The impact of being with friends vs. strangers on paranoia in psychosis

An Experience Sampling Method (ESM) study on the relationship between nature of company and experiences of momentary paranoia in people with non-affective psychotic disorders, their healthy relatives and controls

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Abstract

People with non-affective psychosis experience major problems in social life. Both paranoid delusions and low social engagement are associated with low quality of life. There is no empirical consensus on the connections between social surroundings and delusions of paranoia. Knowledge of risk and protective factors in daily social life could lead to new clinical strategies to diminish the occurrence of paranoia, and thereby increase the quality of life of people with non-affective psychosis. This study therefore investigated the relationship between nature of social company and experiences of momentary paranoia in people with non-affective psychosis.

Psychotic patients, their healthy relatives, and healthy controls took part in the research. The experience sampling method (ESM) was used, which allows examining the moment to moment changes in social interactions and momentary paranoia in the real context of daily life. 72 participants took part in the study. Participants filled in questionnaires on an electronic device, ten times a day, for one week. The data was analyzed using mixed multilevel analyses.

It was found that patients experienced more momentary paranoia than relatives, and relatives experienced more momentary paranoia than healthy controls. In contrast to the expectation, patients experienced more momentary paranoia when they were in the company of a stranger compared to when they were accompanied by a close relation, as did relatives and controls. Furthermore, patients experienced less momentary paranoia when they were in the company of others (both strangers and close relations) than when they were alone. Social withdrawal thus seems dysfunctional in terms of the occurrence of paranoia. Yet, patients were alone more often than relatives and healthy controls. Company of other people, even unfamiliar others, might be a protective factor for the experience of paranoia in psychotic patients and should therefore be stimulated in treatment and other interventions.

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Introduction

"I cannot eat the food at the hospital. The nurses poisoned it to kill me." "Bad people are spying on me. They hided camera's in my house." "Everyone at my job is disadvantaging me. They are flocking together, making plans to make me get fired." These thoughts are illustrations of *paranoia*, a common type of delusion in people with non-affective psychotic disorders (American Psychiatric Association [APA], 2013). These disorders (schizophrenia, schizoaffective disorder and psychosis not otherwise specified) are highly disabling (APA, 2013). People with non-affective psychosis experience major problems in social life, such as social isolation (APA, 2013). Both paranoia and low social engagement are associated with lower quality of life (APA, 2013; Bow-Thomas, Velligan, Miller, & Olsen, 1999; Chino, Nemoto, Fujii, & Mizuno, 2009; Lambert & Naber, 2004; Norman et al., 2000; Ritsner et al., 2003). The current study will investigate the relationship between social life and paranoia in people with psychosis. It is of great importance to further investigate this issue. Knowledge of risk and protective factors in daily social life could lead to new clinical strategies to diminish the occurrence of paranoia, and thereby increase the quality of life of people with non-affective psychosis (Myin-Germeys, Nicolson, & Delespaul, 2001). Specifically, if it appears that paranoia in patients is higher when they are in the company of others, it might be adaptive for them to avoid contact with others in certain at-risk periods. However, if it appears that patients experience less paranoia when they are accompanied by (familiar) others, it might be helpful to seek the company of those others instead. The current study might thus give insight into the (function of) social withdrawal that is commonly seen among psychotic patients, and identified as a symptom of psychosis.

Non-affective psychotic disorders are characterized by the presence of *positive* and *negative symptoms.* Both the positive and negative symptoms of psychotic disorders are strongly associated with occupational and social dysfunction (APA, 2013). Negative symptoms of psychotic disorders include diminished emotional expression, making little eye contact, a decrease in motivation to initiate activities, a lack of interest in social interactions, diminished speech, and a lower ability to experience pleasure (APA, 2013). Positive symptoms of psychosis are hallucinations, disorganized thinking, speech and behaviour, and delusions. A *Delusion* is "*a rigid system of beliefs with which a person is preoccupied and to which the person firmly holds, despite the logical absurdity of the beliefs and a lack of supporting evidence.*" ("Delusion", 2017). The most common delusion is the delusion of persecution or paranoia, as illustrated in the introduction (APA, 2013). Paranoia is defined as the false or exaggerated perception or belief that one is being harmed or persecuted by a particular person or group of people, or that others have harmful intentions towards oneself (APA, 2013; Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001).

Tielens (2012) describes the essence of psychosis as a problem in the *interpretation* of the (social) surrounding. Psychotic people are thought to have a disturbance in processing information in social interaction. Tielens (2012) compares a paranoid delusion to a magnet: in the process of interpreting social cues, paranoid patients are constantly 'pulled' to the possibility of harassment. They appraise ambiguous social cues (e. g. the look on a face, the gesture of a person) as signs of harmful intentions (Freeman, 2007; Tielens, 2012).

Several studies have found relationships between social context and delusions of paranoia. Freeman et al. (2002) presented a multifactorial model of the formation and maintenance of persecutory delusions. The researchers state that "*if the person is isolated, unable to revise his or*

her thoughts on the basis of interactions with supportive others, then ideas of threat are more likely to flourish." (Freeman et al., 2002, p. 335). This statement suggests that social isolation facilitates the growth of delusions of paranoia, which inclines that social contact with supportive others can *diminish* or *prevent* these delusions.

Studies suggest that paranoia might fluctuate in intensity, not only over days, weeks, months or years but also over moments within the day (Collip et al., 2011; Myin-Germeys et al., 2001; Oorschot, Kwapil, Delespaul, and Myin-Germeys, 2009). Changes in social surrounding (e.g. the presence of others) may be crucial in these short-term fluctuations, conceptualized as '*momentary paranoia*' (Collip et al., 2011).

Collip et al. (2011) conducted a study on the effect of real-life social situations on changes in momentary paranoia. The researchers used a structured diary technique to assess momentary social context and paranoia in daily life; namely the Experience Sampling Method (ESM). The sample consisted of 154 participants, among which were currently paranoid patients, currently non-paranoid patients, remitted psychotic patients, high-schizotypy participants, and controls. These participants were divided into three groups with different degrees of *trait paranoia*, namely the low, the medium and the high paranoia group. In the concept of trait paranoia, paranoia is seen as a continuous trait or phenotype in the population (Collip et al., 2011), which holds that individuals have a rather stable tendency towards paranoia.

