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THEME—TRAINING AND SERVICE FOR THE GERIATRIC CLIENT

Identification of Communicative Competence in the Geriatric Population

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At one time or another, each of us has used audiometric test data, hearing handicap survey information and speechreading test scores to draw inferences regarding the aging adult's level of communicative competence. At Purdue University we have recently begun to explore the feasibility of using a videotaped "slice-of-life" screening procedure as a more direct indication of communicative ability in this population. In the videotape, everyday sentences are presented for visual speech perception in a variety of contexts. Since environmental cues suffer least from differences in lighting, speaker-receiver distance, momentary inattention or distraction, eye-blink rate, minor visual acuity differences and other related factors, it was felt that measuring the geriatric's ability to appropriately use situational cue information during visual speech perception would provide a meaningful estimate of his general communicative competence when the spoken message is not audible.

In the videotape (Refer to Appendix A), ten sentences were recorded first without background cues in the standard speechreading test format, then with relevant and non-relevant visual and auditory background cues. Sentences were constructed using words selected from the Thorndike and Lorge (1944) list of the 1000 most familiar words. The resulting sentences averaged 7.2 words in length. Proper nouns and proper names were not used. Phonetic loading was avoided. Sentences varied in form: six declarative; three rising interrogative; and one falling interrogative.

Visual background scenes were created by videotaping slides of everyday situations. Auditory cues were dubbed onto the videotape from available commercial recordings. A young female adult with general

Mid-western American dialect presented the sentences for videotape recording using natural rate, rhythm and voice, although only the video portion was recorded. Sentences were recorded under three situational background conditions. In the first condition, each sentence was recorded without situational cues in the traditional speechreading test format. (Refer to videotaped examples) Then sentences were recorded along with a non-relevant visual background scene and a non-relevant audible signal (Refer to videotaped examples). This condition is comparable to the situation where the topic of conversation is unrelated to the conversational environment. Finally, each sentence was presented along with a relevant visual and audible background cue (Refer to videotaped examples). This situation simulated a theoretically optimal "difficult" communication condition in which all background cues are relevant to the sentence topic.

Twenty-four geriatrics ranging in age from 61 to 87 years ($\bar{X}=72.9$ yrs.) participated in the screening. They were selected on the basis of age, functional hearing and vision, and ability to understand sentences and everyday situations. Subjects meeting these criteria were randomly assigned to speechread the sentences under one of the three conditions. Subjects viewing the videotape were instructed to relate all or any part of the perceived message to the examiner. They were encouraged to guess and to use as much time as necessary. Their verbal responses were positively reinforced and recorded by the examiner for later scoring. The entire screening procedure averaged less than 25 minutes per subject.

Responses were given full credit (10%) if the appropriate meaning of the sentences was understood, regardless of whether or not words of minor importance were understood. Partial credit (5%) was allowed for correct speechreading of any number of essential or key words and/or partial understanding of the meaning of the sentence. No credit was allowed for responses which could not be linked to the test sentence in word composition or intended meaning. To reduce scoring bias, responses were scored by two raters independently and found to be within 96% point-by-point agreement.

The differences among the three groups was found to be significant ($p<.005$) Post hoc analysis demonstrated that performance under the condition with non-relevant auditory and visual background cues and the condition with no auditory or visual background cues was not significantly different from one another, but both were different from the condition where relevant auditory and visual background cues were provided ($p< .01$). From the figure the relative difficulty of the three conditions can be seen.

These findings concur with pilot study data in which four young adults with normal auditory and visual acuity identified the meaning of ten

