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Language competence among cognitively non-disabled individuals with cerebral palsy

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Abstract

Many persons with congenital brain damage such as cerebral palsy do not experience intellectual or cognitive dysfunction. Nevertheless, in this group we find more individuals with reading and writing difficulties than average. These difficulties may be related to poor underlying basic linguistic knowledge. In this study the intention is to explore basic linguistic competence in individuals with cerebral palsy who have reading and writing difficulties. Standard tests of language function will be used. The results may help us in deciding what to include in compensatory language or communication aids.

Introduction

Many individuals with congenital brain damage, cerebral palsy for example, have physical impairment accompanied by cognitive dysfunction. However, there is also a large group of individuals with cerebral palsy who do not show any evidence of a decreased cognitive level. This group often has to struggle against other persons’ prejudices toward individuals with speaking difficulties (dysarthria), involuntary facial gestures and limb movements etc. Their problem is often that they have to prove themselves to be intellectually competent.

Nevertheless, adult individuals with cerebral palsy show a higher incidence of reading and writing difficulties than do the rest of the population. The reason for this can be discussed in many aspects. It may be due to fewer years of education or lower expectations from their environment and themselves. Reading and writing difficulties may also be part of the brain damage itself. In analogy with dyslexia, these reading and writing difficulties do not necessarily have to be related to other cognitive or intellectual disorders (Höijen & Lundberg, 1992). Reading and writing difficulties among individuals with cerebral palsy may thus be considered as an additional handicap.

Reading and writing difficulties may also be related to poor basic linguistic knowledge. We know that other stages of disturbances of brain functions give rise to linguistic dysfunctions (e.g. aphasia after stroke) and this may also be the case in persons with cerebral palsy. Poor basic linguistic knowledge may also be due to abnormal development during the phase in life when linguistic skills normally are developed. Depending on the presence and degree of dysarthria, it may also be related to different language acquisition strategies due to inability to produce oral language during the prewriting stage (Bishop et al., 1990). Poor basic linguistic knowledge may also, just like reading and writing difficulties later on, be related to low expectations from school and family.

Regardless of the reasons for this possible language deficiency, it must imply another additional handicap in being part of the "normal" society with "normal" expectations, including aspects such as education and employment, if one does not fully master the linguistic code.

The important point here is that there are individuals with cerebral palsy who are cognitively and intellectually normally functioning and at the same time have basic linguistic knowledge that does not meet with society's demands and expectations for a non-disabled person.

In a study by Dahlgren-Sandberg & Hjelmquist, the relationship between literacy skills and intellectual level, and the level of phonological awareness in nonspeaking individuals was explored. It was found that reading skills were far behind other verbal abilities. Berninger & Gans found in another study (1986) that nonspeaking individuals of normal intelligence with cerebral palsy sometimes receive a higher score on verbal tests than on nonverbal, which would seem contradictory to the hypothesis in this paper. The argument for this discrepancy is that verbal reasoning may have substituted physical exploration of the world. They also point out that the three individuals in their study show "relatively better receptive oral language at the discourse level than any other level and were relatively better at encoding (spelling) than decoding (recognizing) written words. All were underachieving in
reading relative to their verbal aptitude and receptive oral language at the discourse level."

In a current project, in which the original aim was to investigate the effect of a computerized linguistic aid (Prophet, a word prediction program that has been in use in various versions for more than 10 years, which has been used by individuals with reading and writing difficulties in addition to a motoric dysfunction), it became apparent that it was necessary to conduct an investigation of the linguistic knowledge of the subjects that were to participate. The reasons for this were twofold: a) to be able to relate the reading and writing difficulties to a basic linguistic level and b) to establish a linguistic baseline for further intervention and possibly improved linguistic skills.

Method

In the overall evaluation of Prophet we are interested in quantitative aspects of the written texts such as speed and effectiveness, correctness of spelling, morphology and syntax, and qualitative aspects such as intelligibility and expressive use of the language, and the users' own experiences. The linguistic part of this study thus consists of three parts: a) a basic language profile b) a qualitative and quantitative analysis of the written texts and c) documentation of possible generalized and transferred effects.

Parameters that are to reflect the different aspects of the language have been defined and included as a theoretical background in this basic linguistic profile. These parameters are:

Competence
- Phonemic identification and discrimination
- Impressive and expressive vocabulary:
- Morphology: congruence, verb inflection, noun inflection
- Syntax: word order in subclauses, conjunctions, word order in questions.

Linguistic awareness
- Phonology: phonemic distinction, rhyming skills, combining sounds into words, segmenting words into sounds, phoneme substitution, phoneme deletion
- Morphology: combining morphemes into words, inflection operations.

The establishment of the linguistic baseline will be achieved with traditional testing methods. It turned out to be a project in itself to find established tests that matched all the parameters we had defined. The existing tests did not measure exactly what we were interested in or were based on a slightly different theory than our own. Furthermore, there are not very many tests on the market and most tests have been developed to use with children, and to use them with adults may sometimes be offending. Our current test battery is therefore a mixture of registered and standardized tests, translated and reformulated tests developed by other persons and development of own material.

Tests

The following references are what we are currently using; it may be augmented during the course of the project:
- Phonological awareness: Magnusson E & Nauclet K "Bedömning av språklig medvetenhet"
  Elbro C "Bo skriver ord" och "Lis skriver ord"
- Morphology: Bishop D "T R O G", material developed within the project
  Ege B "Ringstedtmaterialet"
  Hellquist B "Språkligt Impressivt Test"
  Holmberg & Stenkvist "Nya Londamaterialet"
- Syntax: Ege B "Ringstedtmaterialet"
  Hellquist B "Språkligt Impressivt Test"
  Holmberg & Stenkvist, "Nya Londamaterialet"
- Impressive vocabulary: Dunn LM & Dunn L "Peabody Picture Vocabulary Test"
- Expressive vocabulary: Boston Naming
- Reading: A decoding test developed within the project
  SL50, SL40, OS64, OS12
  Johansson M-G "Klassdiagnoser i läsning och skrivning"
  Jacobson C "Ordkedjetest"
- Cognition: Raven's coloured progressive matrices

Subjects

Individuals with cerebral palsy, including moderate to severe physical impairment and who are cognitively and intellectually on an average level (the actual criterion is that they are considered so officially) will participate in a linguistic testing procedure.

Expected results

The study is descriptive with the purpose of exploring the relationship between cognition and language competence. It will result in a
linguistic profile that can be related to the subject's cognitive level and compared to that of a non-disabled person. With an increased body of knowledge about the linguistic competence of the potential communication aid user, we may be better at both predicting the type of aid a person will need and contributing to the process of developing new communication aids.

References


Dahlgren-Sandberg A & Hjelmquisat E. Reading and Writing Skills among Nonspeaking Persons - A preliminary Study (Submitted for publication).
