

The Study of Non-Verbal Behaviour has Potentialities to Enhance the Relationship between the Individual and their Environment in People with Parkinson's Disease

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Abstract

Parkinson's disease (PD) is a neurodegenerative disorder which ranks second in prevalence to Alzheimer's disease and is characterized by motor and non-motor symptoms. Along with the most traditional description, motor symptoms include verbal behavioural problems, like voice changes and articulation alterations, as well as non-verbal behavioural difficulties, such as changes in face expression, lack of fluidity in body movement and abnormal body posture. All of these can cause people to feel really uncomfortable when struggling with communicational situations. The aim of this study is to extend previous investigations on communication in PD, first by exploring the non-verbal behaviour in a sample of PD patients, and second by framing our results in the theoretical background of paradoxical kinesia in PD. We developed an analytical description of videotaped behaviour of PD patients during therapeutic theatre sessions, along with the application of PDQ-39. Our results make it possible to conclude that this group of people with PD do not perceive communication as a problem they have to deal with frequently. However, there are some particularities about communication probably associated with people's difficulties with movement and its emotional and social consequences. This is in line with the behavioural analysis in which people with PD showed preserved communicational abilities and compensatory strategies, which were effective to communicate messages and feelings. Our results allow us to suggest that people with PD have preserved capabilities to express themselves in communicational settings. This is consistent with the occurrence of paradoxical kinesia, that is, the possibility that people with PD may act as if they did not have the movement disorder, given the appropriate environment and their preserved capabilities.

Introduction

Behaviour is the output of neural processing executed by the activity of glands and muscles in the body and manifested in time and space. It has at least three qualities: (a) behaviour is relational, (b) dynamic, and (c) high dimensional [1].

The term 'relational' refers to the interplay between the living organism and the environment in which behaviour occurs. Here, communication is an essential component [2].

We assume that body movement is the instrument of behaviour [3] and that non-verbal communication comprises the observable aspects of non-verbal behaviour that provide clues both to members of the interpersonal communication and to the actor and the observer [4].

Parkinson's disease (PD) is a neurodegenerative disorder, which ranks second in prevalence to Alzheimer's disease. Its prevalence increases with the age of the population considered [5]. The disease is characterized by a compromise in movement. Its symptoms include rigidity, resting tremor, postural reflexes alteration, mood disorders mainly depression and problems with body expression, all of which raise the risk of facing difficulties during interpersonal communication [6]. In fact, motor symptoms in people with PD include verbal behavioural problems, like voice changes and articulation alterations [6], and non-verbal behavioural difficulties, like changes in face expression, lack of fluidity in body movement, and abnormal body posture [7,8]. There are other possible sources of communication problems, such as an impairment of emotional processing. These affective abilities have been studied, for example, by assessing the recognition of facial emotions [9-12], with varying results [13,14].

It is worth noting that not all the people with PD face these difficulties or endure communication problems to the same degree. There is no cure for PD, and so compensatory and remedial strategies have to be implemented in therapeutic settings to help people cope with the disease.

Although PD affects movement, people are still able to move, because the disease does not prevent movement per se but its modulation. Moreover, people with PD can move as if they did not

have Parkinson, an effect called paradoxical kinesia. First described by Souques in 1921 [15], paradoxical kinesia is a common feature of the motor system [16], which has been investigated in several papers [17-20]. As a phenomenon, the occurrence of paradoxical kinesia requires the relationship between the individual and his or her environment. The individual has movement in potentiality and is able to benefit from the environmental affordances in order to move his or her body [21].

The aim of this study is to extend previous investigations on communication in PD, first by looking into non-verbal behaviour in a sample of PD patients, and second by framing our results in the theoretical background of paradoxical kinesia in PD.

Methods

We worked with a convenience sample of people with Parkinson's disease ($n=6$) with medium to moderate severity (Hoehn & Yahr 2-3, one participant 4) [22,23], recruited from the group of people with PD who attend the Parkinson's Workshop.

The patients participated in the study during the "on" state, the period in which the effect of the antiparkinsonian medication mainly levodopa is optimum.

We developed an analytical description of behaviour (for methodological directions) [24-28]. Behaviour was recorded by the author with a Flip Slide HD video camera and then reproduced with the aid of the ELAN 4.9.2. system. The recordings took place in the Parkinson's Workshop setting, where participants were performing body expression and theatre activities.

Knowing that body movement can be closely related to the person's emotions [29,30] and interpersonal communication [6], we explored the participants' quality of life using the Parkinson's disease Questionnaire, PDQ-39 [31]. The PDQ-39 is a measure of subjective health status for PD patients, which includes eight dimensions: mobility, activities of daily living, emotional well-being, stigma, social support, cognitions, communication and bodily discomfort [32].