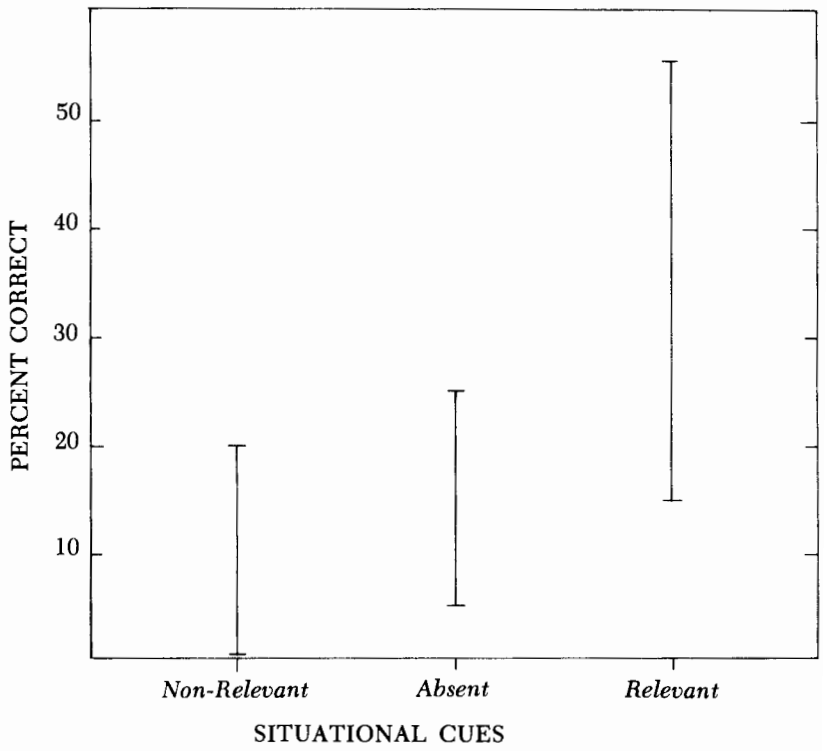

Figure 1. Mean percent correct visual speech perception scores for geriatric subjects. The range of scores is represented by vertical lines.

everyday sentences under *each* of the three background conditions presented in randomized order. Their performance with no situational cues was improved when relevant cues were provided and worsened when non-relevant cues were provided. Although the pilot subjects demonstrated the same general response pattern as the geriatric subjects, their overall performance was considerably better than that of the geriatrics.

Geriatric subjects used relevant cues to facilitate visual speech perception. This finding is supported by related research. It suggests that situational cues define a category of information which has a strong influence on visual speech perception. Situational cues, if not disconfirmed, will activate certain expectations. It might also be speculated that non-use of situational cue information in assessing visual speech perception would appear to underestimate the geriatric's everyday communicative competence.

Since one is generally unable to predict the relevance of a spoken message to any particular situation, it was of some further interest to

