



Clinical Outcomes in Unilateral Adult Cochlear Implant Recipients with Better Pre-op Sentence Scores

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Longitudinal Performance Study at Washington University in St. Louis

**Goal: Identify factors that predict word
recognition in adults who receive
cochlear implants**

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Longitudinal Performance Study

- **108 postlingually deafened adults**
 - **Defined as onset of severe-to-profound hearing loss in both ears after age 3**
- **Implanted between Jan 2003 and Oct 2008**
- **First implant for all participants**
- **Gender: 62 females, 46 males**



Longitudinal Performance Study

- **Age at CI**
 - **Mean 57 yrs (range 23-83 yrs)**
- **Duration of severe-to-profound hearing loss**
 - **Mean 13 yrs (range 6 mos to 45 yrs)**
- **Pre-operative sentence scores**
 - **Mean 15% (range 0-61%)**



Independent Variables

- Age at implant
- Duration of HL
- Duration of pre-implant HA use
- Lipreading score for sentences
- Pre-operative sentence recognition score
- Education level
- Electrode array position
- Electrode array insertion depth
- Cognitive factors



Dependent Variables

- Initial word recognition score
- Final word recognition score
- Rate of growth from initial to final word score
 - 12 test intervals between 2 weeks and 2 years post-activation of the implant



Why assess with a
pre-operative **sentence** test
and a post-operative **word**
test?



