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# Als je niet hoort wat je ziet

Wouter Dreschler  
AMC - Amsterdam



# Inhoud

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- Twee werelden
- Interactie
  - Oor en oog als concurrenten
  - Oor en oog als aanvulling
- Revalidatie
  - Het oog wil ook wat (bij hoortoestellen)
  - Het oog wil ook wat (bij CI)
  - Hulpmiddelen voor audiovisuele informatie
- Twee soorten honden
- De AV-kennel?

# In de voortuin van het AMC ...ligt VISIO

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# Oog en oor als compagnons

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Juist voor slechthorenden:

- Liplezen
- Spraakafzien
- (Ondersteunende) gebaren
- Ondertiteling



*.... alle handjes helpen*

# Oor en oog als compagnons

## Audiovisual Integration and Lipreading Abilities of Older Adults with Normal and Impaired Hearing

Nancy Tye-Murray,<sup>1</sup> Mitchell S. Sommers,<sup>2</sup> and Brent Spehar<sup>1</sup>

**Objective:** The purpose of the current study was to examine how age-related hearing impairment affects lipreading and auditory-visual integration. The working hypothesis for the investigation was that presbycusis hearing loss would increase reliance on visual speech information, resulting in better lipreading and auditory-visual integration in older persons who have hearing impairment, compared with older persons who have normal hearing.

TABLE 1. Demographic and audiologic characteristics of participants with normal hearing and participants with hearing impairment

Variable	Participant group			
	Normal hearing		Hearing impairment	
	Mean	SD	Mean	SD
Age	73.3	4.5	74.1	7.6
WAIS	47	9	52	9
Thresholds (dB SPL)				
250	11.4	6.3	30.5	13.7
500	11.7	6.7	36.8	10.1
1000	11.6	6.9	44.0	8.4
2000	16.8	10.2	49.0	7.0
4000	18.1	16.9	55.3	11.3
PTA (500, 1 k, 2 k)	14.0	6.5	43.2	6.1

Eat & Hearings, Vol. 28, No. 8, 686-688

# Oor en oog als compagnons

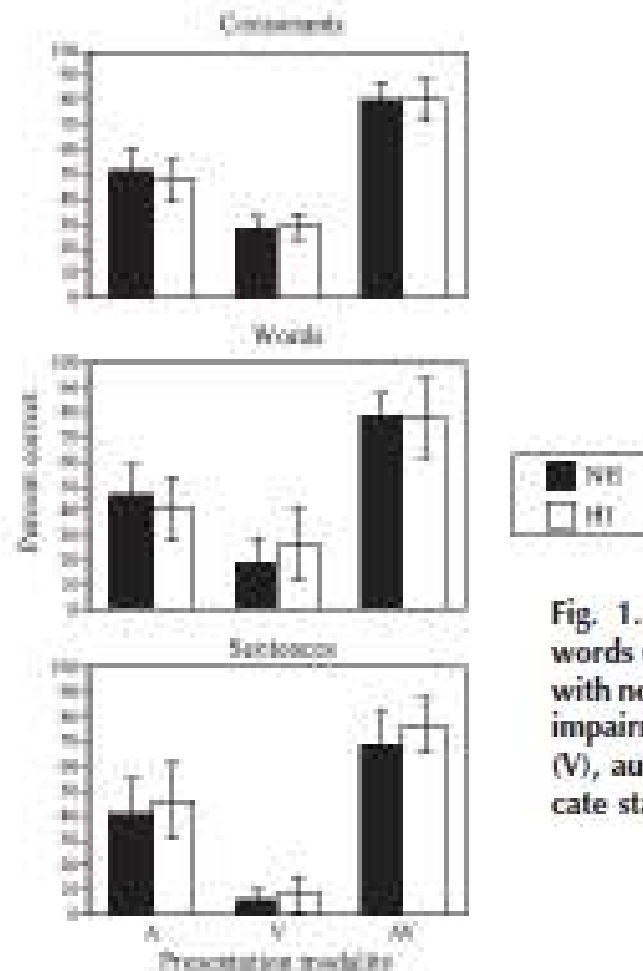


Fig. 1. Percent correct identification of consonants (top), words (middle), and sentences (bottom) for older participants with normal hearing (NH) and older participants with hearing impairment (HI). Presentation modality refers to visual-only (V), auditory-only (A), and audiovisual (AV). Error bars indicate standard deviations.

Eat & Hearings, Vol. 28, No. 8, 696-698

# Oor en oog als concurrenten

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## Objective Measures of Listening Effort: Effects of Background Noise and Noise Reduction

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Brent Edwards  
Stanley Hoising Research Center,  
Berkeley, CA

Erin Holter  
University of California at Berkeley

**Purpose:** This work is aimed at addressing a seeming contradiction related to the use of noise-reduction (NR) algorithms in hearing aids. The problem is that although some listeners claim a subjective improvement from NR, it has not been shown to improve speech intelligibility, often even making it worse.

