small-over-large unit priority may be a developmental trend which recurs despite quite large variations in the degree of phonic emphasis in beginning reading instruction. Possibly the introduction of letter-sound knowledge by one method or another is sufficient to produce the effect.
Goswami and East (submitted)

Goswami and East replicated the first of Duncan et al's (1997) common unit studies (Expt. 3A) with a group of 32 Primary 1 children who were following a mixed teaching programme in a school in Cambridge, England. The mean BAS Reading Age was 5.7 years. Children were told that the shared sounds were at the beginning (onsets, bodies), in the middle (peaks), or at the end of the words (codas, rimes). The accuracy scores have been summarised in Table 3 (Goswami and East, pre-test) together with the results obtained by Duncan et al (1997). It can be seen that the two sets of data are very comparable. In particular, the advantage of onsets over rimes (78% vs 17% correct) was replicated.

--- Table 3 about here ---

Goswami and East then introduced an intervention which was designed to increase awareness of rhyming and analogy. Children were taught in small groups using rhyming stories and accompanying activities (Goswami, 1996). Each child studied two books from the series, adapted according to their reading level, spread over 19 teaching sessions and occupying a total period of 5 hours or so. The programme drew children’s attention to rimes in reading and memory games and involved the copying of onset and rime segments from the blackboard and the making of rime-based analogies in reading and spelling with the help of clue words.

The common unit task was repeated following this intervention. Results of this post-test are shown in Table 3. Following training, there was an overall improvement in performance on the task. This was largest for the rime unit (about 35%) and suggests that the training was successful in raising awareness of large units (bodies
and rimes) to a level similar to that observed for Primary 2 children in the studies by Duncan et al (submitted) and Bolik et al (submitted).

The replications all support the conclusion that children's awareness of speech segments, as assessed in the common unit task, follows a small-to-large unit pathway which starts with small (phoneme-sized) units and advances up the syllabic hierarchy (Figure 1) towards larger units (bodies and rimes). This progression appears to be linked to letter-sound knowledge and reading progress and can be accelerated by focused instruction.

**EPI- VERSUS META- LEVELS OF LINGUISTIC AWARENESS**

Duncan et al (1997) argued that the surprising and counter-intuitive outcome of the common unit experiments could be understood within the framework of a theory of metalinguistic development set out by Gombert (1992). This theory follows many others in suggesting that it may be necessary to distinguish between implicit and explicit forms of phonological awareness. The terminology proposed by Gombert identifies an *epilinguistic* process as a preliminary linguistic organisation which is not accessible to conscious awareness, and a more advanced *metalinguistic* process which does include awareness and intentional control over linguistic segments.

There are two features of Gombert’s theory which are important in the present context. The first concerns the relationship between the epi- and meta- levels of awareness. In agreement with other theorists (Karmiloff-Smith, 1986) Gombert proposes that meta-awareness is built on the basis of pre-existing epilinguistic awareness. The second proposal is that metalinguistic awareness is, nonetheless, an
optional development which occurs only if external circumstances demand the establishment of intentional control over speech segments. Gombert believes that the most usual source of such a demand is the task of learning to read. In this he acknowledges the work of Morais and his Brussels group who demonstrated that adults who had never learned to read were unable to perform phoneme deletion tasks (Morais, Cary, Alegria and Bertelson, 1979).

Given this *epi-* versus *meta-* distinction, the question about the way in which awareness of the components of the syllable (Figure 1) develops becomes more complicated than was previously realised. We have to ask whether the question refers to an *epi-* or a *meta-* level of awareness and what kinds of tasks might be most appropriate for measuring awareness at each level. Tasks which involve matching and comparison, such as the same-different judgement or the odd-word-out tasks, may be performed with only an *epilinguistic* level of awareness, while tasks which involve isolation and manipulation of linguistic segments, such as deletion and transposition or common unit identification, seem to demand *metalinguistic* awareness.

