Are we having a laugh? Conversational laughter in schizophrenia

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Abstract

Social exclusion and social dysfunction are persistent and debilitating aspects of schizophrenia. The interactional impact of patients' social deficits during actual dialogue is poorly understood. Through analysis of a corpus of patients' triadic interactions we explored laughter as a marker of discomfort or coalition in patients' interactions. Patient interactions did not differ from controls in terms of laughter production. However, patients who were more symptomatic laughed less frequently, while their partners showed a trend for displaying more shared laughter, potentially indicating coalition formation.

1 Introduction

Schizophrenia patients have difficulty interacting with others and are one of the most socially excluded groups in society (Huxley & Thornicroft, 2003; Social Exclusion Unit, 2004). Although some of patients' social exclusion may be due to stigma from others, patients' interactional difficulties may further compound this problem. The nature of patients' social deficits remains unclear. Evidence from the field of social cognition suggests that patients with schizophrenia have difficulty perceiving and interpreting social cues from others such as those conveyed through verbal and nonverbal communication (Green, 2016). However, this evidence has been gathered from off-line pen and paper tests, which patients complete in isolation. Such tests are far removed from the social context they represent and it is unclear if patients' performance on these tests represents their social cognitive skills during actual dialogues with others. Furthermore, we know little about the impact patients' social deficits may have on others' perception of the interaction, their ability to engage in social interaction and develop relationships with them.

In order to explore such questions, we have collected a corpus of interactions involving patients with schizophrenia and unfamiliar healthy controls, who are unaware of patients' diagnoses, thus eliminating the element of stigma. Analysis of nonverbal communication in this corpus revealed that the undisclosed presence of a patient in a triadic interaction changed the nonverbal behaviour of patients' interacting partners (Lavelle et al., 2012), as well as patterns of filled and unfilled pauses (Howes et al., 2017). Furthermore, patients' increased gesture use when speaking was associated with their partners perceiving the interaction more negatively, reporting experiencing poorer rapport with patients (Lavelle et al, 2012). This suggests that patients' partners may experience difficulty on an interpersonal level when interacting with a patient.

Laughter can be as a marker of discomfort or awkwardness in social interaction (Haakana et al., 2002). In multiparty interaction, shared laughter may also indicate coalition between the laughing parties (Osvaldsson, 2004; Bryant, 2012). This study investigated laughter in the corpus of patients' triadic interactions, specifically examining shared laughter as markers of coalition formation.

2 Methods

2.1 Participants

The study consisted of two conditions: (i) a patient condition, comprising 20 patient groups (one schizophrenia outpatient and two healthy participants) and (ii) a control condition, comprising 20 control groups (three healthy participants). All interacting partners had not met prior to the study. Patients' partners were unaware of the patients' diagnosis and all participants were naive to the purposes of the study. Thus, the interactions were as naturalistic as possible within the motion capture environment.

2.2 Dialogue Task

Interactions were audio-visually recorded using two, 2-D video cameras and simultaneously motion captured in 3-D. Participants discussed a fictional moral dilemma called 'the balloon task', and reached a joint decision on the outcome. The task states that there are four people in a hot air balloon, the balloon is losing height and is going to crash into the mountains killing everyone on board. The only way to save the balloon is to select one person that can be thrown from the balloon, saving the lives of the remaining three. The four passengers are: Dr. Nick Riviera – a cancer research scientist, who believes he is on the brink of discovering a cure for most common types of cancer; Mrs. Susanne Harris – who is a primary school teacher and over the moon because she is 7 months pregnant with her second child; Mr. William Harris – the pilot of the balloon, and the only one on board with balloon flying experience, he is also the husband of Susanne, who he loves very much; Miss Heather Sloan – a 9 year-old music prodigy, considered by many to be a "twenty first century Mozart".