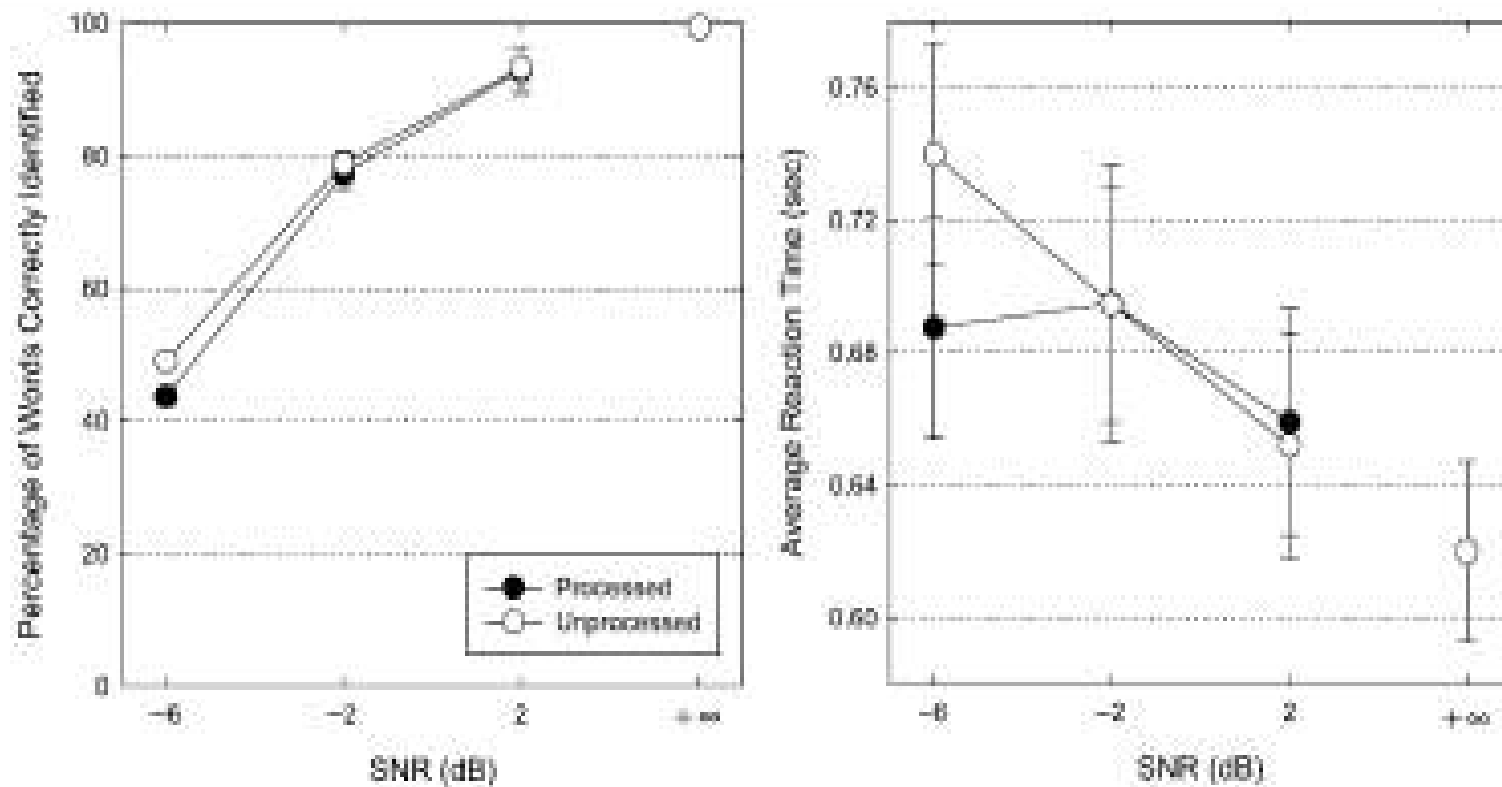
**Method:** To address this, the hypothesis tested here is that the positive effects of NR might be to reduce cognitive effort directed toward speech reception, making it available for other tasks. Normal-hearing individuals participated in 2 dual-task experiments, in which 1 task was to report sentences or words in noise set to various signal-to-noise ratios. Secondary tasks involved either holding words in short-term memory or responding in a complex visual reaction-time task.

**Results:** At low values of signal-to-noise ratio, although NR had no positive effect on speech reception thresholds, it led to better performance on the word memory task and quicker responses in visual reaction times.

