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## Psychiatry Research

journal homepage: [www.elsevier.com/locate/psychres](http://www.elsevier.com/locate/psychres)

# 'No man is an island'. Testing the specific role of social isolation in formal thought disorder



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## ARTICLE INFO

### Article history:

Received 17 October 2014

Received in revised form

27 July 2015

Accepted 6 September 2015

Available online 8 September 2015

### Keywords:

Formal thought disorder

Social isolation

Psychosis

Schizophrenia

Hallucinations

delusions

## ABSTRACT

Recent work has focused on the role of the environment in psychosis with emerging evidence that specific psychotic experiences are associated with specific types of adversity. One risk factor that has been often associated with psychosis is social isolation, with studies identifying isolation as an important feature of prodromal psychosis and others reporting that social networks of psychotic patients are smaller and less dense than those of healthy individuals. In the present study, we tested a prediction that social isolation would be specifically associated with formal thought disorder. 80 patients diagnosed with psychosis-spectrum disorder and 30 healthy participants were assessed for formal thought disorder with speech samples acquired during an interview that promoted personal disclosure and an interview targeting everyday topics. Social isolation was significantly associated with formal thought disorder in the neutral interview and in the salient interview, even when controlling for comorbid hallucinations, delusions and suspiciousness. Hallucinations, delusions and suspiciousness were not associated with social isolation when formal thought disorder was controlled for. Formal thought disorder is robustly and specifically associated with social isolation. Social cognitive mechanisms and processes are discussed which may explain this relationship as well as implications for clinical practice and future research.

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## 1. Introduction

Over the last decade, there has been a renewed interest in the role of social adversity in schizophrenia (Van Os et al., 2010; Read et al., 2014). Factors such as familial miscommunication (de Sousa et al., 2014), migration (Cantor-Graae and Selten, 2005), exposure to urban environments (Vassos et al., 2012), childhood sexual abuse, bullying and other childhood (Varese et al., 2012a, 2012b) and adulthood adverse events (Beards et al., 2013) are associated with an increase in the risk of psychosis. In addition, there is emerging evidence that specific adversities are related to specific psychotic symptoms. Examples include associations between childhood sexual abuse and hallucinations and between disrupted early attachment relationships and paranoia (Bentall et al., 2012; Shevlin et al., 2014). Psychological mechanisms that might explain these relationships have also been suggested (Varese et al., 2012a, 2012b; Bentall et al., 2014; Sitko et al., 2014).

### 1.1. The relevance of formal thought disorder (FTD)

FTD refers to a set of communicational, cognitive and language disturbances that render the speech of some individuals difficult to follow and apparently unintelligible (Andreasen, 1982). Examples of FTD can vary from instances of incoherence (e.g. "Yes, they add up and kind of like a solution. It's say, it's a equine or equinox, like fungi. Something in the brain tells you it's a high number. Bacteriology, a numerate number, it's a particle, therefore it contains solution is to answer the right question" Laws et al., 1999, p. 105) to illogicality (e.g. "Parents are the people that raise you. Anything that raises you can be a parent. Parents can be anything, material, vegetable, or mineral, that has taught you something" Andreasen, 1986, p. 478).

These disturbances have been relatively neglected in social psychiatry research but are important for several reasons. First, FTD is highly prevalent in psychotic patients, with some estimates reaching 91% (Roche et al., 2014). Second, it is associated with poorer occupational functioning (Racenstein et al., 1999), poorer social functioning (Bowie and Harvey, 2008; Bowie et al., 2011), and poorer quality of life (Tan et al., 2014). Third, FTD has been found to be highly predictive of future psychotic relapse (Wilcox,

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1990) a picture that is further complicated by the relative lack of evidence-based therapeutic strategies to address it (Beck et al., 2009; Stolar and Grant, 2011) and its persistent course (Marengo and Harrow, 1987, 1997; Docherty et al., 2003; Bowie et al., 2005). Last but not least, FTD seems to be an early predictor of later conversion into psychosis in high-risk populations (Ott et al., 2002; Cannon et al., 2008; Bearden et al., 2011) providing clinicians and services alike with a potential window of opportunity for early detection and preventative work.

### 1.2. Psychological mechanisms in FTD

Over the years several psychological mechanisms have been evoked to explain FTD including difficulties at the level of ‘theory-of mind’ (ToM; Frith, 1992; Hardy-Baylé et al., 2003; Sprong et al., 2007), poor internal source monitoring (Harvey, 1985; Nienow and Docherty, 2004), deficits at the level of executive function (McGrath, 1991; Kerns and Berenbaum, 2002) and semantic hyperpriming (Spitzer, 1997; Pomarol-Clotet et al., 2008). A widely replicated finding, reported in both schizophrenia patients and bipolar patients, is that FTD and communication disturbances are more evident when patients discuss affective-laden topics (Shimkunas, 1972; Docherty et al., 1994; Haddock et al., 1995; Docherty, 1996, 2005; Tai et al., 2004).