Participants in the low and medium trait paranoia groups reported more momentary paranoia in less-familiar company than in familiar company. This seems a sensible, adaptive process: when being with a stranger, an individual has to be warier of the intention of this person than when being with someone familiar with whom he or she has a history of positive interactions

(Collip et al., 2011). People in the high trait paranoia group reported more momentary paranoia than people in the other groups, but no difference in momentary paranoia between familiar and unfamiliar company was found for this group. This finding implies that people with high levels of trait paranoia, unlike people with medium or low levels of trait paranoia, seem to be suspicious of malevolent intentions of other people regardless of their relationship with them. Thus, according to Collip et al., "…*momentary paranoia seems to become autonomous and independent of the social reality."* (Collip et al., 2011, p. 919). This finding matches the magnet-metaphor of paranoid delusion by Tielens (2012).

However, the findings of the study of Collip et al. (2011) must be interpreted cautiously. The distribution of controls, high-schizotypy participants, and remitted, low- and high paranoid patients over the trait paranoia groups seems counterintuitive. For example, only 56 % of the low paranoia group consisted of healthy controls, and only 74 % of the 'high paranoid patients' was in the high paranoia group. The sample was divided into these groups based on the tertiles of the score distribution on the Paranoia Scale (PS) by Fenigstein and Vanable (1992). The PS is a 20-item self-report questionnaire, developed to measure subclinical levels of paranoid ideation (Fenigstein & Vanable, 1992). It seems inconsistent to construct paranoia tertile groups based on a one-occasion questionnaire when you argue that paranoia is a fluctuating concept.

Myin-Germeys et al. (2001) also conducted an ESM-study investigating the effects of daily life contexts on delusions. Their sample consisted of 48 chronic schizophrenic spectrum patients. The researchers found that being with a familiar other decreased the risk of experiencing a delusional moment +/- 90 minutes later (Myin-Germeys et al., 2001). The presence of familiar others thus appeared to be a protective factor against delusions. This effect was not found for the presence of strangers (Myin-Germeys et al., 2001). This finding is in line with the statement of

Freeman et al. (2002), mentioned before: interactions with supportive others can diminish or prevent delusions.

Intuitive, the results of the two studies discussed above seem contradicting. Collip et al. (2011) explain these contrasting results by the composition of the samples of the two studies. Collip et al. differentiated a high trait paranoia group, whereas the sample of the study by Myin-Germeys et al. (2001) consisted mostly of stable patients, with medium rather than high levels of trait paranoia (see textbox). The mechanism of reactivity to different types of social company might be different in patients with higher symptom severity.

> Myin-Germeys et al. (2001) assessed 'delusional thought content' by the Brief Psychiatric Rating Scale (BPRS). The average score for their sample was 3.3 on a seven-point range, which can be interpreted as 'mildly ill' (Leucht et al., 2005a).

In sum, there is no empirical consensus on the relationship between nature of social company and experiences of momentary paranoia in people with non-affective psychotic disorders. As discussed, Collip et al. (2011) found an interesting relation between trait paranoia, nature of company and momentary paranoia. However, the distribution of healthy controls and patients over the trait paranoia groups that these researchers made seems illogical. Accordingly, the current study will further investigate the relationship between social company and momentary paranoia utilizing three authentic participant groups (as far as psychiatric diagnoses are authentic): patients, healthy relatives of patients, and controls. Research shows that psychotic symptoms are reported not only by psychotic patients but also by healthy members of the general population (Kelleher & Cannon, 2011; Van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009). Healthy individuals who report these symptoms are considered to represent

a non-clinical psychosis phenotype. Research shows that this non-clinical psychosis phenotype is familial, heritable and coheres with familial schizophrenia-spectrum disorder (Kelleher & Cannon, 2011; Van Os et al., 2009). Relatives of psychotic patients are thus presumable to experience subclinical psychotic symptoms. Therefore, including healthy relatives of psychotic patients in the current research makes it possible to look at social aspects and the tendency to experience paranoia in terms of a genetic risk to the illness. If similar mechanisms will be found for relatives and patients, it can be concluded that the findings on social companionship and paranoia in patients are not due to antipsychotic medication or secondary to the illness.

The experience sampling method (ESM), developed by Larson and Csikszentmihalyi (1983), is an adequate method to investigate moment to moment changes in social interactions, feelings and experiences in the real context of daily life (Delespaul, 1995). In this method, participants fill in questionnaires at random moments during the day, whilst living their daily lives. In their review on ESM research in the field of non-affective psychotic disorders, Oorschot et al. (2009) demonstrated the method to be feasible and valid for research among the psychotic population.

The hypotheses of the current study are formulated as follows:

1. Patients experience more momentary paranoia than relatives and relatives experience more momentary paranoia than healthy controls.
2. Healthy controls experience more momentary paranoia while being with strangers than while being with friends. Patients, however, experience momentary paranoia regardless of the type of company. In relatives, the effect of nature of company on momentary paranoia will be intermediate.

Method

Participants

Eighty participants took part in the current study. There were three participant groups:

1. Patients: people with a current primary diagnosis of non-affective psychotic disorder.
2. Relatives: healthy first-degree relatives of non-affective psychotic patients.
3. Controls: control individuals without a personal or family history of psychosis.

Recruitment of patients took place via South London and Maudsley and Oxleas NHS Foundation Trusts, with the help of the Mental Health Research Network and via other research projects within the Psychosis Studies department at the Institute of Psychiatry, Psychology and Neuroscience (IoPPN). Relatives were recruited via patients and via the website rethink.org. Control participants were recruited through online advertisements on the websites Gumtree, Callforparticipants, Craigslist, and via circular emails at the IoPPN, and other research projects within the Psychosis Studies department.

The inclusion criteria for all participants were: age between 18 and 64, and a sufficient command of the English language. An additional inclusion criterion for patients was: current treatment of atypical antipsychotics. Exclusion criteria for all participants were: any history of neurological conditions, and any history of alcohol or drug dependence within six months of the study screening. Control participants were screened for family history of psychosis and relatives were screened for psychosis.

Instruments

Data utilized for the purpose of the current study was part of a larger research, the Decision making, context and psychosis (DECOP) study (Shergill & Fett, 2014). Beside the assessments used in the current study, other assessments were conducted. Only measurements utilized in the current study will be described.

Demographic data

Participants were asked to fill out a demographic questionnaire containing questions concerning gender, date of birth, nationality and ethnicity, annual income, smoking status, current psychiatric diagnosis, medication, and family history of psychosis.