**Conclusions:** Results from both dual tasks support the hypothesis that NR reduces listening effort and frees up cognitive resources for other tasks. Future hearing aid research should incorporate objective measurements of cognitive benefits.

# Oor en oog als concurrenten

Figure 4. Mean speech intelligibility performance (left panel) and mean reaction times (right panel) as a function of SNR, averaged across 25 listeners in Experiment 2. The parameter is presence of NR processing. Error bars denote 1 SEM.





# Het oog wil ook wat (hoortoestellen)

## Effects of Amplification and Speechreading on Consonant Recognition by Persons with Impaired Hearing

Brian E. Walden, Kenneth W. Grant, and Mary T. Coed

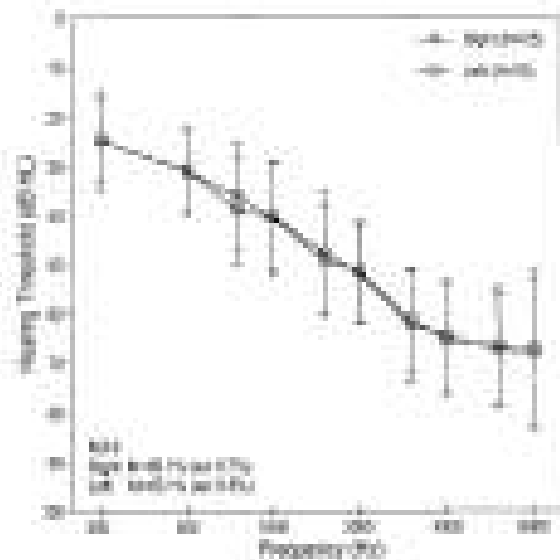


Figure 1. Mean air-conduction thresholds and mean NLA word-recognition scores for the right and left ears of the 15 participants. The error bars in this and all subsequent figures for mean data indicate 1 SD.

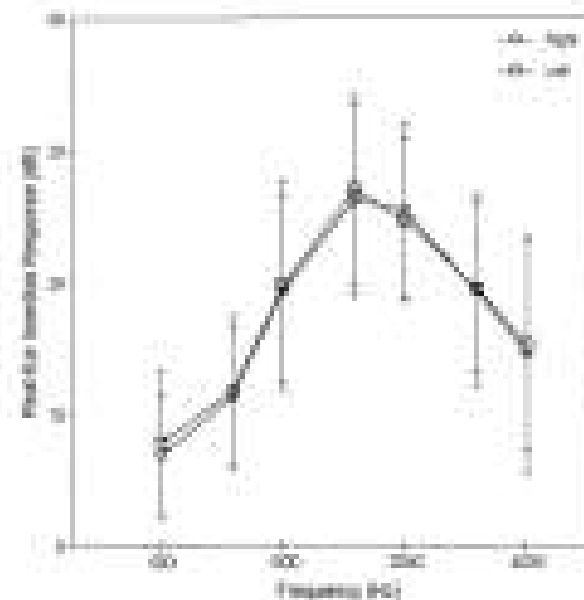


Figure 2. Mean real-ear RT2 insertion responses for the right and left ears of the 15 participants. Measurements were obtained with a 60 dB SPL input.

(Ear & Hearing 2001;22:333-341)

# Het oog wil ook wat (hoortoestellen)

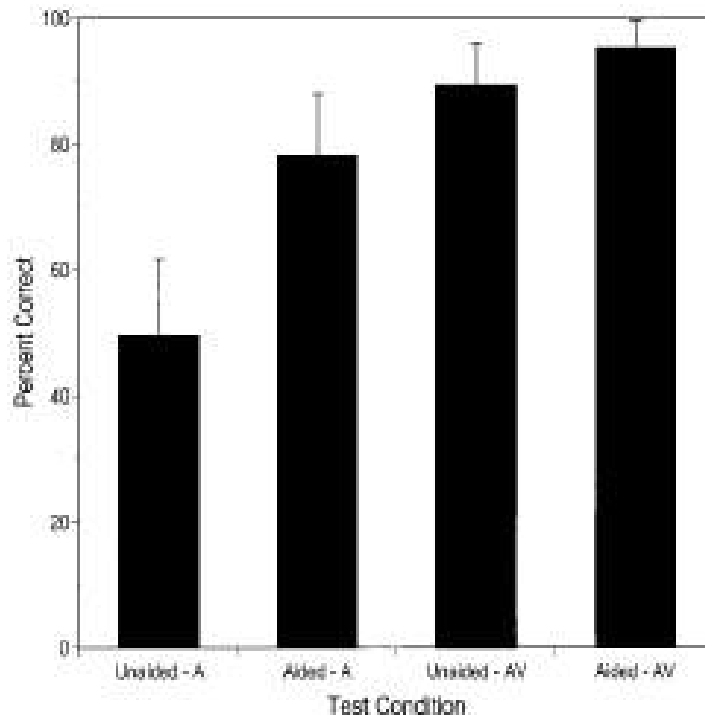


Figure 3. Mean percent correct consonant recognition for each of the four test conditions.