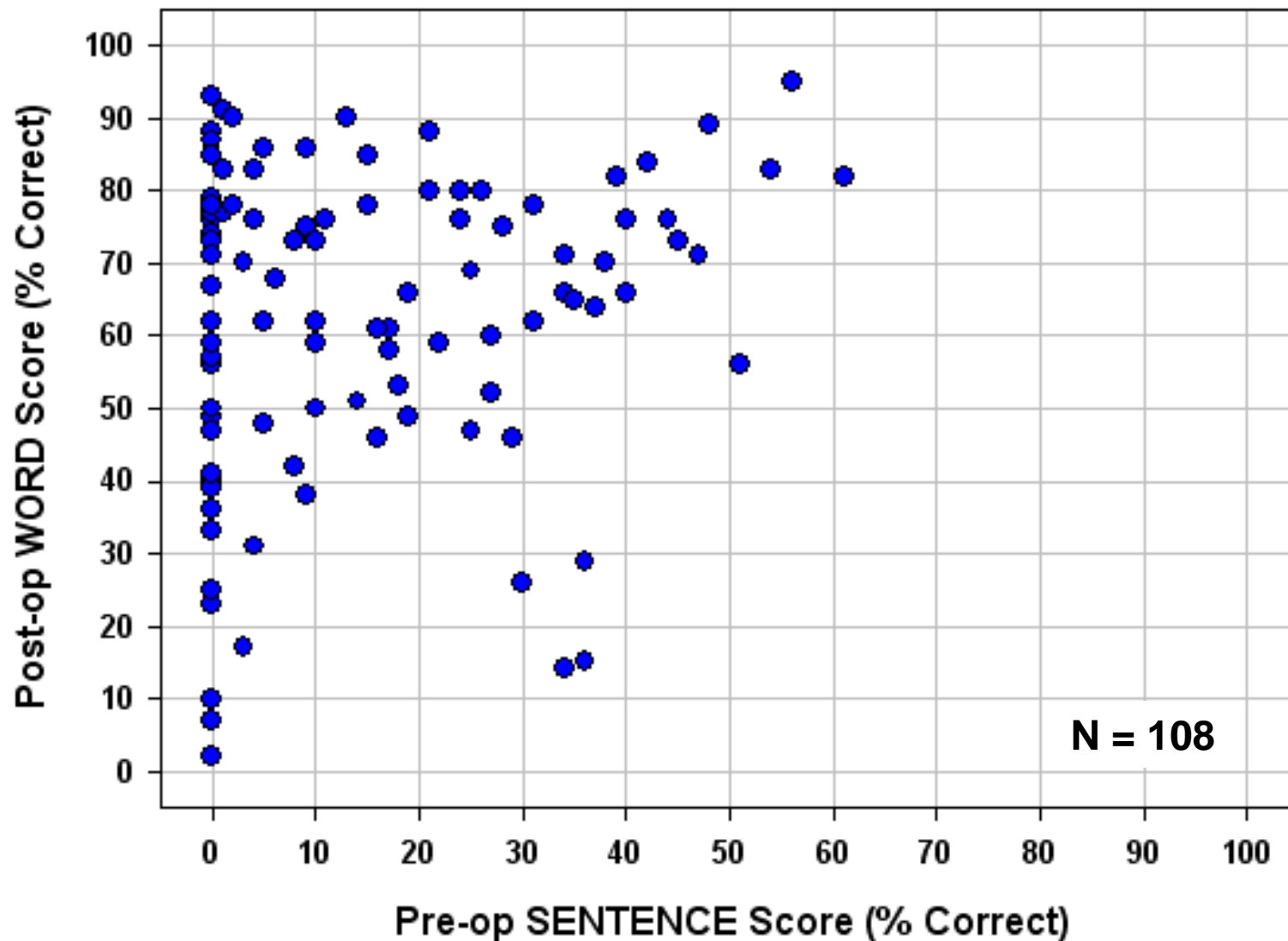
Sentence versus Word Tests

- **Sentence tests—simple sentences**
 - Example: “The cat jumped over the fence”
 - Post-operatively, patients score high
 - Ceiling effects; problematic for longitudinal tracking
- **Word tests—single syllable words**
 - Example: “goose”, “jar”, “lag”
 - Few ceiling effects; better for longitudinal studies



Longitudinal Performance Study at Washington University

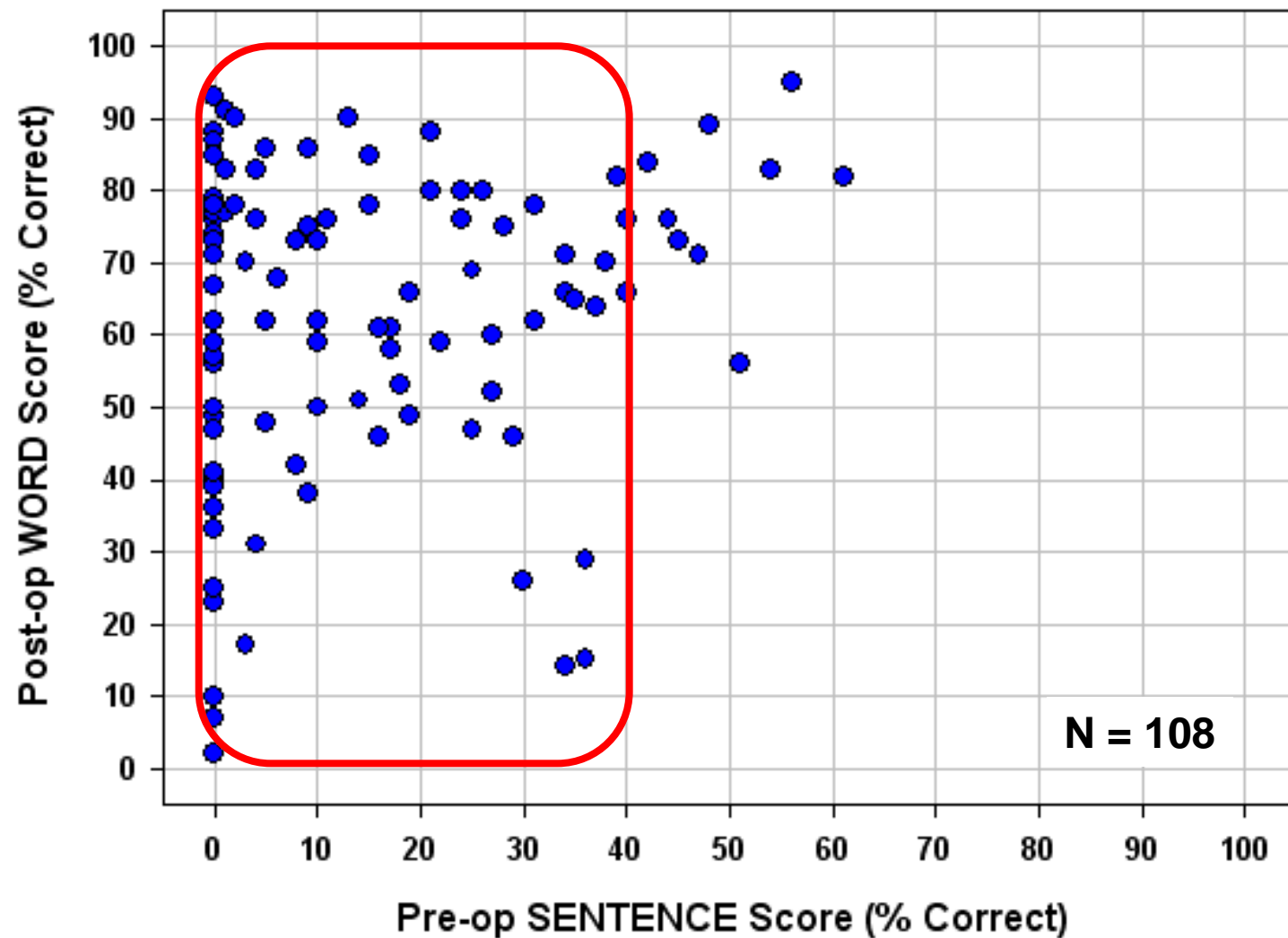
Post-op WORD Scores vs. Pre-op SENTENCE Scores





