In its effort to support the work and development of rehabilitation students, the Canadian Journal of Rehabilitation will periodically publish papers written by students in various rehabilitation disciplines. Promising papers are reviewed and revised by the Divisional Editors of CJR. The aim is to assist students with the publishing process in the hope of encouraging them to pursue research and writing after they graduate.

The following student paper came out of the Research in Rehabilitation Conference (RIRC) which took place in Edmonton June 27 - 28, 1987. In association with the Conference, RIRC sponsors a student essay contest and CJR extended its support by awarding the contest winner a one-year subscription to the journal and offering to publish the prize winning paper. The winning essay was “Language Development in Down’s Syndrome Children” by Peter Flipsen, third year student in the Department of Speech Pathology and Audiology at the University of Alberta.

Language Development in Children with Down’s Syndrome: Delayed or Deviant? A Review of Some of the Current Literature

Peter Flipsen

The development of language in children with Down’s Syndrome is assessed through a review of the current literature. Prelinguistic behaviors, pragmatics, semantics, syntax, phonology, and morphology are all examined. The fundamental question addressed is whether children with this syndrome develop language in the same manner as non-Down’s children or whether they do so differently. The question has important implications for treatment in that each position (delay versus deviance) necessitates quite different approaches to therapy. No definitive conclusion can be made, however, since three areas (phonology, semantics, and syntax) point to deviant development while the other three (prelinguistic behaviors, pragmatics, and morphology) indicate delay.

Down’s Syndrome is the most commonly occurring genetic aberration (Grossman, 1983) as well as being the most common specific type of mental retardation (Stoel-Gammon, 1981). Children with this syndrome exhibit language that is distinct from that of non-Down’s children of the same chronological age (Kamhi & Johnston, 1982). This paper will examine the nature of that distinction. In particular, the sequence of language acquisition is discussed with reference to phonology, semantics, syntax, morphology and pragmatics. Prelinguistic behaviors are examined in light of their impact on the development of language. The assumption here is that normal language development is an interactive process involving development of form (syntax, morphology, and phonology), content (semantics), and use (pragmatic) skills (Bloom & Lahey, 1978).

Slow or Different?

There has been considerable discussion as to whether the development of language in Down’s syndrome is merely slow or is, in fact, different. Researchers (Bernstein & Tiegerman, 1985;
Morss, 1983) have addressed this issue generally. It is, however, still not fully resolved.

The question has important implications for parents and educators as well as for speech-language pathologists. If Down’s syndrome language development is merely slow or delayed, treatment procedures and support will be geared to facilitative techniques focusing on enhancing the normal sequence of development. If, however, language development in Down’s syndrome is different or deviant, the nature and degree of deviation needs to be ascertained. Therapy procedures would then tend to be more syndrome specific and/or problematic.

PRELINGUISTIC BEHAVIOURS

In assessing prelinguistic behaviours, it is essentially the realm of mother-child interactions that is being considered. Stressing Bloom and Lahey’s (1978) interactive model, the mother and child influence each other. The child’s early actions are interpreted by the mother as being intentional and she responds as such. The child then eventually sees that its actions can influence others and he or she starts to exhibit true intentionality or means-ends behaviour.

In the case of children with Down’s syndrome, Peterson and Sherrod (1982) report a “...striking lack of rapport...” (p. 396) between mother and child. Although the children in that study were already producing words, the noted quality of the interaction would likely be the result of poor interactions at the preverbal stage. Jones (1980) noted that while there were often more interactions between mother and her Down’s syndrome child, these tended to be more ritualistic and less communicative in nature.

Looking behaviour of infants with Down’s syndrome was assessed by Gunn, Berry, and Andrews (1982). They found that these infants spent twice as much time as non-Down’s infants focussing on mother. Infants with Down’s syndrome also tended to use much less referential looking (i.e. trying to get mother’s attention). This would seem, then to indicate at least a delay in means-ends development. These infants were slow to recognize that their actions could have an influence on their environment. This finding also relates to Jones’ (1980) conclusion that the interactions were more ritualistic and less interactive.

Thus, maintenance of ritualistic interactions, the lack of clear means-ends behaviour, and a tendency for the mother-child interactions to be mother-directed in Down’s syndrome (Cardoso-Martins & Mervis, 1985) could conceivably lead to maternal frustration. This might account for the later lack of rapport noted by Peterson and Sherrod (1982).

Having addressed means-ends behaviour, object permanence development needs to be discussed. Before appreciating that objects have names, the child must realize that there are things in the environment that are permanent. Morss (1983) feels that there is a different pattern of development here. He reports that “…achievement of a task [such as finding a hidden object] is less likely, in the Down’s syndrome infant to represent a stable acquisition.” (p. 45). Morss contends that acquisition of a skill is highly stable in normal development.