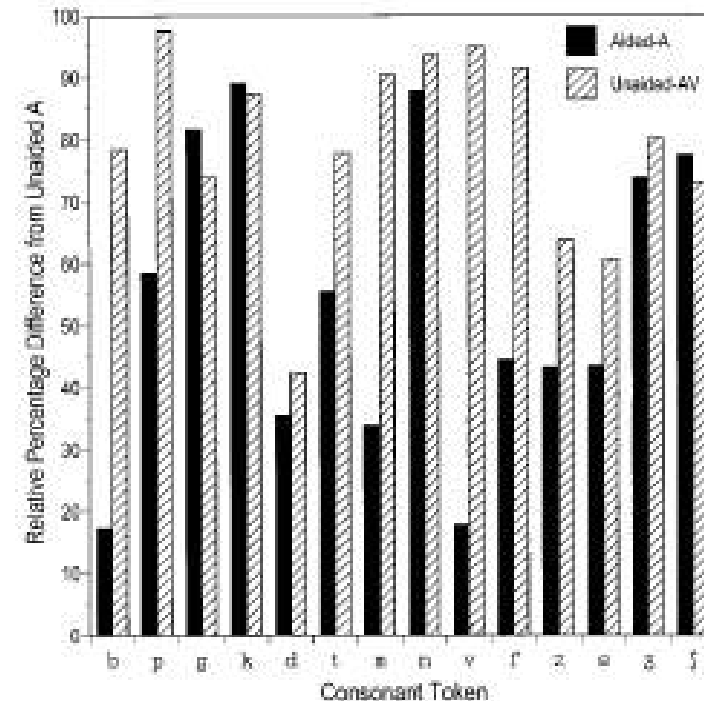


Figure 5. Mean improvement in consonant recognition from the baseline Unaided-A condition, for each of the 14 consonants, from amplification (Aided-A) and from speechreading (Unaided-AV). Data reflect the percentage of the improvement possible (i.e., 100 – baseline score) that was obtained from each source of information.

