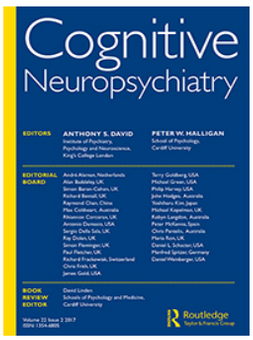

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# Differential patterns in mind perception in subclinical paranoia: relationships to self-reported empathy

Benjamin Buck[a], Neil Hester[a], David L. Penn[a,b] and Kurt Gray[a]

[a]Department of Psychology and Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA; [b]Australian Catholic University, Melbourne, Australia

**ABSTRACT**

*Introduction:* Although social cognition skills and biases are well-studied in paranoia, "mind perception" – perceiving the extent to which someone even possesses a thinking, feeling mind – is not. We sought to better characterise the profile of mind perception for individuals with paranoia.

*Methods:* We examined links between mind perception and paranoia in a large ($n = 890$) subclinical sample. Participants completed measures of paranoia, schizotypy, mind perception, and dispositional empathy. These assessments were examined for their relationships to one another, as well as the possibility that mind perception partially mediates the relationship between paranoia and empathy.

*Results:* Analyses revealed that increased paranoia was linked to less mind perception towards people. This distorted mind perception partially explained the link between paranoia and both perspective taking and empathic concern.

*Conclusions:* In paranoia – and psychopathology more broadly – understanding and addressing distorted mind perception may be one component of restoring social functioning.

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Paranoia; psychosis; mind perception; social cognition

## Introduction

Recent developments in schizophrenia research have focused on specific symptoms rather than the broad syndrome (Bentall et al., 2009; Combs, Finn, Wohlfahrt, Penn, & Basso, 2013), and one symptom of interest is paranoia. Paranoia is associated with a range of adverse outcomes, including poor physical health, poor social functioning, isolation, and stress (see Freeman, 2007 for a review). Contributors to the development of paranoia include deficits in social cognition (Green et al., 2008) and metacognition (Lysaker et al., 2013). Those with paranoia are less accurate in identifying emotions (Combs, Michael, & Penn, 2006; Combs et al., 2013), assume others' intentions are hostile (Combs et al., 2009), report a reduced tendency to engage in perspective taking (Montag, Heinz, Kunz, & Gallinat, 2007), are less apt to form complex ideas about themselves and others (i.e., self-reflectivity and mind of the other; Hamm et al., 2012) and use these ideas to solve problems (i.e., mastery; Lysaker et al., 2005).

**CONTACT** Benjamin Buck buck@unc.edu

When someone incorrectly uses social information, a common assumption in schizophrenia research is that he or she lacks skills necessary to understand others' minds. However, these deficits may stem from something even more basic – a failure to even *perceive* minds. Before someone can understand another person's emotions or intentions, they first have to see that other person as capable of these mental states; they have to engage in "mind perception".

Perspective taking and empathising may seem like basic cognitive elements; however, the process of mind perception may underlie these skills. While previous clinical research has examined some components of recognising minds (Dimaggio, Lysaker, Carcione, Nicolò, & Semerari, 2008; Lysaker et al., 2013), minimal previous clinical research has examined how judgments of the presence of mind differ across certain targets. Rather than accurately understanding the *contents* of others' minds, "mind perception" from the social psychology literature involves understanding the mere *presence* of mind across a range of other entities, including people, animals, and technology (Epley & Waytz, 2010). People see minds along two related but separable dimensions: the capacity to for feelings and sensations (experience) and the capacity for thought and action (agency; Gray, Gray, & Wegner, 2007). This kind of mind perception has been studied in subclinical samples, but rarely studied in clinical psychology. One study demonstrated links between mind perception and autism, psychopathy, and schizotypy; increased autism symptoms were linked to reduced perception of agency towards adults, increased psychopathy symptoms were linked to reduced perceptions of experience in both humans and animals, and increased schizotypy symptoms were linked to increased perceptions of agency and experience in objects commonly believed to possess none, like trees and the dead (Gray, Jenkins, Heberlein, & Wegner, 2011). These divergent patterns suggest that mind perception provides a way to broadly understand the underlying nature of psychopathology using two common dimensions – agency and experience.

