

A Study of Emotional Processing in Parkinson's Disease

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This study investigated three aspects of processing materials with emotional content in patients with idiopathic Parkinson's disease (PD): the ability to produce affective prosody, to discriminate affectively loaded speech, and to detect the surprise element in humorous sketches. Study aims were the characterization of an emotional processing deficit, and to test whether impaired emotional processing is mental state dependent. Forty-eight nondemented PD patients were divided according to neuropsychological criteria into a sample with intact mental functions and a sample with mild to moderate cognitive deterioration, particularly memory impairment. PD patients with intact cognitive functions were solely impaired at producing affectively loaded sentences, but otherwise displayed normal emotional processing abilities as compared to a clinical control group. PD patients with mental impairment were significantly disabled on all three tasks. The observed emotional processing deficit was not related to variables like age, disease duration, degree of functional impairment, motor disability or depression. Active and receptive emotional prosody were significantly correlated. Further strong positive correlations were found between the ability to disclose pictorial humour and tasks of visuo-conceptual knowledge, as well as between the ability to produce affectively loaded speech and years of schooling. These results were interpreted as indicating that not only the production of emotional prosody, but also its recognition and the discovery of pictorial humour are reduced in a subgroup of PD patients with mental impairment. Impaired emotional processing skills are mental state dependent findings in PD which seem to be independent from demographic or disease variables and may indicate beginning dementia. © 1998 Academic Press

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INTRODUCTION

Emotional dysprosody (EDP), the inability to vocally express feelings like excitement, anger and sadness, but also intentions in verbal communication

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such as interrogations, the production of verbal humour or vocal imitation is a frequent symptom in Parkinson's disease (PD). Patients with EDP have been described as producing monotonous, flat and poorly inflected speech. Their utterances lack melodic intonation due to a reduction in vocal pitch, stress, and timing and typically induce the impression among hearers that the speaker is emotionally indifferent (Kent & Rosenbek, 1982). Studies of EDP in PD have come to conflicting results as to its concept and associated findings. Some authors favor the idea that dysprosody is a particular motor symptom in PD, independent from the speaker's mental and affective status (Ackermann & Ziegler, 1989; Hertrich & Ackermann, 1993) mainly resulting from akinesia-induced mechanical impairment of the vocal cords; however, these studies have concentrated on prosody production in PD. Other studies have described EDP as a deficit of expressive speech which, however, is not associated with a failure to understand the emotional content of perceived utterances (Darkins & Fromkin, 1988; Caekebeke et al., 1991). A third line of results has found both comprehension and production of affective prosody diminished in PD (Blonder et al., 1989; Scott et al., 1984). Further issues regard the specificity of EDP in PD. Several investigations have demonstrated that PD patients may have problems understanding the affective content of facial expressions, verbal humor or music (Blonder et al., 1989; Scott et al., 1984; Jacobs et al., 1995). It is therefore unclear, whether EDP is a deficit confined to speech, or part of a more general impairment comprising the processing of various emotional stimuli. Furthermore, it also remains to be determined whether EDP is among those cognitive impairments such as loss of memory, visuospatial skills, and regulative behavior occurring with relatively high disease specificity even in nondemented PD patients (Caltagirone et al., 1989; Taylor & Saint-Cyr, 1995), or whether EDP is a predominantly mental state dependent deficit similar to that found in Alzheimer's disease (Albert et al., 1991). Finally, depression, a frequent co-occurring symptom in PD (Celesia & Wanamaker, 1972; Boller, 1980; Gotham et al., 1986), may also play an important but at present not a clearly defined role in the processing of emotional stimuli.

Taken together, the concept of EDP in PD is controversial and poorly understood, even more as most prior studies of EDP have covered only selective aspects of dysprosody, such as the characteristic impairments of motor speech, of linguistic or neurological features and were therefore inappropriate to detect correlational factors of EDP. Also, studies of neuropsychological deficits in PD, especially of EDP, have frequently been hampered by substantial variations in diagnostic criteria, group size, definitions of neuropsychological abnormality, matching of groups for levels of cognitive impairment, and attention to potential confounding factors such as therapy regimes and motor fluctuations. The principal aims of this investigation were (a) to describe two aspects of emotional processing, namely affective pros-

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