# Het oog wil ook wat (hoortoestellen)

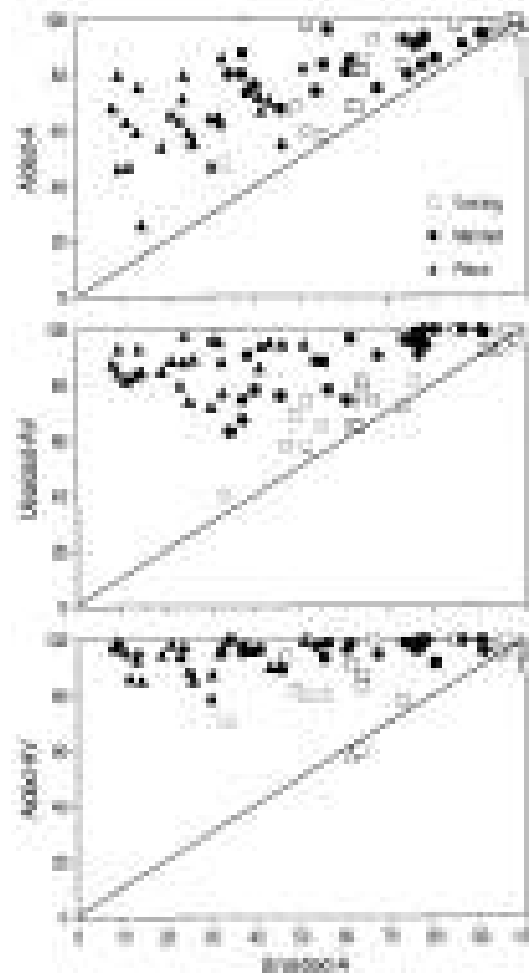
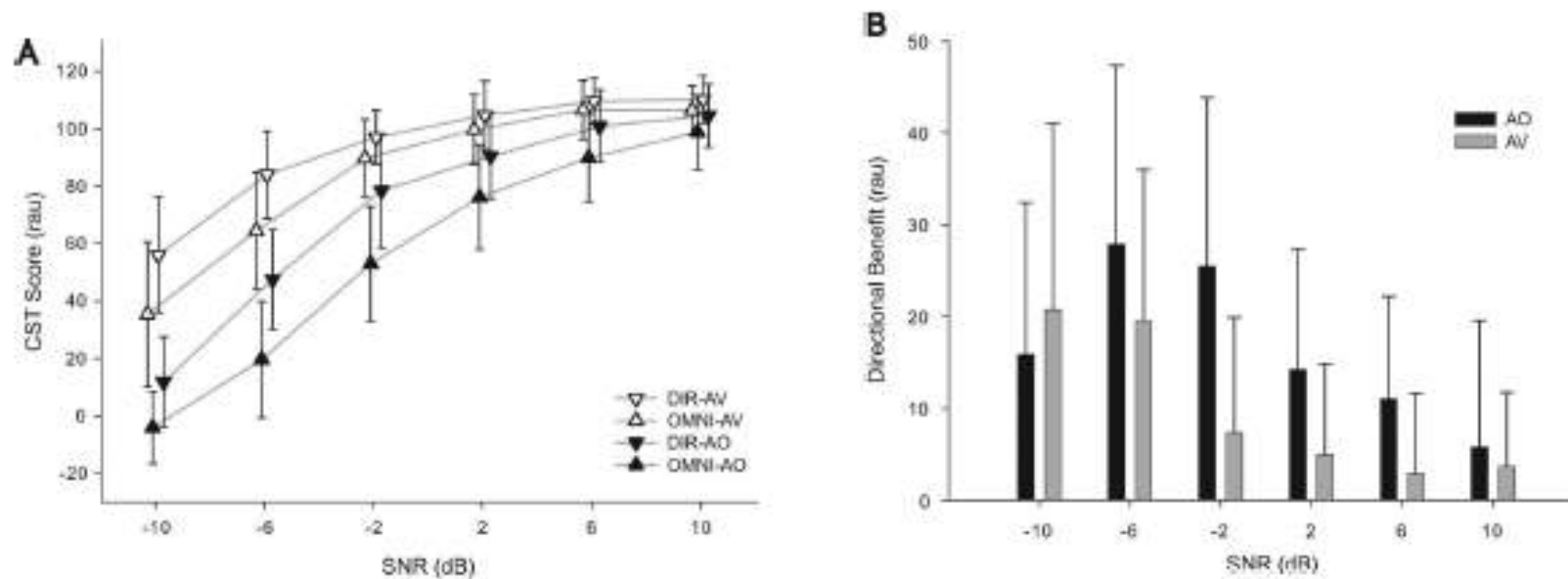


Figure 6. Percent information transmission for voicing, manner of articulation, and place of articulation. The Unaided-A (baseline) condition is shown along the abscissa of all three panels. The Aided-A, Unaided-AV, and Aided-AV conditions are shown along the ordinate of the top, middle, and bottom panels, respectively.

# Het oog wil ook wat (hoortoestellen)

## Impact of Visual Cues on Directional Benefit and Preference: Part I—Laboratory Tests

Yu-Hsiang Wu and Ruth A. Bentler



JAR & HEARING, VOL. 31, NO. 1, 11-14

# Het oog wil ook wat (hoortoestellen)

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**Conclusions:** These results suggest that AO laboratory testing overestimates the DIR benefit and preference for DIR processing that hearing aid users may have in most face-to-face conversations in typical SNR, real-world environments. Additionally, because the DIR benefit measured in the AV condition cannot be predicted by the benefit score obtained from traditional AO laboratory testing, the effect of visual cues should be considered in establishing a valid laboratory/clinical environment and protocol for DIR microphone hearing aid testing. In light of these findings, consultations should be provided for hearing aid users with superior lipreading skills to help them adjust their expectations regarding the possibly small perceivable benefit gained from DIR microphone hearing aids.

(Ear & Hearing 2010;31;22–34)

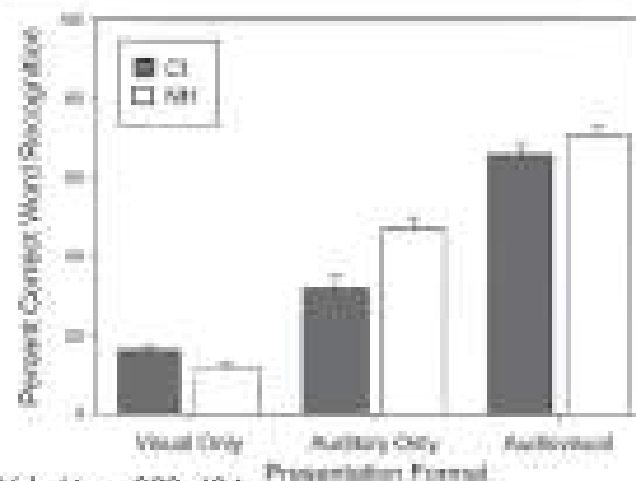
# Het oog wil ook wat (CI)

Adam R. Kaiser  
Karen Iler Kirk  
Indiana University School of  
Medicine, Indianapolis

Lorin Lachs  
David B. Pisoni  
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## Talker and Lexical Effects on Audiovisual Word Recognition by Adults With Cochlear Implants

Figure 1. Percentage correct word recognition performance of the CI and the NH listeners under the three presentation formats averaged over talker and lexical variables. CI listeners were tested in quiet and NH listeners were tested in noise at -5 dB SNR. Error bars represent 95% confidence intervals.

