Why you can't be in sync with schizophrenia patients

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Abstract

Most individuals with schizophrenia will be confronted with some form of stigma. In recent years, clinicians and family members have increasingly contested the term "schizophrenia". Many of them discuss changing this name, as a means to fight stigma. Up until now, surprisingly, most research has been conducted using self-reports and behavioural research is lacking. The aim of our study was to assess through an experimental design if the term "schizophrenia" itself modifies social behaviours. Forty participants were asked to engage in a synchronization task with a dot displayed on a screen and moved by another person. Non-clinicians participants had to synchronize their movements as accurately as possible with either a schizophrenia patient, a patient with "neuro-emotional integration disorder" or a healthy subject, kept out of sight. Each condition was counterbalanced between participants. In fact, the movements of the dot were pre-recorded (five trajectories) and were therefore identical for all three conditions. Measuring the error between the displayed and performed trajectories, participants exhibited more errors when they thought they were interacting with a patient in comparison to the "healthy" subject. Post-hoc analysis revealed an even higher difference between "schizophrenia" and "healthy" conditions. Altogether, our results show a significant behavioral impact of the term "schizophrenia" with possibly negative consequences on social interactions. The effect of changing the name reduces this impact but remains unclear.

Keywords: Stigma, psychotic disorders, mirror game, stereotype, sociomotor behaviour, synchronization

Introduction

It is widely acknowledged that individuals with mental disorders are stigmatized and are subject to negative public attitudes (Angermeyer and Matschinger, 2003). Individuals with schizophrenia are the most negatively perceived, considered more dangerous and unpredictable than those with other mental disorders such as depression, autism or bipolar disorders (Angermeyer and Matschinger, 2003; Wood et al., 2014).

Stigma has dramatic consequences for patients, in particular reduced quality of life, recovery (Thornicroft et al., 2009), general functioning, or self-esteem (Gerlinger et al., 2013). Many means of fighting stigma have therefore been studied such as public campaigns (Clement et al., 2013) or hallucination simulators (Ando et al., 2011). In recent years, the term 'schizophrenia' has been increasingly contested by patients, family members, clinicians and researchers (Lasalvia et al., 2015). This could be of particular interest as individuals attribute characteristics to people based on their given name (Mehrabian, 2001) such as lower social status or negative impressions (Laham et al., 2012). This process called "name stereotype" (Zwebner et al., 2017) could extend to mental disorder labels such as *schizophrenia* and thus further encourage changing the name of schizophrenia for a less stigmatizing one. Japan was the first country to change the name of schizophrenia. After one year, 82% of psychiatrists found the new term more effective in reducing stigma and promising for social integration (Sato, 2006). Furthermore, recent research has explored how the activation of social constructs via priming can affect behaviour such as social interaction (Wheeler and DeMarree, 2009).

However to date no study has explored in a mental disorder if the label (e.g. *schizophrenia*) and the stereotypes associated with it could have a direct impact on social behaviour. Most of the past research on stigmatization has focused on self-report measures of stigma which can be influenced by social desirability biases; non-clinician individuals may be reluctant to reveal their negative attitudes towards individuals with schizophrenia.

Consequently, our study aimed to assess if the term *schizophrenia* itself impacts behaviour among the general public towards patients suffering from the disorder. We assessed the effect of the label stereotype *schizophrenia* on social interaction using a motor synchrony task. Motor synchrony is an objective tool widely used to measure

nonverbal quality of social interaction (Vicaria and Dickens, 2016) and refers here to an interaction task where participants have to synchronize as accurately as possible with a moving dot on a screen to evaluate effective social distance, a process underlying stigma (Won et al., 2018)

We also evaluated the impact of another term proposed by Levin to replace the label schizophrenia, namely "Neuro-emotional integration disorder" (NEID) (Levin, 2006) on the same motor synchrony task. We collectively chose this term among the different names proposed in European and North American countries where the term schizophrenia is still officially adopted. We expect the term *schizophrenia* to reduce the quality of motor synchronization.

