

Dichotic Listening Versus Dichhaptic Braille Reading*

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Ten congenitally totally blind male adults were administered Dichhaptic Braille Reading and Dichotic Listening Tasks. The performance of the hands on Dichhaptic Braille Reading were compared with the performances of the ears on Dichotic Listening. The study was to examine the hemispheric specialization for spatial-linguistic stimuli, such as Braille.

Nine of the ten subjects showed an RHA and an REA on tasks involving simultaneous reception of stimuli by the right and the left. This suggested a left hemisphere specialization both for spatial linguistic and auditory linguistic meaningful stimuli.

One of the subjects showed an LHA and an LEA indicating a Right hemisphere specialization for language in a right hander.

Performances of the right hands and the right ears indicated the better performance of the hands over the ears. The same was true with the left hands and the left ears.

It was hypothesized that it might have been either because the somesthetic modality was stronger than the auditory modality in analysing the materials or because of the differences in the competition achieved in the pathways of both the modalities.

All the ten subjects reported right handedness. Nine of the ten subjects indicated left hemispheric specialization for linguistic processing. One of the subjects indicated a rare right hemispheric specialization for linguistic processing, even though he was a right hander.

Nine of the ten subjects reported a left hand proficiency in reading Braille and showed an RHA on Dichhaptic Braille Reading Task. One of the subjects reported right hand proficiency but showed an LHA.

It was hypothesized that the ipsilateral pathways might become stronger in perceiving spatial linguistic stimuli, such as Braille in the absence of competition from the other side.

Based on the findings, a model of "Shift of Processing Hemisphere and Meaningful Linguistic Stimuli" was proposed. The model indicated that the hemispheric specialization for a given stimuli is dependent upon the linguistic meaningfulness of that particular stimuli.

Four phases of the model were described.

To conclude, the more linguistically meaningful the stimulus, the greater the specialization of the left hemisphere for that particular stimulus.

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Limitations of the Present Study

- (1) Only ten subjects were tested.
- (2) Only words were presented for both Dichhaptic Braille Reading and Dichotic Listening Tasks.
- (3) Tests were not administered to validate the handedness and hand Proficiency for want of time. The handedness and hand proficiency were based on the reports from the subjects and from observations.

Recommendations for Further Research

- (1) The study can be repeated with more subjects.
- (2) The study can be carried out with the sinistral blind subjects to note the differences between the right and the left handers.

- (3) The blind subjects who have neuro-pathological histories can be studied. This may help in constructing diagnostic tools based on Dichhaptic Braille Reading and Dichotic Listening Tasks.
- (4) The study can be repeated using Braille letters and sentences and shapes. This may provide further validation of the proposed model.
- (5) Studies can be done with children of different age groups, to note the age of establishment of hemispheric specialization for Braille.
- (6) Neurophysiological studies should be done using Braille as stimuli both in monhaptic and dichhaptic conditions. This may help in testing the hypothesis, that the ipsilateral pathways will be stronger in the Braille Reading under monhaptic conditions.