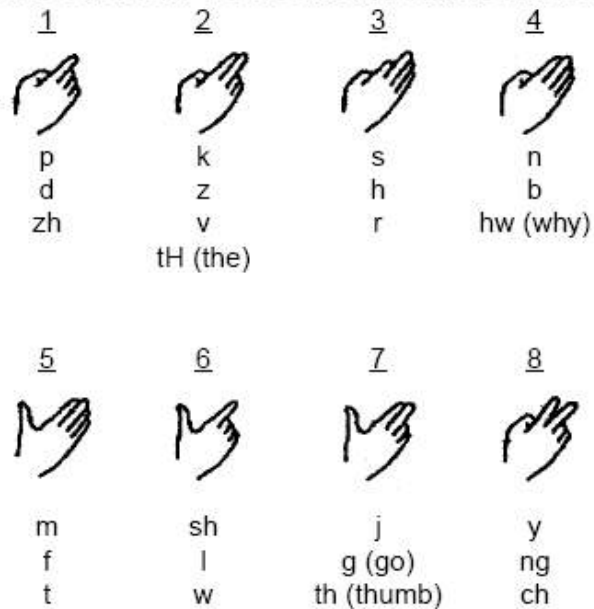


Journal of Speech, Language, and Hearing Research • Vol. 46 • 390-404

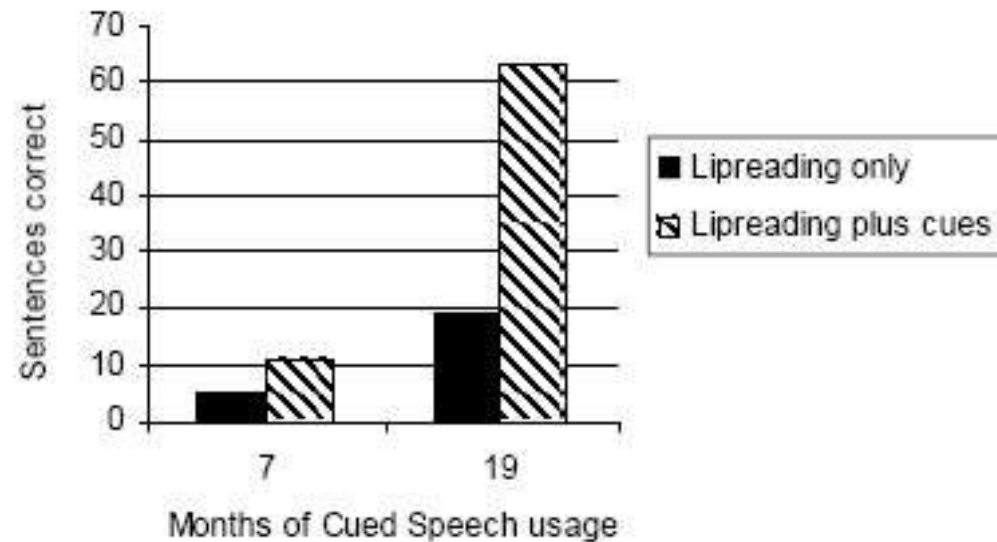
# Hulpmiddelen voor oog en oor

- 1980-1990: Cued speech in een bril

## CUED SPEECH CONSONANT HANDSHAPES

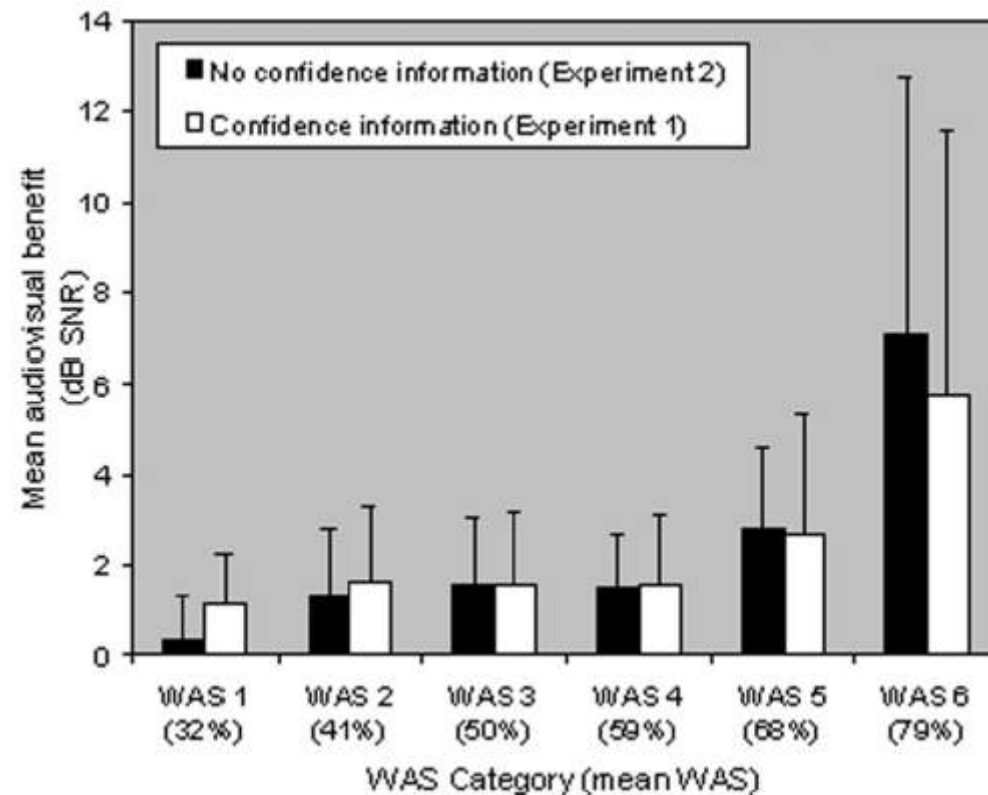


## Reception of Sentences after Cued Speech Instruction



# Hulpmiddelen voor oog en oor

- 2005-2010: Ondersteuning door ASR

