Communication problems in the elderly

Susan Edwards  
School of Linguistics & Applied Language Studies (SLALS)  
&  
Kate Tucker  
SLALS & WPCT  
Health Research Fellowship
• How communication can be compromised in the elderly

• Types of dementia and some associated communication problems

• Aphasia: a language problem associated with stroke

• Some recent aphasia research
Elderly population

Population of people 65+ was 16% (1988)

Projected to reach 22% (2036)

Large increase in those 80+ years
Normal aging & communication

- Hearing and visual deficits
- Changes in attention and memory
- Slowing of motor processes
- Changes in dentition and saliva management
- Side effects of drugs
- Reduced communication network
Communication

Language form & meaning

sounds, words, sentences
• Pronunciation of speech sounds:

• Use of intonation, volume: supra segmental level

• Use of language: appropriate and adequate

• Non-verbal communication:
  gesture, facial expression, proximity
Communication problems

Dementia

Stroke
Road traffic accidents
Tumours
Progressive neurological conditions
Dementia

• Deterioration of higher cortical functions: memory, problem solving; learned motor skills; social skills; control of emotional reactions.

• Deterioration of intellect of sufficient magnitude to interfere with social or occupational functioning
Current prevalence

UK 750,100

+ 65 years 1 in 20 people

+ 80 1 in 5

Reports vary: these figures are from the Alzheimer’s Society
Types of dementia defined by aetiology:

1. Frontal-temporal: e.g. progressive non-fluent semantic (fluent)

2. Temporal-parietal: e.g. dementia Alzheimer’s type

3. Degenerative neurological (e.g Parkinson’s)

4. Vascular (multi-infarct)

(Wallin 1994)
Language characteristics: frontal-temporal

Speech reduced

Impaired word retrieval

Incomplete utterances

Perseveration and echolalia

Stereotypic utterances

Inattention ➔ poor comprehension (but see Cooke et al 2000)
Progressive non-fluent: also known as progressive aphasia

Non-fluent hesitant speech

Impaired word retrieval

Errors of sounds and words

Comprehension relatively preserved
Semantic dementia

Fluent effortless speech

Loss of word meaning in speech and understanding

Well preserved repertoire of speech sounds and intact grammar
Dementia Alzheimer’s type (DAT)

Word finding difficulty leading to hesitant output
a little girl looking at a father
She’s both the same (taken from following speech sample)

Incomplete utterances

Speech sound errors

Problems understanding sentences with complex syntax the girl was kissed by the boy (Waters et al 2000)
Speech sample

what with the doggies on .. a little girl looking at a father that he’s looking up at his boyfriend and he’s coming down again there he is again one day he’s going right round there and down there one’s going up and looking at somebody and that other one’s going up … she’s both the same that’s when she’s like that and that’s when she’s like that … yes something there she’s got
Describe how you make a cup of tea
don’t you know?

Well, different people make it in different ways. How do you make a cup of tea?

Well depends how big but if you want an ordinary one you just pick it up … oh I’ve forgotten … and put it on the heat … heat it up and when you’ve finished you can put it out and put as much stuff as you like in it
Aphasia or dysphasia

An acquired language disorder as a consequence of brain damage, e.g. stroke
Strokes

• One of the major causes of communication problems in the elderly.

• 1 every 5 minutes
Incidence

- 110,000 new strokes per year in the UK
- 72% over 65 years
- 1/3 will die within 4 weeks
- Of the survivors 1/3 will have communication problems

NSF 2000
• Caused by vascular lesions to the brain

• Lesions to the dominant cerebral cortex result in aphasia → language problems

• Lesions to neural pathways from the cortex to the speech musculature result in dysarthria → pronunciation problems
Aphasia

• May affect selection of correct speech sounds; understanding and use of vocabulary and processing and implementation grammatical operations

• Comprehension and production
Types of aphasia (Goodglass & Kaplan 1976, 1983, 2001)

• Non-fluent aphasia: associated with frontal lobe damage: Broca’s aphasia

• Fluent aphasia: associated with temporal lobe damage: Wernicke’s aphasia
Aphasia characteristics

Aphasia syndromes can be distinguished by pattern of deficits in

output and understanding
Modularity

Aphasia: a condition where *language* is damaged but other *cognitive* functions are spared

Dementia: a condition where *language* and *other cognitive* functions are impaired
In aphasia, comprehension and production can be differentially impaired. Domains or levels of language can be differentially impaired.
Classically, Broca’s aphasia is thought to arise as a consequence of damage to the grammar, or impaired access to grammatical representations or operations. (Grodzinsky 2001 and commentaries in same volume of BBS. 23)

Wernicke’s aphasia arises from damage to the mental lexicon/semantic system or impaired access to the lexical semantic system.
Broca’s aphasia