Experience Sampling Method (ESM)

The participants received an iPod and were asked to fill in a questionnaire on this device ten times a day, when a tone sounded. Hereafter, these questionnaires and their corresponding sounds will be called 'beeps'. Beeps appeared at random times between 8.00 am and 10.30 pm, for seven successive days. The questionnaire contained either 30 or 34 items (depending on the answer to item 18 (I am on my own)). These items assessed concerns like current activity, mood, company, and substance use. In the current study, six items of this questionnaire were used, to measure the variables 'momentary paranoia', 'being with others', and 'nature of company'.

Momentary paranoia has been assessed by the items 'I feel suspicious', 'I feel safe' (reversed score), 'I feel that others dislike me' and 'I feel that others intend to harm me', all rated on seven-point Likert scales (ranging from 'not at all' to 'very'). These items were also used to

measure (momentary) paranoia in the studies of Collip et al. (2011) and Thewissen, Bentall, Lecomte, Van Os, and Myin-Germeys (2008). These researchers respectively reported Cronbach's α's of .82 and .89 for the construct (Collip et al., 2011; Thewissen et al., 2008). Thewissen et al. (2008) found significant positive correlations of the construct with other paranoia measures: scores correlated positively with total score on the Paranoia Scale (PS) (Pearson bivariate correlation, $r = .42$, $p < .01$) and with Positive and Negative Syndrome Scale (PANSS) item P6; 'paranoia/persecution' (Pearson bivariate correlation, $r = .58$, $p < .01$). In the current study, the internal consistency (Cronbach's α) for the construct was .78. Scores on the momentary paranoia construct correlated positively with PANSS item P6; 'paranoia/persecution' (Pearson bivariate correlation, $r = .55$, $p < .01$).

Being alone has been measured by the item 'I am on my own' (answer options yes/no).

Nature of company has been measured by the item 'I am with …', containing the answer options 'partner', 'family', 'friend(s)', 'housemate(s)', 'colleague(s)', 'acquaintance(s)', 'stranger(s)', and 'other'. For the purpose of the current study these items have been divided in three categories, namely 'close relation' (partner, family, friend(s)), 'distant relation' (housemate(s), colleague(s), acquaintance(s)), and 'stranger' (stranger(s), other).

Positive and Negative Syndrome Scale (PANSS)

To assess the severity of psychotic symptoms, a semi-structured interview was conducted among patients, namely the Positive and Negative Syndrome Scale (PANSS) by Kay, Fiszbein, and Opler (1987). Based on this interview, the interviewer assigns ratings to 30 items. Seven of these items constitute a positive scale (for example item P1; delusions), seven items constitute a negative scale (for example item N1; blunted affect) and sixteen items constitute a general

psychopathology scale (for example item G1; somatic concern). The researcher rates each item based on a seven-point rating scale, representing increasing levels of psychopathology: 1 = absent, 2 = minimal, 3 = mild, 4 = moderate, 5 = moderate severe, 6 = severe, 7 = extreme.

The PANSS is one of the most widely used instruments in schizophrenia research and its psychometric properties have been assessed (Kay, Fiszbein, & Opler, 1987; Kay, Opler, & Lindenmayer, 1988; Peralta, Cuesta, & de Leon, 1995; Peralta & Cuesta, 1994; Van den Oord et al., 2006). The PANSS has shown good inter-rater reliability (all ICCs > .80) and good concurrent validity of the positive and negative subscales compared to the Scale for the Assessment of Positive and Negative Symptoms (r = .70 and r = .81, respectively) (Berry et al., 2008; Peralta & Cuesta, 1994).

Wechsler Abbreviated Scale of Intelligence (WASI)

The standardized Vocabulary subtest and the Matrix Reasoning subtest of the Wechsler Abbreviated Scale of Intelligence (WASI) were carried out among all participants (Wechsler, 1999). In the Vocabulary subtest, participants had to name 4 objects in pictures and give the definition of 37 words. In the Matrix Reasoning subtest, participants had to select pieces to complete 35 incomplete patterns. Based on the scores on these subtests estimated scaled IQ scores were calculated. These scores cannot be seen as equivalents of intelligence scores measured with a complete intelligence measurement (Axelrod, 2002). However, the subtests are a suitable screening measure for general intelligence and the advantage of this measure is the short administration time (Hays, Reas, & Shaw, 2002). Good convergent validity for these subscales compared to similar subscales of the Kaufman Brief Intelligence Test (K-BIT) has been found, r = .83, r = .83 (Hays et al., 2002).

Procedure

The data analyzed in the current study was collected by trained researchers, at the Institute of Psychiatry, Psychology and Neuroscience (IoPPN), a faculty of King's College London.

Members of the research team contacted potential participants and verified in- and exclusion criteria. If these criteria were met, detailed information about the study procedure was sent by mail or e-mail. If prospective participants decided to take part in the study, they contacted the researchers to make an appointment for a test session.

The first test session, of approximately one hour, took place at IoPPN. The researcher explained the research and an informed consent form was signed by the participant. Thereafter, the participant completed a battery of tasks and two subtests of the Wechsler Abbreviated Scale of Intelligence (WASI). The participant received an iPod and was given the instruction to fill in questionnaires on this device, for the next seven days. Usage of the ESM program on the iPod was explained and demonstrated.

After the week of filling in questionnaires on the iPod (the ESM-week), the participants returned to the IoPPN for the second test session, of approximately two hours and 45 minutes. Participants completed several tasks and the semi-structured Positive and Negative Syndrome Scale (PANSS) interview was conducted. Participants returned the iPod and received a compensation for their participation in the study and their travel costs.

Analyses

The data have been analyzed using the program IBM SPSS 24. Beeps that were not filled in within days 1 until 7, and 'false' beeps, e.g. beeps that were completed within 15 minutes after

each other, were removed from the dataset. Data from participants who had less than 23 remaining beeps (less than a third) were removed (Delespaul, 1995).

Estimated IQ scores were calculated from the raw subtests scores. An Analysis of variance (ANOVA) and post hoc tests (Bonferroni corrected) were carried out to test the variance of age, IQ, and gender between participant groups. As these characteristics might influence the outcome, it was investigated if they differed between groups, to be able to control for confounding in the analyses.

Variables were recoded as follows: The variable 'momentary paranoia' was constructed from four ESM-items. Internal consistency (Cronbach's α) of the variable was assessed by reliability analysis.

To examine group differences in time spent alone and in company of others, a percentage of being alone was calculated per participant. ANOVA and post hoc tests (Bonferroni corrected) were carried out to test the variance of being alone between groups.

