Form or Substance? The Linguistic Awareness of Pre-school Children and School Children Investigated by Means of a Rhyming Test

Eva Magnusson, Kerstin Nauclér and Ewa Söderpalm

The development of language in children does not only include the production and perception of language but does also entail a certain amount of linguistic awareness. Linguistic awareness is the term used by Mattingly (1972) to describe the speaker's/listener's ability to focus on the linguistic expression rather than on the linguistic content. On the phonological level linguistic awareness can be defined as the ability to disregard the meaning of words and to concentrate on their sound structure, e.g. the ability to realize that "train" is a short word although it refers to a long object and to be able to segment the sound sequence /treːn/ into four segments although a train may consist of more than four parts.

Several questions concerning the development of linguistic awareness merit a further investigation, i.e.

      -the relation between linguistic awareness
      and language development
      -the relation between linguistic awareness
      and cognitive development

-the relation between linguistic awareness
                and reading and writing acquisition.

There are different opinions about the relationship between the
development of linguistic awareness and language development on
one hand and cognitive development on the other. Some
researchers (e.g. Mattingly 1972, Marshall and Morton 1978)
regard language development as a prerequisite for linguistic
awareness while others (e.g. Hakes 1980) regard cognitive
developmental level as more important for the development of
linguistic awareness. Intermediate position is taken by
researchers who assign importance to both linguistic and
cognitive factors (e.g. Tornéus 1983). It has been shown by
e.g. Bruce (1964), Calfee et al. (1973), that younger children
do not show the same degree of linguistic awareness as older
children do. Liberman et al. (1977) have reported that very few
five-year-old children (17%) can indicate the correct number of
sound segments in a word while most of the six-year-olds (70%)
manage such a task. Syllables, on the other hand, are easily
mastered by five-year-old children.

Since linguistic awareness develops gradually it is, however,
hard to decide whether the increased awareness in normally
developing children is a consequence of the cognitive or of the
linguistic development. One way of clarifying this issue is to
study the linguistic awareness of children whose language
development is not as advanced as that of their peers. If two
children of the same age who differ in language development
show the same degree of linguistic awareness, it can be assumed
that the linguistic awareness is a consequence of the cognitive
development. If on the other hand the linguistic awareness of
the two children differs, it can be concluded that language
development is more important than cognitive level. A suitable
test design would thus be to compare the linguistic awareness
of groups of children differing in language development but
matched for age/cognitive level, that is to compare groups of
language disordered children with groups of normally developing

children.

The relation between linguistic awareness and reading-spelling
acquisition is also subject to different opinions. Some
reserchers like Valtin (in press) and Ehri (1979) consider
linguistic awareness as the result of reading acquisition
whereas others like Calfee et al. (1972), Liberman (1973), and
Tornéus (1983) regard linguistic awareness as the prerequisite
for reading aquisition.

The most relevant aspect of linguistic awareness in relation to
reading and spelling is the awareness of phonological
structure. The ability to segment within the syllable is of
particular importance. It has been shown in a longitudinal
study conducted by Lundberg and his co-workers in Sweden (1980)
that linguistic awareness as measured by segmentation tasks is
the best predictor of pre-school children's future reading and
spelling success.

One such task which requires segmentation ability is rhyming.
The manipulations performed in rhyming are to separate
prevocalic element(s) of the stressed syllable from the rest of
the syllable and to use what is left of the syllable or the
word as a model when producing new rhymes. A rhyming test would
thus be an appropriate instrument to study linguistic awareness
as regards its relation to language and cognitive developmental
level as well as to literacy.

PROCEDURE

A rhyming test was therefore constructed and administered to 10
pre-school and 10 school children. Half of the children in each
group had developed language normally and the other half had
been diagnosed as language disordered. The ages of the
pre-school children were between 3;11 - 5;8 years for the
normally developed ones and between 5;10 - 7;2 years for the

167

disordered children. The ages of the school children varied
between 7;1 and 7;10 for both the subgroups (first grade).