Method

1. Participants

Forty healthy adults voluntarily participated in the study. They had no personal lifetime history of psychosis or affective disorder. Exclusion criteria were: (a) known neurological disease, (b) substance abuse in the past month, (c) people with schizophrenia (d) people with a family member suffering from schizophrenia and (e) to be a caregiver.

First, participants were told a cover story to ensure they were fully unaware of the real goal of the experiment. The experimenter told them that the psychiatric hospital was testing a new computer-based network allowing patients to play therapeutic video games from their rooms with their families and friends anywhere else. The game consisted in moving a dot on a screen with a handle to follow as accurately as possible the dot moved by the second player (a simplified "mirror-game" (Noy et al., 2011) designed for interpersonal coordination studies). Participants, facing the screen, were seated in front of an experimental apparatus allowing them to freely move the handle in the horizontal direction. The experimental protocol was divided into three rounds of five trials each. Before each trial, the participant was told by a message written on the screen to interact with either a patient suffering from schizophrenia (SZP), a patient suffering from a NEID or a healthy subject (CTRL). The order of presentation of the three

rounds was counterbalanced across participants. In reality, nobody was actually playing with the participant, only an artificial agent. During each round five pre-recorded trajectories of the dot were displayed randomly on the screen. The three rounds constituted our three experimental conditions and differed only by the text written on the screen.

2. Dependant variables

We measured the trajectory performed by the participants using a handle allowing free horizontal movements. Displacement was recorded with a spatial resolution of .054 cm and a sampling frequency of 100Hz. The error in performance was then calculated using the relative position error (RPE), a measure of the distance between the trajectory displayed on the screen and the trajectory actually performed by the participant (Słowiński et al., 2016).

3. Data analysis

Condition differences and interactions were analysed with repeated measures ANOVA. Post-hoc tests were used when the nature of the effects had to be specified. Size effects were reported using the partial eta squared η_p^2.

Results

Demographic characteristics are displayed in Table 1.

The 3 *Conditions* (SZP, NEID, CTRL) × 5 *Trajectory* ANOVA performed on the RPE revealed a *Conditions* main effect ($F_{(2,78)}=3.37$, $p=.039$, $\eta_p^2=.08$), a *Trajectory* main effect ($F_{(4,156)}=3.51$, $p=.009$, $\eta_p^2=.08$) and failed to show a *Conditions × Trajectory* interaction ($F_{(8,312)}=.68$, $p=.71$, $\eta_p^2=.02$). Newman-Keuls decomposition of the *Conditions* main effect showed only a significant difference between SZP and CTRL ($p=.033$), no significant difference between NEID and CTRL ($p=.10$) and between SZP and NEID ($p=.38$). This result indicates that participants exhibited higher errors when they thought they were interacting with a *schizophrenia* patient ($p=.033$) than with a healthy subject (Figure 1). Newman-Keuls decomposition of the *Trajectory* main effect showed that only one trajectory significantly differed from the two others ($p=.027$ and

p=.004 respectively). This shows that the effective level of difficulty between the five trajectories was mainly the same. Finally, the absence of a significant *Conditions ×Trajectory* interaction shows that the *Conditions* main effect was not affected by the level of difficulty of the trajectories.

Discussion

First, our medium to large main condition effect indicated that priming participants with the schizophrenia stereotype altered their motor performance. More precisely, participants exhibited more synchronization errors when they believed they were interacting with an individual with schizophrenia than with a healthy subject.. Thus, the term *schizophrenia,* without any face or any behavior of an individual person, modifies the participants' performance. This suggests that the stereotypes associated with the word "schizophrenia" affects behavior. These findings confirm a large body of research on prime-to behaviour effects showing that stereotypes can influence subsequent behavior (Chalabaev et al., 2013). Indeed, most published studies focused on self-report measures of stigma (Wood et al., 2014) with knowledge and attribution questionnaires or social distance scales. Researchers have become interested in automatically activated versus deliberately endorsed evaluations (Wittenbrink, 2007). In the domain of stigma, negative reactions towards people with mental illnesses can be activated automatically, potentially escaping conscious awareness or control, and can influence a range of subsequent behaviours. Automatic evaluations may be less susceptible to social desirability bias than explicitly reported attitudes and self-report measures (Wilson., 2002).

