

Hearing Care for Adults 2009 – The Challenge of Aging

Communication Disorders in Older Adults

An International Conference Sponsored by Phonak
Chicago Illinois USA
16th to 18th Nov 2009

JB Orange, PhD

Associate Professor and Director

School of Communication Sciences and Disorders

Faculty of Health Sciences

University of Western Ontario

London Ontario CANADA N6G 1H1

T 519-661-2111 X88921 F 519-850-2369

JBOrange@UWO.ca

<http://publish.uwo.ca/~jborange/>



Summary of Age-Related Language and Communication Changes

- Use shorter sentences with fewer clauses and fewer multiple clauses (decreasing linguistic complexity)
- Use more revisions and interjections
- Difficulty understanding L-branching sentences
 - (e.g., “The little girl who sang to the teacher smiled at the boy.”)
- Semantic knowledge ↑ up to ~ 70 years of age
- Difficulty with word retrieval and recall vs. recognition
 - Word class and word frequency dependent
 - Fewer semantic paraphasias and increasing circumlocutions
 - Increasing semantic confusions among words; particularly nouns vs. verbs
 - Poorer use of sound and written cues for recall and retrieval
 - Slower semantic access

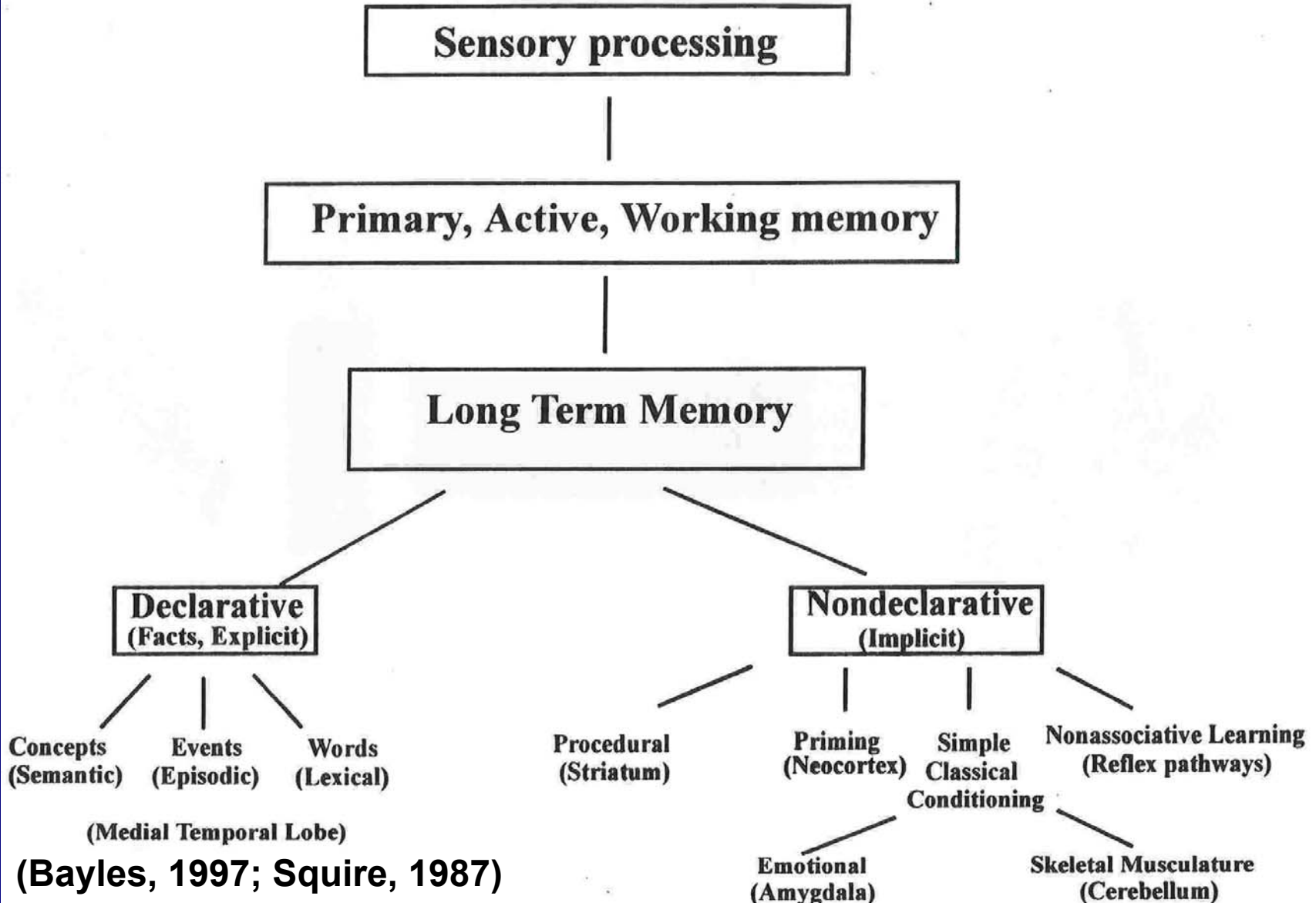
Summary of Age-Related Language and Communication Changes (cont'd)

- Can be talkative and off-topic
- Use effectively wide range of communication breakdown signals and repair strategies
- Difficulty processing implied and inferred concepts vs. concrete and main ideas
- Use elaborate story structures – sequential and embedded episodes (autobiographical memories weaved with historical events)
 - Stories rated positively
- Increasing use of self-disclosures (painful and not painful)

Summary of Age-Related Language and Communication Changes (cont'd)

- Increases in referential ambiguity; fewer cohesive ties (high pronoun : noun ratio)
- More referencing errors, particularly in story-telling
- Declines in text processing comprehension (working memory problems and text-processing demands)
 - Mediated by increasing levels of education and verbal ability

