PHONEME AWARENESS, SYLLABIC STRUCTURE, AND PHONETIC SUBSTANCE

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The research presented in this paper is part of a longitudinal project where groups of language disordered and normally speaking children are studied with the aim of identifying the linguistic abilities that are most important, or even indispensable, for learning to read and write. The project started four years ago when the children were six years old, i.e. one year before they started school. Beside testings in the pre-school, testings were also done in the first and third grades and a follow-up is planned in grade four

In the discussion of reading and writing acquisition and subsequent problems, a lot of interest has been shown in recent years for the role of linguistic, or more precisely phonological, awareness and for the relation of phoneme awareness to reading and writing. Some researchers regard phonemic awareness as a prerequisite for learning to read and write, while others regard it as an effect of reading and writing acquisition. Those who hold phoneme awareness to be a prerequisite often base their opinion on work with children, e.g. on studies where the effect of phoneme awareness on reading and writing achievements, and the training of such awareness, are studied in beginning readers (e.g. Mann & Liberman 1982, Bradley & Bryant 1985). Among those who see phoneme awareness as an effect of literacy, we often find researchers who have worked with older readers or with illiterate adults who, in some studies, have been found to be unaware of phonemes (Morais et al. 1979). An intermediate position is taken by those who argue that phoneme awareness is both a prerequisite and an effect of reading acquisition (e.g. Ehri & Wilce 1979, Valtin 1984).

It is well known that reading ability is not indispensable in order to become aware of phonemes as evidenced by all the non literate pre-schoolers who enjoy rhyming and other playful activities that require an awareness of phonemes. On the other hand, from the ability to read does not automatically follow an awareness of phonemes as shown by the findings that readers of non-alphabetic writings systems are phonemically unaware (Mann 1986, Read et al. 1986).

Linguistic awareness is often discussed as if children were either linguistically aware or totally unaware. In our studies of non literate pre-school children (e.g. Magnusson & Nauclér 1987), we have noticed that the same subjects appear to be more or less aware depending on the type of task they are given: more children show linguistic awareness on a rhyme recognition task than on a phoneme identification task. Furthermore, it seems to be important which type of segments they are asked to manipulate and which sequences or structures these segments are part of. The present study was undertaken with the aim of looking into how syllabic structure and segment type (or phonetic substance) influence children who are in the process of developing phoneme awareness .

PROCEDURE

For the study we have used data from our longitudinal project. At the

time the children were six years old and still non literate pre-schoolers. From the various meta-linguistic tasks the children were given at the pre-school testing (Magnusson & Nauclér 1987), we have chosen two tasks: identification and segmentation of phonemes.

Identification of phonemes In the identification task the children were asked to identify two consonants, a fricative /s/ and a plosive /t/, and two vowels, a back vowel /u/ and a front vowel /i/ in a number of familiar words. The target sounds appeared in either initial, medial, or final position of the word - or not at all (see table 1). The children were asked if they could hear the target sounds in words said by the experimenter and their task was to indicate whether or not the sound - in their opinion - was part of the sound sturcture of the word.

Table 1. Words used in the identification task.

Ident. of /s/	Ident. of /t/	Ident. of /u/	Ident. of /i/
sol	nalle	bil	Ida
Lisa	katt	Ola	mage
apa	mus	mor	docka
myra	tak	kaka	bi
hus	äta	dörr	bok
båt	nål	ko	pil

Segmentation of phonemes In the segmentation task the children's task was to indicate the number of phonemes by selecting the correct number of markers of some kind. The words used in the task varied as to the number of phonemes as well as to syllabic structure, e.g. VC, CV, VCC, CVC, CCVC, CVCC. Both monosyllabic and bisyllabic words were included (see table 3 below).

RESULTS

Even if both the tasks were designed to measure the awareness of phonemes, the identification task turned out to be easier than the segmentation. More children understood the task and suggested a solution for each of the test items in the identification task than in the segmentation task (92 out of 114 as compared to 83). This was so although the identification task contained more test items (24) than the segmentation task (18).

Identification Both segment type and position of the segment in the word influenced the children's ability to identify phonemes. As regards segment type, Vs were easier to identify than Cs (see table 2). There was no difference as to how well the children identified the

Table 2. 92 subjects' correct identifications of phonemes. ( ) number of possible identifications.

Type of phoneme		Position		
C (1104)	V (1104)	Initial (368)	Medial (368)	Final(368)
834	916	306	263	262
/s/ 447	/i/ 463			
/t/ 387	/u/ 453			

two Vs, /i/ and /u/, but there was a difference between the Cs so that the fricative /s/ was more often correctly identified than the plosive /t/ and almost as often as one of the Vs, namely /u/. If position is considered irrespective of segment type, we find that more phonemes were correctly identified in initial than in either medial or final position.

Segmentation The length of the word seemed to influence children's ability to segment words into phonemes so that words with four phonemes were more difficult to segment than words with three phonemes (see table 3). However, such a difference was not found between words with two or three phonemes.

In words with two phonemes, syllabic structure was important so that CV syllables were easier to segment than VC syllables. Segment type, whether a fricative or a plosive, did not influence the children's ability to manage the task as in the identification task.

Table 3. 83 subjects' correct segmentations.

CV	VC		
se 62	ös 51		
gå 60	ek 55		
CVC	VCV	VCC	CCV
katt 49	apa 56	ost 59	stå 43
sol 52	åka 50	arm 43	bra 38
	CVCV	CVCC	CCVC
	bada 28	dans 22	glas 30
	titta 16	mask 24	spik 14

In words with three phonemes, the segmentation was influenced by whether or not there were consonant clusters, the position of the cluster, and to some extent by the type of cluster. Words with clusters (e.g. 'stå', 'bra') were more difficult to segment than words with only singletons (e.g. 'sol', 'apa') and words with initial clusters (e.g. 'stå') were more difficult than word with final clusters (e.g. 'ost').

To be able to segment the cluster /st/ in final position as in 'ost' did not ensure that the children were able to segment the same cluster in initial position as in e.g. 'stå'. Nor did the ability to segment /st/ in 'ost' and 'stå' guarantee the segmentation of sC-clusters in words like 'mask' and 'spik' whith one additional segment. These longer words make larger demands on short term memory, and may for some children exceed their short term memory capacity. When tested for short term memory it was found that some of the children had a memory span of only two or three items.

The type of cluster made the task more or less difficult. Clusters with /s/ were easier to segment than clusters with /r/ ('stå' was easier than 'bra'), although we cannot argue that clusters with /s/ were easier than all clusters containing liquids as e.g. 'glas' was segmented correctly by more children than 'spik'.

SUMMING UP

Segment type is important for the children's results on the identification task. This is consistent with the way the task was presented; the children were given a sound as a model and their task could be described as finding a perceptual match to the target sound. In order to do this, they have to perceive words not just as entities but have to have gained at least some insight into the possibility of segmenting words into smaller units, even if the demands on their knowledge about the segmental structure are not as heavy as in the segmentation task. Position in the word also influences the children's identifications so that segments in initial position are the easiest to identify.

In the segmentation task, on the other hand, segment type does not seem to be as important as in the identification task, while word length and syllabic structure play a more important role. Provided that the number of phonemes in the word does not exceed the short term memory limit (which we have reason to assume in a number of cases) syllabic structure is important, whether it is a CV or VC syllable, whether or not there are clusters, and whether the clusters are word initial or word final.

In conclusion it can be said that both type of segment (or phonetic substance) and syllabic structure are crucial for the achievements of children who are in the process of developing an awareness of phonemes. The importance of each factor is partly dependent on the type of task the children are given.

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