	Language development normal	disordered
Pre-school children	3;11 - 5;8	5;10 - 7;2
School children	7;1 - 7;10	7;1 - 7;10

Table 1. Age of the twenty subjects

The test consisted of two parts. In part I, the child was
presented with 3 pictures and the corresponding words (model
words) (see figure 1). The child was instructed to point to the
picture which represented the word that sounded most similar to
a new word pronounced by the experimenter (test words).
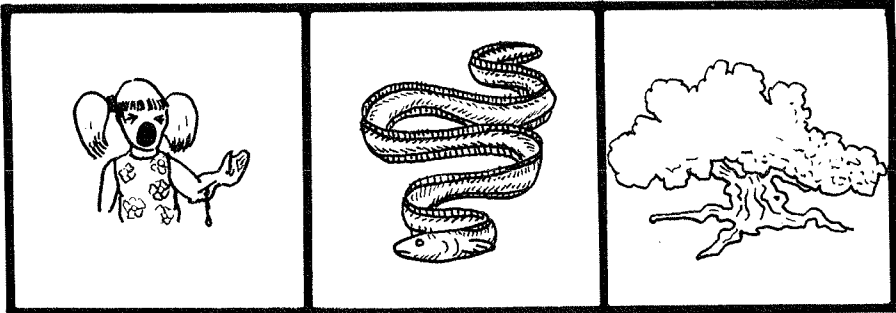

MODEL WORDS   [aj]   [o:l]   [e:k]
TEST WORDS   [bo:l], [ste:k], [maj] etc

Fig.1 Rhyming test. Part I.

This procedure is modeled on a procedure used by Calfee et al. (1980) for testing and training phonetic segmentation. It has, however, been modified to fit the special demands of language disordered children.

Since the children answered by pointing and not by speaking, the deviant speech of the language disordered children did not influence the result. Because of the often limited memory capacity of the language disordered group (Gahne et al. 1983) the demands on memory had to be kept low. Therefore, the words were selected in such a way that only the test words (CVC structure) and not the models (VC structure) had to be segmented. The vowels were phonetically well seperated.

In part I of the test, however, it would be possible to find the appropriate rhyming words by comparing the vowels only. Therefore, part II of the test consisted of tasks of a somewhat different type (see figure 2). Only one model word was presented at a time, illustrated as before by a picture.
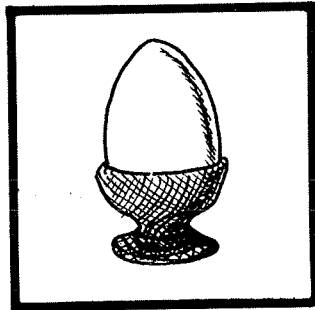
MODEL WORD   [ɛg]   egg
TEST WORDS   [hɛg], ⌊nɛb], [tag], [sɛk] etc

Fig.2 Rhyming test. Part II.

The child's task now was to decide whether a number of test words rhymed with the model word or not. The test words were varied in such a way that in the non-rhyming words either the

169

vowel or the post-vocalic consonant differed from that of the model word, some by several distinctive features and others by one feature, e.g. VOICE or ROUNDING. The complete list of test words can be found in appendix 1.

RESULTS

From the error scores presented in table 2 it can be seen that the normally developed children made fewer errors than the language disordered children and school children made fewer errors than pre-school children. However, as a group, the language disordered school children made fewer errors than the normally developed pre-school children. It should be noted that there are some children around the age of four in the pre-school group and they seem to have difficulties in understanding the instructions. Children as young as four have probably not reached the cognitive level necessary for this type of task. The group which made the highest number of errors was the language disordered pre-school children. There seemed to be no correlation between age and linguistic awareness as measured by rhyming in this group.

	Normal			Disordered		
	I	II	Total	I	II	Total
Pre-school children	19	48	67	38	71	109
School children	4	5	9	16	37	53
Total	23	53	76	54	108	162

Table 2. Number of errors in the rhyming test, part I and II, made by the twenty subjects.

170

All subjects made more mistakes in part II of the test than in part I. This is as could be expected since part I does not require segmentation of the post-vocalic consonant but can be managed by comparing vowels that are phonetically well separated. Part II, thus, puts higher demands on both segmentation ability and ability to discriminate between phonetically close segments.