Critically, it cannot be assumed that a child who can perform a task measuring epilinguistic awareness of a sound will also possess a metalinguistic awareness of that sound. Duncan et al (1997) observed just such a dissociation. Beginning readers whose performance in a rhyming odd-word-out task was excellent were unable to identify the rime segment shared by two rhyming words in the common unit task. This was taken to imply that these children possessed an epilinguistic awareness of rhyme but had not yet developed a meta-awareness of rhyme. We can see parallels with the work that Morais carried out with illiterate poets in rural Portugal (Morais, 1991). These poets possessed highly developed epilinguistic awareness of rhyming, shown by their capacity to produce complex rhyming verses, but were unable to perform
phoneme manipulation tasks, or, most significantly, to explain the basis of rhyming by reference to speech segments.

**IS THIS EPI-VERSUS META-DISTINCTION OF ANY PRACTICAL IMPORTANCE TO LITERACY EDUCATORS?**

We believe that the common unit results and their interpretation in terms of epi- and metalinguistic awareness of rimes and phonemes have a direct impact on the advice which might be given to teachers of beginning reading, especially the question of whether teaching programmes should begin by emphasising large units (rimes) or small units (graphemes-phonemes). In a recent article in this *Journal*, Chew (1997) commented on the relative merits of the "new phonics" approach which emphasises rhyme and analogy from the start of instruction, and the "traditional phonics" approach which gives priority to letter-sounds and grapheme-phoneme correspondences. She concluded that the "new phonics" (large unit) approach was founded on two proposals regarding the linguistic awareness available to children at the beginning of literacy instruction:

1) beginning readers already possess a well-developed awareness of rhyme
2) beginning readers lack and have difficulty in achieving an awareness of phonemes.

The conclusion drawn was that instruction will be most effective if it starts at the level of awareness which is already established. Hence, teaching should start at the rhyme level and progress gradually towards the phoneme level.

Chew (1997) considered that the conclusion must be in some way in error since it conflicted with her experience that young children could quite easily learn to
identify and synthesise letter-sounds at the beginning stage of reading. Further, this ability seemed not to be contingent on performance on phonemic awareness tasks. We can now see more clearly how the error may have arisen. The problem is that the two premisses are formulated in terms of different levels of linguistic awareness. Premiss 1 refers to *epilinguistic* awareness of rhyme while Premiss 2 refers to *metalinguistic* awareness of phonemes. The use of arguments which are articulated at two different levels of linguistic awareness invalidates the conclusion in favour of a rhyme-to-phoneme progression.

A reformulation of the proposals makes this difference explicit:

1) beginning readers already possess a well-developed *epilinguistic* awareness of rhyme
2) beginning readers lack a *metalinguistic* awareness of both rhyme and phonemes.

The case for a “new phonics” (large unit) approach is now less clear since beginning readers possess an awareness of rhyme at an epilinguistic level but not at a metalinguistic level, and in this latter sense, rhyme and phonemes cannot be distinguished.

The results of the common unit studies agree in suggesting that there is a small-to-large unit progression in the development of metalinguistic awareness:

1) beginning readers develop *meta*-awareness of phonemes rapidly in response to alphabetic instruction as Reading Age advances
2) *meta*-awareness of rimes develops more gradually and is not normally apparent until Reading Age has advanced beyond 7 years.

These proposals are mainly based on results obtained from children who have been learning by the mixed method in which letter-sound learning is combined with
vocabulary acquisition. In order to draw general conclusions we would need to be assured that the results are not specific to local teaching methods but instead reflect fundamental aspects of literacy acquisition, for example, the general principle that complex structures, such as rimes, are necessarily learned later than simple structures, such as graphemes-phonemes. The study by Bolik et al (submitted) provides preliminary evidence that this may be the case.