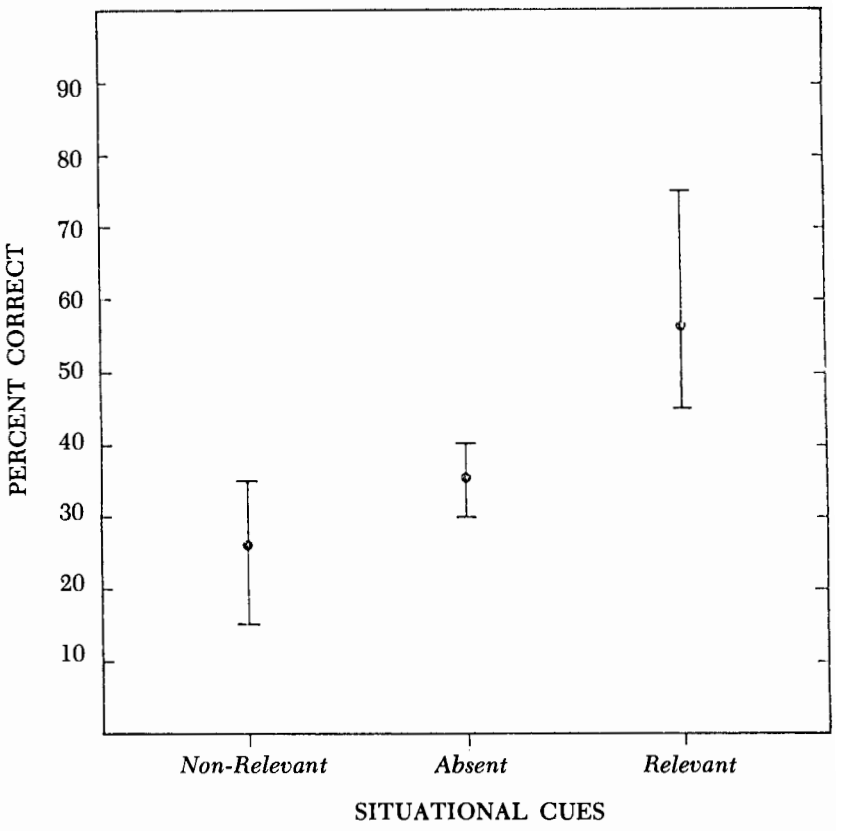

Figure 2. Mean percent correct visual speech perception scores for young adult subjects. The range of scores is represented by vertical lines.

observe individual subject variability across *all* situational cue conditions. Thus, the three subject groups were recalled and administered test items originally assigned to other groups.

As in the original analysis, the majority of the subjects demonstrated low speechreading ability when the message was presented without situational cues and when non-relevant cues were provided. Considerably improved ability was demonstrated when relevant cues were provided.

Several exceptions were noted. Two subjects (A and B) demonstrated essentially undifferentiated performance across all conditions. They performed at a higher level than their peers when non-relevant cues were provided and at a lower level than their peers with relevant cues. They appear to have relied almost exclusively on visual speech perception being neither distracted nor assisted by background cues. Another subject (C)

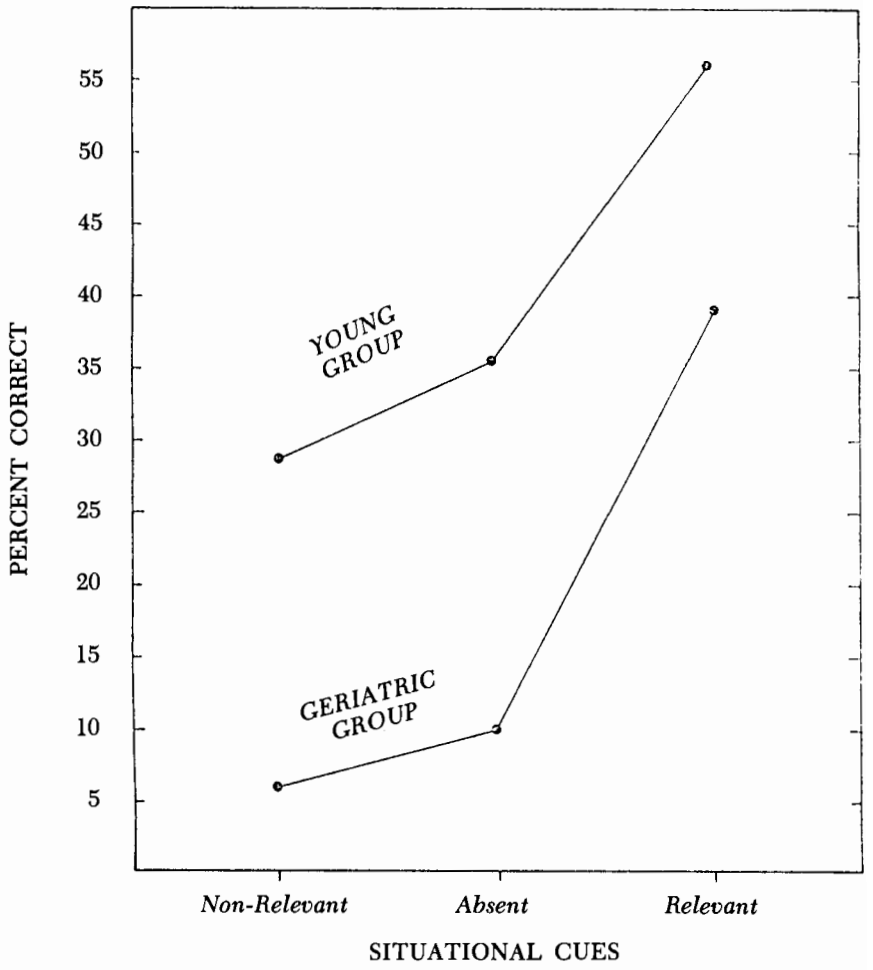

Figure 3. Mean percent correct visual speech perception scores for geriatric and young adult subjects.

demonstrated considerably poorer performance when situational cues were provided than when no cues at all were provided. This subject appeared to be distracted by extra-linguistic information. The final exception was a subject (D) who demonstrated generally undifferentiated high performance both when relevant cues were provided and when no cues were provided. His performance was considerably lower when non-relevant cues were provided. This observation is contrary to research demonstrating no difference in speechreading performance attributable to use of neutral and irrelevant visual background cues.