(samples from Varlokosta & Edwards 2002)

woman … /pa/ no… cleaning … plate …
water … pouring …ground … two kids …
boy … stool … wobbling stool … give …
take it … cookies
Wernicke’s aphasia

yes, well, that’s a .. that’s the ordinary karmie brayzie and the boy’s falling over up here ... up here the ... but his... on here .. he’s made a terrible ... and she’s tried to push that and she shouldn’t done should she ... but I can’t see the boy he’s been around the first time to get hold of her before she’s gone really but er...but stupid really... all the water going down here which should be wrong, you see...I can see that part ... then she got XX and he’s got ... but there’s nothing here and er ... and she’s got this... trying out down here ... so he fall over and fall in the water I imagine terrible
### Differences between aphasia and dementia

<table>
<thead>
<tr>
<th>Aphasia</th>
<th>Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden onset</td>
<td>Gradual onset</td>
</tr>
<tr>
<td>Focal brain lesion</td>
<td>Diffuse brain damage</td>
</tr>
<tr>
<td>Impairment of communication is primary</td>
<td>Communication impairment part of general deterioration of cognitive functioning</td>
</tr>
</tbody>
</table>
**Aphasia**

- May be chronic but not progressive
- Little change in non-verbal cognitive skills
- All domains of language are vulnerable

**Dementia**

- Progressive
- Associated with degeneration of other cognitive functions
- Marked problems with lexical retrieval
Research

Speakers with aphasia portray different profiles

To seek a parsimonious account of what looks like manifestations of disparate conditions
A series of studies examining the pattern of comprehension loss in fluent aphasia.

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Comprehension in Wernicke’s aphasia

People who have lesions in the posterior portions of the dominant cerebral cortex.

Problems understanding language *because* of lexical semantic deficit: grammar is intact
# Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>76</td>
<td>65</td>
<td>81</td>
<td>70</td>
<td>60</td>
<td>75</td>
<td>60</td>
<td>59</td>
<td>57</td>
<td>67 years</td>
</tr>
<tr>
<td>Ed (years)</td>
<td>12</td>
<td>15</td>
<td>12</td>
<td>8</td>
<td>11</td>
<td>9</td>
<td>12</td>
<td>12</td>
<td>20</td>
<td>10 years</td>
</tr>
<tr>
<td>TSO (mths)</td>
<td>63</td>
<td>96</td>
<td>15</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>18</td>
<td>10</td>
<td>25 mths</td>
</tr>
<tr>
<td>Gender</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>M</td>
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</tbody>
</table>
Some examples from testing understanding of language

(40 items)
Verb naming
Verb comprehension
Sentence comprehension
Judging sentence plausibility
(from Bastiaanse, Edwards and Rispens 2002)

(25 items)
Judging event structure
(from McCann forthcoming)
Verb production

Target verb: Sewing
Verb comprehension

Target verb: Sitting

Distractors:
- one semantically related verb (sleeping)
- one semantically related noun (chair)
- one noun semantically related to the distractor verb (bed)
Verb comprehension / production

Percentage correct

Verb Prod
Verb Comp

Subjects

1 2 3 4 5 6 7 8 9
Sentence comprehension

Active
the woman saves the man

Subject cleft
it is the woman who saves the man

Passive
the man is saved by the woman

Object cleft
it is the man who the woman saves
Comprehension verbs / sentences

Subjects

Percentage correct

Verb Comp
Sent Comp

Subjects

1 2 3 4 5 6 7 8 9

Percentage correct
0 10 20 30 40 50 60 70 80 90 100
Comprehension of sentences in four sentence types

Active sentences (72%)
Subject clefts (74%)
Passives (55%)
Object clefts (58%)
<table>
<thead>
<tr>
<th>Thematic roles</th>
<th>Event structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>*The wood saws the man</td>
<td>*The boy stood in an hour</td>
</tr>
<tr>
<td>The child throws the ball</td>
<td>The woman stood for an hour</td>
</tr>
<tr>
<td>*The girl is written by the letter</td>
<td>*The girl walked home for an hour</td>
</tr>
<tr>
<td>The dress is worn by the woman</td>
<td>The boy walked home in an hour</td>
</tr>
</tbody>
</table>
Comparison of judgement tasks

Thematic roles  Event Structure

79%  47%
Summary

Some overlap between language problems in dementia and aphasia

Domains of language can be differentially affected

Difference in production and comprehension skills
Comprehension deficits are complex

More knowledgeable about aphasia than language problems in dementia

*but an area of increasing interest in language research.*
How can we, that is normal speakers, help?
For people with aphasia

PWA are neither deaf nor demented

PWA do not necessarily have problems with understanding but many do

Talk slowly, clearly but with normal intonation
Avoid long and complex sentences

Try and establish topic of conversation

Give alternatives when the aphasic speaker struggles to find a word

Allow time for a response
Encourage any attempt to communicate; (writing/gesture/drawing)

Accept incomplete utterances

and

Seek the advice of a speech and language therapist
For people with dementia

Seek to find out which language processes are affected in a PWD

Avoid complex vocabulary and grammar

Monitor their responses to language (to check understanding)
Use more than one input modality (writing/speech/gesture)

Aim to be literal, concrete; avoid abstract

Listen attentively and facilitate by providing choices, forced alternatives
Allow for the impact of communication impairment on behaviour and *vice versa*.

Provide opportunities for communication and

Seek advice from a speech and language therapist.
The end

Thank you