If this point is allowed, the common unit results might be interpreted by teachers as suggesting that there is a two-phase development in reading, an initial foundation phase extending up to a Reading Age of about 7 years in which it is appropriate to emphasise the mastery of the small units (graphemes-phonemes), and a subsequent orthographic phase in which large units, especially a rime-based organisation of the lexicon, become relevant (Seymour, 1997).

**IMPLICATIONS FOR INSTRUCTION**

These conclusions tend to support the view that the small unit emphasis of “traditional phonics” is appropriate for teaching the initial (foundation) phase of reading development. However, the effectiveness of this approach, particularly the time which children take to progress through the foundation phase, may vary depending on the particular version of the method which is implemented.

Johnston and Watson (1997) note that traditional phonics covers a range of procedures. They surveyed 10 Scottish Primary schools and found that most were using an analytic method, emphasising common sounds in groups of words, with phonic concepts (letter-sounds, digraphs, blends) being introduced in a leisurely way over 1-2 years in parallel with reading scheme vocabularies. This corresponds to the
mixed method which we observed in the Dundee schools. An alternative approach is a *synthetic* method in which letter-sound concepts are taught intensively over an 8 week period at the outset of instruction together with tuition in blending of sounds and prior to vocabulary learning (Lloyd, 1992).

In December of the Primary 1 year, Johnston and Watson compared outcomes for schools using these two approaches and concluded that the synthetic method produced significant advantages in reading progress. They also found differences in the groups’ performance on the Yopp-Singer segmentation task, a measure of metalinguistic awareness of phonemes. Accuracy for the analytic phonics group was 16%, whereas accuracy in the synthetic phonics group was 65%, indicating that it is possible to establish good meta-awareness of phonemes amongst 5 year old beginning readers.

It seems likely that rime-oriented instruction could similarly serve to direct and accelerate the formation of a rime-based orthographic system. Goswami and East (submitted) showed that there was a gain in *meta*-awareness of rimes in Primary 1 children following exposure to Goswami’s (1996) programme in which rhymes and analogies were emphasised. However, the study did not determine whether the intervention produced gains in Reading Age or other evidence of an acceleration of orthographic growth.

Some existing research sounds a note of caution about the viability of teaching large unit strategies in the early (foundation) phase of development. In 1992, Ehri and Robbins drew attention to the possibility that analogy strategies were dependent upon letter-sound decoding ability. By distinguishing beginning readers with decoding ability from nondecoders, Ehri and Robbins were able to demonstrate that nondecoders failed to capitalise on the rime-based analogical relations between
training and transfer items. Similarly, Walton (1995) has reported that phoneme identification ability improves kindergartners’ ability to use rhyme analogies.

Savage and Stuart’s (1998) results suggest that, for children to use rime-based analogies, they must be familiar with more than one word containing the appropriate rime unit. This conclusion is supported by the findings of Bowey and her colleagues (Bowey and Hansen, 1994; Bowey and Underwood, 1996) which suggest that the use of a rime-based strategy is contingent upon the size of a child’s reading vocabulary and is, consequently, a late-emerging development (Coltheart and Leahy, 1992; Leslie and Calhoon, 1995; Duncan et al, submitted).

The indications are that reading by rhyme and analogy is a relatively advanced and complex process which requires that foundation skills should be in place before it can operate effectively. These include letter knowledge, simple decoding, and a sufficiently extensive sight vocabulary. Further research will be required to determine the optimal timing for the introduction of large unit instruction.
ACKNOWLEDGEMENTS

We would like to express our gratitude to Dundee City Council and to the Primary school pupils and staff who assisted us with this study. The work referred to in this paper has been funded by E.S.R.C. awards (R000232743 and R000222321).

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DUNCAN, L.G., SEYMOUR, P.H.K. and HILL, S. (submitted) Small to large unit progression in metaphorological awareness and reading.