DISCUSSION

Language development seems to play an important role for the development of linguistic awareness as the normally speaking school children perfomed better than the language disordered school children. The same holds for the pre-school groups, even though the normally speaking pre-school children were considerably younger than the language disordered ones (cf. table 1).

Thus, age and cognitive level can not be the only determinants contributing to the development of linguistic awareness. The fact that school children score higher than pre-school children shows that age/cognitive level are not totally irrelevant. It could even be assumed that reading and spelling instruction to a certain extent promotes the growth of linguistic awareness as the language disordered school-children perform better than the normally speaking pre-school children. It is however obvious that reading and spelling ability is not a prerequisite for the development of linguistic awareness as illustrated by the illiterate pre-school children's rhyming performance.

When examining the results more closely we find that in part I, the most common difficulty among the youngest and/or the language disordered children was their inability to disregard content. Instead of concentrating on sound structure their choices implicated that they focused on content, basing their rhyming choices on semantic associations instead of on the

171

similarity of sounds. For instance, when the test word was skrek (screamed) they pointed to aj (ow) instead of ek (oak), thus demonstrating an inability to disregard substance and to concentrate on form.

In part II, the errors can be of two types: false acceptances and false rejections. A comparison between the distribution of false acceptances and false rejections in part II and the errors in part I suggests that if a child makes more errors in part II than in part I, this can be explained as a lacking of ability to discriminate rather than as an inability to segment. In view of the fact that most of the children who showed this pattern were language disordered the explanation seems reasonable.

The numerous errors in part II as compared to the less frequent ones in part I were earlier attributed to the fact that the words in part II required segmentation while part I might be managed by comparing the vowels in the test words and in the models. However, an alternative explanation for the differential level of difficulty in the two parts of the test can be suggested if we discuss our results in terms of syllable structure. It has been suggested by e.g. Fudge (1969) that the structure of the syllable is hierarchical and divisible into onset and rhyme and that the rhyme is further divisible into peak and coda. Empirical data as e.g. in Treiman (1983) show that it is much easier to segment between the onset and the rhyme of the syllable than between the peak and the coda of the rhyme as a consequence of the hierarchical structure of the syllable. In our test the segmentation required in part I is between the onset and the rhyme while in part II a segmentation within the rhyme, i.e. between the peak and the coda, is required. Thus, our results can be interpreted as reflecting this hierarchical structure. Empirical data of other types such as slips of the tongue also reveal the internal structure of the syllable as pre-vocalic consonants are more often involved in speech errors than post-vocalic ones (Hockett 1967,

172

MacKay 1972, Söderpalm 1979).

Children who are in the process of becoming aware of the segmentability of sequences seem to be dependent on what kind of segments they are supposed to handle within the rhyme. It is obvious from our data that certain consonant types such as nasals are much more difficult to segment from the preceeding vowel than stops or fricatives. It has been shown by House (1982) that non-coronal nasals have special acoustic characteristics depending on the preceeding vowel and thus require special identification strategies. Therefore, initially, it does not seem to be a question of form or substance but rather an interaction between form and phonetic substance contributing to an increasing of linguistic awareness.

TO SUM UP:

Since the normally developed children performed better than the language disordered children on the rhyming test it can be argued that language development is more important than cognitive development for linguistic awareness. Cognitive factors may also be of some importance since the language disordered school children performed somewhat better than the normally developed pre-school children. For this result, however, reading and spelling acquisition could be an influencing factor.

ACKNOWLEDGEMENTS

173

REFERENCES

Bruce, D.J. 1964. The analysis of word sounds by young children. British Journal of Educational Psychology 34:158-170

Calfee, R., Chapman, R. & Venezky, R. 1972. How a child needs to think to learn to read. In Gregg (ed.) Cognition in learning and memory. John Wiley & Sons, Inc.