Difficulties with perspective taking and empathy in paranoia may be partly explained by deficits in mind perception. Understanding the motives of others (i.e., theory of mind) may begin with ascribing them the basic abilities to form intentions. To the extent that those with paranoia under-ascribe mind to other humans, they may also have trouble engaging in perspective taking to understand their motives or account for their feelings. Understanding how mind perception affects the presence of paranoia could extend and complicate models of mental state attribution, including clarifying what components of such judgments are automatic and which are effortful.

Given the relevance of mind perception to other disorders, and its potential role in social cognition and metacognition, we examined its link to paranoia in a large sample of subclinical participants. We predicted that those with increased paranoia would under-ascribe mind in human targets. We further predicted that mind perception in humans would partially explain the links between increased paranoia and reduced empathic concern and perspective taking. Because schizotypy commonly co-occurs with paranoia and has its own unique profile for mind perception (Gray et al., 2011), we repeated analyses controlling for schizotypy for an examination of mind perception specific to paranoia.

## Methods

### Participants

Eight hundred and ninety online survey respondents on Amazon Mechanical Turk completed the study ($M_{age}$ = 31.94 years, $SD_{age}$ = 11.42 years, 60% women). Forty-five participants were excluded from final analyses for either failing to complete the survey or for failing attention checks (i.e., strongly endorsing all three statements: "I believe I can fly." "I have never been disliked." "I have had my nose broken many times.").

### Measures

#### The mind survey

The Mind Survey asks participants to rate how much they perceive various targets to possess different mental capacities (0 = not at all to 6 = very much) (Gray et al., 2011). Targets included an adult female, adult male, a baby human, deceased human, a dog, God, an infant, a robot, a tree, and Superman. Mental capacities included both agency-related capacities (exercise self-control, have memories, and act morally) and experience-related capacities (feel fear, pleasure, and hunger). As we were interested in overall mind perception, we combined these six items together into a single index, consistent with recent research (Gray, Knickman & Wegner, 2011).

#### The paranoia scale

The Paranoia Scale contains statements assessing paranoid thoughts and behaviours. Participants provided responses to these statements on a 5-point scale from "not at all applicable to me" (1) to "extremely applicable to me" (5), and these scores were aggregated (Fenigstein & Vanable, 1992).

#### The interpersonal reactivity index

The interpersonal reactivity index (IRI) is a 28-item self-report scale of empathy, comprised of four scales: perspective taking (the tendency to adopt another's perspective), empathic concern (the tendency to experience concern for others), personal distress (the tendency to feel distressed in interpersonal situations), and fantasy (the tendency to imagine oneself in the place of fictional characters) (Davis, 1983).

#### The schizotypal personality questionnaire – brief

The schizotypal personality questionnaire – brief (SPQ-B) is a 22-item self-report scale of thoughts and behaviours that provides screening questions for schizotypal personality disorder (Raine & Benishay, 1995). We used the mean of all responses. Results related to the mind perception profile of schizotypy are reported elsewhere (Gray et al., 2011).

### Procedure and data analysis

First, to explore relationships between mind perception and paranoia, we examined correlations between paranoia and perceptions of mind across all nine targets. Given previous research demonstrating that mind perception of those with schizotypy differs from a general population, we repeated these correlations controlling for levels of schizotypy.

Second, we conducted two bootstrapping analyses of indirect effects to determine whether the relationships between paranoia and two important interpersonal skills – perspective taking and empathic concern – are partly explained by the perception of human minds.

## Results

Higher levels of paranoia correlated positively with a tendency to perceive mind in dead people, trees, robots, and Superman, and negatively correlated with a tendency to perceive mind in men, women, and babies (Table 1). These analyses were repeated controlling for schizotypy, and relationships with all non-human targets except one (robots) were no longer significant.[1] Negative correlations with all human targets remained significant. As hypothesised, higher levels of paranoia correlated negatively with a tendency to perceive mind in humans.