Memory and Aging



Working Memory and Aging

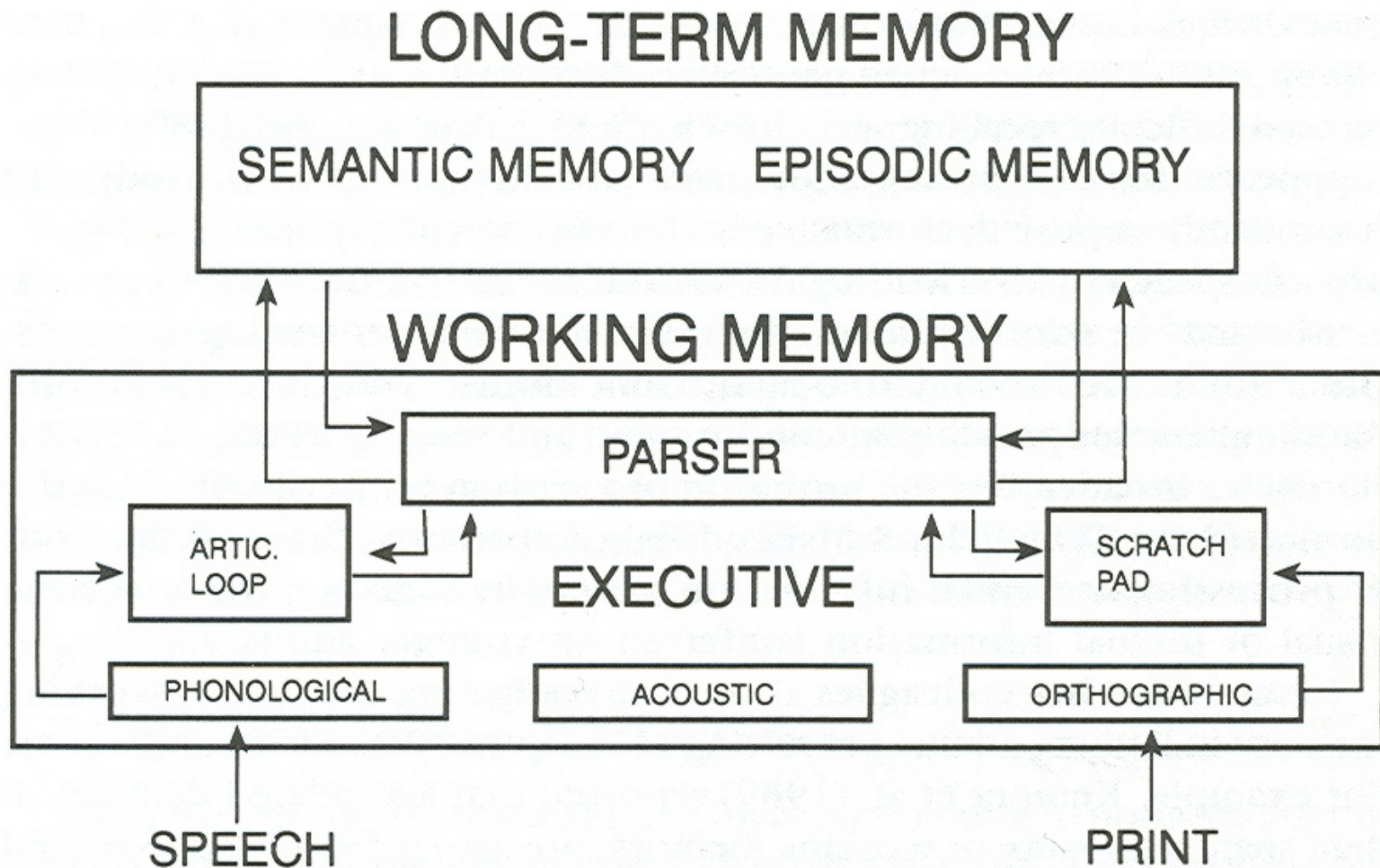
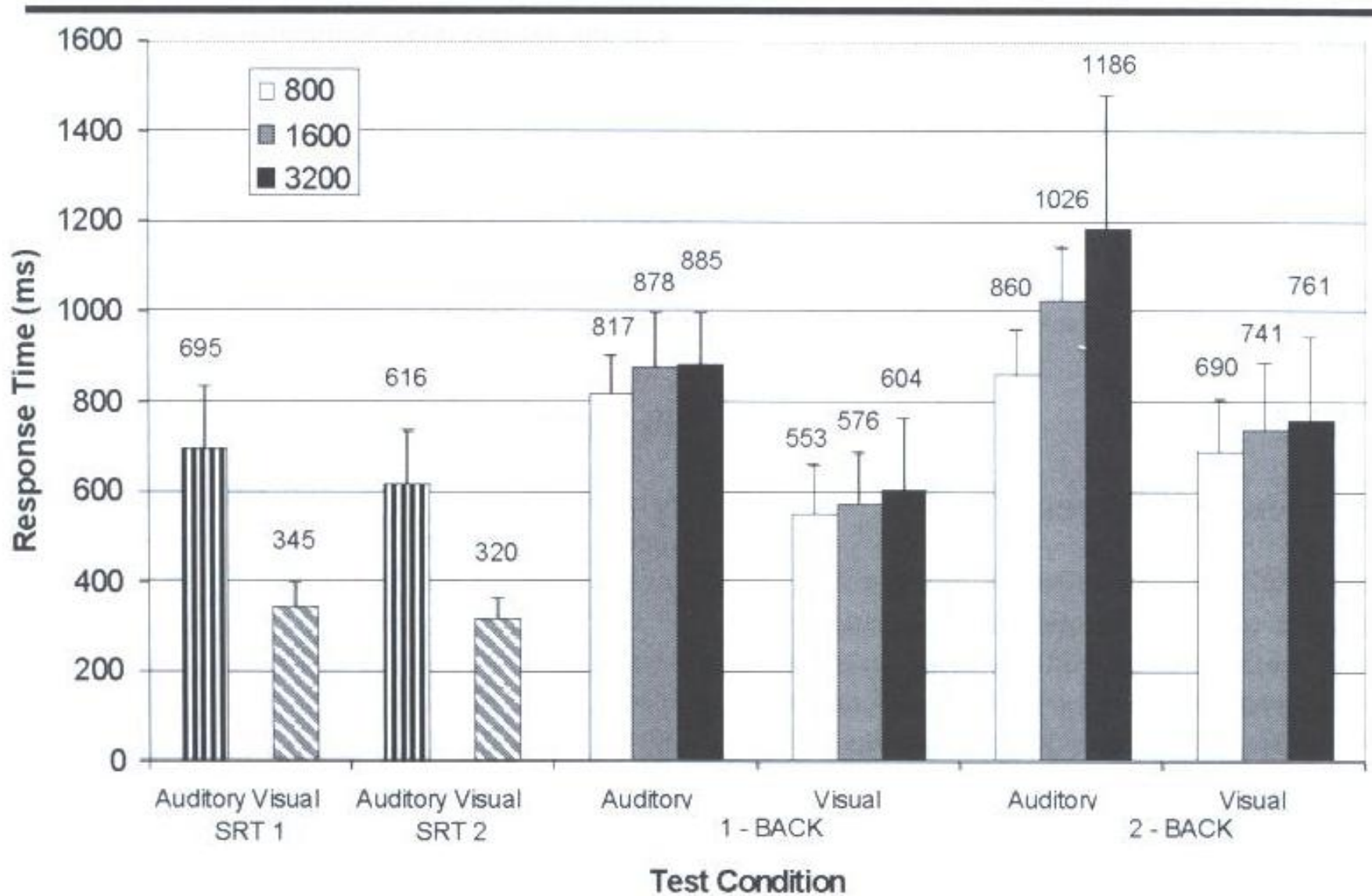