Longitudinal Performance Study at Washington University

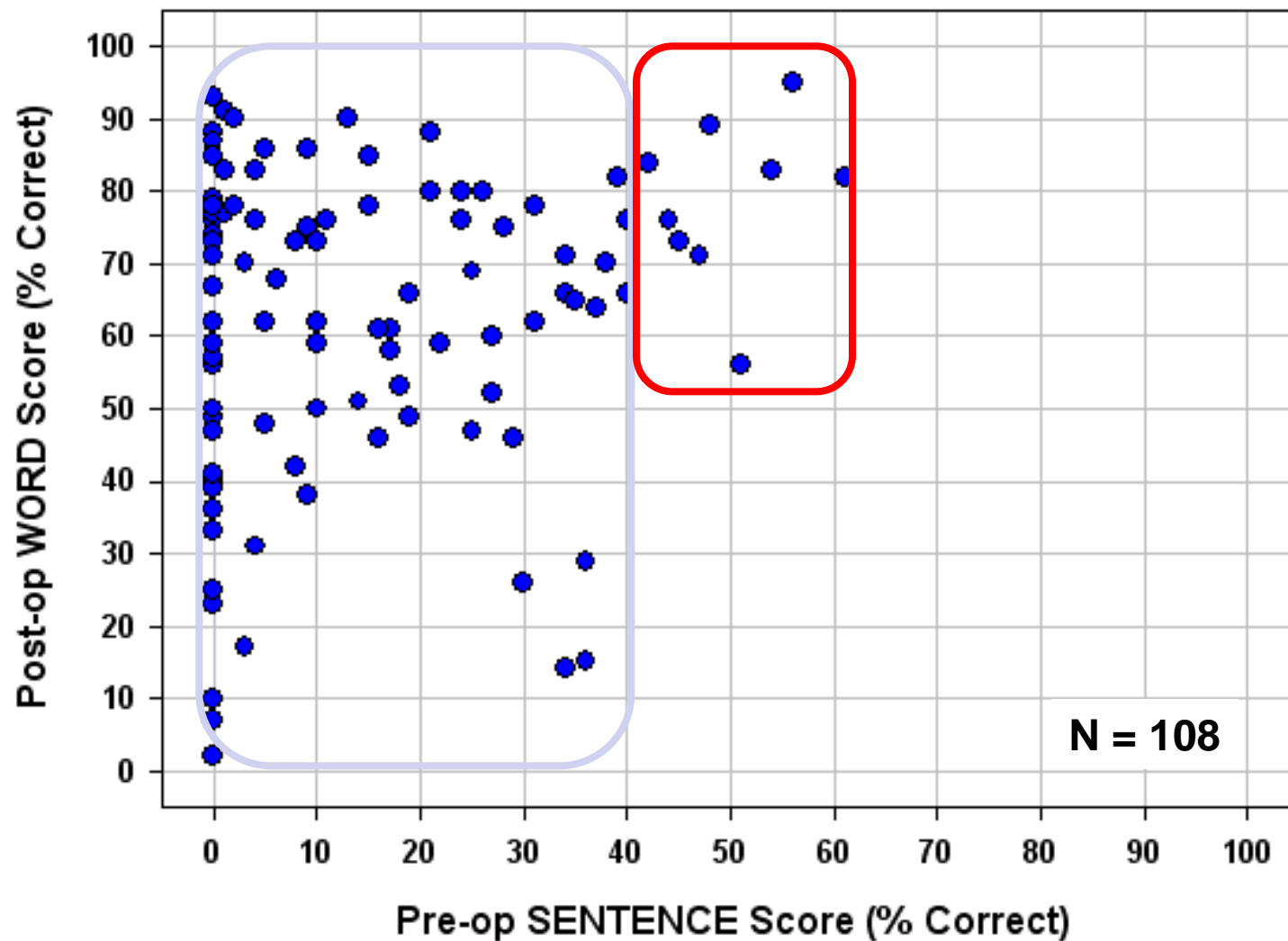
Post-op WORD Scores vs. Pre-op SENTENCE Scores