Ethic Note: We followed the recommendations of the Declaration of Helsinki: Ethical principles for medical research involving human subjects [33].

Results

Descriptive categories

We developed descriptive categories based on an ad hoc integration of types of gestures selected from previous studies and adapted to the videotaped samples of behaviour.

Some non-verbal behaviours are called co-speech gestures, that is, spontaneous arm and hand movements, frequently produced while speaking, which add relevant information to what is said verbally [34]. We used the Cleary et al [34] and Humphries et al [35] classification of co-speech gestures, including four types: (a) deictic, (b) pragmatic, (c) metaphoric, and (d) iconic.

We also selected (a) the smile categories and the direction of gaze from Picairn et al [8], (b) other facial expressions [8,25], and (c) the self-manipulative gestures from Ekman & Friesen [36].

The types selected were adapted to form our descriptive corpus of

gesture categories together with the consideration of the actor's point of view [35].

Humphreys et al. [35] studied the point of view the person's co-speech gestures adopted when describing actions. The authors assumed that the first-person point of view -the character viewpoint was a situation in which the motor imagery affected in PD patients was maximized and was the most common position adopted by the controls without PD. The third-person point of view the observer viewpoint exploited the visual imagery and was the most prominent point of view adopted by PD people in their study.

Analysis of behaviour

We analysed 17 short fragments of videotaped gestural behaviour without words and 15 short fragments with words. We focused on co-speech gestures frequency and quality smiles and its sub-types, other facial expressions, the actor's point of view, and the word and gesture rate.

Our observations showed that there was a quantity and a variety of gestures in the behaviour of participants. The quantity of gestural behaviour registered was not scarce and the gestures were complete, synchronous with themselves and with the speech, coherent in relation to sense, and with a median grade of fluidity. Gestures were rather complex and showed some amplitude with regard to the position of the body.

These parameters were different among the participants and varied depending on whether the performance was accompanied by speech or not, showing individual differences regarding the benefit or limitation of using verbal language and body gesture.

Participants were able to use the first-person perspective when gesturing, similar to what controls without PD and occasionally PD patients did in the study by Humphreys et al [35]. According to these authors, people with PD could represent actions mostly by the third-person point of view, and this finding was related to the difficulty these people showed when using motor imagery. Therefore, Humphreys et al. results are different from ours, since we found that people with PD adopted the first person perspective very frequently when describing actions.

Unlike the results of Duncan et al. [37], one of whose observations was the difficulty PD patients had with synchrony between speech and movement, we observed that the patients were able to develop a gestural behaviour whilst speaking that showed coherence in time and sense.

We observed a high frequency of pragmatic gestures, followed by iconic and deictic gestures, and some self-manipulators, which differs from the decrease of co-speech gestures and gestures in PD patients' own body reported by Pitcairn et al. [8]. Besides, in our sample the direction of the gaze showed efficacy for communicating messages. Indeed, the participants were able to exploit the possibilities of using their gaze to overcome their difficulty with communication due to the lack of movement fluidity and the alteration of facial expression.

It is worth highlighting the patients' ability to use the direction of gaze for communicational purposes, considering that the direction of gaze is a category used both in the study of kinesics and proxemics and is related to the language pattern and physical proximity between the actors [38].

The smiles were spontaneous, and not only happy but also sceptical, among other types. This finding was not consistent with the findings of Pitcairn et al. [8], for whom the majority of smiles in patients were phoney with very little presence of other kinds of smiles [39-41].

The word and gesture rates were very different among the participants, depending on the demands of the situation represented and on other variables, such as the person’s mobility and his or her difficulty in performing improvised fictional situations [42,43].

Data from quality of life

We report here the results of the PDQ-39 dimensions that, according to the content of the items, were most relevant to our work. One of the participants did not answer the PDQ-39; therefore we report the results from the other 5 participants. Although our sample is small, we decided to show the results using the media and standard deviation, which are reported in brackets, considering that each item has 5 alternative answers never, occasionally, sometimes, often and always numbered from 1 to 5 respectively (Table 1).

Regarding stigma, the feeling of having to conceal PD from other people was more or less frequent (2,4[1,7]), as was the case

when avoiding situations which involve eating or drinking in public (2,4[1,1]). Fewer times they felt embarrassed in public at having PD (2[1,3]), and they felt still less worried by other people’s reaction to them (1,6[0,9]).