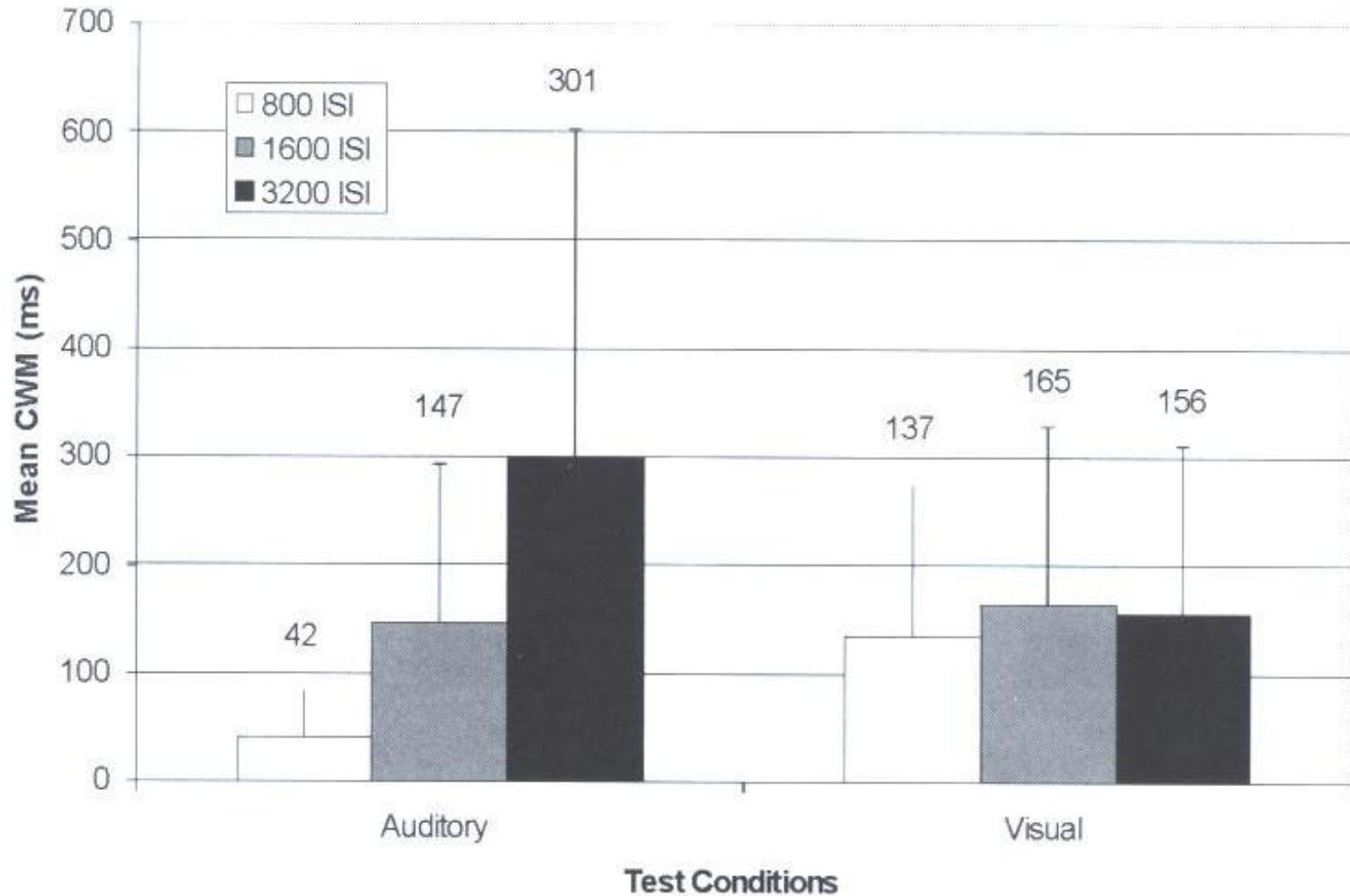
FIG. 5.3. Working-memory model of the locus of aging effects on language processing. (Baddeley & Hitch, 1974; Baddeley, 1986; Kemper, 1992)

Figure 2. Mean response time (+SD) in four tests, two modalities, and three levels of ISI.



(Hancock, LaPointe, Stierwalt, Bourgeois, & Zwann, 2007, *Contemporary Issues in CSD*, 34, 73-85)

Figure 4. Mean computed working memory (2 back – 1 back) RT (ms) in two modalities and three levels of ISI.