The hypotheses were operationalized as follows: Hypothesis 1: There is a main effect of 'group' on momentary paranoia. Hypothesis 2: There is an interaction effect for 'group' and 'nature of company' on momentary paranoia. Mixed multilevel analysis was carried out to test these main- and interaction effects of 'group' and 'nature of company' on momentary paranoia. This method is suitable for the data, since it takes the hierarchical structure of the data into account (Field, 2013). Gender was also added to the model, to control for confounding. Nonsignificant variables were removed from the model, to increase the power.

To enable testing of group differences in momentary paranoia, dummy variables were created for the variable 'group'. These variables were separately included in multilevel models. Gender was also added to these models to control for confounding.

Results

Sample characteristics

Eighty participants took part in the study. Eight participants (three patients, three relatives, and two controls) completed less than a third of the beeps and were therefore removed from the database (Delespaul, 1995). Data from 72 participants were included in the analyses.

ANOVA showed that the mean estimated IQ score and the gender distribution differed significantly between groups (see Table 1). Post hoc tests demonstrated that mean estimated IQ scores differed significantly between patients and controls ($p < .01$), and between controls and relatives ($p = .02$), but not between patients and relatives ($p = .09$). The patient group and the control group consisted of mostly men (83% and 67% respectively), whereas the relative group consisted of mostly women (73%). Accordingly, post hoc tests demonstrated that the gender distribution differed significantly between relatives and the other groups ($p < .01$, $p = .01$) but not between patients and controls ($p = .56$). The mean age of the sample was 38.9 and did not differ significantly between groups. The mean number of observations (completed beeps) for the participants that were included in the analyses was 48 and did not differ significantly between groups.

Patients had current primary diagnoses of schizophrenia (n = 23), schizoaffective disorder (n = 4), and psychosis (n = 2). A mean total score on the Positive and Negative Syndrome Scale (PANSS) of $M = 55.8$ ($SD = 12.9$) was found for this group.

Table 1.

Analysis of variance of Age, IQ, Gender, and Completed beeps between participant groups

	Patients (n = 29)	Relatives (n = 19)	Controls (n = 24)	Variance			
	M (SD)	*M (SD)*	*M (SD)*	*F*	*df*	*df*	*p*
Age	38.61 (9.36)	37.93 (13.92)	36.88 (8.00)	.18	2	69	.83
IQ	98.62 (13.05)	106.74 (14.41)	117.33 (10.00)	14.68*	2	69	.00
	% Male	% Male	% Male				
Gender	82.8 %	26.3 %	66.7 %	9.75*	2	69	.00
Completed beeps	47.83 (12.92)	44.63 (11.84)	51.88 (11.21)	1.95	2	69	.15

Group differences in time spent alone and in company of others

On average, patients reported to be alone in 72.2% of the beeps, relatives reported being alone in 43.3% of the beeps and controls reported to be alone in 56.8% of the beeps (see Figure 1). ANOVA showed that time spent alone differed significantly between groups, $F(2,69) = 6.82$, $p < .01$. Post hoc tests demonstrated that being alone differed significantly only between patients and relatives, $p < .01$.

The initial categorization of the variable ‘nature of company’ resulted into too small groups. Specifically, the number of beeps wherein patients reported to be around distant relations was too low to incorporate in the analyses (see Figure 1). Therefore, only the categories ‘stranger’ and ‘close relation’ were included in the analyses.

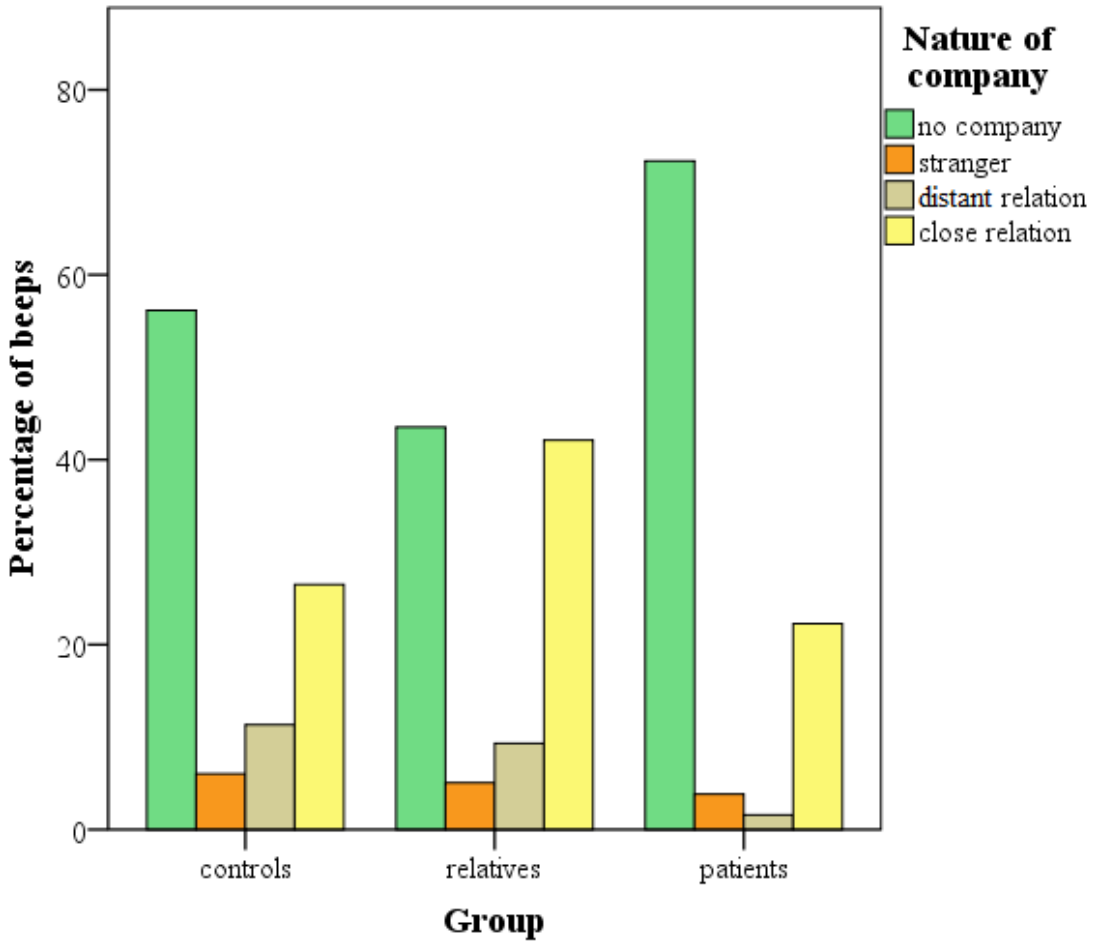

Figure 1. Percentage of beeps within groups spent in company categories.