Much less is known about social predictors of FTD. Although FTD has often been assumed to be an endophenotype of schizophrenia (Meehl, 1962; Levy et al., 2010) several studies have identified important psychosocial factors associated with its development such as dysfunctional family communication (Wahlberg et al., 1997, 2000; Roisko et al., 2014), childhood adversity (Toth et al., 2011; Shah et al., 2014) and institutionalization (Walker et al., 1981).

### 1.3. Social isolation and psychosis

Since Faris and Dunham’s (Faris, 1934; Faris and Dunham, 1939) classic ecological study in Chicago, there has been an accumulation of studies showing that social isolation is an important factor in psychosis (Van Os et al., 2000; Boydell et al., 2004). The relevance of social isolation in schizophrenia has also been well acknowledged in the psychoanalytical literature (Sullivan, 1953). For example, Freud argued for the centrality of the patient’s withdrawal from the surrounding world as a crucial process in psychosis (i.e. process of libidinal decathexis, Freud, 1957) and other authors have argued that this process of desocialisation is crucial to understand psychotic experiences given its detrimental impact on symbolic thought (Arieti, 1974).

Consistent with this, early empirical studies have reported for example higher levels of social isolation in communities with high incidence rates of schizophrenia (Jaco, 1954) and higher rates of social isolation in patients diagnosed with schizophrenia (Hirschberg, 1985). These findings have been supported by other studies that have reported that psychotic patients have smaller social networks (Erickson et al., 1989), fewer individuals in their social networks (Macdonald et al., 2000), fewer confidants (Morgan et al., 2008) and are three times more likely to have low frequency of contact with others in their social network (Reininghaus et al., 2008) with some studies suggesting that this may be significantly more pronounced in urban environments (Schomerus et al., 2007).

Population studies with a non-clinical samples have also reported associations between lack of perceived social support and psychotic experiences (Alptekin et al., 2009) and a dose–response relationship between having smaller primary network at baseline and self-reported psychotic experiences at 18-month follow-up (Wiles et al., 2006). Other studies and reviews have reported that isolation is also a factor that challenges patient’s recovery (Soundy

et al., 2015), is associated with increased number of admissions (Simone et al., 2013) and with poorer outcomes (Harvey et al., 2007).

It has been suggested that social isolation may be the result of a “social network crisis” following first admission to a mental health ward (Lipton et al., 1981). However, the population studies mentioned above have been carried out with samples of non-clinical participants that have never been admitted. Moreover, both retrospective and prospective birth cohort studies have found that social isolation in childhood is associated with a later diagnosis of schizophrenia (Jones et al., 1994; Cannon et al., 2008; Welham et al., 2009). In a cohort study of 50,054 Swedish conscripts, individuals who later developed psychotic experiences at a 15-year follow up were significantly more likely to have fewer than two friends and to prefer smaller groups (Malmberg et al., 1998) suggesting that social isolation may predate the onset of symptoms and the diagnosis. Consistent with this, a recent systematic review revealed that individuals diagnosed with first episode of psychosis have significantly smaller social networks than healthy individuals suggesting again that social isolation and smaller social networks predate onset of psychotic disorder (Gayer-Anderson and Morgan, 2013). Finally, studies of individuals with prodromal symptoms report as well that social withdrawal is a very common feature in individuals before the onset of psychosis (Tan and Ang, 2001; Mäki et al., 2014).

### 1.4. Social isolation and specific symptoms

How might social isolation contribute to the onset, development or maintenance of individual psychotic symptoms? Hoffman (2007, 2008) has suggested that social isolation and withdrawal during critical developmental periods may lead to deafferentation of brain regions that support social cognition and therefore predispose individuals to psychotic experiences (e.g. leading to the induction of anomalous experiences). Studies using animal models have reported findings consistent with this hypothesis (Silva-Gómez et al., 2003; Fone and Porkess, 2008; Fabricius et al., 2011).

In a more psychological account, Freeman and colleagues (2002; Freeman and Garety, 2006; Freeman, 2007) have suggested that social isolation may contribute to maintenance of persecutory beliefs by not allowing opportunities for these beliefs to be reviewed and disconfirmed by people in the social network of the individual. Drawing on data from large population study, Freeman et al. (2011) reported an association between self-reported paranoia and a range of demographic (e.g. being single) and psychological indicators of social isolation (e.g. less perceived social support). However, in a different study the association between number of social supports and paranoia was not significant when authors adjusted for confounders (Freeman et al., 2008).

The possible association between FTD and social isolation has not yet been explored empirically but there are some interesting clues to why isolation might be a particularly relevant factor in this cluster of symptoms. Some authors have reported that, when thought-disordered patients are asked to clarify some of their utterances, for example by providing more contextual information, these utterances become intelligible and comprehensible (Harrow et al., 1983). Hence, patients seem able to construct coherent utterances when cued to do so in an appropriate social context. The same group of researchers proposed that patients’ apparent unintelligible utterances may be a consequence of the *intermingling* of decontextualized personal concerns and worries coupled with an inability to take the perspective of the listener and to speak to the listener’s needs (Harrow et al., 1983, 2000; Lanin-Kettering and Harrow, 1985) which is a prerequisite for the establishment of conversational alignment (Pickering and Garrod, 2006). Such an account is consistent with those social-cognitive

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