(Hancock, LaPointe, Stierwalt, Bourgeois, & Zwann, 2007, *Contemporary Issues in CSD*, 34, 73-85)

Language in Aging Related Disorders – Aphasia

Obtain Discourse Samples

(Average Number of Words Per Best 3 Utterances)

(0–5 words)
Nonfluent Aphasias

Broca's aphasia
Transcortical motor aphasia
Mixed nonfluent aphasia
Global aphasias

(6–8 words)
Borderline Fluent Aphasias

Anterior capsular/putaminal aphasia
Posterior capsular/putaminal aphasia
Thalamic aphasia

(9 or more words)
Fluent Aphasias

Wernicke's aphasia
Transcortical sensory aphasia
Conduction aphasia
Anomic aphasia

Administer Standardized Tests of Auditory Comprehension

Auditory Comprehension Skills

Nonfluent Aphasias

Very Poor
↓
Global

Poor-Fair
↓
Mixed N/F

Relatively Good
↓
Broca's;
TCM

Borderline Fluent Aphasias

Poor
↓
Post. C/P

Highly Variable
↓
Thalamic

Relatively Good
↓
Ant. C/P

Fluent Aphasias

Poor
↓
Wernicke's;
TCS

Relatively Good
↓
Conduction;
Anomic

Language and Cognitive-Communication in Aging Related Disorders – Depression

- Lethargy
 - Slower cognitive processing
 - Slower response times
- Anomia
 - Semantic fluency and retrieval/access < word recognition
 - Medications
- Spoken and written discourse
 - Referencing problems

Speech in Aging Related Disorders – Motor Speech

Parkinson's Disease (e.g., Berg et al., 2003; Bertella et al., 2002; Caballol, et al., 2007; Cohen, 1998; Cummings, et al., 1988; Grossman, 1999; Murray & Stout, 1999; Natsopoulos et al., 1991)

- Cognitive impairments (35-85%) and dementia (15-25%) (PD-D vs. LBD)
 - Attention systems and processes
 - Executive functions
 - Multiple memory systems
 - Visuospatial skills

- Comprehension problems
 - Complex morphosyntactic units – reversible sentences
 - Inferencing
 - Figurative language
 - Problems processing facial expressions

- Expression difficulties
 - Reduced verb and semantic word fluency
 - Reduced amount and degree of informational content
 - Simplified syntax and low proportion of diversified grammar

Speech in Aging Related Disorders – Motor Speech (cont'd)

Amyotrophic Lateral Sclerosis (e.g., Ayre, 1998; Bak & Hodges, 2004; Cooper & Orange, 2008, Grossman et al., 2008; Narasimha, 2009; Strong et al., 1996, 1999, 2007, 2008)

- Cognitive impairments (35-55%) and dementia (FTDfv; 5-15%)
 - Attention systems and processes
 - Executive functions
 - Multiple memory systems
 - Visuospatial skills

- Expression difficulties
 - Verb naming < noun naming
 - Poor letter and semantic verbal fluency – living items category
 - Reduced grammatical complexity
 - Semantic and verbal paraphasias
 - Fewer self-corrections/utterance

Mild Cognitive Impairment (MCI)

(Ritchie & Touchon, 2000)

- Not considered normal for age and education level
- Defined clinically or neuropsychologically
- Evolved from earlier concepts of cognitive decline in aging without dementia:
 - Benign senescent forgetfulness (Kral, 1962)
 - Age-associated memory impairment (Crook et al., 1986)
 - Age-associated cognitive decline (Levy et al., 1994)
 - Mild cognitive decline (ICD-10, 1993)
 - Cognitively impaired not demented (CSHA, 1994)
 - Cognitively impaired not demented yet (CINDY) (CSHA, 1994)

Mild Cognitive Impairment (MCI)

(Petersen et al. 1999; Mendez & Cummings, 2003)

1. Memory complaint, preferably corroborated by informant
2. Objective memory impairment corrected for age and education (i.e., scores 1.5 SDs \geq Mean for normals)
3. Largely intact general cognitive function
4. Essentially preserved activities of daily living (ADL)
5. Not demented
6. No specific medical, neurological or psychiatric causes for memory difficulty


Summary of Language and Communication Changes in MCI

- Few studies
 - Mostly screening/brief measures within larger test batteries of cognition
- Decreasing verbal fluency scores (letter and semantic categories)
- Decreasing confrontation naming scores (Boston Naming Test – BNT)
- Do not benefit from semantic cues

Dementia: DSM IV-TR (2000)

- Multiple cognitive deficits of gradual onset and continual decline including both:
 - A. **Memory impairment**
 - B. One (or more) of the following:
 1. Language problems
 2. Movement programming problems (**apraxia**)
 3. Perceptions stripped of meaning (**agnosia**)
 4. Disturbance in executive functioning (e.g., planning, organizing, sequencing ideas, etc.)
- Cognitive deficits:
 1. Cause significant impairment in social or occupational functioning
 2. Represent significant decline from previous functioning
- Not due to other CNS conditions, systemic conditions known to cause dementia, substance abuse induced dementia, delirium, another primary psychiatric disorder

Types of Dementia: Selected Examples

- DAT/AD
 - Familial-DAT
 - Early onset-DAT
 - Down's syndrome-DAT
- Mixed (DAT + VaD)
- Vascular dementia (VaD)
- Dementia with Lewy bodies (DLB)
- FTLD (FLD [Fv plus sub-variants] + PNFA [Fv] + semantic dementia [Tv])
- Dementia lacking distinctive histology (DLDH)
- Binswanger disease
- PPA
- FTLD
- Pick's  Pick Complex
- Dementia with motor neurone disease
 - Parkinson's, ALS, MS, HC, etc.
- AIDS dementia complex (ADC)
- Progressive supranuclear palsy (PSP) and corticobasal degeneration (CBD)
- Creutzfeldt-Jakob disease (CJD)
- Normal pressure hydrocephalus (NPH)
- Syphilis
- Wernicke-Korsakoff syndrome

Dementia Epidemiology – Worldwide*

- 35.6 million estimated 2010 (24.2M 2001; 4.6M new cases/yr)
 - 46% Asia
 - 30% Europe
 - 12% North America
- Doubling ~ every 20 years
 - 65.7M 2030; 115.4M 2050
- Majority (57.7%) live in low and middle income countries
 - 40% increase Europe over next 20 yrs
 - 63% ↑ North America
 - 77% ↑ southern Latin America; 134-146% rest of Latin America
 - 89% ↑ Asia Pacific; 117% East Asia; 107% South Asia
 - 125% ↑ North Africa and Middle East
- \$315 B (2005 US \$) costs for dementia care/yr worldwide