The effects of 'group' and 'nature of company' on momentary paranoia

A significant main effect was found for group on momentary paranoia, $b = .19$, $p = .04$, 95% CI = [.01, .37]. Patients reported a mean score of $M = 2.36$ ($SD = 1.27$) on momentary paranoia, the mean score for relatives was $M = 1.78$ ($SD = .97$) and controls reported a mean momentary paranoia score of $M = 1.70$ ($SD = .95$) (see Figure 2).

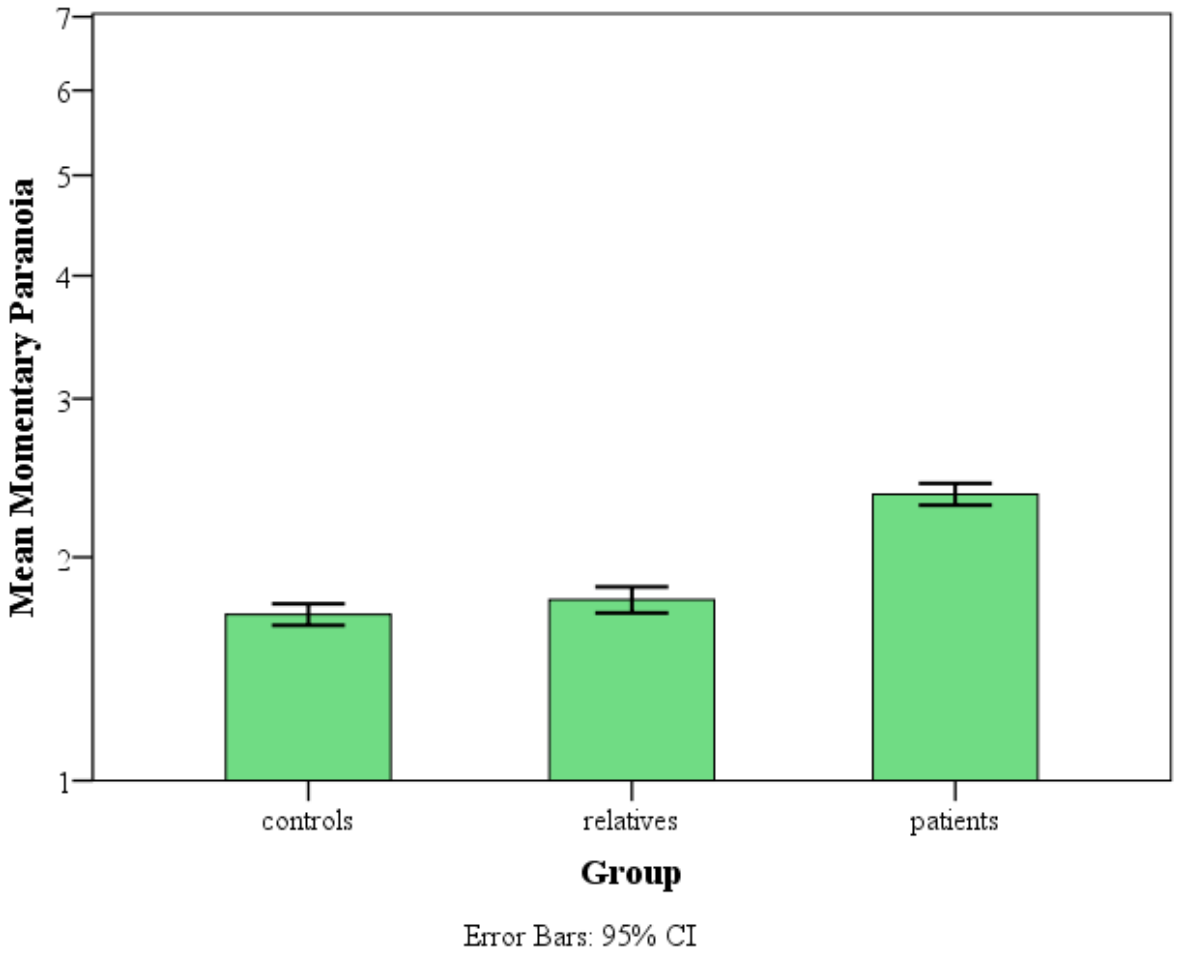

Figure 2. Mean score on momentary paranoia per group.

A significant main effect for nature of company on momentary paranoia was also found, b = -.45, p < .01, 95% CI = [-.70, -.22]. In all three groups, mean scores on momentary paranoia were higher when being in the company of a stranger compared to being around a close relation (see Figure 3).

