Motor imagery when watching dance in people with and without Parkinson's disease

Ashkan Karimi[1], Rebecca Barnstaple[1], Udichi Das[1], Danai Kokkinopoulou[1], Susan Marsh-Rollo[2], Xianze Meng[1], Jianna Neufeld[1], Devki Patel[1], Laurel J Trainor[2], Jody White Van de Klippe[3], Joseph FX DeSouza[1], Judith Bek[4,5]

[1]York University, Canada; [2]McMaster University, Canada; [3]Hamilton City Ballet, Canada; [4]University College Dublin, Ireland; [5]University of Toronto, Canada

INTRODUCTION

Dance and music activate multiple neural pathways and can provide therapeutic effects for people with **Parkinson's disease (PD).** Recent findings indicate that long-term dance participation may slow symptom progression[1], but little is known about neural mechanisms underlying effects of dance for PD.

Motor simulation through observation and imagery of movement may contribute to effects of dance in people with PD[2,3]. These processes are widely used within dance, and are known to activate the brain's motor system and facilitate movement. This pilot study explored the role of motor simulation in effects of dance for people with and without PD.

Aims of the study:

1. Compare neural activity while watching dance with and without motor imagery.
2. Compare movement (kinematics) while performing dance with and without motor imagery.

METHODS

Participants: People with PD (n=8) and without PD of a similar age range (n=12) attended a study at McMaster LIVELab.

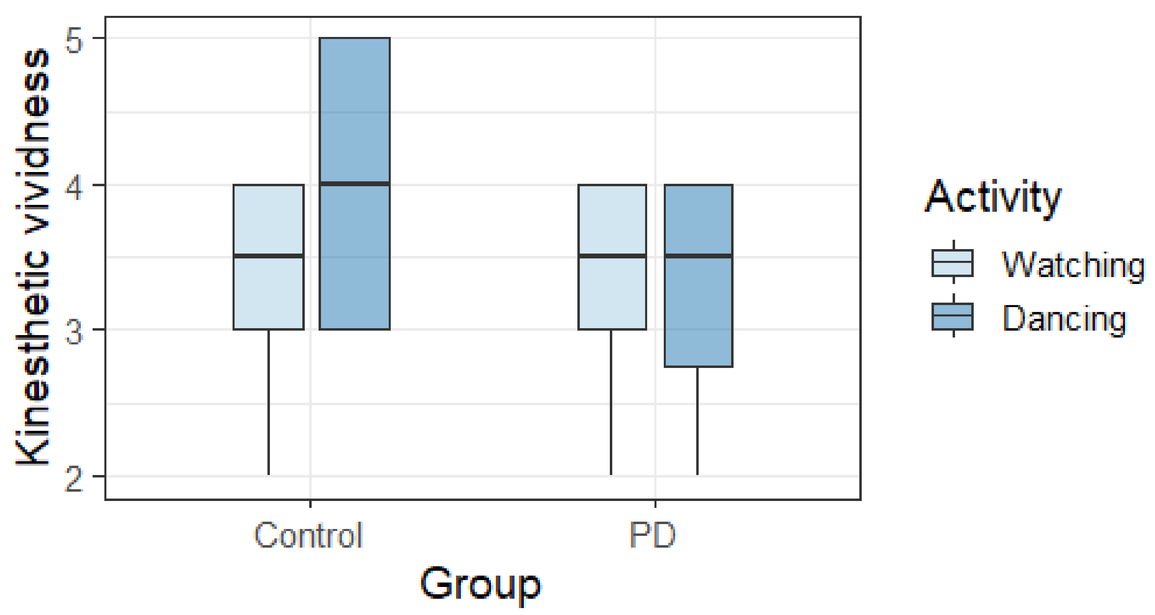
Measures: In **Part 1**, participants watched a dance choreography performed by an instructor while their brain activity was recorded with EEG.

In **Part 2**, participants watched and performed the choreography, while movement was recorded with a motion capture system.

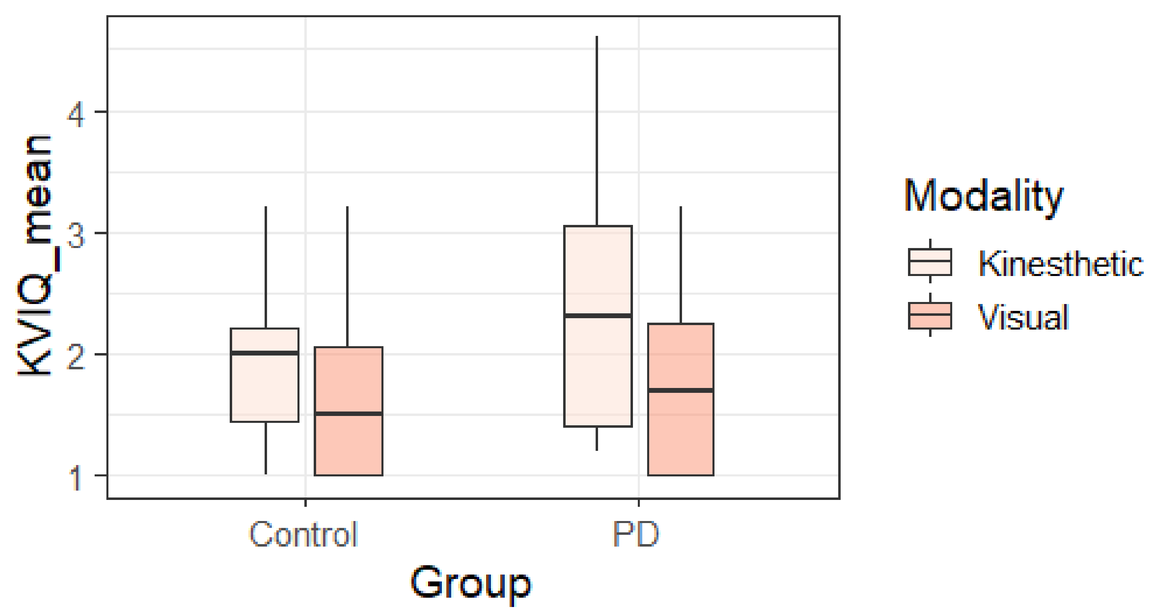
The choreography was demonstrated first without imagery, then with imagery-evoking narrative and instructions to imagine the dance. Participants rated their **imagery vividness** when watching the dance in Part 1 (watch only) and Part 2 (watch and perform).

RESULTS

Initial analysis showed that participants without PD (Control group) reported **increased kinesthetic imagery vividness** when watching before performing the dance (Part 2) compared to watching only (Part 1), while participants with PD did not show any significant change in vividness.



However, a general measure of motor imagery vividness (Kinesthetic and Visual Imagery Questionnaire; KVIQ) did not differ between groups in either visual or kinesthetic modality.



DISCUSSION

These initial findings suggest that PD may affect the ability to generate kinesthetic imagery to support movement when participating in dance, which could be an important consideration in designing therapeutic dance programs.

Analysis of neural activity and kinematics will provide further insights into the effects of motor simulation when watching and participating in dance.

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