

Speech in Noise in the n200 Study in Linköping Sweden

Henrik Danielsson

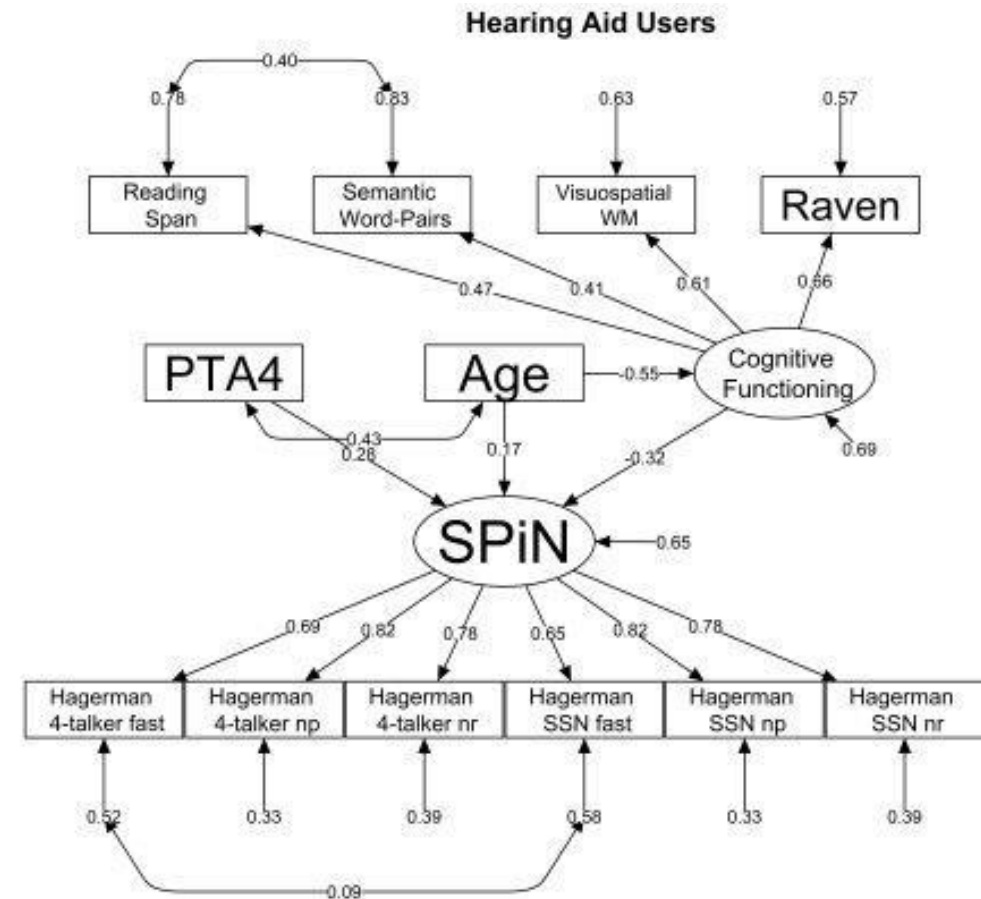
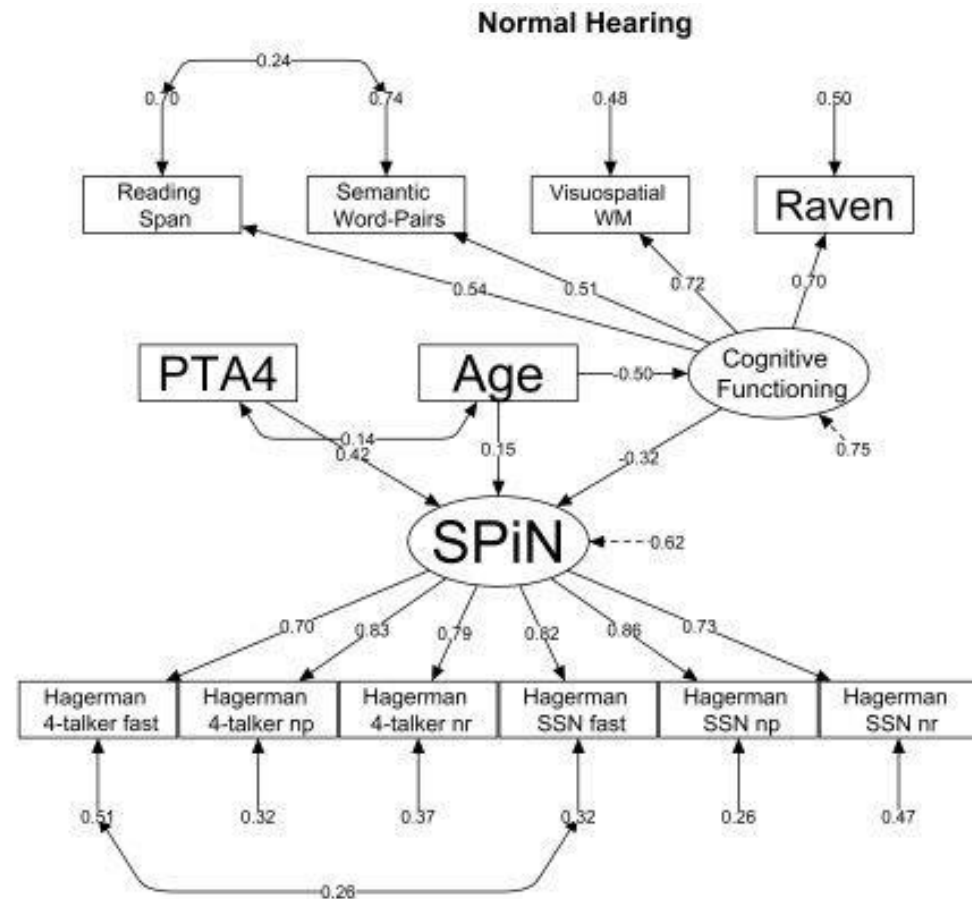
Erik Marsja

