

Comprehension of metaphor and irony in schizophrenia during remission: The role of theory of mind and IQ

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Abstract

The study reported herein explored the comprehension of metaphor and irony in schizophrenia during remission, and examined the role of IQ and a theory of mind. Performance of 29 Schizophrenic patients in remission and 22 healthy controls was compared on metaphor and irony comprehension tasks and first- and second-order theory of mind tasks. Participants' IQs were measured using the Wechsler Adult Intelligence Scale-Revised, and the symptoms of individuals with schizophrenia were assessed using the Positive and Negative Syndrome Scale. The results showed that patients with schizophrenia were impaired in their comprehension of metaphor and irony as compared with healthy controls. A theory of mind deficit was found in patients with remitted schizophrenia. The comprehension of metaphor was significantly correlated with second-order false belief understanding and the comprehension of irony was not significantly related to theory of mind. IQ and verbal IQ did not explain the deficit of metaphor and irony comprehension. These findings were not explained by Happé's [Happé, F.G.E., 1993. Communication competence and theory of mind in autism: a test of relevance theory. *Cognition* 48, 101–119] theory and the shared semantic understanding requirement was discussed.

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1. Introduction

In metaphorical and ironical speech, the actual meaning is not identical to the literal meaning, so the comprehension of non-literal language is different from literal language. For example, the understanding

of metaphor and irony requires that interpreters go beyond the literal meaning of words to infer the intended meaning of statements (Sperber and Wilson, 1986, 1998, 2002). In recent years, studies that have included symptomatically acute and remitted patients have investigated their comprehension of metaphor and irony. Research has indicated that patients with schizophrenia have difficulty in the interpretation of metaphor and irony, but study findings have been inconsistent (Mitchley et al., 1998; Langdon and Coltheart, 2004; Herold et al., 2002).

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Drury et al. (1998) found that schizophrenic patients who suffered from acute episodes of illness performed metaphor tasks, but not irony tasks, less competently than psychotic and depressed patients. Mitchley et al. (1998) found that patients with schizophrenia who were not in an acute episode of illness during test periods had specific difficulty in the understanding of irony compared with in-patient psychiatric controls. Herold et al. (2002) showed that remitted patients who had earlier suffered from acute paranoid schizophrenia, demonstrated statistically significant impairment in irony tasks, though not in metaphor tasks, as compared with normal control groups. Langdon et al. (2002a,b) investigated disturbed communication in schizophrenia and found that patients' understanding of irony and metaphor was selectively impaired relative to healthy controls. Symptomatic schizophrenic patients demonstrated a deficit in the comprehension of non-literal language, such as metaphor and irony. However, whether or not patients with schizophrenia can improve their understanding of irony and metaphor during remission was unresolved. The current study addresses this issue.

According to Sperber and Wilson's (1986, 1998) 'theory of relevance', the comprehension of non-literal language, such as metaphor and irony, not only involves semantic and syntactical decoding, but also requires non-linguistic inference. The appreciation of other mental states (e.g., knowledge, intention and belief) plays an important role in the understanding of speech content: for example, the understanding of irony requires an inference that a speaker's expressed intention is contrary to the surface meaning of the speech. The ability to infer and attribute mental states to others has been termed "theory of mind" (Premack and Woodruff, 1978) and is often assessed with the performance of first- and second-order false belief tasks (Wimmer and Perner, 1983; Perner et al., 1987). Happé (1993) demonstrated a strong theoretical relationship between theory of mind ability and an understanding of metaphor and irony. The ability to understand metaphor has been linked to a first-order theory of mind and the ability to understand irony has been linked to a second-order theory of mind. As metaphorical interpretation requires only limited understanding of a speaker's intentions, whereas ironical appreciation requires recognition of the speaker's understanding of a thought about the world, the comprehension of ironical speech requires a more sophisticated theory of mind ability than metaphoric speech (Happé, 1993, 1995; Langdon et al., 2002a,b). Colston and Gibbs (2003, Exp. 2) revealed that normal

people draw second-order meta-representational inferences about a speaker's intentions and beliefs in the understanding of irony but not of metaphor. Langdon et al. (2002a,b) concluded that a disruption to normal adult mind-reading processes causes selective difficulties with the interpretation of irony in schizophrenic patients and that highly sophisticated normal adult mind-reading processes are not necessary for the interpretation of metaphor. Inhibitory control is required for both theory of mind and for the normal interpretation of metaphor and irony. The role of theory of mind in the understanding of metaphor and irony requires further examination.

Studies have indicated that patients with schizophrenia may exhibit a theory of mind deficit (Frith, 1992; Doody et al., 1998; Frith and Corcoran, 1996). Mazza et al. (2001) showed that chronic patients with normal IQs performed significantly less competently than normal controls in first- and second-order false belief tasks. Frith and Corcoran (1996) found that patients with schizophrenia in their remission group performed less competently than normal controls in second-order false belief tasks, but as competently as normal controls and psychiatric groups in first-order false belief tasks. They argued that patients with theory of mind deficits may make modest recoveries during remission (Frith and Corcoran, 1996). Pickup and Frith (2001) also found patients with behavioral signs and paranoid symptoms performed less competently than normal controls in first- and second-order theory of mind tasks, but that the remitted patients performed as competently as normal controls. Doody et al. (1998) concluded that an impaired theory of mind in second-order tasks is specific to schizophrenia when compared with mild learning disability and affective disorder control groups. Brüne (2003) found that patients with chronic disorganized schizophrenia were impaired relative to healthy controls in theory of mind tasks (e.g., first-order and second-order false belief tasks). In our study, we not only assessed theory of mind performance in remitted schizophrenia to compare findings with previous studies, but we also explored theory of mind in the comprehension of metaphor and irony in schizophrenia.

The role of IQ in the understanding of metaphor and irony warrants attention. Mitchley et al. (1998) demonstrated that even with Raven's IQ as a covariate, there was a significant difference between schizophrenic and control subjects who performed irony tasks. They argued that general intelligence cannot explain the inability of schizophrenic to understand irony. As patients often suffer from cognitive deficit and intelligence decline, it is difficult to completely match their

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