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## Contents

- Page 3      Movement and reversible sentence comprehension.  
*David Howard and Sonia Brownsett*
- Page 5      Crossing the divide: Interaction and accommodation between past  
tense verbs in a case of progressive fluent aphasia.  
*Elaine Funnell and Michael Kopelman*
- Page 6      The role of noun syntax in spoken word production.  
*Ruth Herbert and Wendy Best*
- Page 7      Apraxia of Speech (AOS): Do people with aphasia make more apraxic  
errors when producing 'proper sentences'?  
*Cath Mumby*
- Page 8      Errorless and errorful learning of verbs and nouns in aphasia: a case  
series study.  
*Paul Conroy, Matt Lambon Ralph and Karen Sage*
- Page 9      Treating verbs in fluent aphasia: a clinical study.  
*Susan Edwards and Kate Tucker*
- Page 10     Verb and noun association therapy: a study of therapy effects.  
*Janet Webster and Barbara Gordon*

## Movement and reversible sentence comprehension.

David Howard, University of Newcastle upon Tyne  
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People with agrammatism make errors in choosing the correct picture to go with a reversible sentence where the distractor reverses the roles, and this difficulty is found particularly when constituents are moved from their canonical positions, as, for example, in passives or object clefts. One interpretation of this pattern from Grodzinsky attributes this to a difficulty in assigning thematic roles to arguments marked by traces, and from this he predicts below chance performance with psychological verbs where the subject is the experiencer.

Six people with agrammatic, non-fluent speech production and six age-matched normal people were tested in sentence picture matching with reverse role distractors with eight types of sentences:

Sentence type	Action verb	Psychological verb
Active	<i>The boy pulls the girl</i>	<i>The woman astonishes the man</i>
Full passive	<i>The girl is pulled by the boy</i>	<i>The man is astonished by the woman</i>
Truncated passive	<i>The girl is pulled</i>	<i>The man is astonished</i>
Subject cleft	<i>It is the boy who pulls the girl</i>	<i>It is the woman who astonishes the man</i>
Subject cleft and full passive	<i>It is the boy who the girl is pulled by</i>	<i>It is the woman who the man is astonished by</i>
Subject cleft and truncated passive	<i>It is the boy who is pulled</i>	<i>It is the man who is astonished</i>
Object cleft	<i>It is the girl who the boy pulls</i>	<i>It is the man who the woman astonishes</i>
Object cleft and full passive	<i>It is the boy who the girl is pulled by</i>	<i>It is the woman who the man is astonished by</i>

There were forty sentences of each type, half with psychological verbs and half with action verbs.

Both people with aphasia and normal participants were overall more accurate with action verbs than psychological verbs. People with aphasia were generally less accurate with the conditions involving moved arguments. Examining individual performance patterns, only two people with aphasia showed the pattern Grodzinsky defines as the paradigm for people with aphasia: active sentences above chance and full passives at chance. Contrary to Grodzinsky's claims, no subject showed below chance performance with experiencer psychological verbs. Truncated passives, both as simple sentences and in clefts, patterned with full passives (performance at or near chance) with some participants, and with active sentences (performance above chance) for others.

There were differences between verbs in their overall accuracy of interpretation. This turns out to be related at least partly to psycholinguistic properties of the words. The implications for our understanding of the breakdown in sentence comprehension will be discussed.

## **Crossing the divide: Interaction and accommodation between past tense verbs in a case of progressive fluent aphasia.**

**Elaine Funnell, University of London**  
**Michael Kopelman, Kings College London**

We report a study of the production of past-tense verbs by a man (AM) with a refractory phonological system associated with a progressive fluent aphasia. Irregular verbs ending in an alveolar stop consonant (/d/, /t/) tend to be better preserved than other irregular verbs in people with progressive fluent aphasia (Patterson et al (2002)). We explored this phonological effect using the standard 'Today-Yesterday' task, but using blocked lists of verbs, with or without a final alveolar stop consonant, in order to establish the phonological blue-prints of particular verb types. We then alternated the established verb with a different verb-type. We found patterns of interference and accommodation that crossed the regular-irregular verb divide. Established regular and irregular verbs with base forms that end in an alveolar stop consonant interfered with each other. Irregular verbs, such as 'write', inhibited the addition of an alveolar stop consonant to regular verbs, such as 'want', and instead inserted a past tense rime, eg /wort/ (as in 'thought'). In turn, established regular verbs, such as 'want', prevented a change of vowel in irregular verbs such as 'write' and instead added to the base form an unstressed syllable completed by an alveolar stop consonant eg 'writed'. Neither of these established verbs affected the past-tense forms of regular verbs, such as 'look', which were completed with an alveolar stop consonant as usual; but both caused embedded irregular forms, such as 'give', to be completed with /d/ or /t/ (eg 'gived'). These, and other findings, are consistent with an interactive morphological-phonological system in which final alveolar stop consonants behave as past tense markers, and past tense rimes behave like morphemes. Moreover, from within this system both so-called regular and irregular verbs are produced.

