

Speaking in ellipses: The effect of a compensatory style of speech on functional communication in chronic agrammatism

INTRODUCTION

The *adaptation theory* (e.g. Kolk, 1995; Kolk & Van Grunsven, 1985; Kolk, Van Grunsven, & Keyser, 1984) provides a strong theoretical framework for planning compensation therapy for chronically agrammatic speakers. The adaptation theory consists of two components. The first component specifies the underlying linguistic impairment. Due to a hypothesised temporal disorder, the capacity for language production is reduced. As a result, sentence production is hampered and morphological errors are likely to occur. The second component specifies how the speaker compensates for this disorder.

A first form of compensation – *corrective adaptation* - consists of repairing the errors that result from using the reduced language production system for sentence production. Through *preventive adaptation* agrammatic speakers seek to avoid morphological errors: They produce simple sentences only. If the conceptual message is simplified even further, syntactic processing becomes biased towards the part of the normal repertoire that has the lowest degree of complexity, being *ellipses* (e.g. *everybody inside*). What distinguishes elliptical from sentential constructions is that they contain fewer grammatical morphemes. The approach of Kolk et al. is in line with Progovac's (2006) analysis of nonsententials. Progovac argues that nonsententials result from selecting lexical items with unspecified or default form of tense and case. As a result, a tense phrase is lacking. In ellipses, time is given pragmatically, by context or by the use of temporal adverbs. There is evidence from brain imaging that ellipses require less linguistic processing than full sentences (Indefrey et al., 2001).

There is considerable variability between agrammatic speakers in the form of their grammatical output (Goodglass, Christiansen, & Gallagher, 1993; Hofstede, 1992). Under our account, this means that some agrammatic speakers learn to apply preventive adaptation on their own accord (i.e. *preventive* speakers), while other speakers – the *non-preventive* ones - stick to the error-strewn production of sentences, which typically fails.

The Reduced Syntax Therapy (REST; Schlenck, Schlenck, & Springer, 1995, see also Springer, Huber, Schlenck, & Schlenck, 2000) is a therapy that teaches German and English agrammatic speakers to produce reduced utterances. We claim that REST trains the use of normal ellipses.

Although it can be argued that the continuous usage of ellipses is the best solution to the linguistic disorder in the chronic phase, REST has some possible limitations. Firstly, the continuous production of ellipses requires executive - attention – control because it is non-automatic (e.g. Purdy, 2002; Rende, 2000, Miyake et al., 2000). Since aphasic speakers are often claimed to have impaired executive functioning, they may have difficulty learning and applying elliptical style regularly. Secondly, agrammatic speakers may not choose to produce ellipses because it is less rewarding.

The study reported here seeks to provide an answer to the question whether a Dutch and adapted version of the REST will enable chronically agrammatic speakers of Dutch to use elliptical constructions more frequently and whether this will bring about an increase in functional communication.

METHOD

With a *multiple single-case design*, we investigated the efficacy of the Dutch and adapted version of REST. Twelve Dutch-speaking adults with chronic agrammatism participated. Dependent measures of communicative performance and executive functioning were carried out at three points in time: before proceeding into REST, immediately after REST, and 6 months after therapy had been ended.

The three untrained communicative conditions that the participants were presented with were: the semi-standardized interview of the Aachen Aphasia Test (AAT), a picture description task with distracting environmental stimuli (PDT), and three games of *happy families* (HF) played with a significant other. The neuropsychological test battery to measure executive function consisted of the Stroop-Colour-Word Test, the Wisconsin Card Sorting Test, and the Tower of London Test. In addition, we investigated participants' acceptance of elliptical style and their awareness of hampered spoken language production.

Increases in the relative number of ellipses produced and their length were taken as primary measures of the effect of REST on grammatical output. The effects on functional communication were assessed as well. More specifically, the dependent outcome measure of communicative efficacy was the percentage of Essential Information Units (EIUs) that each participant expressed. Communicative efficiency was operationally defined as the number of EIUs produced per minute.

RESULTS

Learning to use elliptical style regularly

All agrammatic speakers ($N = 12$) were able to learn to overuse elliptical style during the 16 weeks of therapy. They successfully completed an average of 8 out of the 10 therapy levels.

Effects of REST on grammatical output

Across untrained communicative settings, 11 out of the 12 participants significantly increased the percentage of ellipses and/or their length. Even 6 months after ending the therapy programme, significant effects of REST on grammatical output could be established in 9 out of these 11 participants.

Individual differences

The participants using less preventive adaptation before proceeding into REST typically showed larger effects than those already using preventive adaptation to some extent. This held for the percentage of ellipses produced across untrained conditions, in the AAT, and in the HF.

Effects of REST on functional communication

Gains in communicative efficiency could be demonstrated in 89% of the participants who showed significant increases in elliptical style. With respect to communicative efficacy, significant improvements were observed as well; however, only in 38% of the participants who significantly elaborated elliptical style.

Possible disturbing and facilitating factors

We sought to specify the cognitive mechanisms that underlie individual differences in the effects of REST. The less agrammatic speakers used elliptical style before proceeding into therapy, the more they were likely to: (a) accept elliptical style (significant), (b) have

knowledge of their hampered spoken language production (n.s.), and (c) have relatively unimpaired executive functioning (n.s.).

DISCUSSION

The more non-preventive speakers not only showed significantly larger effects of REST, but also had somewhat better skills to apply elliptical style than the ones already using ellipses regularly before REST. This leads to the question why the former, who wanted and were able to use elliptical style more, needed REST to actually do so. There seem to be two neuropsychological factors in this paradox: acceptance of elliptical style and executive functioning.

To start with acceptance of elliptical style, it seems quite possible that REST provided the more non-preventive speakers with an efficient style of speech, which they may have been unaware of before. The fact they could learn to use ellipses on a regular basis with relative ease may have increased their acceptance of this style of speech. It may also explain why they applied it more often after therapy.

A second aspect of the paradox relates to executive functioning. It is surprising that the more preventive speakers, who seem to be more limited in executive functioning, already initiated elliptical style frequently before proceeding into therapy. Two explanations suggest themselves. A first explanation is that they have already learned to suppress the prepotent response to produce a sentence, whereas the more non-preventive speakers have not. An alternative explanation is that, with increasing difficulty in sentence production, the prepotent response to produce sentences may be more easily suppressed. Hypothesising that preventive speakers are more seriously hampered in sentence production than non-preventive speakers, the former may meet the goal of employing ellipses regularly with less effort.

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