Longitudinal Performance Study at Washington University

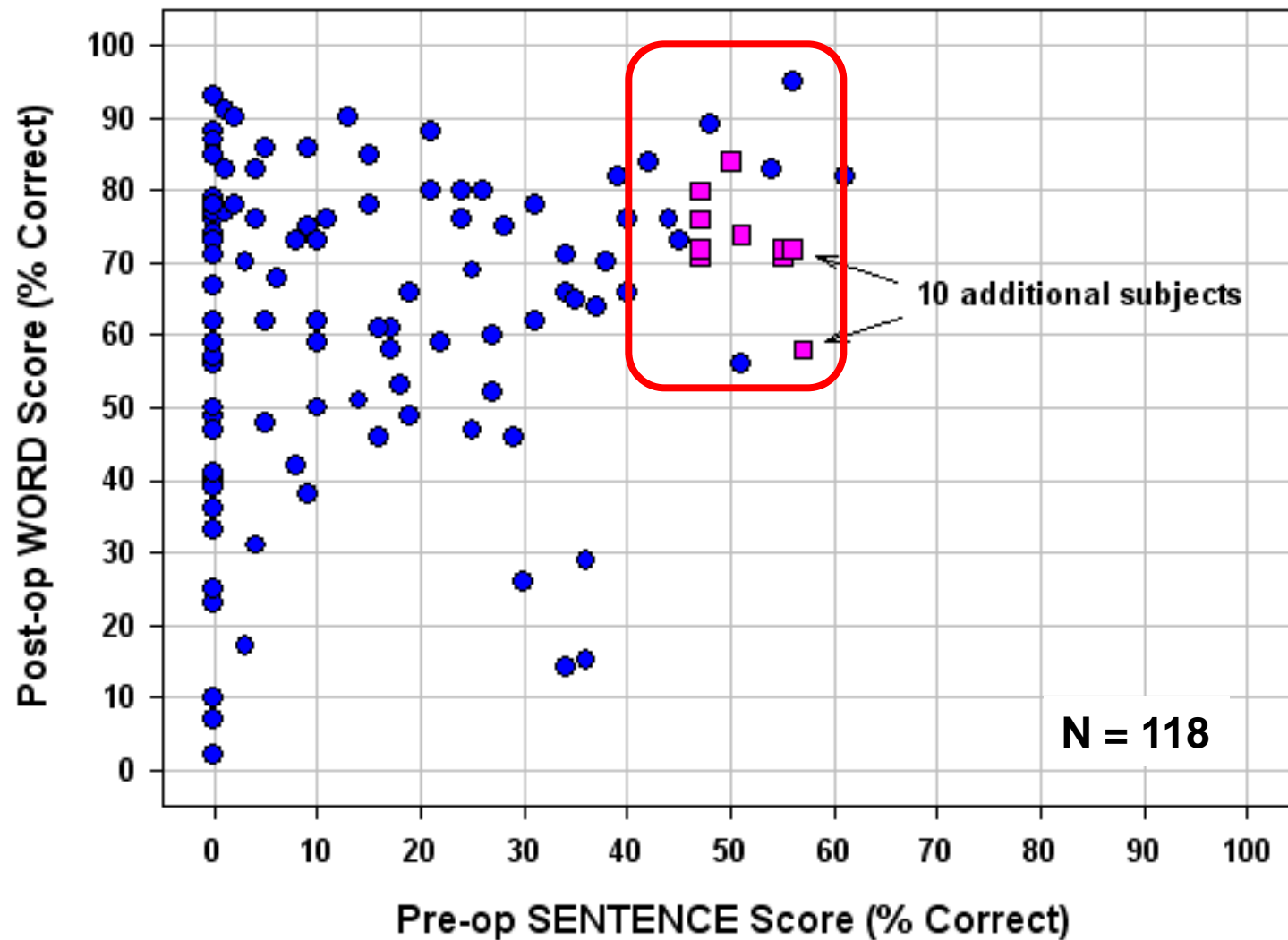
Post-op WORD Scores vs. Pre-op SENTENCE Scores