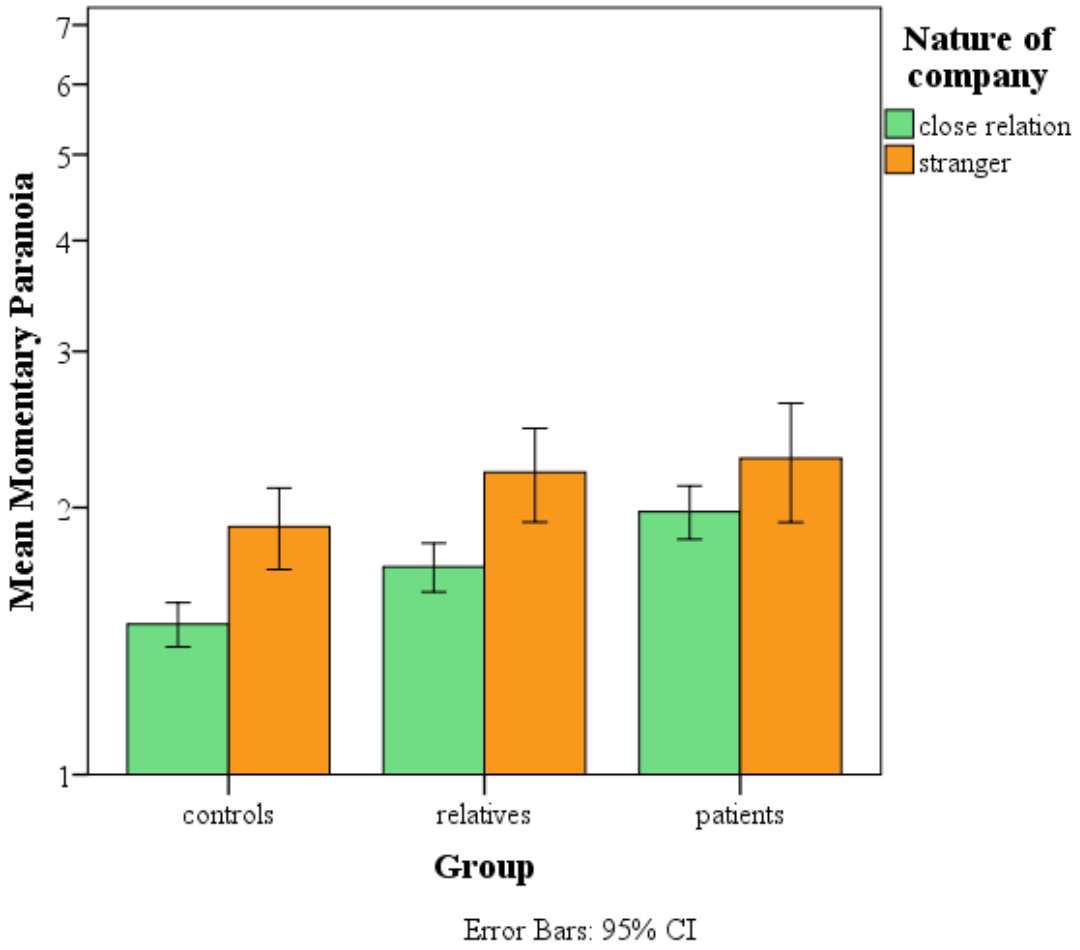

Figure 3. Mean score on momentary paranoia per company category per group.

No significant interaction effect for nature of company by group on momentary paranoia was demonstrated in the model, b = .06, p = .53, 95% CI = [-.13, .26]. After removing the interaction effect, the main effect for group on momentary paranoia became more significant, b = .24, p < .01, 95% CI = [.17, .32]. The dummy variables were all significant predictors of momentary paranoia, demonstrating that momentary paranoia differed significantly between each of the three groups (see Table 2).

Table 2.

Multilevel model analyses outcomes of differences in momentary paranoia between groups

	b	*p*	95% CI		-2 LL
Dummy 1 relatives (0) patients (1)	- .66	< .01	-.77	-.54	7027.13
Dummy 2 controls (0) relatives (1)	-.09	.05	-.18	-.00	5757.41
Dummy 3 controls (0) patients (1)	-.66	< .01	-.74	-.57	8112.23

Discussion

This study investigated the relationship between nature of social company and experiences of momentary paranoia in people with non-affective psychosis, their healthy relatives, and controls.

According to the expectations, patients experienced more momentary paranoia than relatives, and relatives experienced more momentary paranoia than healthy controls. Relatives thus showed a similar mechanism as patients in terms of the experience of momentary paranoia. Therefore, it can be concluded that the greater occurrence of momentary paranoia in patients and relatives could reflect the genetic risk to psychosis. This genetic risk seems to be associated with greater suspiciousness in daily life.

The results did not confirm the expectation that patients would experience momentary paranoia regardless of the type of company. Patients reported more momentary paranoia when they were in the company of a stranger compared to when they were accompanied by a close relation, just like relatives and controls. The mechanism of type of social company on the experience of paranoia was the same for patients as for the other groups. This result seems in contrast to the conclusions of Collip et al. (2011), who found that people with high levels of trait paranoia, unlike people with medium or low levels of trait paranoia, experienced momentary paranoia while being with other people regardless of their relationship with them. The distribution of participants by Collip et al. (2011) (based on level of trait paranoia), that seemed counterintuitive, might represent the manifestation of paranoia in the population better than the distribution of participants in the current study (based on diagnosis). Perhaps paranoia should be seen as a continuous trait or phenotype in the population (Collip et al., 2011), instead of solely as

a symptom of psychosis. The fact that research shows that psychotic symptoms are reported not only by psychotic patients but also by healthy members of the general population (Kelleher & Cannon, 2011; Van Os et al., 2009) advocates this suggestion.

However, the finding of the current study that patients experienced more paranoia in the company of strangers than in the company of familiar others, matches the findings of Myin-Germeys et al. (2001). These researchers found that the presence of familiar others was a protective factor for the occurrence of momentary paranoia in chronic schizophrenic spectrum patients. The finding is also in line with the statement of Freeman et al. (2002), that interactions with supportive others can diminish or prevent delusions, suggesting that social isolation facilitates the growth of delusions of paranoia.

An exploratory, non-hypothesized analysis in the current study (see textbox) showed that momentary paranoia in patients was lower when they were in the company of others than when they were alone. This interesting result should be further investigated in future research. It suggests that company of other people, even unfamiliar others, might be a protective factor for the occurrence of paranoia. For people who suffer from paranoid delusions, it might therefore be helpful to seek the company of other people.

Mixed multilevel analysis showed a significant effect for 'being alone' on momentary paranoia for patients, $b = .46$, $p < .01$, 95% CI = [.31, .60].

However, in the current study, patients reported to be alone more often than relatives and healthy controls. This finding fits the assumption that psychotic patients are more often socially isolated and have smaller social networks (APA, 2013; Macdonald, Hayes & Baglioni, 2000). The finding is in line with prior research stating that psychosis is related to reduced social engagement (Fett et al., 2012). The time that patients participating in the current study spent

around distant relations (colleagues, housemates, and acquaintances) was considerably low. This can probably be explained by the fact that many patients (79.3 %) had no occupation in the form of a study or (voluntary) work (compared to 16.7 % of the controls and 21.1 % of the relatives).

The results of the current study seem to point out that the social isolation, that is frequently seen in patients, is dysfunctional in terms of preventing paranoid delusions. To wit, patients reported more momentary paranoia when they were alone than when they were accompanied by others. What is then the reason of this social isolation? Social disengagement of patients could be caused by many factors, such as poor social skills (Mueser et al., 1991), being stigmatized because of the psychotic disorder (Loganathan & Murthy, 2008), and a history of negative social experiences (Tielens, 2012). Because of the association of social isolation with lower quality of life and because the current study pointed out that company might be a protective factor for the occurrence of paranoia, social engagement of patients should be stimulated. Social skill training could possibly help patients to engage more (successfully) in social interactions (Kurtz & Mueser, 2008). Social integration projects could also be helpful (Tielens, 2012). Furthermore, patients could possibly benefit from education for their social environment (family for example), so that their behaviour might be better understood, which might result in more understanding and support from the environment. Campaigns to reduce the stigma of psychiatric disorders, and psychosis in particular, might also be beneficial for the engagement of psychotic patients in society (Gaebel et al., 2008). Links between real life social behaviour, social skills, interventions to improve social engagement of patients, and illness symptoms should be further investigated.