* Alzheimer's Disease International World Report, 2009 www.alz.co.uk/worldreport ; Ferri et al., 2005; Wimo et al., 2003

DAT – Early/Mild Stage

- Individuals aware of communication difficulties
- Word finding problems for names of people, places, objects and actions
 - Circumlocutions, gesture or associated word used as strategy for word finding problems
- Uses clichés and stereotyped phrases
- Communicates sufficiently for most social situations
- Problems understanding:
 - Complex sentences and concepts (e.g., metaphors and proverbs)
 - Humour, analogies, sarcasm, abstract expressions
- Generally only a few minor problems understanding what is said in 'everyday' conversations

(Bayles, et al., 1982; Kertesz et al., 1982; Orange et al, 1996; Ripich et al., 1996)

DAT – Middle/Moderate Stage

- Person less aware of language and communication problems
- Pronounced word finding problems; circumlocution
 - Empty and irrelevant utterances (e.g., words such as “**thing**”, “**this**”, and “**that**” often used in place of substantive nouns)
- Frequently repeat words, utterances, and ideas
- Disinhibited; inappropriate utterances (i.e., poor sensitivity to ‘where’ and with ‘whom’ he/she is speaking – context and partner factors)
- Digresses and rambles; poor topic maintenance
- Problems understanding simple commands
- Can be lost in multi-partner conversations

(Bayles & Kaszniak, 1987; Cummings et al., 1985; Kemper, 1995; Kertesz, et al., 1982; Orange et al., 1998)

DAT – Late/Severe Stage

- Highly variable
- Spoken vocabulary severely reduced - unrelated words in utterances
- Repeats self and what others say – perseverative
- Word order and word agreement impaired
- "Islands" of fluent, coherent language
- Speech disturbances emerge (i.e., stuttering and pronunciation errors)
- Relies on intonation, syllable and word stress patterns, emotional tone of voice, and familiarity of voice and music

(Bayles & Tomoeda, 1994, 2007; Causino-Lamar et al., 1994)



Hearing Care for Adults 2009 – The Challenge of Aging

The data presented is currently
under peer review for publication
and can not be shown here.
Thank you for your understanding.

November, 16–18, 2009
Hyatt Regency
Chicago, USA

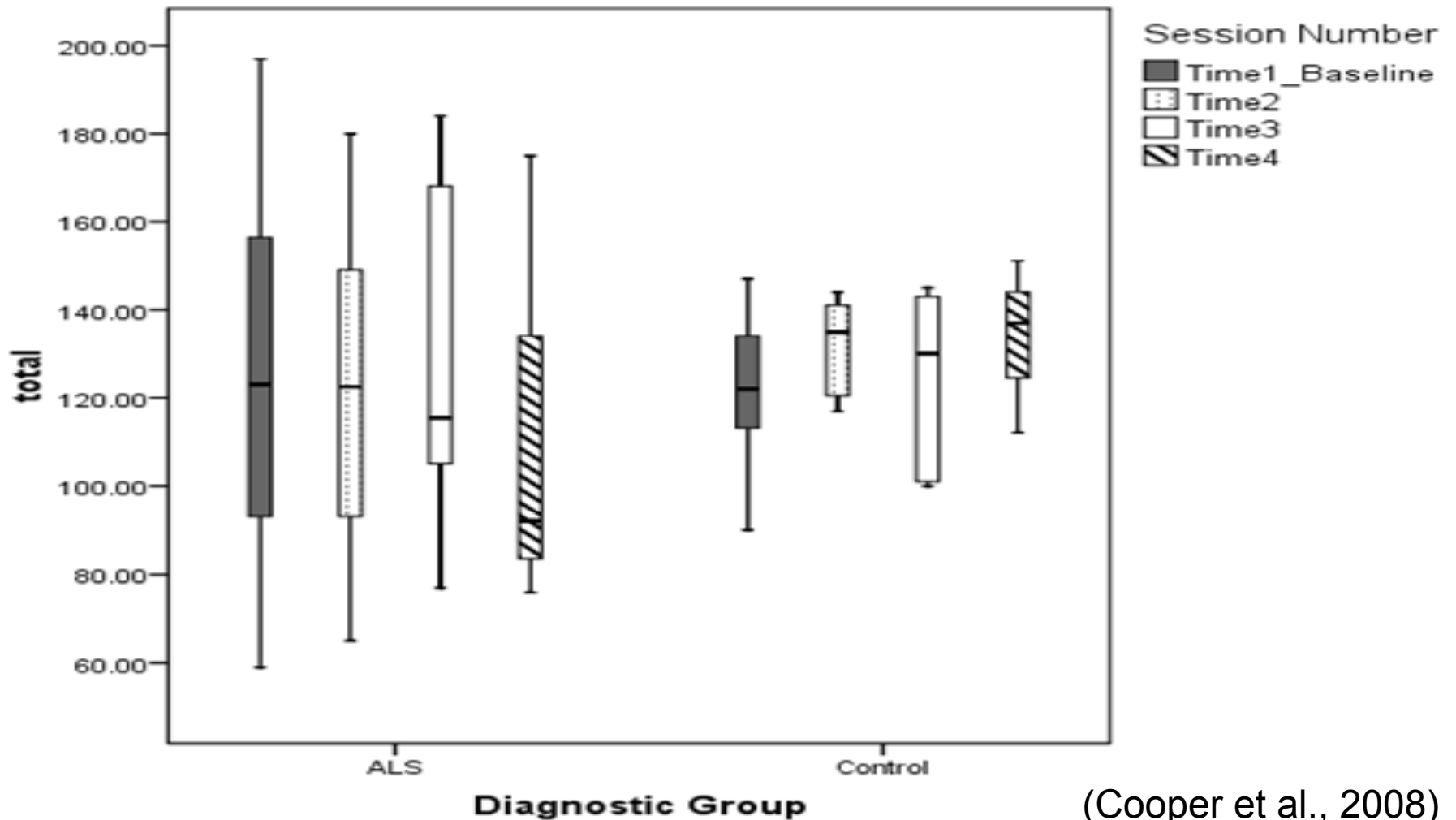
An International Conference sponsored by Phonak