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APPENDIX: Stimuli for the Replication of the Common Unit Task

<table>
<thead>
<tr>
<th></th>
<th>SIMPLE STRUCTURE</th>
<th>COMPLEX STRUCTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONSET</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Demonstration Item</em></td>
<td>pig-pen</td>
<td>-</td>
</tr>
<tr>
<td><em>Practice Items</em></td>
<td>cot-cage</td>
<td>cloud-club</td>
</tr>
<tr>
<td></td>
<td>sun-sock</td>
<td>truck-train</td>
</tr>
<tr>
<td></td>
<td>ball-bin</td>
<td>green-growl</td>
</tr>
<tr>
<td><em>Experimental Items</em></td>
<td>face-food</td>
<td>float-flame</td>
</tr>
<tr>
<td></td>
<td>dish-duck</td>
<td>bread-brush</td>
</tr>
<tr>
<td></td>
<td>hen-hat</td>
<td>stair-stool</td>
</tr>
<tr>
<td></td>
<td>tail-tin</td>
<td>pram-press</td>
</tr>
<tr>
<td><strong>CODA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Demonstration Item</em></td>
<td>pig-dog</td>
<td>-</td>
</tr>
<tr>
<td><em>Practice Items</em></td>
<td>cat-hut</td>
<td>dart-hurt*</td>
</tr>
<tr>
<td></td>
<td>ship-tap</td>
<td>kilt-salt</td>
</tr>
<tr>
<td></td>
<td>bag-log</td>
<td>list-post</td>
</tr>
<tr>
<td><em>Experimental Items</em></td>
<td>tap-shop</td>
<td>paint-count</td>
</tr>
<tr>
<td></td>
<td>week-bake</td>
<td>field-gold</td>
</tr>
<tr>
<td></td>
<td>gum-bomb</td>
<td>jump-limp</td>
</tr>
<tr>
<td></td>
<td>road-food</td>
<td>left-soft</td>
</tr>
<tr>
<td><strong>BODY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Demonstration Item</em></td>
<td>pat-pan</td>
<td>-</td>
</tr>
<tr>
<td><em>Practice Items</em></td>
<td>chair-chase*</td>
<td>trap-track</td>
</tr>
<tr>
<td></td>
<td>hop-hall*</td>
<td>floor-float*</td>
</tr>
<tr>
<td></td>
<td>doll-dog</td>
<td>skip-skin</td>
</tr>
<tr>
<td><em>Experimental Items</em></td>
<td>mat-man</td>
<td>cloth-clock</td>
</tr>
<tr>
<td></td>
<td>cake-cage</td>
<td>sleep-sleeve</td>
</tr>
<tr>
<td></td>
<td>soup-suit</td>
<td>plug-plum</td>
</tr>
<tr>
<td></td>
<td>bead-beef</td>
<td>stole-stone</td>
</tr>
<tr>
<td><strong>RIME</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Demonstration Item</em></td>
<td>pat-mat</td>
<td>-</td>
</tr>
<tr>
<td><em>Practice Items</em></td>
<td>hood-food*</td>
<td>pink-sink</td>
</tr>
<tr>
<td></td>
<td>sail-pail</td>
<td>soft-loft</td>
</tr>
<tr>
<td></td>
<td>hot-cot</td>
<td>ghost-toast</td>
</tr>
<tr>
<td><em>Experimental Items</em></td>
<td>boat-goat</td>
<td>paste-waist</td>
</tr>
<tr>
<td></td>
<td>jug-rug</td>
<td>lamp-stamp</td>
</tr>
<tr>
<td></td>
<td>sail-tail</td>
<td>lunch-punch</td>
</tr>
<tr>
<td></td>
<td>map-tap</td>
<td>pound-round</td>
</tr>
</tbody>
</table>

* Items which are appropriate for Scottish but not English pronunciation.
LEGENDS FOR FIGURES