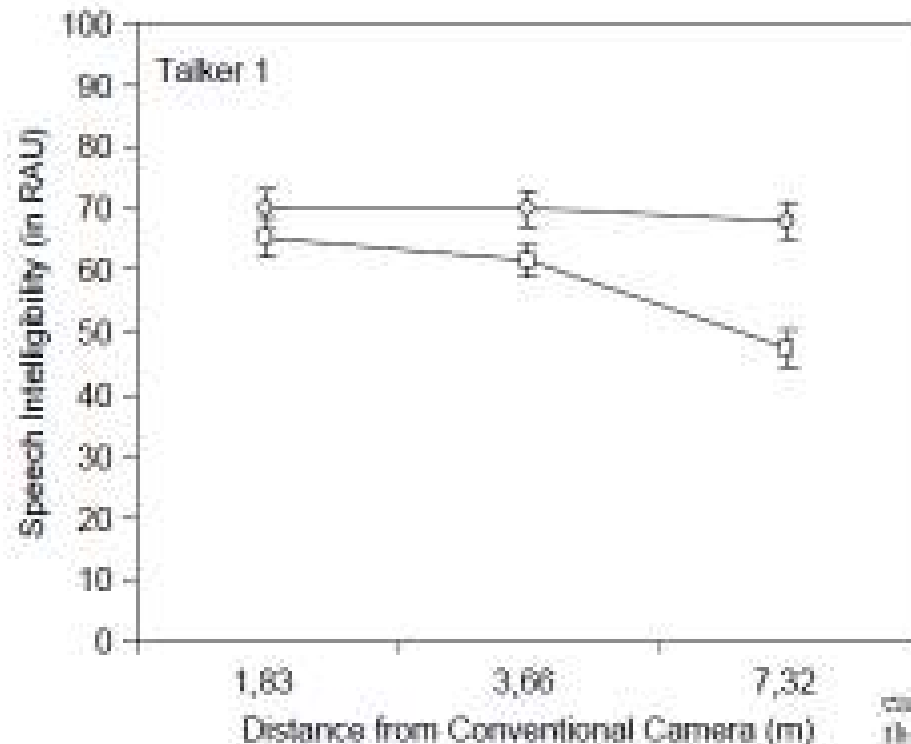


ZENKELD ET AL. / EAR & HEARING, VOL. 29, NO. 6, 838-852



# Hulpmiddelen voor oog en oor

- Na 2010: Audio-visuele solo-apparatuur?



each panel the mean speech-recognition performances obtained with the conventional video camera (open squares) and with the microcamera of the audiovisual-FM system (open circles) are shown separately. Error bars indicate  $\pm 1$  standard error.