PHONAK life is on

FTDfv

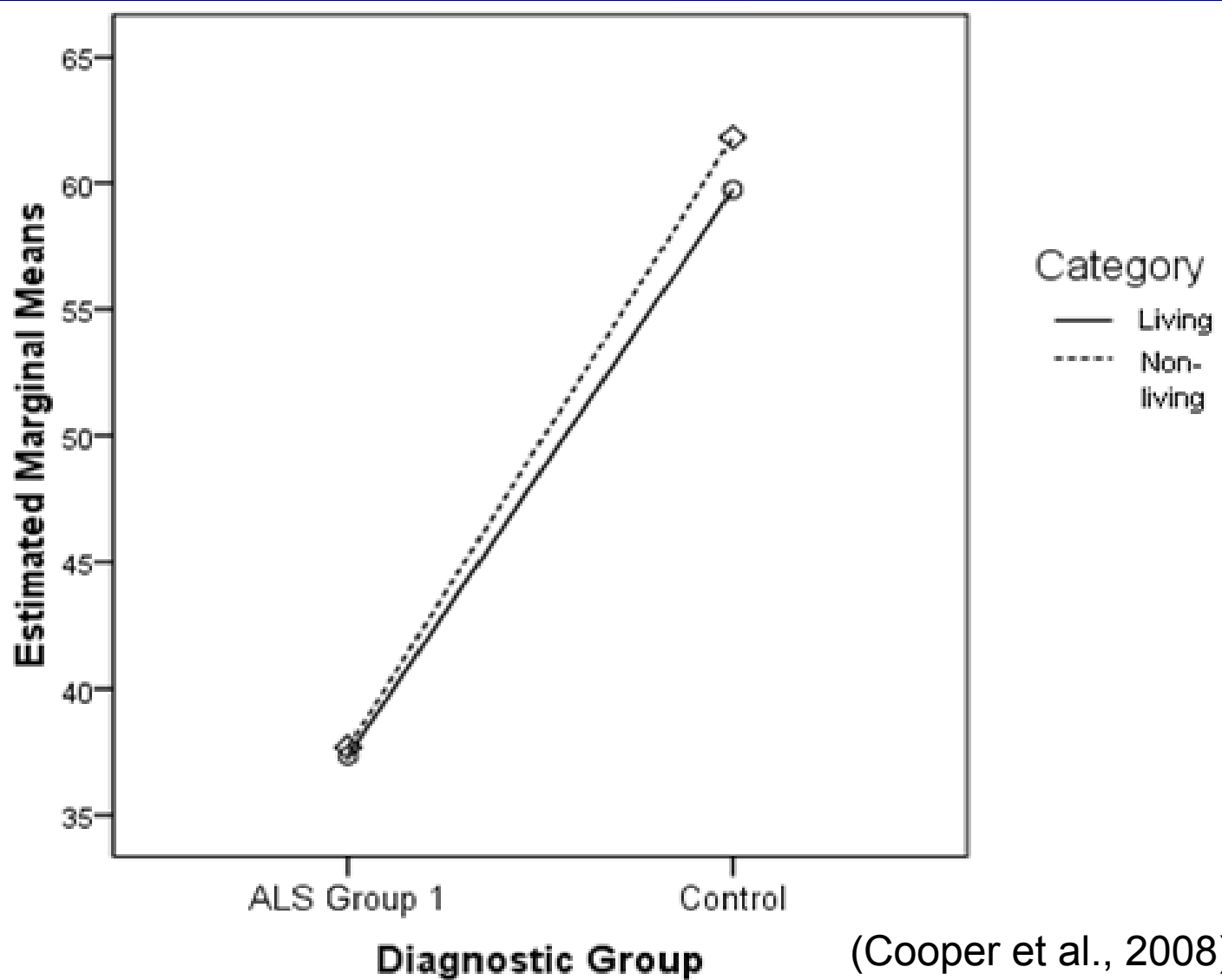
- Language and cognitive-communication affected
- Generative naming (i.e., letter and verbal fluency) problems common
- Morphosyntactic errors – primarily on regular vs. irregular verbs
- Spelling errors on irregularly spelled words
- Topic maintenance problems – quick, unrelated topic shifting
- Unusual and inappropriate comments (and behaviours)

(Neary et al., 1998)



(Cooper et al., 2008)

1. NS difference between ALS vs. controls on total # items
2. NS difference in rate of change over time between ALS vs. controls
3. ALS sub-group (n = 3; 1 SD below others) showed significantly lower scores than controls ($p < 0.05$)



1. NS difference between bulbar- vs. limb-onset groups
2. More ALS produced semantically related errors vs. controls
3. ALS sub-group produced significantly more errors in living vs. non-living categories ($p < 0.05$)

FTDfv – Progressive Non-Fluent Aphasia (PNFA)

- Halting, telegraphic or agrammatic spoken language
- Motor speech problems in many (oral and verbal apraxias)
- Writing > speaking (Hillis et al. 2004)
 - Written naming > oral naming, especially actions vs. objects (Hillis et al. 2002)
- Better spoken naming of objects vs. actions (Hillis et al. 2006)

FTDfv - PNFA (cont'd)

- Reading comph > auditory comph (Holland et al. 1985)
- Impaired spelling of irregular words - surface dysgraphia
- Impaired reading of irregular words - surface dyslexia
- Multiple pragmatic difficulties (e.g., topic maintenance)
(Orange et al., 1998)

FTDtv – SD (cont'd)

- Loss of receptive and expressive vocabulary
- Impoverished knowledge of wide range of living items and inanimate objects
- Relative sparing of expressive language syntax, orthography, phonology, prosody
- Selective impairment of semantic memory
- Preservation of episodic memory