All Subjects at Washington University for This Report

Post-op WORD Scores vs. Pre-op SENTENCE Scores



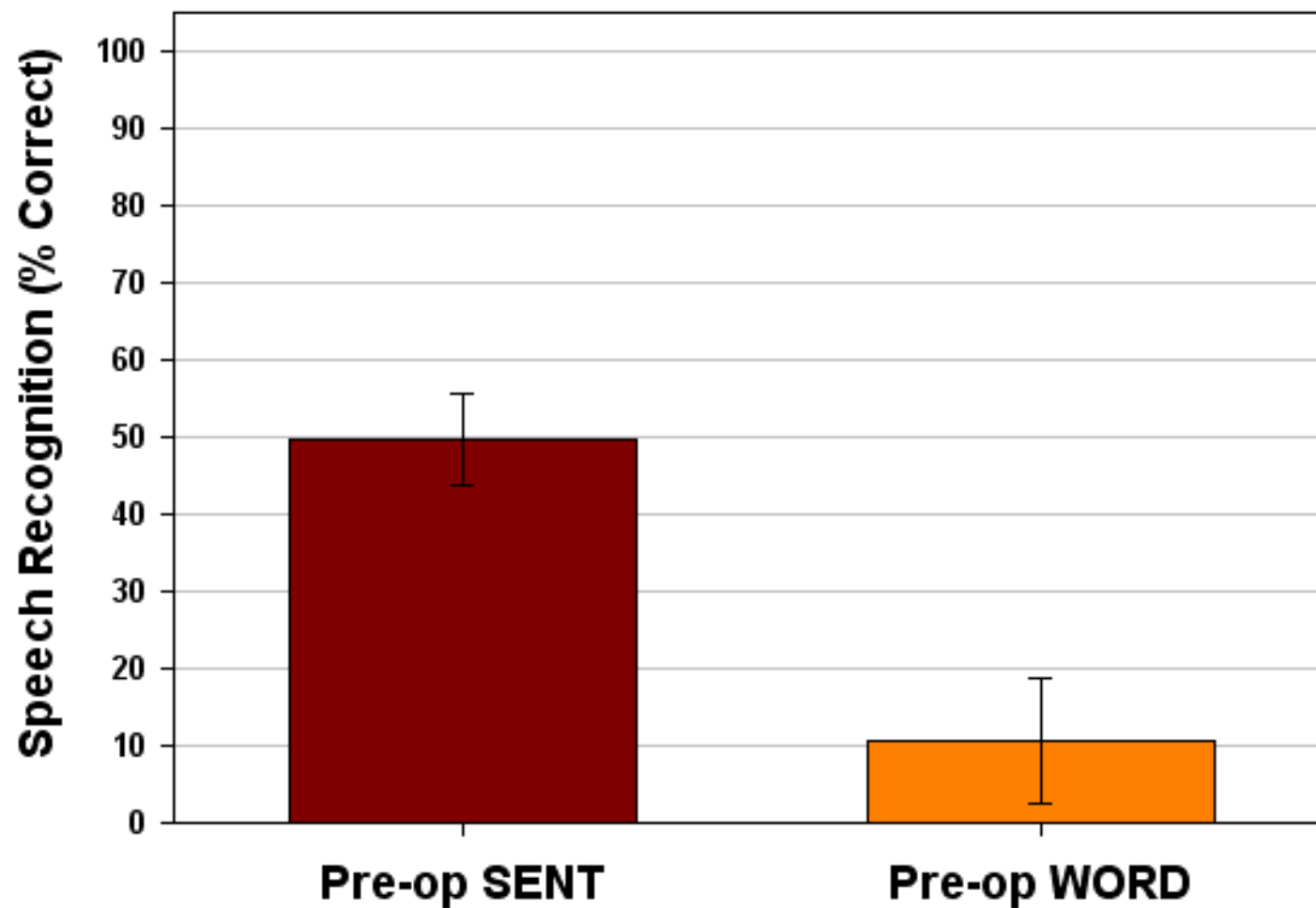


Combined Patients in 40-61% Range

- **N = 20**
- **Age at CI**
 - Mean 52 yrs (range 30-71 yrs)
- **Duration hearing loss**
 - Mean 9 yrs (range 1-40 yrs)
- **Pre-operative sentence scores**
 - Mean 50% (range 40-61%)