Patterson, K., Lambon Ralph, M.A., Hodges, J.R. and McClelland, J.L. (2001). Deficits in irregular past-tense verb morphology associated with degraded semantic knowledge. *Neuropsychologia*, 39, 709-724.

# **The role of noun syntax in spoken word production**

**Ruth Herbert, University of Sheffield**  
**Wendy Best, University College London**

## Background

Assessment and intervention for anomia proceed from the assumption that a semantic representation maps directly onto a phonological form (e.g. Patterson and Shewell, 1987). Current accounts of spoken word production incorporate an intermediate level, where syntactic information is made available via a lemma (Levelt et al, 1999) or a word (Dell et al, 1997) node. According to such theories anomia can then arise following damage to lemma access.

Studies of syntactic knowledge in noun production typically investigate grammatical gender. As this feature does not operate in English we used mass and count nouns instead. These command different syntactic structures (a cat, \*some cat; \* a water, some water). We investigated participants' knowledge of these differences.

## Methods

### *Participants*

We collected data from normal control participants and from people with aphasia. The people with aphasia were screened to ensure that none had a significant semantic impairment.

### *Procedure*

We devised novel tasks to investigate noun syntax processing, including input tasks (e.g. grammaticality judgement) and a range of output tasks (e.g. picture naming with syntactic judgements, determiner plus noun production). Each participant with aphasia underwent language testing in a case series design.

Some of the participants also underwent therapy for spoken word production which focused on noun syntax. We assessed spoken naming, and syntactic knowledge and production after therapy.

## Results

The data from the group of nine participants revealed significant relationships between syntactic knowledge and picture naming. Data from one participant whom we studied in depth indicated that access to some syntactic information can facilitate noun production. The therapy study showed that people with aphasia with a deficit in access to spoken word forms can benefit from a therapy which focuses on noun syntax.

## Conclusions

The research indicates that noun production can be facilitated by knowledge of syntax, and that, if damaged, this knowledge can be remediated in therapy, leading to better spoken word production.

# **Apraxia of Speech (AOS): Do people with aphasia make more apraxic errors when producing ‘proper sentences’?**

**Kath Mumby, University of Manchester**

## Introduction

Apraxia of speech (AOS) has been characterised as a motor programming disorder, comprising defective sequencing and execution of motor speech patterns. Where speech production involves grammar there are additional demands on planning and sequencing, and this study asked whether the increased load is associated with apraxic error occurrence.

## Method

A group of ten people with AOS and aphasia took part in the study, (representing Broca’s, Anomic, and Conduction aphasias.) They were videoed telling the story of their stroke, and the apraxic errors within their spontaneous speech were analysed. 180 Text Units per person were categorised according to grammatical type, connectivity with the preceding Text Unit, the grammatical word classes within them (noun, verb etc.) and the number of syllables. The occurrence of errors within the Text Units was analysed using random intercept multilevel logistic regressions.

## Results

Apraxic errors were found to be a function of the type of Text Unit ( $p=0.002$ ). Taking the number of syllables into account, compared with Minor Text Units all other text unit types had greater odds of an error, especially clausal and lexical text units. In addition the connectivity of a Text Unit with the preceding one was significant ( $p=0.0003$ ). Further modelling showed no clear-cut association of grammatical word class with apraxic errors.

## Discussion

The relationship between apraxic errors and grammar in spontaneous speech could not be explained with reference to automaticity alone, but concerned the nature of Text Units and their connectivity.

## Conclusion

There are indications that apraxic errors may be related to grammar in the spontaneous speech of people with aphasia, and that the odds of apraxic errors increase when people attempt ‘proper sentences’. The impact of these findings on everyday communication and rehabilitation needs to be explored further.

# **Errorless and errorful learning of verbs and nouns in aphasia: a case series study.**

**Paul Conroy, Matt Lambon Ralph & Karen Sage, University of Manchester**

## Research questions

Given the accounts of relative verb or noun deficits within aphasic participants in the literature, what will the prevalence of these symptom patterns be across a relatively randomly sampled set of participants? Do verbs and nouns respond in similar ways to errorless and errorful (hierarchical cueing) therapies for participants with aphasia? What effects will gains in verb naming have on sentence production?