2.3 Symptom Assessment

Patients' symptom severity was assessed using the Positive and Negative Syndromes Scale (Kay et al., 1987). There are two main symptom groups in schizophrenia, positive symptoms referring to the additional aspects that patients experience such as hallucinations and delusional beliefs, and negative symptoms, which refer to the reduction in normal experience such as the expression and experience of emotions, motivation, social activity. Patients receive a score for each symptom group and an overall symptom severity score.

2.4 Interpersonal Rapport

Following the interaction all participants rated the level of rapport they experienced with each of their interacting partners on a scale of 1-10.

2.5 Dialogue annotation

Laughter was hand coded using the ELAN annotation tool. Each laughter event was categorised as 'shared laughter' – laughing at the same time as another interacting partner, or 'individual laughter' – laughter occurs alone, in the absence of laughter by others.

2.6 Analysis

The duration of laughter as a percentage of whole interaction was calculated for each individual. The frequency of laughter events (shared or individual) by interaction duration was also calculated for each individual. Participant types were compared using a mixed model regression analysis adjusting for triadic group. Correlational analysis examined the relationship between frequency of laughter events displayed by participants (shared and individual) and (i) patients' symptoms and (ii) rapport score received from others.

3 Preliminary Results

Patients or their healthy participant partners did not significantly differ from controls in terms of the frequency of shared or individual laughter they produced during the interaction (figure 1).
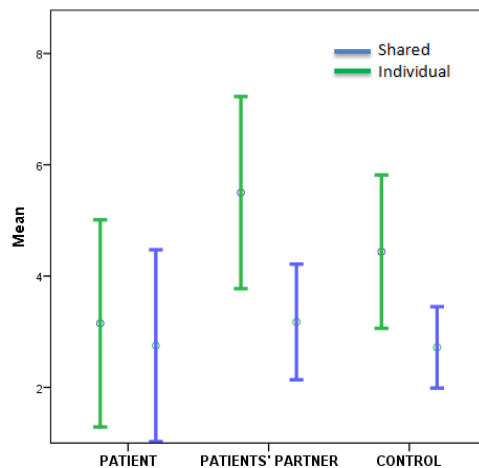

Figure 1. Mean frequency of shared and individual laughter events per second by participant type.

Patients with more negative symptoms (e.g. social withdrawal and diminished affect) laughed less frequently (Rho (20)=-.50, p=.03). Patients' increased positive symptoms (e.g. hallucinations and delusional beliefs) are associated with their partners displaying less shared laughter (Rho(40)=-.34, p=.03).

Control participants showed a significant positive association between their laughter duration and the rapport score they received from others (Rho(48)=.43, p=.001). This positive association with rapport was evident both for shared laughter (Rho(48)=.35, p=.01) and individual laughter (Rho(48)=.44, p=.002).

However, patients' partners who had a higher frequency of shared laughter events received a higher rapport score from others (Rho(25)=.46, *p*=.02). No other relationships between rapport and laughter in the patient condition were significant.

4 Discussion

The preliminary results showed no significant difference in the frequency or duration of laughter events in patient and control interactions. However, patients with more negative symptoms laughed less often, and patients' increased positive symptoms was associated with their partners displaying less shared laughter. This was seen despite patients having only mild to moderate symptom levels and displaying no overt symptoms during the interaction task.

A significant positive relationship between all forms of laughter (shared and individual) and interpersonal rapport was identified in control interactions. Although this relationship was not apparent in patients' interactions, shared laughter was associated with better rapport scores in patients' partners. However this may be mediated by patients' symptoms.

Overall it appears that the large variations in laughter presentation across all groups (figure 1), make it difficult to draw conclusions from this level of analysis. Patients' symptoms appear to influence their own production of laughter and the shared laughter of their partners. Furthering our understanding of the role of laughter in patients' interactions requires analysis at a more fine grained level, examining laughter in the context of when it occurs in the interaction, whether patients lead or follow in the shared laughter events, and the temporal relationship of laughter to specific conversational features such as turn-taking. This more comprehensive analysis will form the focus of this presentation.

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