Limitations and strengths of the study

Participants that were included in the patient group of the current study were not very ill (see textbox). The patient group of the current study can therefore not be seen as representative for the acutely ill psychotic population. Likewise, the mean scores of patients on momentary paranoia in the ESM questionnaires were not very high. If the patient group would have consisted of more severely ill patients, the results of the current study might have been different. The low illness severity of the patient group must be taken into account in the interpretation of the results: it is not ascertained if the mechanisms found in the current study are the same in more severely ill patients.

> The mean total score on the Positive and Negative Syndrome Scale (PANSS) of patients in the current study was low. According to the PANSS scoring criteria, the mean scores on PANSS items of the patients equal minimal psychopathology. There is no official cut-off score for this instrument (Leucht et al., 2005b). Leucht et al. (2005b) compared the PANSS with simultaneous ratings of Clinical Global Impressions (CGI). Being considered "mildly ill" according to the CGI approximately corresponded to a PANSS total score of 58 (Leucht et al., 2005b). The mean PANSS total score for patients in the current study was 55.8.

The finding that momentary paranoia in patients was lower when they were in the company of others than when they were alone is genuinely interesting. This finding, however, must be interpreted with cautiousness, since it was an non-hypothesized finding. Therefore, further research on this topic is recommended.

The number of participants per group in the current study might seem low, but the high amount of measurements per participant (an average of 48 completed measurements) compensates the relatively low number of participants in terms of power.

A specific strength of the current study was the utilization of the Experience Sampling Method, since this allowed investigating the moment to moment changes in social interactions and momentary paranoia in the real context of daily life (Delespaul, 1995). Furthermore, the inclusion of relatives in the research was also a strong point, because this made it possible to look at social aspects and the tendency to experience paranoia in terms of a genetic risk to the illness.

Suggestions for future research

As stated before, links between real life social behaviour, social skills, interventions to improve social engagement of patients, and illness symptoms should be investigated. The Experience Sampling Method is recommended for this purpose. It would be interesting if future researchers investigating these topics would manage to include participants with higher illness severity. This would enable exploring the effect of illness severity on social contact and paranoia. This could possibly be achieved by recruiting patients at mental health institutions aimed for treatment of severe psychotic patients.

Conclusion

In contrast to the expectation, patients experienced more momentary paranoia when they were in the company of a stranger compared to when they were accompanied by a close relation, as did relatives and controls. Reactivity to different types of social contact thus seemed 'normal' for the patient group of the current study. This might be caused by the fact that the illness severity of the patient group in the current study was relatively low.

Furthermore, patients experienced less momentary paranoia when they were in the company of others (both strangers and close relations) than when they were alone. Social

withdrawal thus seems dysfunctional in terms of the occurrence of paranoia. However, patients were alone more often than relatives and healthy controls. Company of other people, even unfamiliar others, might be a protective factor for the experience of paranoia in psychotic patients and should therefore be stimulated in treatment and other interventions.

References

American Psychiatric Association. (2013). Schizophrenia Spectrum and Other Psychotic Disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author. http://dx.doi.org/10.1176/appi.books.9780890425596.dsm02

Axelrod, B. N. (2002). Validity of the Wechsler abbreviated scale of intelligence and other very short forms of estimating intellectual functioning. *Assessment, 9*(1), 17-23. https://doi.org/10.1177/1073191102009001003

Bentall, R. P., Corcoran, R., Howard, R., Blackwood, N., & Kinderman, P. (2001). Persecutory delusions: a review and theoretical integration. *Clinical psychology review, 21*(8), 1143-1192. https://doi.org/10.1016/S0272-7358(01)00106-4

Berry, K., Barrowclough, C., & Wearden, A. (2008). Attachment theory: a framework for understanding symptoms and interpersonal relationships in psychosis. *Behaviour Research and Therapy, 46*(12), 1275-1282. https://doi.org/10.1016/j.brat.2008.08.009

Bow-Thomas, C. C., Velligan, D. I., Miller, A. L., & Olsen, J. (1999). Predicting quality of life from symptomatology in schizophrenia at exacerbation and stabilization. *Psychiatry Research, 86*(2), 131-142. https://doi.org/10.1016/S0165-1781(99)00023-2

Chino, B., Nemoto, T., Fujii, C., & Mizuno, M. (2009). Subjective assessments of the quality of life, well-being and self-efficacy in patients with schizophrenia. *Psychiatry and clinical neurosciences, 63*(4), 521-528. doi:10.1111/j.1440-1819.2009.01995.x

Collip, D., Oorschot, M., Thewissen, V., Van Os, J., Bentall, R., & Myin-Germeys, I. (2011). Social world interactions: how company connects to paranoia. *Psychological medicine,* 41(5), 911-921. https://doi.org/10.1017/S0033291710001558

Delespaul, P. (1995). *Assessing schizophrenia in daily life: The experience sampling method.* Maastricht, The Netherlands: Maastricht Univ. Press

Delusion. (2017). In *Encyclopaedia Britannica Online*. Retrieved from https://www.britannica.com/science/delusion

Fenigstein, A., & Vanable, P. A. (1992). Paranoia and self-consciousness. *Journal of personality and social psychology, 62*(1), 129. http://dx.doi.org/10.1037/0022-3514.62.1.129

Fett, A.-K. J., Shergill, S. S., Joyce, D. W., Riedl, A., Strobel, M., Gromann, P. M., & Krabbendam, L. (2012). To trust or not to trust: the dynamics of social interaction in psychosis. *Brain, 135*(3), 976-984. https://doi.org/10.1093/brain/awr359

Field, A. (2013). *Discovering statistics using IBM SPSS statistics.* London, England: Sage.