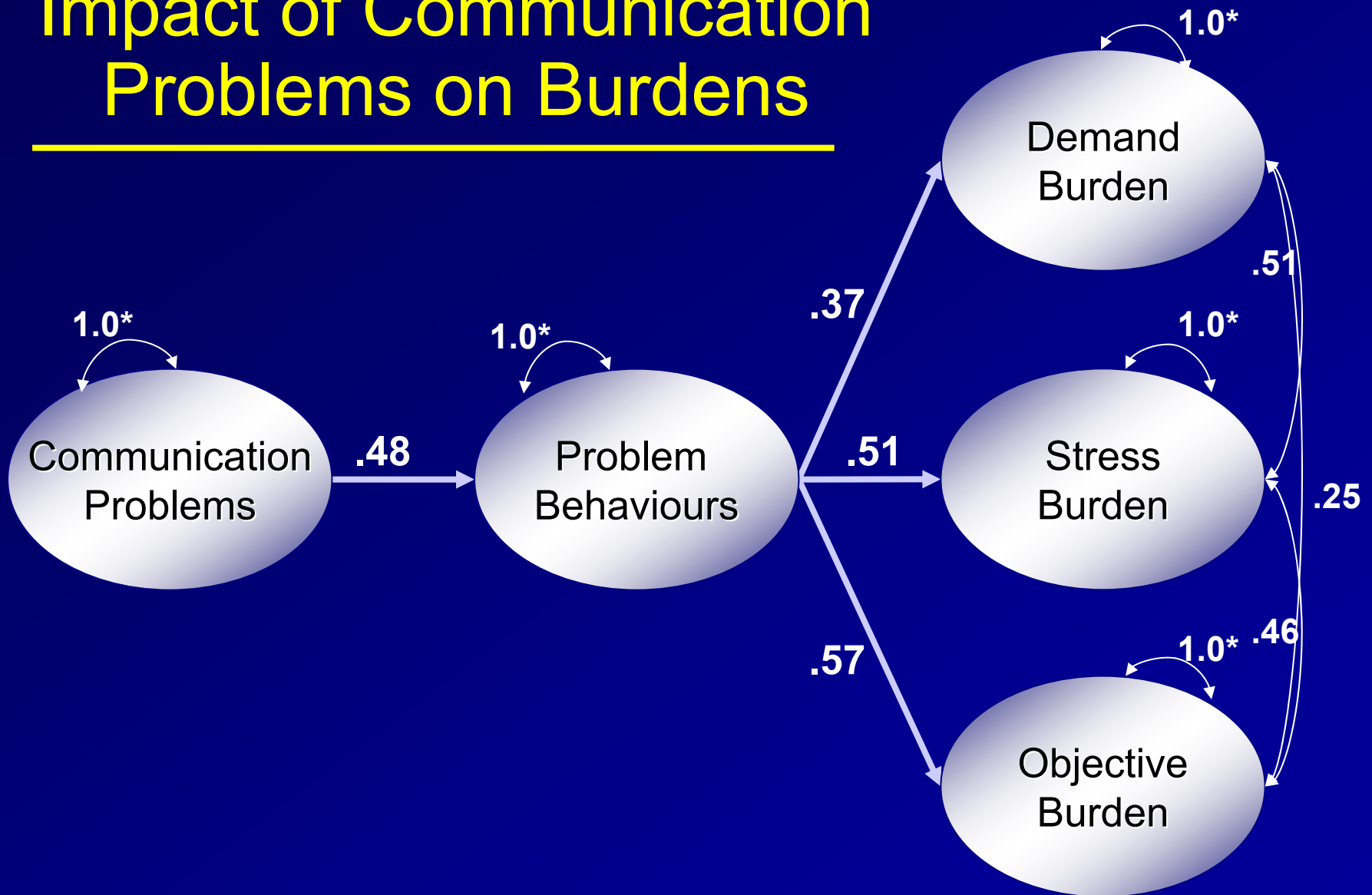
(Patterson & Hodges, 1992)

How do Research Findings Influence Clinical Practice?

Caregivers' Perspectives of Language and Communication in Dementia

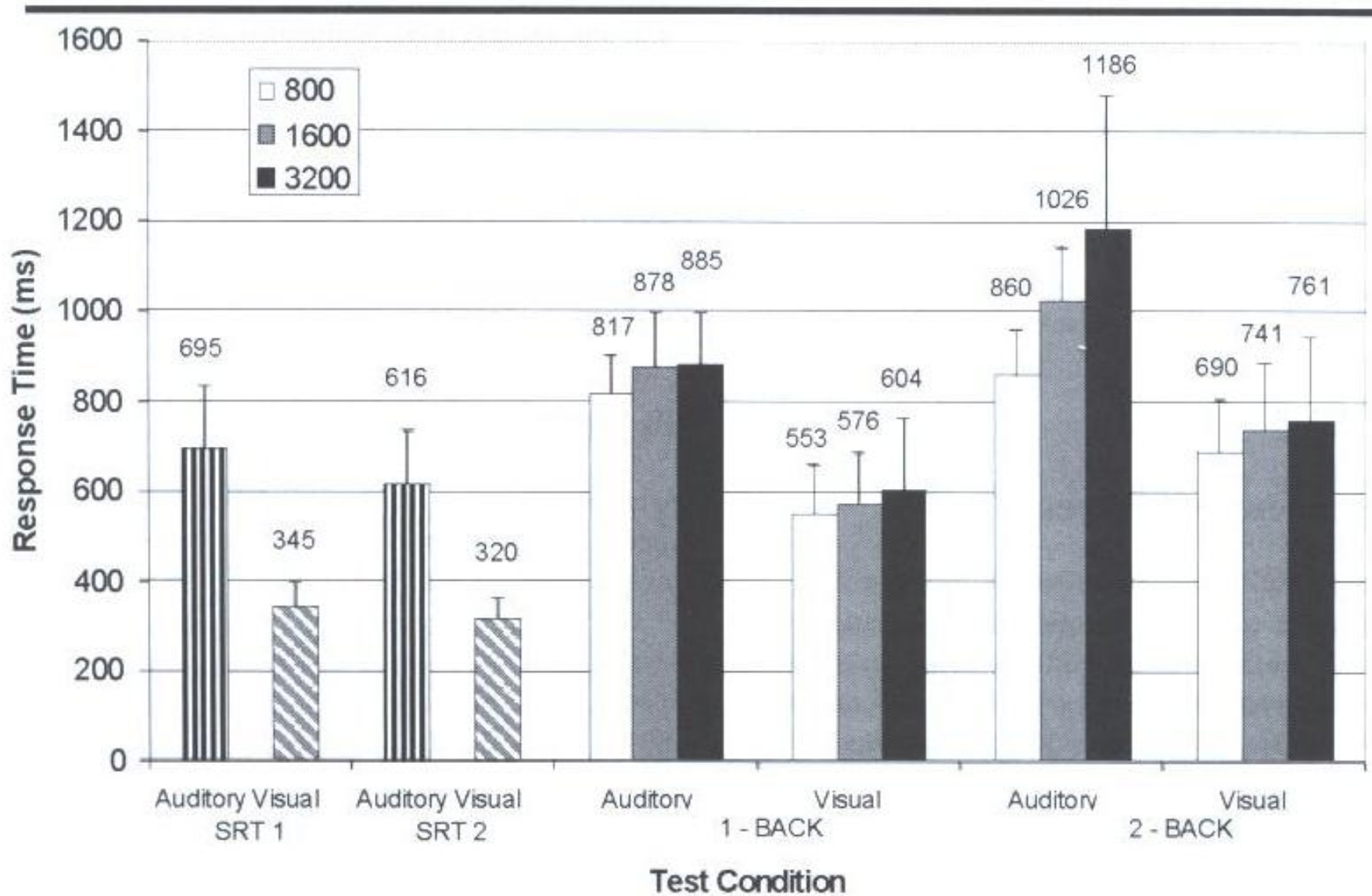
- Caregivers identify problems early
- Far reaching effects on their social and emotional well-being
- Perceived to be a primary problem in caregiver coping and increased risk for institutionalization

