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Recommended Citation

Vallandingham, D. (2019). Short Term Memory Abilities of Skilled Signers. *JADARA, 24*(3). Retrieved from https://repository.wcsu.edu/jadara/vol24/iss3/5

SHORT TERM MEMORY ABILITIES OF SKILLED SIGNERS

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Abstract

The principal purpose of this study was to investigate the short term auditory storage and retrieval abilities of skilled interpreters for the deaf.

It was assumed that the task of interpreting spoken English to ASL involved short term auditory storage, the efficacy of which was related to chunking abilities of the listener.

Three groups of ten subjects each made up the sample population. Group A was composed of individuals with interest in but limited knowledge of sign language. Group B was composed of individuals with no knowledge of sign language. Group C was composed of individuals holding the Comprehensive Skills Certificate from the National Registry of Interpreters for the Deaf.

Free-recall short term storage tasks were utilized to evaluate recall efficiency of the sample groups for familiar and unfamiliar information. English proverbs were used for the familiar stimuli, and novel sentences generated from the proverbs were used for the unfamiliar stimuli.

Results indicate that skilled interpreters perform efficiently on recall tasks involving conceptually accurate recall of novel sentences. The results were interpreted as supporting the hypothesis that skilled interpreters for the hearing impaired are efficient chunkers of linguistic information. A discussion of the results and needs for further research is presented.

Interpreting refers to the "act a person performs when conveying one person's message to another" (Caccamise, 1980, p.1) and may involve a change in the mode of communication used by the sender, a change in the language used by the sender, or both. Provision of interpreting services for persons with hearing losses involves two languages and two communication modes. The two languages usually involved in the interpreting process are English and American Sign Language (ASL), although a distinction should be made between written and spoken English. Modes of communication usually involved in the interpreting process are oral/aural (spoken English) and manual/visual (sign language/fingerspelling).

A manual/visual language, ASL utilizes arbitrary, rule-governed symbols as meaningful communication units. These symbols involve combinations of hand shapes, positions, orientations, and movements along with direction of the signer's eyes, facial expressions, and body posture. ASL is now generally recognized as a distinct language with its own grammar (Stokoe, 1978).

In order to fulfill the role as facilitator in a normal communication situation, any interpreter for the deaf must translate spoken English into sign language as a sender, and sign language into spoken English as a receiver. Such two-way communication situations involve aural/oral and manual/visual modes of communication. The perceptual and cognitive processes involved in the interpreting situation will depend on the communication mode in operation at a given point in time. In other words, the processes involved in voice-to-sign interpreting will be different than the processes involved in sign-to-voice interpreting. Investigation of interpreting skills should, therefore, approach each mode separately.

Interpreting spoken English into ASL requires

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the interpreter to (1) encode an auditory input (stimulus) into a meaningful unit or chunk of information, (2) store the unit or chunk in some sort of memory store, (3) retrieve a semantically equivalent sign unit from linguistic memory, and (4) express the communicative unit in manual/visual form (Alcorn and Kanda, 1984; Grosjean, 1980; Marslen-Wilson, 1975). Systematic investigation of this process is needed in order to define interpreter aptitudes and skills, assess interpreter training programs, and develop screening/assessment tools for interpreter training programs. It was the purpose of this study to investigate the short term auditory storage (STS) abilities of skilled interpreters.

Studies dealing with the perception of sentences have indicated that a sentence processed through the auditory channel "may be grouped or segmented during listening into processing units or chunks which correspond to large linguistic constituents in surface-phrase structure...natural linguistic units, such as sentences and clauses, and interpreted before the limited short term memory store is exceeded" (Jarvella, 1971, p. 409). The listener encodes a semantic product which is a joint function of input information and prior knowledge in long term (semantic or secondary) memory (Baddelly, 1986; Eysenck, 1977; Herriot, 1974; Houston, 1986;) The amount of information which may be stored in STS is a function of the individual's ability to chunk the presented information (Houston, 1986; Johnson, 1970; Miller, 1956; Murdock, 1974).

In the process of interpreting spoken English to ASL, the interpreter must encode the auditory stimuli using syntactic and semantic information, then store the encoded information while it is recoded into ASL. The present study hypothesizes that individuals who are skilled in the area of interpreting for the deaf are also efficient in the encoding/chunking of information. This is related to general language competency. Since the capacity of STS is a function of encoding/chunking ability, the efficiency of skilled interpreters in encoding/chunking of information would be reflected in improved STS capacity for linguistic material such as sentences.

Method

Subjects

Three distinct subject groups were utilized in this study: (1) individuals skilled in the interpreting of spoken English to ASL; (2) college students with interest in, but limited knowledge of, sign language; and (3) a random group of non-signers. Skilled interpreters were defined as individuals who held certification from the National Registry of Interpreters for the Deaf. Children of deaf parents were excluded form this group since ASL may have been the first language learned by such signers. Interested college students were defined by enrollment in the Introduction to Deafness classes at the University of Arizona. This group was included due to possible motivational effects noted in second language learning. The third group consisted of individuals randomly selected from college students who had no instruction in sign language.