Analyses of indirect effects were conducted using the Preacher and Hayes (2004) bootstrapping method. The correlational results prompted the inclusion of schizotypy as control variable for the primary analysis. For each analysis, paranoia was included as the predictor variable and perception of human minds (average of men, women and babies) was included as a mediating variable. Given that perspective taking and empathic concern are skills typically applied to other people, we predicted that perception of human minds would partially explain the effects of paranoia on these skills.

As predicted, there was an indirect effect of paranoia on perspective taking through the perception of human minds, 99% CI [−.07, −.01], as well as an indirect effect on empathic concern through the perception of human minds, 99% CI [−.07, −.01] (Figure 1(a,b)).[2] To test whether this indirect effect was specific to other-focused skills, and not a broad predictor of all of the subscales of the IRI, we also analysed whether the perception of human minds partly explained paranoia's relationship with personal distress. There was no indirect effect of paranoia on personal distress through the perception of human minds, 95% CI [−.01, .02].

**Table 1.** Mean total scores of targets on the mind survey as well as correlations of the paranoia scale with perceptions of mind in the mind survey ($n = 845$).

| | *M* (SD) | Pearson correlations | |
|---|---|---|---|
| | Mind survey | Paranoia scale | (controlling for SPQ-B) |
| Perceptions of mind | | | |
| Man | 12.19 (1.72) | −.20*** | −.16*** |
| Woman | 12.08 (1.66) | −.16*** | −.13*** |
| Baby | 8.13 (1.94) | −.08* | −.10** |
| Dead person | 1.37 (2.63) | .11** | .06 |
| Dog | 8.95 (1.93) | .03 | −.02 |
| God | 6.30 (3.84) | .06^ | .03 |
| Tree | 2.80 (2.86) | .17* | .04 |
| Robot | 2.72 (2.05) | .14** | .09* |
| Superman | 5.72 (4.95) | .09** | .05 |

^$p < .10$.
*$p < 0.05$.
**$p < 0.01$.
***$p < .001$.

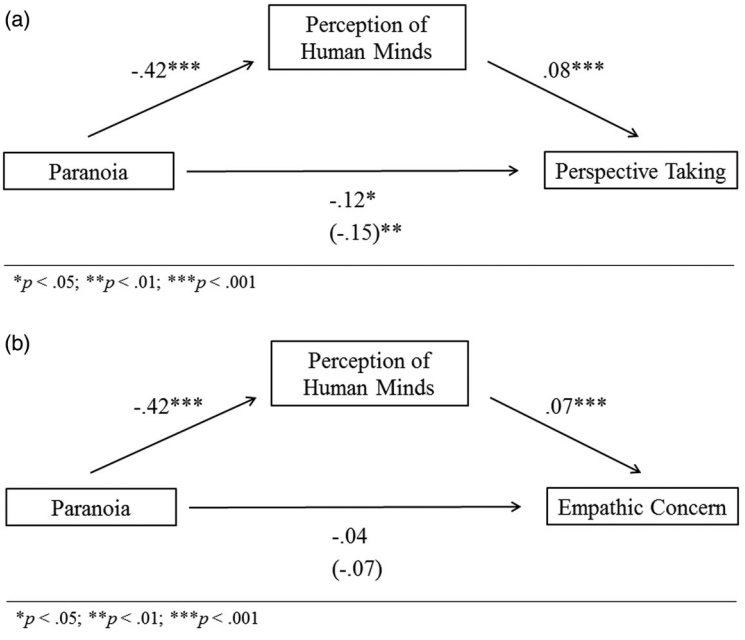


**Figure 1.** (a) Indirect effect of paranoia on perspective taking through perception of human minds, controlling for schizophrenia. Numbers represent effect sizes. (Numbers in parentheses represent the size of the direct effect before the addition of the mediating variable). (b) Indirect effect of paranoia on empathic concern through perception of human minds, controlling for schizophrenia. Numbers represent effect sizes. (Numbers in parentheses represent the size of the direct effect before the addition of the mediating variable).