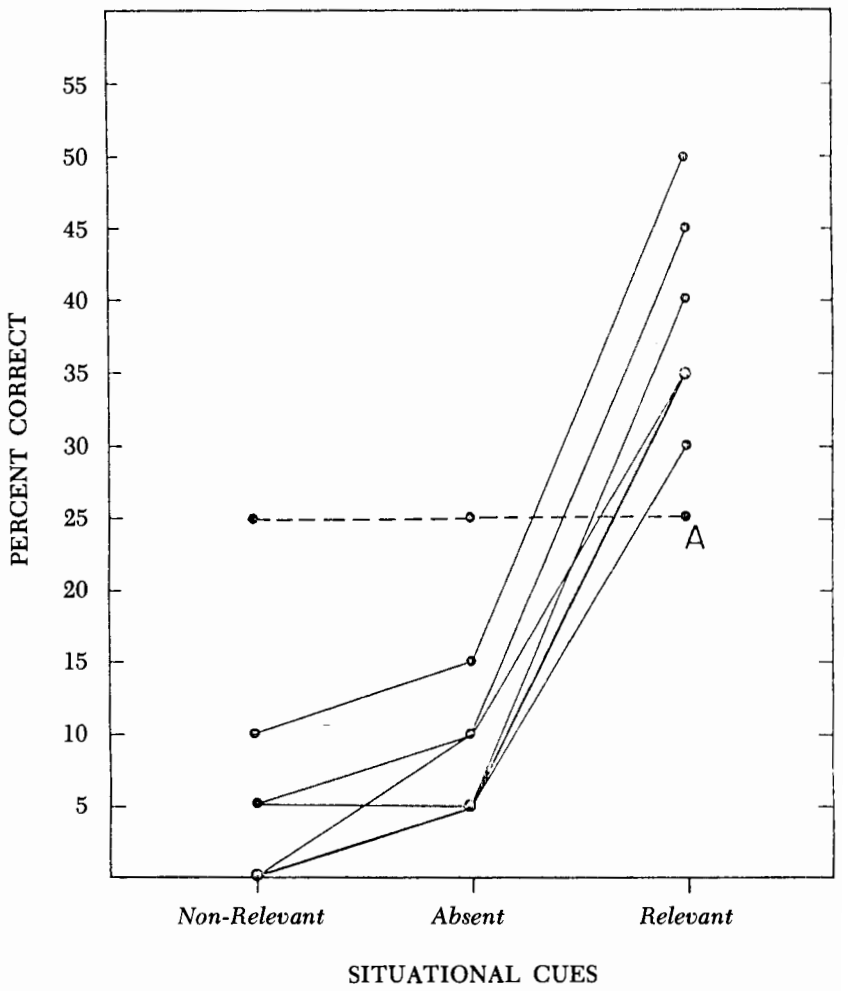

Figure 4. Mean percent correct visual speech perception scores for geriatric subjects first viewing sentences without situational cues. Subject A's performance is indicated by the dashed line.

