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'All the better for not seeing you': Effects of communicative context on the speech of an individual with acquired communication difficulties

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ABSTRACT

Evidence shows that speakers adjust their speech depending on the demands of the listener. However, it is unclear whether people with acquired communication disorders can and do make similar adaptations. This study investigated the impact of different conversational settings on the intelligibility of a speaker with acquired communication difficulties. Twenty-eight assessors listened to recordings of the speaker reading aloud 40 words and 32 sentences to a listener who was either face-to-face or unseen. The speaker's ability to convey information was measured by the accuracy of assessors' orthographic transcriptions of the words and sentences. Assessors' scores were significantly higher in the unseen condition for the single word task particularly if they had heard the face-to-face condition first. Scores for the sentence task were significantly higher in the second presentation regardless of the condition. The results from this study suggest that therapy conducted in situations where the client is not able to see their conversation partner may encourage them to perform at a higher level and increase the clarity of their speech.

Learning outcomes: Readers will be able to describe: (1) the range of conversational adjustments made by speakers without communication difficulties; (2) differences between these tasks in offering contextual information to the listener; and (3) the potential for using challenging communicative situations to improve the performance of adults with communication disorders.

1. Introduction

Do individuals with acquired communication difficulties make conversational adjustments to benefit their listeners? Many studies have demonstrated that in numerous ways proficient speakers adapt what they say and how they say it depending on circumstances, the cognitive demands of the task and/or the demands of the listener (Bell, 1984; Cameron-Faulkner, Lieven, & Tomasello, 2003; Uchanski, Choi, Braida, Reed, & Durlach, 1996). However, few studies have investigated whether individuals with acquired communication difficulties, who have had normal competencies in language prior to brain injury, modify their speech in order to aid listeners' comprehension. In the present study, we examine whether a woman with acquired aphasia and associated motor speech difficulties speaks differently when she sees the listener and when she does not.

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A speaker's speed of delivery, articulatory precision, complexity of grammatical structure and choice of vocabulary are modified by factors such as task demands and the communicative context. An obvious example would be if the speaker was describing a new and complex task, then he or she would take care to select the appropriate vocabulary and syntax to provide the detailed information required for the task to be completed accurately. Whether information is new or not has also been shown to affect articulation; words that are new tend to be produced with more care, while words that are predictable, either from being heard before or from the linguistic context, are often produced less clearly with shorter durations, reduced vowel spaces and dropped phonemes (Aylett & Turk, 2006). These articulatory changes observed in conversation have not been found when individuals have read words in a list (Fowler, 1988), which suggests that tasks with higher cognitive demands have an effect on articulatory precision.

The listener's needs and knowledge also have been shown to be taken into account when speaking. A range of factors, including the age and language proficiency of the listener have been found to affect the semantic, syntactic and phonetic forms used by the speaker. For example, speakers adjust the complexity of an utterance according to the listener's age (Cameron-Faulkner et al., 2003); select a language code appropriate to the listener's socioeconomic status (Bell, 1984); rephrase or give additional information to utterances if they have not been understood (Goodwin & Heritage, 1990); and adopt a hyper-articulated style of speech when talking to someone who has a hearing impairment (Uchanski et al., 1996).

The term clear speech has been used to refer to the way in which talkers adjust their speaking style to maximise intelligibility for a communication partner (Smiljanic & Bradlow, 2009). A number of acoustic changes have been identified as relating to clear speech production; including expanded vowel space area (Bradlow, Torretta, & Pisoni, 1996), slowed speech rate (Bradlow, Krause, & Hayes 2003) and increased vocal intensity (Dromey, 2000). Aylett and Turk (2006) suggest that there are two opposing constraints affecting the care with which people speak: communicating effectively and using articulatory effort efficiently. Similarly, Lindblom (1990) observed that speakers varied their pronunciation along a continuum of hyper-articulation to hypo-articulation depending on the listening conditions. Hyper-articulation, which involves pronouncing words more clearly than normal, is used when the listening conditions are difficult and the speaker believes the listener needs more acoustic information to understand what is being said.

As articulating words precisely requires effort, it is unlikely that this would be the speaker's usual speech style in conversation. However, a variety of instructions either focusing on the speaker's performance (e.g., 'speak clearly' or 'hyperarticulate') or the listener's experience (e.g., 'speak to someone with a hearing impairment') has been shown to elicit clear speech. Recent research suggests that the wording of the instruction affects the particular acoustic adjustments made by the speaker, possibly because it focuses the speakers' attention to different parameters in speech processing. In their study of four different speaking conditions (habitual, clear, hearing impaired, and overenunciate), Lam, Tjaden, and Wilding (2012) found that instructing healthy young adults to overenunciate was the most effective cue, eliciting the greatest changes in vowel production and speech timing. In contrast, the instruction to 'speak to someone with a hearing impairment', appeared to be more effective in increasing vocal intensity. Further studies are needed to establish whether these findings translate to clinical populations, such as people with acquired communication difficulties, or indeed if such changes would increase their intelligibility.

Many studies have demonstrated that visual cues, such as facial expression and gesture, play an important role in the communicative exchange, supplementing or occasionally overriding the speech signal. Such cues help both the listener and the speaker. When the listener can see the speaker's face, speech intelligibility increases (Garcia & Dagenais, 1998; Keintz, Bunton, & Hoit, 2007) and when the speaker can see the listener's face they have a better idea of whether the message has been transferred successfully. These studies suggest that communication is likely to be less efficient in situations where the conversational partners are unable to see one another. However, there is evidence that speakers are sensitive to the needs of the listener in these conditions and adapt their speech accordingly. Adaptations include increased numbers of words (Boyle, Anderson, & Newlands, 1994), and more filled pauses (e.g., "um" and "uh") when they could not see the listener (Rimé, 1982). Other evidence shows that speakers may also make articulatory changes. In Anderson, Bard, Sotillo, Newlands, and Doherty Sneddon's study (1997) transcription accuracy was better for recordings of speakers where they could see the conversational partner versus when the conversation partner was unseen. We are not aware of any published research on whether people with acquired communication disorders make similar adaptations to their speech.

The presence of dysarthria in a speaker has been shown to have a large impact, both acoustically (Kent & Netsell, 1975; Kent, Netsell, & Abbs, 1979; Kent, Kent, Weismer, & Duffy, 2000; Weismer, Martin, Kent, & Kent, 1992) and perceptually (Mackenzie & Lowit, 2007). The intelligibility of a speaker is influenced by a range of factors, including the severity of the motor speech impairment (Yorkston & Beukelman, 1978) and the familiarity of listeners to the speaker and the speech impairment (Beukelman & Yorkston, 1980). A number of studies have shown that the intelligibility of speakers with dysarthria is affected by communicative gestures, the predictiveness of the message, and the relation of the message to specific contexts (e.g., Garcia & Cannito, 1996). Moreover, intelligibility scores were found to be higher when listeners were presented with audio–visual recordings than audio only recordings, suggesting that they utilised information available through visual speech to compensate for lost acoustic information in the degraded speech signal. These studies suggest that speakers with dysarthria are easier to understand in face-to-face conditions. However, in these studies, the speakers themselves were not involved in conditions that required them to take into account the needs of the listener; the type of recording constituted the two different listening conditions. Therefore, it is not possible to determine from these findings whether individuals with acquired communication difficulties, such as dysarthria and aphasia, retain the ability (i) to