As regards social support, they only occasionally had problems with their close personal relationships (1,3[0,5]). Still less was the frequency of feeling lack of support in the way they need from their spouse or partner (1,2[0,9]), and from their family or close friends (1,4[1]).

With respect to communication, the participants answered that they sometimes had difficulty with their speech (2,2[0,8]), fewer times they felt unable to communicate with people properly (1,8[1,1]), and with still less frequency they felt ignored by people (1,7[1,3]).

Besides, they manifested that they rarely felt isolated and lonely (1,9[1,3]), felt depressed (1,8[1,2]), anxious (2,1[1]), and worried about their future (2[1,3]). They answered that more or less frequently they felt frightened or worried about falling over in public (2,3[1,4]). They were sometimes confined to the house more than they would like to be (2,5[1,5]). They occasionally needed someone else to accompany them when they went out (2[1,5]), and sometimes they had difficulty doing leisure activities (2,5[1]) (Table 1).

Conclusions

Our results allow us to conclude that this group of people with PD do not perceive communication as a problem they have to deal with frequently. However, there are some particularities about communication that they feel occur with some frequency in connection to their lack of confidence in public spaces and the relationships with their context. This is possibly associated with their difficulties with movement and its emotional and social consequences.

The fact that our sample of people with PD feel that they scarcely have problems with stigma, social support, and movement in social settings is consistent with the behavioural analysis in which people with PD showed preserved communicational abilities and compensatory strategies, which were effective to communicate messages and feelings. However, they did not feel completely free from communicational problems, according to what they answered in the quality of life scale. This is a very complex issue that requires much further qualitative and quantitative research in samples of PD patients around the world, along with research on the subjective experience of people with their own body - as an instrument of communication - and the body of others during interpersonal relationships.

Our results make it possible to suggest that people with PD have preserved capabilities to express themselves in communicational settings. This is consistent with the occurrence of paradoxical kinesia, that is, the possibility that people with PD may act as if they did not have the movement disorder, given the appropriate environment.

People with PD will be able to use the environmental affordances to help their body movement. We call affordances to a relational property of the environment, which means that the environment has resources that provide the individual with opportunities to behave through his or her perception. It is the relationship between the environmental object and the individual perception that constitutes the affordance (39). The occurrence of paradoxical kinesia in PD patients can be the result of this relationship.

Table 1: Results from PDQ-39 items.

Item*	Dimension	Results**
Felt you had to conceal your Parkinson's from people?	Stigma	2,4[1,7]
Avoided situations which involve eating or drinking in public?	Stigma	2,4[1,1]
Felt embarrassed in public due to having Parkinson's disease?	Stigma	2[1,3]
Felt worried by other people's reaction to you?	Stigma	1,6[0,9]
Had problems with your close personal relationships?	Social support	1,3[0,5]
Lacked support in the ways you need from your spouse or partner?	Social support	1,2[0,9]
Lacked support in the ways you need from your family or close friends?	Social support	1,4[1]
Felt depressed?	Emotional well-being	1,8[1,2]
Felt isolated and lonely?	Emotional well-being	1,9[1,3]
Felt anxious?	Emotional well-being	2,1[1]
Felt worried about your future?	Emotional well-being	2[1,3]
Had difficulty with your speech?	Communication	2,2[0,8]
Felt unable to communicate with people properly?	Communication	1,8[1,1]
Felt ignored by people?	Communication	1,7[1,3]
Had difficulty doing the leisure activities which you would like to do?	Mobility	2,5[1]
Needed someone else to accompany you when you went out?	Mobility	2[1,5]
Felt frightened or worried about falling over in public?	Mobility	2,3[1,4]
Been confined to the house more than you would like?	Mobility	2,5[1,5]

*General indication: Due to having Parkinson's disease, how often during the last month have you....

**Media [standard deviation]

We think that our study-while limited and non-controlled-provides empirical evidence to support the idea that paradoxical kinesia is a quality of the perceptive-motor system that a complementary therapeutic strategy can take advantage of to enhance mobility in people with PD (40). Indeed, we consider paradoxical kinesia as a window of possibility for people with PD in the context of a chronic illness.

The phenomenon of paradoxical kinesia can serve to design a therapeutic strategy to improve communication by exploiting the individual's potentiality to move and the opportunities the environmental affordances can offer. We think that it is possible to develop a therapeutic environment with a strategic display of affordances to help people with PD to enhance their movement. Indeed, there have been some reports of experiences in which the expressive arts contribute to creating affordances in a therapeutic environment (41-43).