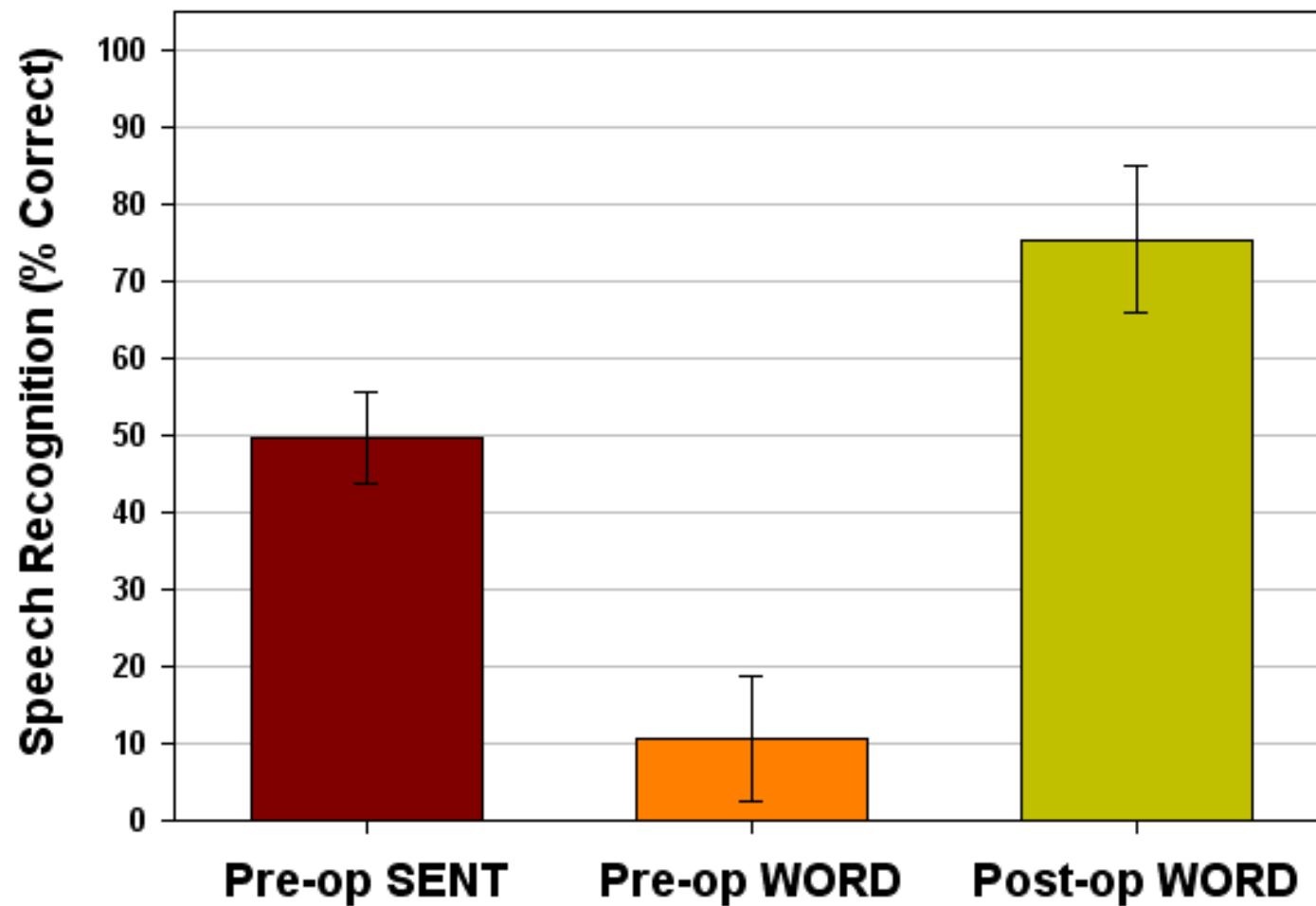


Combined Patients in 40-61% Range





Combined Patients in 40-61% Range



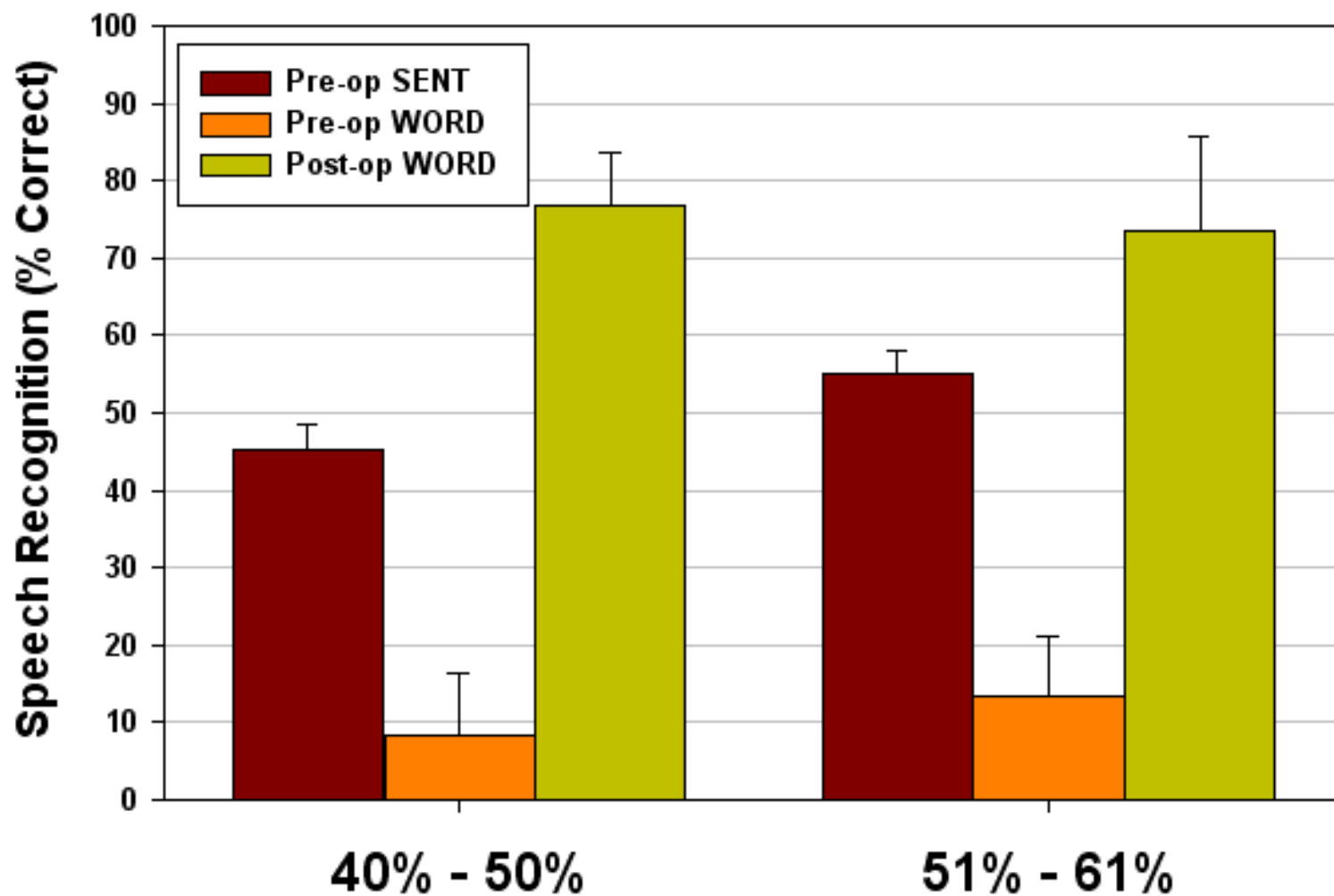


Patients 40-50% & 51-61% Ranges

	40-50% (N=11)		51-61% (N=9)	
	Mean	Range	Mean	Range
Age at CI Implantation (Years)	55	40-71	49	30-60
Duration of Hearing Loss (Years)	7	1-40	10	1.5-35
Pre-op Sentence Scores	45%	40-50%	55%	51-61%