## Methods

A case-series study with errorless and errorful therapy for verb and noun naming was implemented, with nine aphasic participants of various aphasia sub-types and degrees of severity. Errorless therapy consisted of the therapist presenting the spoken and written form of a word, in the presence of an action or object picture, which the participant then repeated five times. Errorful therapy consisted of a five stage cueing hierarchy.

## Results

1) there were no significant differences between levels of baseline verb and noun naming in any participant. 2) all participants showed significant therapy effects across both therapies. 3) significantly greater improvements in noun over verb naming for three more severely-impaired participants. 4) significant errorless over errorful learning benefit for one participant, who showed marked phonological impairment and would reinforce her phonological errors in the errorful therapy. 5) errorless learning had a non-significantly greater effect for seven participants. 6) nouns showed a non-significantly greater therapy effect over verbs for five participants. 7) there were varying consequences of increased verb naming for sentence production, which related to aphasia sub-type and severity of naming impairment.

## Discussion

Despite the many accounts of relative verb or noun naming deficits in the literature, no such dissociation was found in any of our participants with various aphasia sub-types and severity levels. Verbs and nouns responded to errorless and errorful therapy in a strikingly similar way in participants who were more moderately-impaired in naming, and for whom the errorful therapy tended not to evoke many errors. They responded correctly at early stages of the cueing process, and they learnt quickly during therapy. For more severely-impaired participants, nouns responded more to both therapies, and both verbs and nouns responded to a greater extent with the errorless therapy. The errorful therapy induced many more errors for this group as they tended to respond later in the cueing process and often did not learn quickly during therapy.

# **Treating verbs in fluent aphasia: a clinical study.**

**Susan Edwards and Kate Tucker, University of Reading**

## Introduction

Problems with lexical retrieval are common across all types of aphasia but certain word classes are thought to be more vulnerable in some aphasia types. Traditionally, verb retrieval problems have been considered characteristic of non-fluent aphasias but there is growing evidence that verb retrieval problems are also found in fluent aphasia. As verbs are retrieved from the mental lexicon with syntactic as well as phonological and semantic information, we speculated that an improvement in verb retrieval should enhance communicative abilities in this population as in others. We report on an investigation into the effectiveness of verb treatment for three individuals with fluent aphasia.

## Methods & Procedures

Multiple pre-treatment base lines were established over three months in order to monitor language change before treatment. The three participants then received twice-weekly verb treatment over approximately four months. All pre-treatment assessments were administered immediately after treatment and three month post-treatment.

## Outcome & Results

Scores fluctuated in the pre-treatment period. Following treatment, there was a significant improvement in verb retrieval for two of the three participants and a non-significant improvement for the third. All participants were significantly quicker in the verb retrieval task following treatment. There was some improvement on some parameters of connected speech.

## Conclusions

Repeated systematic treatment produced a significant improvement in verb retrieval of practised items but limited improvement in the unpractised items. There was a trend for improvement in connected speech. We discuss the successes and limitations of the treatment and the theoretical and clinical implications of the limited generalisation of improvement found.

# **Verb and noun association therapy: a study of therapy effects**

**Janet Webster, University of Newcastle &  
Barbara Gordon, Durham & Chester-le-Street PCT**

## Introduction

Verb retrieval and sentence production difficulties are a common feature of aphasia. There is a growing literature investigating the use of various therapy techniques for these difficulties. There is, however, limited consensus regarding how verb therapy impacts sentence production and which techniques are most beneficial for which clients. This study considers the use of verb and noun association therapy with an individual client MV for whom previous therapy targeting verb and noun retrieval and 'mapping' had not been effective.

## Methods & Procedures

A multiple, repeated baseline, single case study design was used to investigate the impact of verb and noun association therapy on verb comprehension and production and sentence production. Treatment for each set of verbs consisted of eight sessions of twice weekly therapy.

## Outcome & Results

Therapy resulted in a significant, item-specific improvement to verb retrieval. Similar gains were seen in the comprehension of verbs and the identification of verb and noun associations. Following therapy for the first set of verbs, sentence production to picture stimuli improved but there was no improvement when asked to generate sentences around a given verb. Following the same therapy for the second set of verbs, improvement was seen in both sentence production to picture and in sentence generation. There was no evidence to suggest that the improvement in sentence generation was a consequence of improved retrieval of the nouns used in the therapy task.

## Conclusions

Verb and noun association therapy resulted in significant improvements whereas previous meta-linguistic therapy had produced no gains. The improvement in sentence generation seemed to result from a greater understanding of the relationship between the verb and nouns within the sentence rather than an improvement in the retrieval of particular nouns.