Although with limited scope and generalization, we hope that, from an anthropological-behavioural point of view, our research contributes to the construction of an interdisciplinary and multi-dimensional perspective on Parkinson's disease. This perspective will ultimately help the people who live with PD to improve their quality of life and feel comfortable with themselves in interpersonal communication.

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References

- Gomez-Marin A, Paton JJ, Kampff AR, Costa RM, Mainen ZF. Big behavioral data: psychology, ethology and the foundations of neuroscience. *Nat Neurosci*. 2014; 17:1455-1462.
- Lahitte HB, Hurrell JA. Ideas sobre conducta y cognición. La Plata: Nuevo Siglo; 1990.
- Birdwhistell R. Introduction. In: Kinesics and Context: Essays on Body Motion Communication. Birdwhistell R. (Editor). 5th reprint. University of Pennsylvania Press, USA; 1990; 13-16.
- Ekman P. A methodological discussion of nonverbal behavior. *J Psychol*. 1957; 43: 141-149.
- Pringsheim T, Jette N, Frolkis A, Steeves T. The prevalence of Parkinson's disease: A systematic review and meta-analysis. *Mov Disord*. 2014; 29: 1583-1590.
- Miller N, Noble E, Jones D, Burn D. Life with communication changes in Parkinson's disease. *Age Ageing*. 2006; 35: 235-239.
- Critchley M. Arteriosclerotic parkinsonism. *Brain*. 1929; 52: 23-83.
- Pitcairn TK, Clemien S, Gray JM, Pentland B. Non-verbal cues in the self-presentation of Parkinsonian patients. *Br J Clin Psychol*. 1990; 29: 177-184.
- Assogna F, Pontieri FE, Caltagirone C, Spalletta G. The recognition of facial emotion expressions in Parkinson's disease. *Eur Neuropsychopharmacol*. 2008; 18: 835-848.
- Clark US, Nearing S, Cronin-Golomb A. Visual Exploration of Emotional Facial Expressions in Parkinson's Disease. *Neuropsychologia*. 2010; 48: 1901-1913.
- Kan Y, Kawamura M, Hasegawa Y, Mochizuki S, Nakamura K. Recognition of emotion from facial, prosodic and written verbal stimuli in Parkinson's disease. *Cortex*. 2002; 38: 623-630.
- Yip JTH, Lee TMC, Ho S, Tsang K, Li LSW. Emotion Recognition in Patients With Idiopathic Parkinson's Disease. *Mov Disord*. 2003; 18: 1115-1122.
- Alonso Recio L, Serrano Rodríguez JM, Carvajal Molina F, Leoches Alonso A, Martín Plasencia P. Reconocimiento de expresiones faciales de emociones en la enfermedad de Parkinson: una revisión teórica. *Rev Neurol*. 2012; 54: 479-489.
- Wabnegger A, Ille R, Schwingenschuh P, Katschnig-Winter P, Kögl-Wallner M, Wenzel K, et al. Facial Emotion Recognition in Parkinson's Disease: An fMRI Investigation. *PLoS ONE*. 2015; 10: e0136110.
- Souques AA. Rapport sur les syndromes parkinsoniens. *Revue Neurologique*. 1921; 37: 534-573.
- Ballanguer B, Thobois S, Baraduc P, Turner RS, Broussolle E, Desmurget M. "Paradoxical Kinesia" Is not a Hallmark of Parkinson's Disease but a General Property of the Motor System. *Mov Disord*. 2006; 21: 1490-1495.
- Mazzoni P, Hristova A, Krakauer J. Why don't we move faster? Parkinson's disease, movement vigor, and implicit motivation. *J Neurosci*. 2007; 27: 7105-7116.
- Crucian G, Huang L, Barrett A, Schwartz R, Cibula J, Anderson J, et al. Emotional conversations in Parkinson's disease. *Neurology*. 2001; 56: 159-165.
- Keefe K, Salomone J, Zigmond M, Stricker E. Paradoxical kinesia in parkinsonism is not caused by dopamine release. *Arch Neurol*. 1989; 46: 1070-1075.
- Schlesinger H, Erikh I, Yarnitsky D. Paradoxical kinesia at war. *Mov Disord*. 2007; 22: 2394-2397.
- Bacigalupe MA, Tujague, MP, Castro LE. Las cualidades de los objetos influyen en el tiempo de reacción de las personas con Enfermedad de Parkinson. *Interdisciplinaria*. 2017.
- Bermejo Pareja F, Porta-Etessam J, Díaz Guzmán J, Martínez-Martín P. Más de cien escalas en neurología. Madrid: Aula Médica; 2008.
- Burgener SC, Berger B. Measuring perceived stigma in persons with progressive neurological disease: Alzheimer's dementia and Parkinson's disease. *Dementia*. 2008; 7: 31-53.
- Efron D. Gesto, raza y cultura. Buenos Aires: Nueva Visión. 1970.
- Ekman P. About brows: emotional and conversational signals. In: *Human Ethology*. von Cranach M, Foppa K, Lepenies W, Ploog D (Editors). University Press, Cambridge, UK. 1979; 169-249.
- Lahitte HB. Aportes teórico-metodológicos al estudio del comportamiento. Buenos Aires: Ramos Americana; 1981.
- Lahitte HB, Cascardi JJ. Sobre los gestos. Argentina: Nuevo Siglo; 1990.
- Lahitte HB, Ferrari H, Lázaro L. Etogramática: Teoría y práctica de la descripción en ciencias del comportamiento. Buenos Aires: Nobuko; 2005.
- Morita J, Nagai Y, Moritsu T. Relations between Body Motion and Emotion: Analysis based on Laban Movement Analysis. In: *Proceedings of the 35th Annual Conference of the Cognitive Science Society*. Knauff M, Pauen M, Sebanz N, Wachsmuth I, (Eds.). Cognitive Science Society, Austin, TX, USA. 2013; 1026-1031.
- Vaskinn A, Sundet K, Østefjells T, Nymo K, Melle I, Ueland T. Reading Emotions from Body Movement: A Generalized Impairment in Schizophrenia. *Front Psychol*. 2016; 6: 2058.
- Health Services Research Unit, Department of Public Health and Primary Care, University of Oxford. PDQ-39: Cuestionario calidad de vida en