In addition, Leonard (1972) views frequency of use as a measure of deviant versus normal development patterns. Normal speakers would use structures more consistently than deviant speakers, having established a relationship between the structure and the desired end result (i.e., getting the idea across clearly).

It is quite arguable, however, that the concept of language delay presupposes the possibility of periods of inconsistency, where delayed children may take longer to make the connection between structures and their use. This is supported by Mervis and Cardoso-Martins (1984). They report that, taking into account the overall slower pace of development, children with Down’s syndrome progress through the later stages of object-permanence development in the same manner as non-Down’s children.

Again citing Bloom and Lahey’s (1978) interactive model, the concepts of intentionality and object-permanence make it possible for the child to convey meaning in its interactions. By learning to give and receive meaning, the child develops conversational response skills.

With the Down’s syndrome infant, Jones (1980) noted a tendency for prelinguistic vocalizations to be less intentional (when compared to non-Down’s children matched for mental age). There was also a tendency for the mothers of infants with Down’s syndrome to be more directive and
less interactive. It might be concluded that because the infants with Down’s syndrome are cognitively delayed (the essence of the term mental retardation), they are slow to pick up on their mothers’ reactions. The mother, then, is in the position of continually trying to initiate interactions and achieving less success. In fact, Jones (1980) does cite this as the interaction pattern typical of infants with Down’s syndrome and their mothers.

A final skill that is normally thought to precede language is one of representation or the ability to use one thing to represent another. Language is the ultimate form of representation being the use of a word or symbol to indicate a person, object, or concept.

It is through play that children learn to develop the skill of representation. Wing, Gould, Yeates, and Brierly (1977) report that children with mental retardation develop symbolic (representational) play at about the same mental age as intellectually normal children.

Wing et al. (1977) go on to report that there is an even better relationship between symbolic play and language comprehension age. Their findings are further supported by Motti, Cicchetti, and Sroufe (1983) who found a strong correlation between symbolic play and cognition in children with Down’s syndrome.

Given the above, it can be concluded that for prelinguistic behaviours, children with Down’s syndrome exhibit delayed development.

**PHONOLOGY**

Phoneme acquisition certainly begins before word acquisition. Phonemes are, however, still being acquired after conversational speech appears. Articulation, therefore, is not strictly a prelinguistic skill and so is discussed here separately.

Both Dodd (1972) and Stoel-Gammon (1981) found that Down’s syndrome and non-Down’s infants showed similar patterns of babbling. Jones (1980) contrasts this view stating that “…the Down’s syndrome children tended to repeat sounds in strings (e.g., Da, Da, Da) in contrast to the normal children’s varied vocalizations (e.g., Da, Ga, Du).” (p. 215). Referring once more to the nature of language delay itself, could not the longer time at each stage imply a need for greater amounts of repetition? Indeed there may be more intermediate steps involved in the transition through stages that we only see in delayed children. Dodd’s (1972) non-Down’s children may simply have been further along in those steps of the babbling stage. Conversely, being developmentally normal, they may not have required the intermediate steps.

Stoel-Gammon (1981) found that Down’s syndrome and developmentally normal infants reached the stage of reduplicated babbling at the same chronological age. In fact, she notes that there is little difference in phonological progress between Down’s syndrome and non-Down’s infants in the first year of life. Dodd (1972) supports this viewpoint. It is during the second year that major differences appear.

With the onset of meaningful speech, progress in phoneme acquisition by children with Down’s syndrome more closely matches mental age (Dodd, 1976). Development proceeds at a slower pace but it is here, in phonological development, that children with Down’s syndrome can be said to be most deviant from the normal pattern.

Stoel-Gammon (1981) found that while phonemes are acquired in the same basic order, the phonological processes exhibited go beyond those of developmentally normal children. Cromer (1974) reports a higher proportion of non-rule-governed phonological processes in children with Down’s syndrome. There would, therefore, appear to be significant differences in the way the phonological system is acquired in children with Down’s syndrome. Cromer (1974) contends that the delay itself results in the deviance.

In this area, the literature supports the conclusion of deviance over delay.

**SEMANTICS**

Gillham (1979) examined early vocabulary development in children with Down’s syndrome. He concludes that while the pattern exhibited is very similar to non-Down’s children, it is considerably slower.

A study by Cardoso-Martins, Mervis, and Mervis (1985) reported similar findings. They noted that children with Down’s syndrome were at the same cognitive level as non-Down’s children when comprehension and production of
object names appeared. This provides an interesting parallel to Dodd’s (1976) report on the development of phonology and the appearance of meaningful speech.

It is in the second year though, that Cardoso-Martins and her colleagues (1985) note a discrepancy between vocabulary acquisition and cognitive development. They report that “the level of vocabulary development of the children with Down’s syndrome was lower than would have been expected based on their level of object permanence development.” (pp. 181-182).