Linköping University

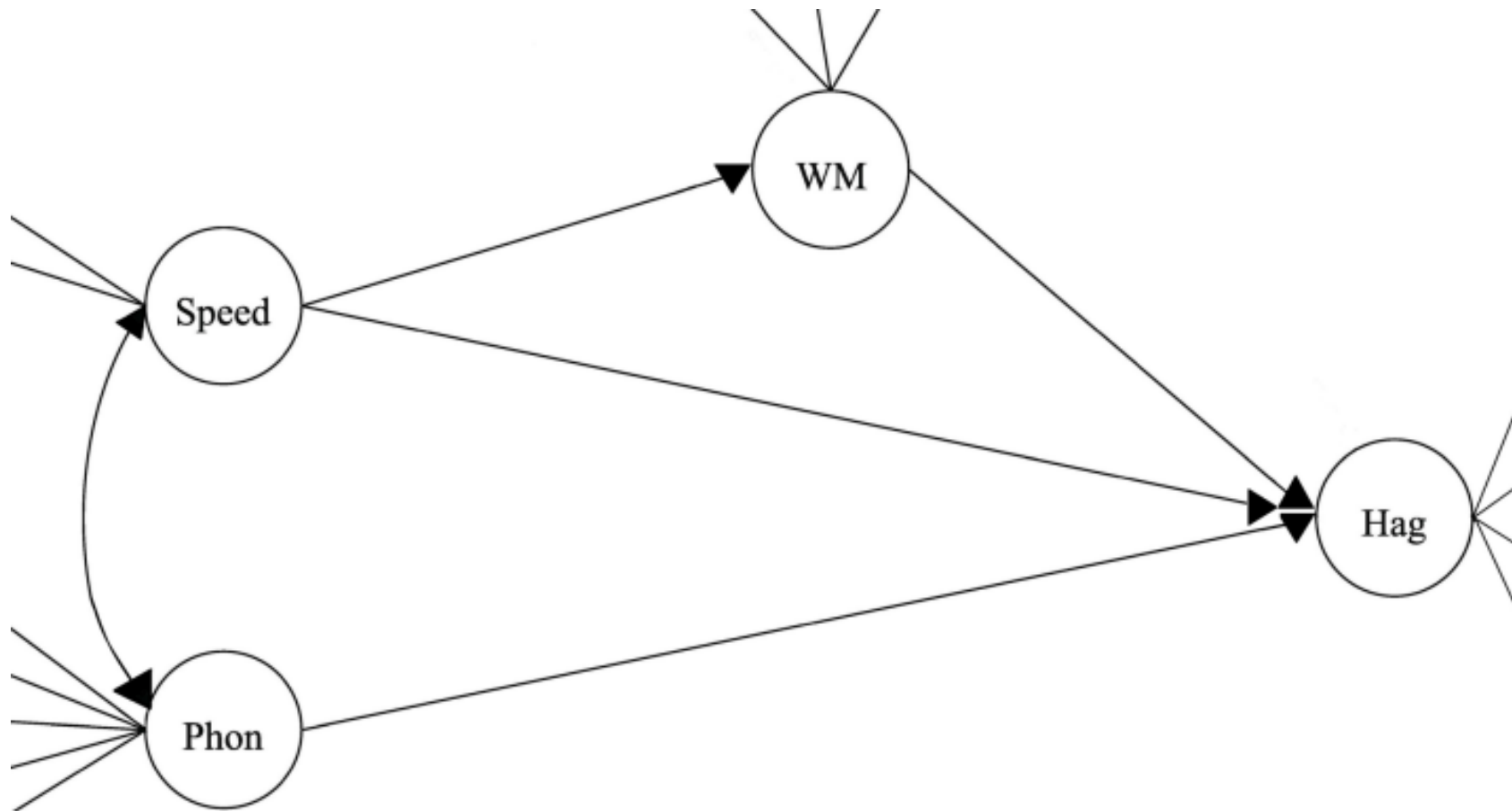
N200

- Initiated to investigate the relationship between hearing, cognition, and speech in noise.
- 200 participants with hearing loss and hearing aids (Hearing aid group)
- 200 participants without hearing loss (No HL group)
- 72* participants with hearing loss but without hearing aids (HL no aid group)

Marsja, E., Stenbäck, V., Moradi, S., Danielsson, H., & Rönnerberg, J. (2022). Is having hearing loss fundamentally different? : Multigroup structural equation modeling of the effect of cognitive functioning on speech identification. *Ear and Hearing*, 43(5), 1437–1446. <https://doi.org/10.1097/aud.0000000000001196>



Homman, L., Danielsson, H., & Rönnerberg, J. (2023). A structural equation mediation model captures the predictions amongst the parameters of the ease of language understanding model. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1015227>



Aim

- To investigate predictors of speech in noise in three groups
- Two SPiN tasks
 - Hearing In Noise Test (HINT)
 - Hagerman sentences (Hagerman)
- Predictors (selection)
 - Better ear PTA for 4 frequencies
 - Reading span
 - Age

SPIN tests

- Hearing in Noise Test (HINT)
 - Target speech 65 dB
 - 50% Signal to noise ratio
 - High-Context & Ecological valid
 - “She sat down by the fire”
- Hagerman Sentences
 - Target speech 65 db
 - 50% and 80% Signal to noise ratio
 - Low-Context sentences
 - ”Ann had five red boxes”