Freeman, D., Garety, P. A., Kuipers, E., Fowler, D., & Bebbington, P. E. (2002). A cognitive model of persecutory delusions. *British Journal of Clinical Psychology, 41*(4), 331-347. doi:10.1348/014466502760387461

Freeman, D. (2007). Suspicious minds: the psychology of persecutory delusions. *Clinical psychology review, 27*(4), 425-457. https://doi.org/10.1016/j.cpr.2006.10.004

Gaebel, W., Zäske, H., Baumann, A. E., Klosterkötter, J., Maier, W., Decker, P., & Möller, H. J. (2008). Evaluation of the German WPA "program against stigma and discrimination because of schizophrenia—Open the Doors": results from representative telephone surveys before and after three years of antistigma interventions. *Schizophrenia research, 98*(1), 184-193. https://doi.org/10.1016/j.schres.2007.09.013

Hays, J. R., Reas, D. L., & Shaw, J. B. (2002). Concurrent validity of the Wechsler abbreviated scale of intelligence and the Kaufman brief intelligence test among psychiatric inpatients. *Psychological reports, 90*(2), 355-359. https://doi.org/10.2466/pr0.2002.90.2.355

Kay, S. R., Fiszbein, A., & Opler, L. A. (1987). The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophrenia bulletin, 13*(2), 261-276. http://dx.doi.org/10.1093/schbul/13.2.261

Kay, S. R., Opler, L. A., & Lindenmayer, J. P. (1988). Reliability and validity of the positive and negative syndrome scale for schizophrenics. *Psychiatry research, 23*(1), 99-110. https://doi.org/10.1016/0165-1781(88)90038-8

Kelleher, I., & Cannon, M. (2011). Psychotic-like experiences in the general population: characterizing a high-risk group for psychosis. *Psychological medicine, 41*(1), 1-6. https://doi.org/10.1017/S0033291710001005

Kurtz, M. M., & Mueser, K. T. (2008). A meta-analysis of controlled research on social skills training for schizophrenia. *Journal of Consulting and Clinical Psychology, 76*(3), 491-504. http://dx.doi.org/10.1037/0022-006X.76.3.491

Lambert, M., & Naber, D. (2004). Current issues in schizophrenia: overview of patient acceptability, functioning capacity and quality of life. *CNS drugs*, *18*(2), 5-17. http://dx.doi.org/10.2165/00023210-200418002-00002

Larson, R., & Csikszentmihalyi, M. (1983). The experience sampling method. *New Directions for Methodology of Social & Behavioral Science, 15*, 41-56.

Leucht, S., Kane, J. M., Kissling, W., Hamann, J., Etschel, E., & Engel, R. R. (2005a). Clinical implications of Brief Psychiatric Rating Scale scores. *British Journal of Psychiatry, 187*, 366-371. doi:10.1192/bjp.187.4.366

Leucht, S., Kane, J. M., Kissling, W., Hamann, J., Etschel, E., & Engel, R. R. (2005b). What does the PANSS mean?. *Schizophrenia research, 79*(2), 231-238. https://doi.org/10.1016/j.schres.2005.04.008

Loganathan, S., & Murthy, S. R. (2008). Experiences of stigma and discrimination endured by people suffering from schizophrenia. *Indian Journal of Psychiatry, 50*(1), 39-46. doi:10.4103/0019-5545.39758

Macdonald, E. M., Hayes, R. L., & Baglioni, A. J. (2000). The quantity and quality of the social networks of young people with early psychosis compared with closely matched controls. *Schizophrenia research, 46*(1), 25-30. https://doi.org/10.1016/S0920-

9964(00)00024-4

Mueser, K. T., Bellack, A. S., Douglas, M. S., & Morrison, R. L. (1991). Prevalence and stability of social skill deficits in schizophrenia. *Schizophrenia research, 5*(2), 167-176. https://doi.org/10.1016/0920-9964(91)90044-R

Myin-Germeys, I., Nicolson, N. A., & Delespaul, P. A. (2001). The context of delusional experiences in the daily life of patients with schizophrenia. *Psychological medicine, 31*(3), 489-498. https://doi.org/10.1017/S0033291701003646

Norman, R. M., Malla, A. K., McLean, T., Voruganti, L. P. N., Cortese, L., McIntosh, E., ... Rickwood, A. (2000). The relationship of symptoms and level of functioning in schizophrenia to general wellbeing and the Quality of Life Scale. *Acta Psychiatrica Scandinavica*, *102*(4), 303-309. doi:10.1034/j.1600-0447.2000.102004303.x

Oorschot, M., Kwapil, T., Delespaul, P., & Myin-Germeys, I. (2009). Momentary assessment research in psychosis. *Psychological assessment, 21*(4), 498-505. http://dx.doi.org/10.1037/a0017077

Peralta, V., & Cuesta, M. J. (1994). Psychometric properties of the positive and negative syndrome scale (PANSS) in schizophrenia. *Psychiatry research*, *53*(1), 31-40. https://doi.org/10.1016/0165-1781(94)90093-0

Peralta, V., Cuesta, M. J., & De Leon, J. (1995). Positive and negative symptoms/syndromes in schizophrenia: reliability and validity of different diagnostic systems. *Psychological medicine, 25*(1), 43-50. https://doi.org/10.1017/S0033291700028075

Ritsner, M., Kurs, R., Gibel, A., Hirschmann, S., Shinkarenko, E., Ratner, Y. (2003). Predictors of quality of life in major psychoses: a naturalistic follow-up study. *Journal of Clinical Psychiatry, 64*(3), 308–315

Shergill, S. & Fett, A. (2014). Research protocol DECOP Decision making, context and psychosis. An investigation of impaired context processing as underlying mechanism of symptoms and social dysfunction in non-affective psychosis. Institute of Psychiatry,

King's College London

Thewissen, V., Bentall, R. P., Lecomte, T., Van Os, J., & Myin-Germeys, I. (2008). Fluctuations in self-esteem and paranoia in the context of daily life. Journal of abnormal psychology, 117(1), 143. http://dx.doi.org/10.1037/0021-843X.117.1.143

Tielens, J. (2012). *In gesprek met psychose: Verbindende gesprekstechniek, praktische handleiding om in contact te komen en te blijven met psychotische mensen.* Utrecht, The Netherlands: De Tijdstroom.

Van den Oord, E. J., Rujescu, D., Robles, J. R., Giegling, I., Birrell, C., Bukszár, J., ... & Muglia, P. (2006). Factor structure and external validity of the PANSS revisited. *Schizophrenia research, 82*(2), 213-223. https://doi.org/10.1016/j.schres.2005.09.002

Van Os, J., Linscott, R. J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness–persistence–impairment model of psychotic disorder. *Psychological medicine, 39*(2), 179-195. https://doi.org/10.1017/S0033291708003814

Wechsler, D. (1999). *Wechsler abbreviated scale of intelligence.* New York, USA: Psychological Corporation.