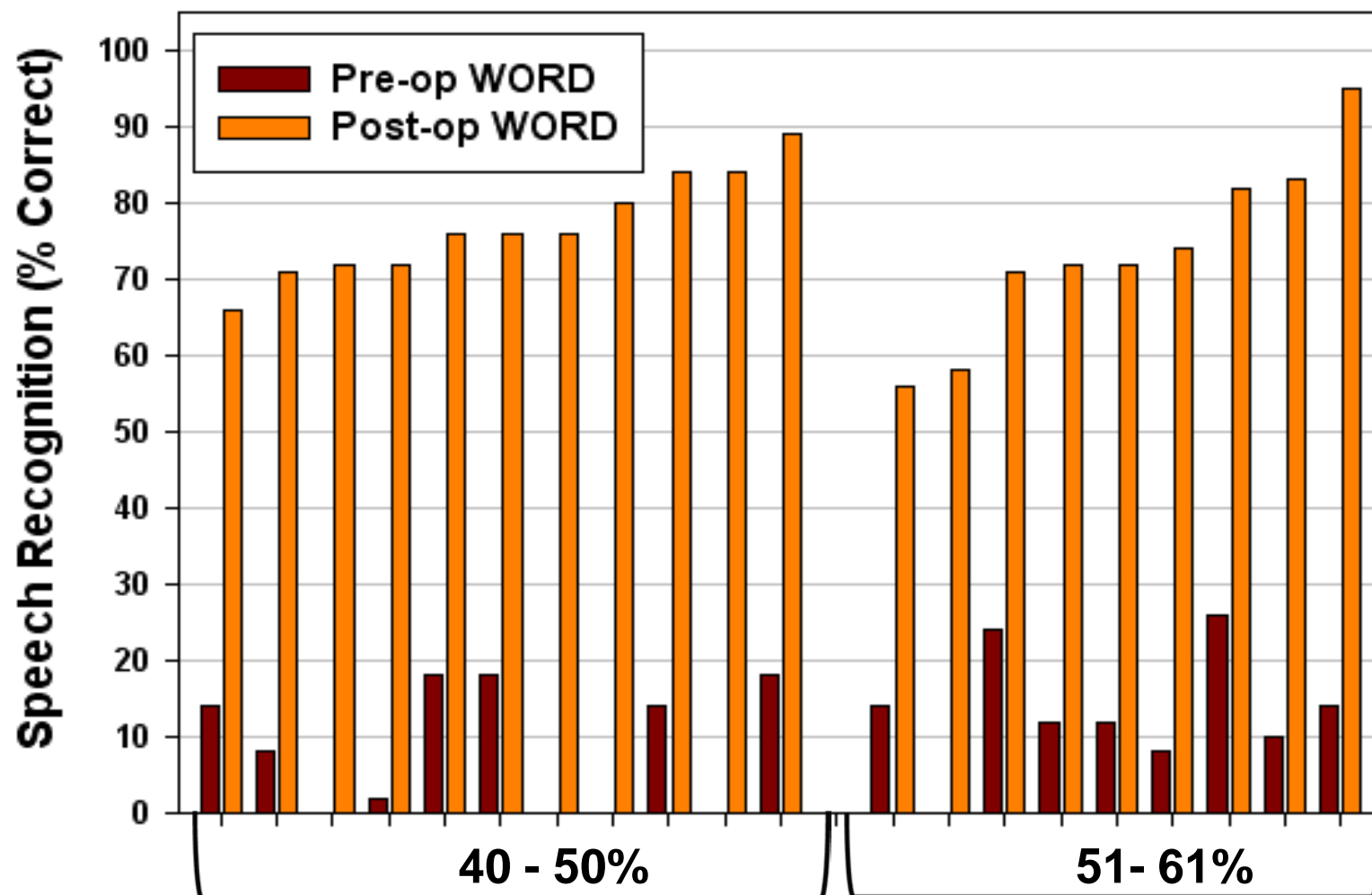


Patients 40-50% & 51-61% Ranges



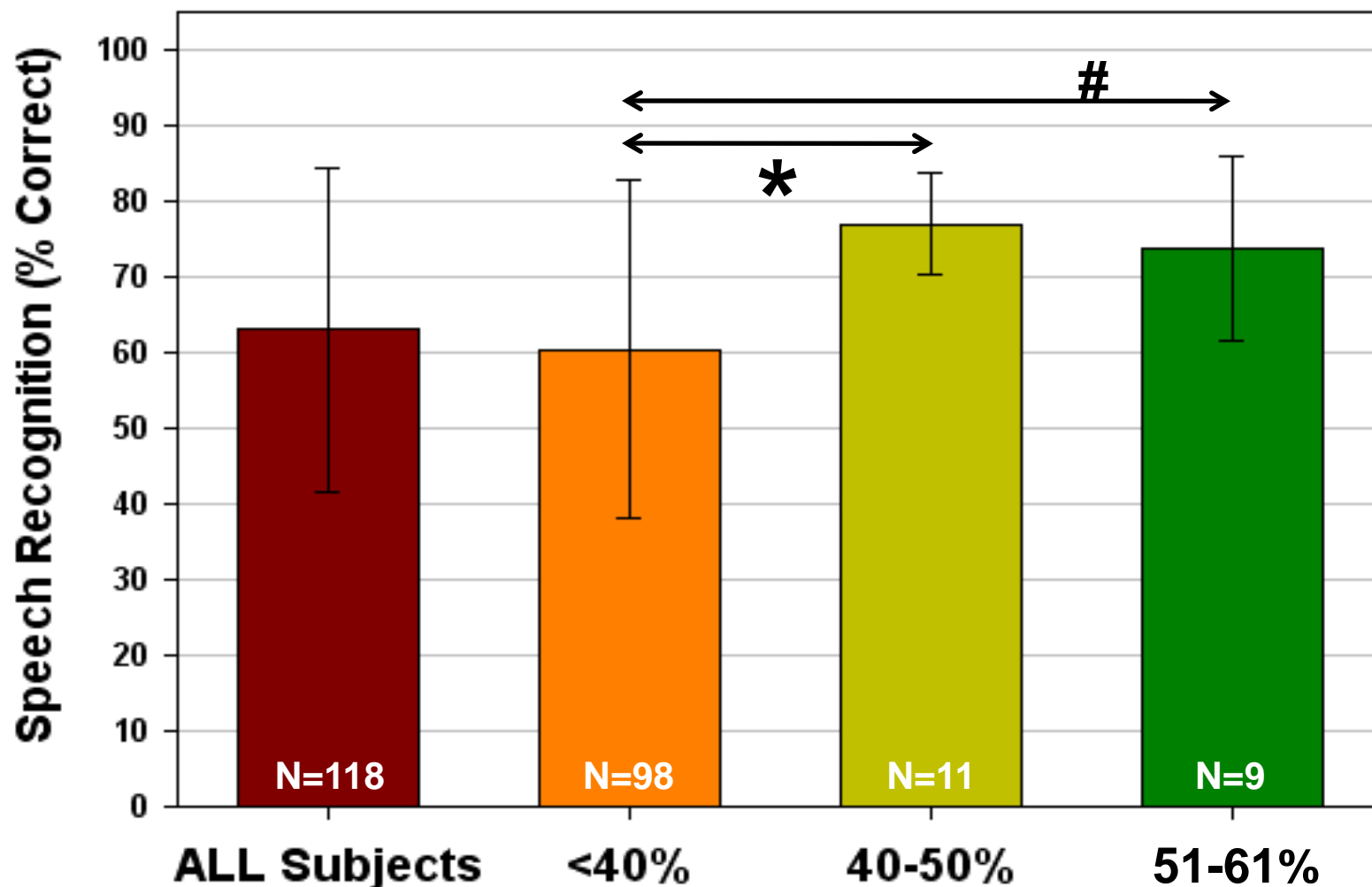


Patients 40-50% & 51-61% Ranges





CI Outcomes – Post-op Word Scores



*- sig difference ($p<0.02$)

- strong trend ($p=0.08$)



Summary

- Patients in the 40-61% range perform significantly better with a cochlear implant than pre-operatively with hearing aids
- We believe patients beyond 65 years of age in this same pre-operative range would benefit from this technology



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WUSM Research Team and Collaborators

Core Collaborators

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