Figure 1  Varieties of Subsyllabic Units
Figure 2  Group Performance in Duncan et al's (1997) Experiment 3B
                        (Phonological Common Unit Identification with Simple and Complex Structures)
Figure 3  Performance in the Common Unit Task Replication
Figure 4  Longitudinal Performance in the Common Unit Task
                        (Duncan et al, submitted)
Figure 5  Nonword Version of the Common Unit Task Graphed by Reading Age
                        (Duncan and Seymour, in preparation)
FIGURES

Figure 1.

```
\begin{itemize}
  \item Syllable /\textit{twist}/
  \item Body /\textit{twi}/
  \item Onset /\textit{tw}/
  \item Phoneme /\textit{t}/
  \item Phoneme /\textit{w}/
  \item Peak /\textit{i}/
  \item Phoneme /\textit{i}/
  \item Coda /\textit{st}/
  \item Phoneme /\textit{s}/
\end{itemize}
```

Figure 2.

![Figure 2](image-url)
Figure 3.
Figure 4.

[Graph showing accuracy percentages for smaller and larger units across different positions: onset, coda, body, rime, with annotations for primary 1 and primary 2.]
Figure 5.

**KEY TO READING AGES**  
$\Delta =$ nonreaders; $\blacktriangle =$ 5.5 years; $\bigcirc =$ 6.5 years; $\bullet =$ 7.5 years;  
$\star =$ 8.5 years.
## TABLES

Table 1  
*Illustration of Conditions and Stimuli in Duncan et al's (1997)*

*Experiment 3B*

<table>
<thead>
<tr>
<th>Common Unit</th>
<th>Simple Version</th>
<th>Complex Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>face-food</td>
<td>bread-brush</td>
</tr>
<tr>
<td>Coda</td>
<td>week-bake</td>
<td>paint-count</td>
</tr>
<tr>
<td>Body</td>
<td>mat-man</td>
<td>cloth-clock</td>
</tr>
<tr>
<td>Rime</td>
<td>boat-goat</td>
<td>paste-waste</td>
</tr>
</tbody>
</table>
Table 2  \textit{Segmented Error Responses in the Common Unit Task Replication}

(Average incidence as a percentage of total errors)

<table>
<thead>
<tr>
<th>Common Unit</th>
<th>Onset Complex CCVC</th>
<th>Onset Simple CVC</th>
<th>Onset Complex CCVC</th>
<th>Rime Simple CVC</th>
<th>Rime Complex CVCC</th>
<th>Coda Complex CVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most Common Error</td>
<td>iph (50%)</td>
<td>iph (43%)</td>
<td>oc (30%)</td>
<td>1-iph (27%)</td>
<td>1-iph (22%)</td>
<td>1-iph (31%)</td>
</tr>
<tr>
<td>2nd Most Common Error</td>
<td>1-body (11%)</td>
<td>oth (7%)</td>
<td>iph (16%)</td>
<td>1-body (26%)</td>
<td>1-body (13%)</td>
<td>1-rime/fph (9%)</td>
</tr>
</tbody>
</table>

\textbf{KEY} \hspace{1cm} \texttt{iph} = shared initial phoneme; \texttt{fph} = shared final phoneme; \texttt{oc} = shared onset cluster;

\texttt{1-iph} = initial phoneme of one of words in stimulus pair; \texttt{1-body} = body of one of words in stimulus pair; \texttt{1-rime} = rime of one of words in stimulus pair; \texttt{oth} = other segmented response.
Table 3  Goswami and East’s (submitted) Replication of the Common Unit Task

<table>
<thead>
<tr>
<th>Study</th>
<th>Section</th>
<th>Common Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Duncan et al (1997)</td>
<td>Experiment 3a</td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
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<tr>
<td>Goswami and East</td>
<td>Pre-test</td>
<td>Mean</td>
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<tr>
<td>(submitted)</td>
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<td>SD</td>
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<tr>
<td></td>
<td>Post-test</td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>Post-Pre Gain</td>
<td></td>
</tr>
</tbody>
</table>