Each group consisted of five male and five female subjects. All subjects had auditory thresholds which were within normal limits as determined by a hearing screening. A total of 30 subjects were included in the study.

Stimulus Materials

Sixteen free-recall lists were used in the study. The lists were subdivided into two groups of eight sentences each. The first group was composed of familiar sentences (English proverbs). The second group was composed of unfamiliar sentences (generated permutations).

Procedure

Each subject was tested individually in a quiet room. Recorded lists were presented at a level judged as comfortably loud by each subject. At the end of each list, the subject was instructed to repeat all the sentences remembered. Responses were recorded in terms of accuracy of recall: each item recalled was scored as having been either syntactically correct or conceptually correct.

Data Analysis

Estimates of STS capacity were obtained from the number of items recalled from the last four

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input positions for each list. Mean STS recall for proverbs and mean STS recall for novel sentences were determined for each subject. The Kruskall-Wallis one-way analysis of variance by ranks was employed to test for significant differences between the subject groups.

Results

Analysis of test results for syntactically correct responses indicated that the three groups were similar in terms of syntactically correct STS recall of proverbs (H = 2.31; p ‹ .32) and of novel sentences (H = 4.89; p ‹ .09).

Analysis of test results for conceptually correct responses indicated a significant difference between the skilled interpreter group and the other sample groups for conceptually correct recall of novel sentences (H = 6.59; p ‹ .04)

Discussion

The finding of significant mean STS recall rank differences on novel sentence tasks and not on familiar sentence tasks would appear to support the hypothesis that skilled interpreters are more efficient chunkers of linguistic information than the other sample groups. Familiar sentences (proverbs) are themselves efficient chunks of information. Further grouping or chunking of information may be extremely limited. Novel sentences, however, are susceptible to further chunking, especially on a semantic level. In other words, chunking efficiency would be most important for stimuli which is not already organized in a psycholinguistic chunk. Novel sentences provide stimuli which probably do not hold preconceived psycholinguistic significance to the listener, and thus depend upon the chunking abilities of the individual for encoding/recall efficiency.

Although the interpreter group performed

statistically better only in the conceptually accurate recall condition, overall interpreter performance appeared superior to the other groups. Mean rank scores of the interpreter group were superior to the other groups for all conditions tested.

In a typical communication situation encountered by the interpreter, spoken English in the form of novel sentences must be retained in memory storage long enough for retrieval of conceptually correct ASL signs. Although syntactical information is sometimes requested by the deaf consumer, conceptual accuracy is vital regardless of whether the syntactic form is English or ASL. The results of the study suggest that individuals who are skilled interpreters are more efficient in short term, conceptually correct recall of novel information than the other sample groups.

Further research must address specific issues before such information can be utilized for screening and evaluation of interpreter training program applicants. A longitudinal study of interpreter trainees would be beneficial in determining if interpreter chunking efficiency is related to the interpreter training process, or if only interpreter trainees with efficient STS chunking strategies are successful.

Research is also needed to further define skills and attributes of the skilled interpreter. For example, what type of visual-perceptual skills, if any, distinguish the skilled interpreter from other groups? Can skilled interpreters be differentiated in terms of general language skills from other groups? Do interpreter training programs develop skills or eliminate those individuals not already possessing needed skills? The future of research into the area of interpreting for deaf people and interpreter training programs not only offers a wealth of areas for investigation, but also the promise of a clearer definition and better understanding of what makes a skilled interpreter.

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References

Alcorn, B. & Kanda, J. (1984). Explanation of the colonomos model. Unpublished paper, Overland Park, KS: Johnson County Community College.

Baddeley, A. (1986). Working memory. Oxford: Clarendon Press.

Caccamise, F. (1980). Introduction to interpreting. Silver Spring, MD: Registry of Interpreters for the Deaf.

Eysenck, M.W. (1977). Human memory: Theory, research, and individual differences. New York: Pergamon Press.

Grosjean, F. (1977). The perception of rate in spoken language and sign languages. Journal of Psycholinguistic Research, 22, 111-130.

Herriott, P. (1974). Attributes of memory. London: Methuen & Co. Ltd.

Houston, J.P. (1986). Fundamentals of learning and memory. New York: Harcourt Brace Joanovich, Inc.

Jarvella, R.J. (1971). Syntactic processing of connected speech. Journal of verbal learning and verbal behavior, 10, 409-416.

Johnson, N.F. (1970). The role of chunking and organization in the process of recall. In G. H. Bower (Ed.) The Psychology of Learning and Motivation: Advances in Research and Theory, Vol. 4. New York: Academic Press.

Marslen-Wilson, W. (1975). Sentence perception as an interactive parallel process. Science, 189, 226-228.

Miller, G.A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. Psychological Review, 63, 81-96.

Murdock, B.B. (1974). Human memory: Theory and data. Potomac, MD: Laurence Erlbaum Associates.

Stokoe, W. (1978). Sign language structure: The first linguistic analysis of American sign language. Silver Spring, MD: National Association of the Deaf.