In terms of the substance of the Down’s syndrome vocabulary, Berstein and Tiegerman (1985) conclude that there is a tendency among children with Down’s syndrome to use more concrete terms. These authors feel that this is merely indicative of delay. Most non-Down’s children go through a period where they use a high proportion of concrete nouns in their productions. If however, this reliance on concrete terms is not in line with that expected by their level of object permanence development (Cardoso-Martins, Mervis, & Mervis, 1985) there must be some degree of deviance from the normal development pattern.

In general then, semantic development would appear to be deviant rather than delayed.

SYNTAX

As in the case of semantic development, there also appears to be a discrepancy between expected complexity and cognitive level (McLeary, Toomey, & Dempsey, 1982). This finding is echoed by Cromer (1974), who feels that this is as would be expected. If there is a critical period for language acquisition, and children with Down’s syndrome do not achieve expected milestones in that period, different strategies may be necessary to acquire language.

McLeary et al. (1982) differ in that they found that the syntactic structure of the children with mental retardation in their study matched that of intellectually normal children of similar mental age. This apparent contradiction might be resolved if one considers Cromer’s (1974) critical period to be a critical period of cognitive development. Of course, Kamhi and Johnston (1982) suggest caution in these comparisons based on mental age. They believe that mental age does not necessarily equate to cognitive level since the psychometric tests used to establish mental age (MA) do not assess performance on “…non-standardized Piagetian-like tasks…[or take into account] motivational and emotional factors in a child’s test performance. …Language development might be consistent with general cognitive level but not MA.” (p. 436).

Some studies have used language age matches based on measures such as Mean Length of Utterance or MLU (e.g., Owens & MacDonald, 1982). Harris (1983) feels that while language age matches are likely valid, MLU is “…not representative of the same linguistic skills for the two groups; Down’s syndrome and normal.” (p. 164). The greater chronological age in children with Down’s syndrome means greater experience and a greater tendency to make longer sentences using conjunctions. (Kamhi & Johnston, 1982). This could well explain the deviant pattern seen in some studies.

Despite this explanation, Harris (1983) does indicate that children with Down’s syndrome approach the task of sentence building differently than do non-Down’s children. He postulates “…variations in the extent to which linguistic subskills are coordinated and synchronized over time.” (p.182). (This is a similar finding to Cromer’s (1974) conclusion of delay leading to deviance.)

It must, then, be concluded that syntactic development is deviant to at least some degree.

MORPHOLOGY

In this area, there has been little work done specifically with Down’s syndrome children. Johnston and Schery (1976) found that children with mental retardation (not necessarily just Down’s syndrome) followed the same basic pattern of acquisition of Brown’s (1973) 14 grammatical morphemes. Newfield and Schlanger (1968) also reported finding a parallel between children with mental retardation (again not restricted to Down’s syndrome) and intellectually normal children in order of acquiring morphological markers.

Bradbury and Lunzer (1972) found that children with mental retardation can learn morphological rules at about the same level of mental ability as intellectually normal children. Children with mental retardation did not learn to apply the rules as quickly however. (This provides an interesting
side-light to the previous discussion on the possible need for intermediate steps in the development of phonology.)

Given that none of the above studies was restricted to children with Down's syndrome, only a very tentative conclusion of delay is possible in this area.

**PRAGMATICS**

This area involves the social aspects of language. In order to develop language, children must learn why it is that we communicate.

As with phonological development, pragmatic development begins in the prelinguistic period. In fact, Bates (1976) believes that most children begin to develop pragmatic (use) skills before semantics (content) or phonology and syntax (form) emerge. (Refer also to the previous section on prelinguistic skills development for further discussion in this area.)

Owens and MacDonald (1982) looked at pragmatic (illlocutionary or intentional) behaviors associated with early speech in children with Down’s syndrome. They found little difference between normal and Down’s syndrome children.

Combining the above result with those seen in prelinguistic behaviors, a conclusion of delay must be reached.

**CONCLUSION**

This paper has been far from an exhaustive analysis but serves to illustrate the depth of the problem. The results give no clear indication as to whether the development of language in children with Down’s syndrome is delayed or deviant. Three areas, phonology, semantics, and syntax, show deviance from the normal pattern. On the side of delay are prelinguistic behaviors, and pragmatic development along with the somewhat nonspecific studies on morphology.

If indeed the process of language acquisition is interactive, one must question why all of the areas do not agree. The debate is far from over. If there is, in fact, a critical period for the acquisition of language, Cromer’s (1974) argument that delay itself results in deviance should be considered in greater detail.

With no clear conclusion to this debate, speech-language pathologists and educators will likely continue to do clinically what has been done for years – teach the normal developmental sequence (assuming delay) with many more substeps and modify programs as needed to fit the individual child.

Should deviant development prove to be the actual pattern, the nature of the deviance will need to be clearly defined before therapy techniques can be systematically developed. Until then our current developmental approaches would seem the wisest course to follow.

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**REFERENCES**


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