

Brief report

Willed action in schizophrenia

Robyn Langdon^{a,b,c,*}, Jen McLaren^a, Vince Polito^a,
Max Coltheart^a, Philip B. Ward^{b,c,d}

^a Macquarie Centre for Cognitive Science, Macquarie University, Australia

^b Schizophrenia Research Unit, South Western Sydney Area Health Service, Australia

^c Cognitive Neuroscience Research Panel, Neuroscience Institute of Schizophrenia and Allied Disorders (NISAD), Australia

^d School of Psychiatry, University of New South Wales, Australia

Received 27 September 2004; received in revised form 30 October 2005; accepted 8 March 2006

Abstract

This study examined stimulus-driven and willed action in schizophrenic patients and healthy controls using an easy finger-tap task and a more demanding peg-placement task under unimanual, bimanual and dual-task conditions. Peg-placement externally cued by a metronome was also examined, as were practice effects. Patients with marked negative symptoms placed fewer pegs unimanually with and without practice and benefited most from metronome-cueing. Under dual-task conditions, when the participants placed pegs while concurrently finger-tapping, finger-tapping slowed down relative to unimanual scores in patients more than controls. Number of pegs placed also dropped off in controls and the patients with fewer negative symptoms. However, patients with more severe negative symptoms placed just as many pegs, and sometimes more, in the dual-task, compared to the unimanual, condition. These patients appeared to be using their finger-tapping just like an ‘external’ pacing-stimulus for peg-placement, thus rendering their peg-placement more stimulus-driven than willed. In contrast, patients with fewer negative symptoms and controls tried to self-generate maximal performance on both finger-tapping and peg-placement, with deleterious effects on both tasks. That the patients with marked negative symptoms performed best when their actions were more stimulus-driven than willed strengthens the case that negative schizophrenic symptoms reflect a disorder of willed action.

© 2006 Elsevier Ireland Ltd. All rights reserved.

Keywords: Self-generation; Apathy; Avolition; Motor control; Negative symptoms

1. Introduction

In recent years, schizophrenia has been characterised as a disorder of willed action. For example, Frith and colleagues (Frith, 1992; Jahanshahi and Frith, 1998; Frith et al., 2000) have proposed that an impaired ability to monitor, or to ascribe agency to, one’s own actions causes

the characteristic Schneiderian symptoms of schizophrenia (e.g., delusions of control, thought insertion). Less attention has been paid recently to the role of impaired initiation (as opposed to monitoring) of willed action in schizophrenia.

In his seminal book “The Cognitive Neuropsychology of Schizophrenia”, Frith (1992) proposed a model of stimulus-driven versus willed action in which he distinguished between a breakdown in the monitoring of willed action and a breakdown in the initiation of willed action. While the breakdown in monitoring of willed action purportedly explains the classic Schneiderian symptoms, the breakdown in initiation of willed action

* Corresponding author. Macquarie Centre for Cognitive Science, Macquarie University, N.S.W. 2109, Australia. Tel.: +61 2 9850 6733; fax: +61 2 9850 6059.

E-mail address: robyn@maccs.mq.edu.au (R. Langdon).

may explain the negative symptoms of schizophrenia (e.g., apathy, anhedonia). As far back as 1920, Krapelin described the characteristic feature of schizophrenia as a loss of volition (see, e.g., Liddle, 1994, for discussion). Liddle (1994) has also proposed that disordered initiation of willed action plays a primary role in schizophrenia. He reported that patients with chronic schizophrenia performed better on tasks that are externally constrained, such as word repetition, compared to tasks that require self-initiation, such as generating category exemplars.

More recently, Fuller and Jahanshahi (1999a) have investigated willed action in schizophrenia using a series of reaction time tasks. They found that patients with schizophrenia generally slowed down as the demand for volitional control increased. These researchers went on to test finger-tapping (an easy manual task) and peg-placement (a more demanding manual task) under unimanual, bimanual and dual-task conditions in chronic patients with schizophrenia and healthy controls (Fuller and Jahanshahi, 1999b). They found that, while the patients' scores were significantly lower than the controls' scores in the unimanual conditions, the patients improved their peg-placement and slowed down their finger-tapping in the dual-task condition relative to their unimanual performance. Controls, in contrast, performed more poorly on both finger-tapping and peg-placement relative to unimanual performances. These authors suggested that the patients were using their finger-tapping just like an 'external' pacing-stimulus for concurrent peg-placement, while the controls were trying to self-generate maximal performance on both tasks. In other words, peg-placement became more stimulus-driven than volitional in patients in the dual-task condition.

The present study aims to investigate peg-placement cued by an external pacing-stimulus (a metronome), in addition to the unimanual, bimanual and dual-task conditions for finger-tapping and peg-placement in chronic patients with schizophrenia and healthy controls. That patients and controls might benefit differentially from practice is also examined. If chronic patients with schizophrenia use finger-tapping like an external pacing-stimulus for peg-placement in the dual-task condition, their level of improved peg-placement (relative to unimanual scores) should be similar to their level of improved peg-placement cued by a metronome.

2. Method

2.1. Participants

Twenty-seven clinical participants (15 males, 12 females) were recruited from outpatient clinics of the

South Western Sydney Area Health Service. Twenty-two had a DSM-IV (American Psychiatric Association, 1994) diagnosis of schizophrenia and five were diagnosed with schizoaffective disorder. Mean age was 37.7 years (range 21–54). This was a chronic group with a mean illness-duration of 13.9 years (SD 7.3). Age of illness-onset ranged from 15–42 years (mean 23.7). All but one patient was receiving neuroleptic medication (five typical, 20 atypical, and one typical-plus-atypical combination). Twenty-two patients (82%) were right-handed. Fifteen healthy controls (7 females, 8 males), matched to the patient group on age, sex and IQ, were recruited from the general community and from amongst university students. Controls were screened using the affective, psychotic and substance abuse screening modules from the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I: First et al., 1996). Their mean age was 36.9 years (range 18–55). Thirteen (87%) were right-handed. Exclusion criteria for both groups included history of central nervous system disease or head injury, current substance abuse and less than 8 years of formal education.

2.2. Materials and procedure

Following administration of the National Adult Reading Test (NART: Nelson, 1982) to assess pre-morbid IQ, participants completed the following tasks:

- (1) Unimanual finger-tapping: Participants repeatedly tapped the right or left Shift-key on a standard computer keyboard using their right or left index finger as quickly as possible for 30 s. Order of hands was counterbalanced. The computer recorded the number of finger-taps per hand, which were then averaged.
- (2) Unimanual peg-placement: Participants placed pegs (3 mm × 25 mm) one after the other in a vertical row of the Purdue Pegboard using their right or left hand as quickly as possible for 30 s. Order of hands was counterbalanced. The experimenter recorded the number of pegs placed per hand, which were then averaged.
- (3) Bimanual finger-tapping: Participants finger-tapped with both hands simultaneously for 30 s. The number of finger-taps per hand was totalled and averaged across both hands.
- (4) Bimanual peg-placement: Participants placed metal pegs in two adjacent vertical rows using both hands simultaneously for 30 s. The number of pegs placed per hand was totalled and averaged across both hands.

Download English Version:

<https://daneshyari.com/en/article/332870>

Download Persian Version:

<https://daneshyari.com/article/332870>

[Daneshyari.com](https://daneshyari.com)