- Enfermedad de Parkinson - Spanish translation and validation. Oxford, UK: University of Oxford; 1999.
32. Jenkinson C, Fitzpatrick R, Peto V, Greenhall R, Hyman N. The Parkinson's Disease Questionnaire (PDQ-39): development and validation of a Parkinson's disease summary index score. *Age and Ageing*. 1997; 26: 353-357.
33. World Medical Association (WMA). WMA Declaration of Helsinki - Ethical principles for medical research involving human subjects. 2013.
34. Cleary RA, Poliakoff E, Galpin A, Dick JP, Holler J. An investigation of co-speech gesture production during action description in Parkinson's disease. *Parkinsonism Relat Disord*. 2011; 17: 753-756.
35. Humphries S, Holler J, Crawford TJ, Herrera E, Poliakoff E. A third-person perspective on co-speech action gestures in Parkinson's disease. *Cortex*. 2016; 78: 44-56.
36. Ekman P, Friesen WV. Nonverbal Behavior. In: *Communication and social interaction*. Ostwald PF (Editor). Grune & Stratton, NY, USA. 1977; 37-46.
37. Duncan S, Galati A, Goodrich W, Olsen Ramig L, Brandabur M. Impairments in complex language and coverbal gestures in Idiopathic Parkinson Disease. In: *Twelfth Biennial Conference on Motor Speech: Motor Speech Disorders & Speech Motor Control*; 2004 March 18-21; Albuquerque, New Mexico.
38. Muñoz Carrión A. Comunicación corporal -kinésica, proxiémica. In: *Universidad Complutense de Madrid, Reyes R, director. Diccionario crítico de ciencias sociales. Tomos 1-4 [Internet]*. Madrid: Plaza y Valdéz; 2009.
39. Chamero A. An outline of a theory of affordances. *Ecol Psychol*. 2003; 15: 181-195.
40. Dillon JL, Bacigalupe MA, Pujol S, Moore ME, Mazza A. Metodología desarrollada para mejorar la calidad de vida de las personas con Enfermedad de Parkinson (EP) mediante la aplicación de los principios teóricos del fenómeno paradójico en el Taller de Parkinson (TdP). *Revista Científica de la Facultad de Ciencias Médicas 3rd Season*. 2010; 2.
41. Bega D, Palmentera P, Wagner A, Hovde M, Barish B, Kwasny MJ, et al. Laughter is the best medicine: The Second City® improvisation as an intervention for Parkinson's disease. *Parkinsonism Relat Disord*. 2017; 34: 62-65.
42. Dubois V, Bacigalupe MA. El espacio de teatro en el Taller de Parkinson. *Revista +E*. 2014; 4: 106-111.
43. Modugno N, Iaconelli S, Fiorli M, Lena F, Kusch I, Mirabella G. Active theater as a complementary therapy for Parkinson's disease rehabilitation: a pilot study. *ScientificWorldJournal*. 2010; 10: 2301-2313.