As proposed by Wyer et al (Wyer et al., 2010) priming a stereotype automatically induces typical interaction sequences that consist either in affiliation behaviours, or in avoidant-antagonistic behaviours (Cesario et al., 2006). As individuals with schizophrenia are considered more dangerous and unpredictable (Angermeyer and Dietrich, 2006), the avoidant-antagonistic behaviour may be the mechanism underlying altered motor synchronization induced by the term *schizophrenia*. In our protocol,

altered motor synchronization seems to reproduce increased social distance due to stigma as described in the literature.

We also explored the effects of activating another label (e.g. Neuro-Emotional Integration Disorder). Unlike the term *schizophrenia*, the term NEID did not result in a significant change in quality of motor performance. Interestingly, the motor performance was located in between both Schizophrenia and Healthy terms, without being significantly different from each of them. If one applies the theory of priming and induction of stereotype responsible for automatic behaviours to the use of a new term, we can hypothesize that the term NEID does not evoke anything concrete for the participants, as it does not exist. However, mentioning a "Disorder" might have however influenced sub-significantly participants behavior (p=.1). As no clear representations or concepts are associated with this term, it does not induce significant stereotype and does not generate automatic avoidant-antagonistic behaviours but a tendency (Corrigan et Watson., 2002).

Our study has some limits, including its small sample size (n=40). Moreover, although the link between motor synchrony and quality of social interaction is now well established, we did not directly assess social interaction. Indeed, this experimental protocol has limited « ecological » validity. However, our methodology with implicit measure avoids biases linked to self-reported questionnaires, particularly social desirability, and therefore adds to the existing literature about stigma in schizophrenia spectrum disorders.

Table caption

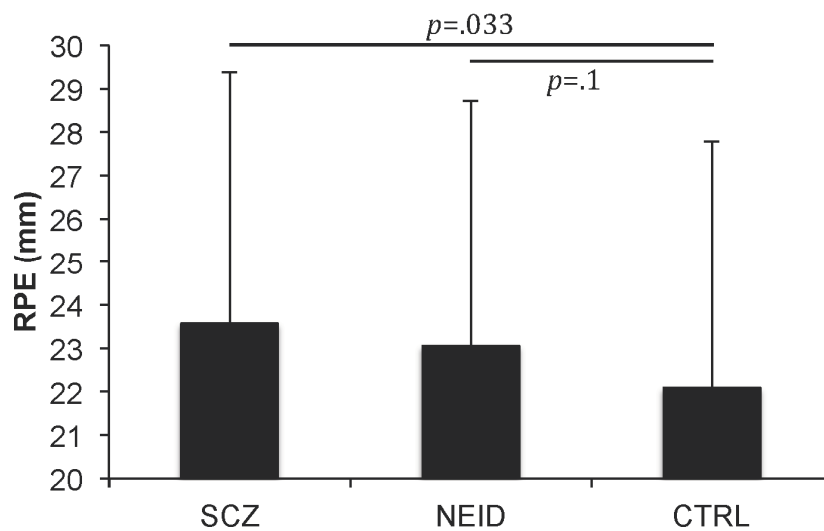**Table 1**

	M	SD	Med	Rg
Age	28,2	9,4	24,5	[21-62]
Level of education	14,7	2	15	[12-18]
	N	**%**		
Gender / Man	16	40		

Socio-demographic description of the participants
Mean, Standard deviation, Median and Range of values are presented for the Age and the Level of education.

Figure caption

Figure 1

Relative Position Error (RPE) in millimetre for the 3 *Conditions* (SZP, NEID and CRTL). Error bars correspond to the standard deviation of the corresponding condition. *p*-values corresponds to the Newman-Keuls test described in the results section

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