Gagné/Charest/Le Munday/  
Desbiens

# Hulpmiddelen voor oog en oor

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de signaalhond (hoorhond)



de blindengeleidehond



Twee soorten honden

# Twee werelden: de zorg

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- Onderzoek ook de functie van de andere zintuigen
  - Wij weten dat de visus bij ouderen achteruit gaat
  - Wij weten hoe belangrijk AV-informatie isMaar wij doen er (vrijwel) niets mee!
  
- Onderscheid maatregelen op de “man” / op de omgeving
  - Wij hebben luistertips
  - En een enkel advies voor verlichting en akoestiekMaar de “brede” aanpak zit onvoldoende in onze “audiologische genen”

# Twee werelden: de wetenschap

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- De omvang van het oogheelkundig onderzoek is een orde groter dan van het audiologisch onderzoek.
- Hopenlijk komt hier onder initiatief van de Nationale HoorStichting en het HoorPlatform binnenkort verbetering in.
- Gelukkig zijn er nu programma's voor een geïntegreerde aanpak
  - ZON-MW programma INZICHT
- Hier hebben Visio en het AMC (penvoerder Jan Koopman) een project ingediend: **Optimising the role of vision and audition in verbal communication; an instrument for integrated rehabilitation.**

# Twee werelden: de opleiding

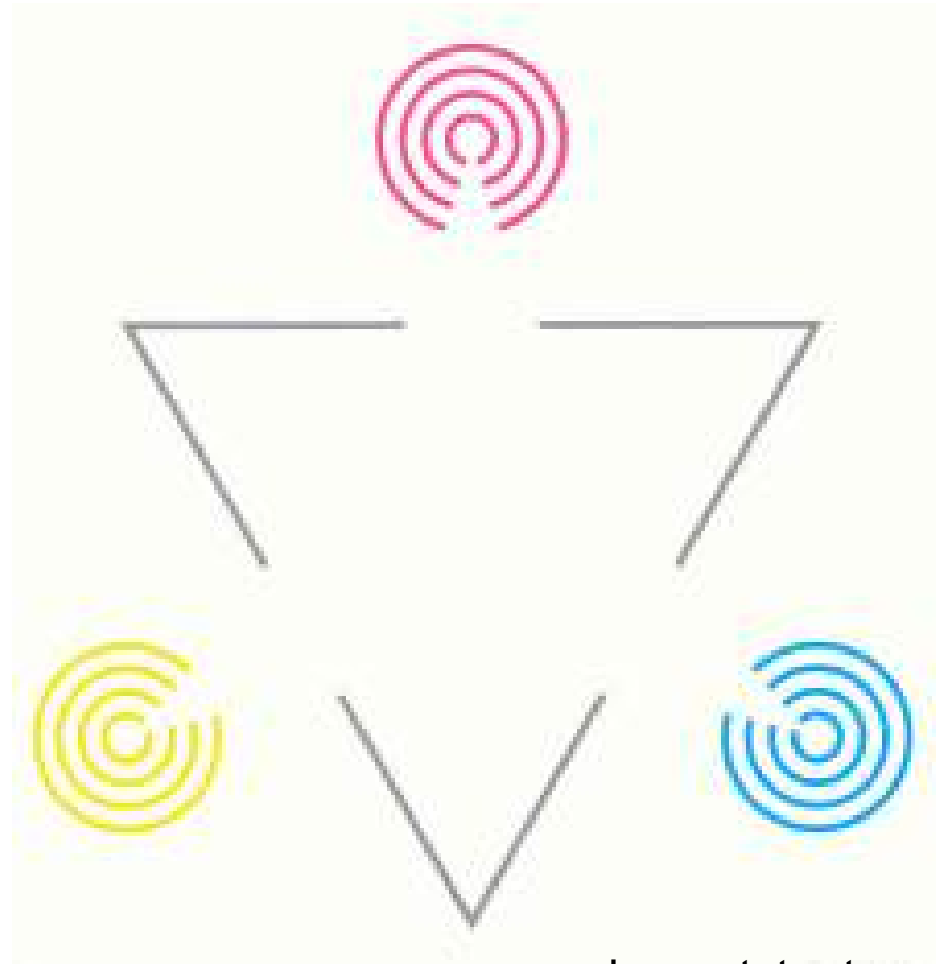
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- Videologie en Audiologie gaan binnen de NVKF hun eigen weg
- Oriëntatie op klinisch-fysicus zintuigfysica of perceptuologie

*Een commissie binnen KKAu is op basis van een eerste oriëntatie in 2006 niet enthousiast geraakt over het combineren van de opleidingen van de klinisch fysicus - audioloog en klinisch fysicus - videoloog.*

# Een nieuw perspectief: samenwerken

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... dan ontstaat een nieuwe dimensie!