These preliminary observations suggest that the geriatric's communicative competence can be screened by using meaningful sentences presented subaudibly in everyday situational contexts. In general, he is able to separate relevant from non-relevant cues and use his situational insight and experiential background to enhance visual speech perception. However, it has also been observed that some geriatrics vary in their ability to use situational cue information to their communicative advantage. This

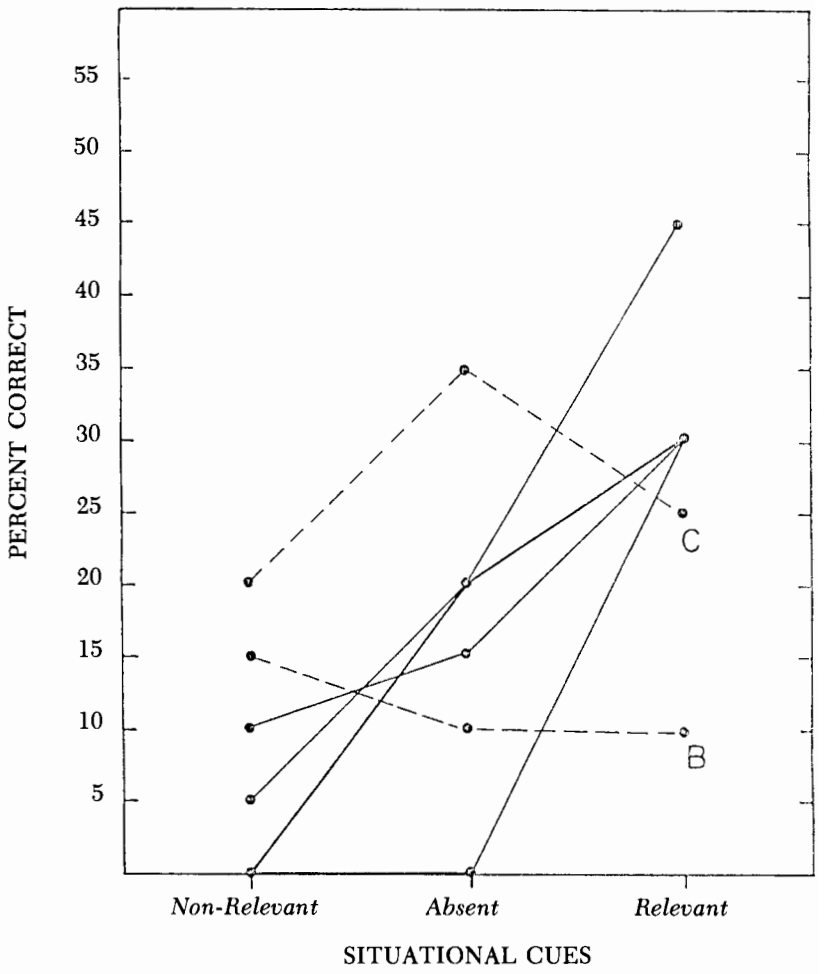

Figure 5. Mean percent correct visual speech perception scores for geriatric subjects first viewing sentences with non-relevant situational cues. Subject B and C's performance is indicated by the dashed line.

finding requires further study as it would appear to have important therapeutic implications.

A revised videotape is currently being produced with the cooperation of the Purdue University Telecommunication Center. The revised videotape will feature a single videotape recording of the sentences inserted in an expanded variety of background conditions creating a "6:00 News" effect. These conditions will include:

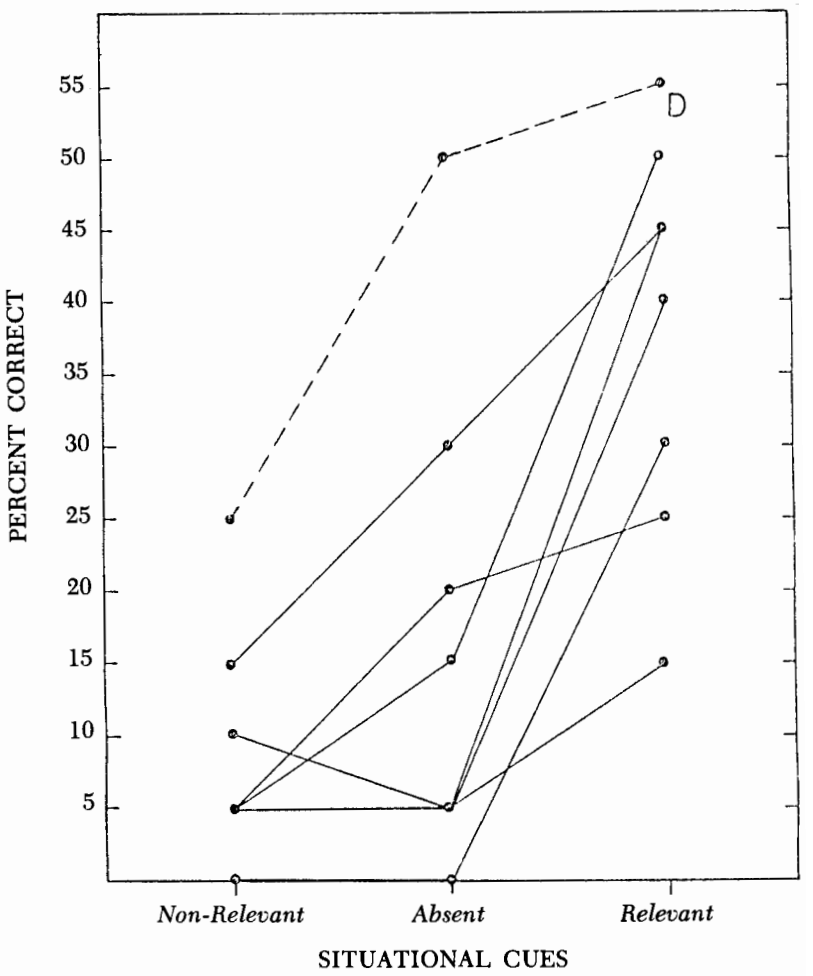

Figure 6. Mean percent correct visual speech perception scores for geriatric subjects first viewing sentences with relevant situational cues. Subject D's performance is indicated by the dashed line.

a. no visual or auditory cues
b. no visual cue and non-relevant auditory cue
c. no visual cue and a relevant auditory cue
d. a non-relevant visual cue and no auditory cue
e. a non-relevant visual and auditory cue
f. a non-relevant visual cue and a relevant auditory cue
g. a relevant visual cue and no auditory cue

h. a relevant visual cue and non-relevant auditory cue
i. a relevant visual and auditory cue

One unresolved consideration is whether to include an unintelligible recording of the spoken message along with a highly intelligible recording auditory cue which slightly precedes message presentation and continues for the duration of the message. This approach would appear to better approximate the everyday listening situation where certain acoustic cues may be perceived, but message intelligibility is negatively influenced by an auditory signal. The efficacy of this approach has not been resolved.

The revised videotape would appear to have potential use as:

1. An assessment/training tool in audiologic rehabilitation.
2. A means for further study of situational cue influence on communicative competence.

APPENDIX A.

	Situational Clues			
	Visual		*Auditory*	
	Relevant	*Non-Relevant*	*Relevant*	*Non-Relevant*
1. Do you like to fly at night?	Jet landing	Skyline	Jet noise	Kennel
2. Some ducks swim in freezing water.	Swimming ducks	Bank	Clucking	RR xing
3. My neighbor goes to church on Sunday.	Church	Seagull	Carillon	Lawn
4. Would you rather swim in a lake or pool?	Swimming Pool	Hallway	Children Diving	Applause
5. Children entertain themselves with rides and games.	Carousel	Shopping Center	Carousel	Gear Stripping
6. Is there a lot of traffic at 5 o'clock?	City Traffic	Flowers	Car Engines, Honking	Chimes Tolling
7. Birds fly over the fishing boats.	Harbor	Woods	Boat Whistle	Cow
8. The building on my corner is a fire trap.	Fire Engines	McDonalds	Sirens	Jackhammers
9. I enjoy an evening at home.	Living Room	Street	Door Chimes	Crow
10. Did you ever ride a horse?	Horse	Home	Neighing	Vacuum Cleaner

Scoring example: 1. Do you like to fly at night?
10% response = Do you like to fly at night?
Do you like to fly?
You like to fly?

5% response = Something about flying (general idea)
Do you like . . . . ? (subject, verb, question)
fly . . . . (word)
fly at night? (phrase, question)

0% response = Butterflies write!
Who let the dog out?
Grab a bite . . . . .
. . . . . (blank) . . . . .