Method

- The two larger groups had comparable mean age (61 years), while the HL no aid group was older (69 years).
- Predictably, the hearing aid group had largest hearing impairment (37 dB better ear PTA), followed by the HL no aid group (28 dB) and the No HL group (10 dB).
- A similar pattern of means was found for both Hint and Hagerman

Analyses

- PCA for Hagerman conditions
- Six separate regression analyses for the 2 Spin tasks and the 3 groups

Beta for predictors in regressions

Predictor	HINT			Hagerman		
	Not HL	Hearing aid	HL no aid	Not HL	Hearing aid	HL no aid
Reading span itemscoring	-0.04	-0.09	-0.21	-0.14	-0.14	-0.25
Age	0.11	0.22	0.28	0.21	0.23	0.39
Audiogram pta5124air better ear	0.25	0.53	0.04	0.43	0.58	0.07

Adjusted R^2 was smaller for HINT [7-20%] than for Hagerman [24-34%]

Beta for predictors in regressions

Only SSN Hagerman

Predictor	HINT			Hagerman		
	Not HL	Hearing aid	HL no aid	Not HL	Hearing aid	HL no aid
Reading span itemscoring	-0.04	-0.09	-0.21	-0.22	-0.08	-0.25
Age	0.11	0.22	0.28	0.17	0.22	0.33
Audiogram pta5124air better ear	0.25	0.53	0.04	0.50	0.49	0.00

Adjusted R^2 was smaller for HINT [7-20%] than for Hagerman [24-34%]

Conclusions

- Difference between HINT and Hagerman
 - Cognition is more important with less context?
- Difference between Hagerman conditions (SSN)
 - Not so much...
- HL no hearing aid group – Audiogram?

Come to Linköping Sweden
June 9-12 2024!

chscom2024.se

Abstract deadline 5th of March