Impact of Communication Problems on Burdens



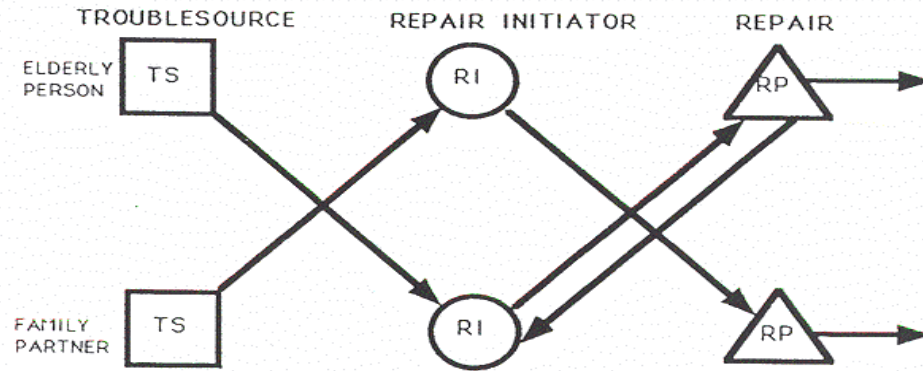
(Savundranayagam, Hummert, & Montgomery, 2005)

Figure 2. Mean response time (+SD) in four tests, two modalities, and three levels of ISI.

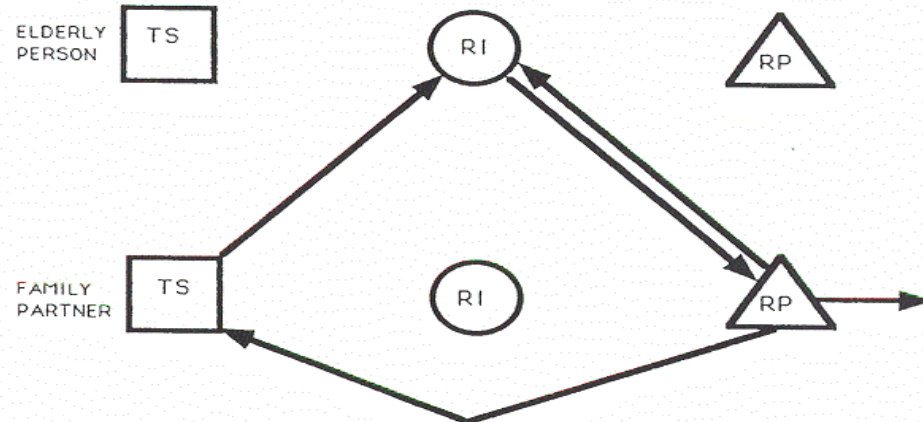


(Hancock, LaPointe, Stierwalt, Bourgeois, & Zwann, 2007, *Contemporary Issues in CSD*, 34, 73-85)

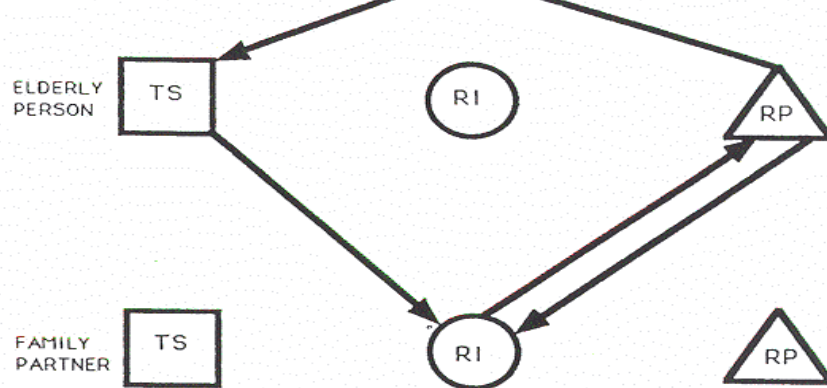
CONTROL



EDAT



MDAT



(Orange, Higginbotham & Lubinski, 2004)

The 'Self' and Personhood

Sabat's (2001) Concept of 'Self'

1. The self of personal identity – “I”, “Me”, ‘My”, “Mine”, etc. used by persons with dementia
2. Self attributes – descriptions of past and present characteristics, beliefs, abilities, and talents
3. Self as public personae – profile of self in society
 - profession, volunteer, public figure, award winner, etc.

Kitwood's (1997) Positive Care Interactions - Personhood

1. Recognition – person known by unique characteristics or name(s)
2. Negotiation – person is consulted about preferences, choices, and needs
3. Validation – acceptance of reality, and acknowledging feelings, connectedness and person
4. Collaboration – align with the person with dementia to engage together in tasks; work together to achieve goals
5. Facilitation – enable person to accomplish what he/she would otherwise be unable to do by providing missing parts of intended actions

(Ryan, Byrne, Spykerman & Orange, 2005)