Calfee, R.C., Lindamood, P. & Lindamood, C. 1973. Acoustic-phonetic skills and reading - Kindergarten through twelfth grade. Journal of Educational Psychology 64:293-298

Calfee, R.C. et al. 1980. Stanford Foundation Skills Test. Book B. Phonetic segmentation. Stanford University (unpublished)

Ehri, L.E. 1979. Linguistic insight: Threshold of reading aquisition. In Waller & MacKinnon (eds.) Reading research: Advances in theory and research, Volume 1, Academic Press, New York

Fudge, E.C. 1969. Syllables. Journal of Linguistics 5:253-286

Gahne, G., Rudberg, L-A. & Åström, E. 1983. Undersökning av korttidsminnets betydelse för läsförmågan. 60-poängsuppsats i fonetik. Stencil. Lunds universitet, Institutionen för lingvistik

Hakes, D.T. 1980. The development of metalinguistic abilities in children. Springer-Verlag, Berlin

Hockett, C.F. 1967. Where the tongue slips, there slip I. In To Honor Roman Jakobson. Mouton, The Hague. Also in Fromkin, V. (ed.) 1973. Speech errors as linguistic evidence. Mouton, The Hague

House, D. 1982. Identification of nasals: An acoustical and perceptual analysis of nasal consonants. Working Papers 22, Phonetic Laboratory, Department of Linguistics, Lund University

Liberman, I.Y. 1973. Segmentation of the spoken word and reading acquisition. Bulletin of the Orton Society 23:65-77

Liberman, I.Y., Shankweiler, C., Liberman, A.M., Fowler, C. & Fischer, F.W. 1977. Phonetic segmentation and recoding in the beginning reader. In Reber & Scarborough (eds.), Towards a psychology of reading: Proceedings of the CUNY conference, Hillsdale, New Jersey

Lundberg, I., Olofsson, Å. & Wall, S. 1980. Reading and spelling skills in first school years predicted from phonemic awareness in kindergarten. Scandinavian Journal of Psychology 21:159-173

MacKay, D.G. 1972. The structure of words and syllables: Evidence from errors in speech. Cognitive Psychology 3:210-227

Marshall, J. & Morton, J. 1978. On the mechanics of Emma. In Sinclair, Jarvella & Levelt (eds.) The child's conception of language. Springer-Verlag, Berlin

Mattingly, I.G. 1972. Reading, the linguistic process, and linguistic awareness. In Kavanagh & Mattingly (eds.), Language by ear and by eye. The MIT Press, Cambridge

Söderpalm, E. 1979. Speech errors in normal and pathological speech. Travaux de l'institut de linguistique de Lund XIV. Gleerups, Lund

Treiman, R. 1983. The structure of spoken syllables: Evidence from novel word games. Cognition 15:49-74

Tornéus, M. 1983. Rim eller reson? Språklig medvetenhet och läsning. Psykologiska institutionen, Umeå Universitet

Valtin, R. (in press) The development of metalinguistic abilities. In Downing & Valtin (eds.) Language awareness and learning to read. Springer-Verlag, Berlin

APPENDIX

Model words and test words in part I and part II of the test

Part I

Model words

[aj], [o:l], [e:k]

Test words

[bo:l], [ste:k], [maj], [haj], [gre:k], [mo:l], [blaj],[ho:l],
[le:k], [sto:l], [skre:k], [ble:k], [skro:l], [svaj], [ve:k]
[kaj], [vro:l], [skraj]

Model words

[i:s], [ʉl], [ɛg]

Test words

[krʉl], [lɛg], [mʉl], [skʉl], [ri:s], [ʃɛg], [di:s], [pri:s], [kri:s],
[gʉl], [vi:s], [hʉl], [gnɛg], [vɛg], [hɛg], [tʉl], [gri:s], [klɛg],

Part II

Model word

[i:s]

Test words

[kri:s], [pri:s], [vi:s], [li:v], [gri:s], [ny:s], [di:s], [hi:t],
[hʉ:s], [li:k], [he:s], [ri:s]

Model word

[ɛg]

Test words

[hɛg], [tag], [vɛg], [nɛb], [vɛ:g], [lɛg], [sɛŋ], [klɛg], [sɛk],
[lʉg], [ʃɛg], [gnɛg]

Model word

[ʉŋ]

Test word

[tʉn], [nʉb], [kʉŋ], [ʃʉŋ], [tɔŋ], [ʃoeŋ], [svʉŋ], [mʉg],
[paŋ], [tʉŋ], [pʉŋ], [plʉŋ]

177