## Discussion

These results provide a mind perception profile for subclinical paranoia. Increased paranoia is linked to reduced mind perception towards humans, but increased mind perception towards objects and the dead. Furthermore, after controlling for schizotypy, reduced perception of human minds persist, suggesting that these differences in mind perception are specific to paranoia. Finally, our analyses of indirect effects show that mind perception partially accounts for paranoia's relationships to empathic concern and perspective taking.

The mind perception profile identified here is consistent with other findings demonstrating a tendency in paranoia to see other people as hostile and aggressive. Specifically, individuals with subclinical paranoia have been shown to both understand others' minds poorly and see others' motives as hostile and blameworthy (Combs et al., 2013). According to this account, a failure to perceive mind would result in less successful perspective taking, which might lead to incorrect or hostile interpretations of others' intentions. Other previous research has worked to identify the preconditions of social cognition in schizophrenia, specifically neurocognition (Sergi et al., 2007; Vauth, Rüsch, Wirtz, & Corrigan, 2004). Mind perception could serve as another contributor or precondition for effective social cognitive skills and management of biases.

This study is preliminary and not without limitations. First, despite highly significant findings, the absolute strength of the correlational relationships are relatively small. This should be interpreted, however, in light of the fact that this is a subclinical analogue

sample, and small relationships in such a sample could indicate stronger relationships in a clinical sample (Gray et al., 2011). Also, the IRI is a self-report assessment of dispositional empathy and may not fully represent individuals' actual skill in this or other areas of social cognition. Future research should examine whether mind perception relates to social cognition skill in performance-based measures.

Finally, one question that has eluded research in social cognition in psychosis at present is the observation that when faced with skill deficits in understanding others' minds, individuals with paranoia make default assumptions of potential threat (Combs & Penn, 2004). The present research does not directly address this issue. Other factors may contribute to this tendency, including insecure attachment (Wickham, Sitko, & Bentall, 2015), arousal (Pankow et al., 2013), or depression (Vorontsova, Garety, & Freeman, 2013); or, to the extent that people cannot form a clear judgment about the intentions of another person, they may assume that the person is threatening until proven otherwise. People are very skilled at identifying threatening stimuli in their environment, such as snakes, knives, and needles, suggesting a basic preference for perceiving threat (LoBue, 2010; Öhman, Flykt, & Esteves, 2001). Furthermore, people also show a systematic bias towards perceiving actions as intentional, rather than accidental (Rosset, 2008), which may partially explain hostile interpretations of certain passages in measures of attributional style.

If indeed, with replication, these mind perception differences prove to be related to the emergence of paranoia, this could provide additional support for interventions that encourage the stimulation of one's ability to recognise and think flexibly about others' mental states (i.e., metacognitive therapies; Van Donkersgoed et al., 2014). As researchers continue to address the ever-important question of *how* people understand others' minds, we hope that they also consider the question of *what* sort of minds people are trying to understand in the first place.

## Notes

1. One potential alternative explanation for these results is that higher paranoia is linked to more random responding, pulling ratings towards the center of the scale and away from extremes, in which humans (high extreme) and objects (low extreme) reside. However, such random responding would not reveal a meaningful mediational pattern, which we investigate next.
2. Although the main effect of paranoia on empathic concern was not significant controlling for schizotypy, we still ran the analysis of indirect effects on the basis of theoretical predictions (see Shrout & Bolger, 2002).

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## References


Bentall, R. P., Rowse, G., Shryane, N., Kinderman, P., Howard, R., Blackwood, N., … Corcoran, R. (2009). The cognitive and affective structure of paranoid delusions: A transdiagnostic investigation of patients with schizophrenia spectrum disorders and depression. *Archives of General Psychiatry*, *66*(3), 236–247.

Combs, D. R., Finn, J. A., Wohlfahrt, W., Penn, D. L., & Basso, M. R. (2013). Social cognition and social functioning in nonclinical paranoia. *Cognitive Neuropsychiatry*, *18*(6), 531–548.

Combs, D. R., Michael, C. O., & Penn, D. L. (2006). Paranoia and emotion perception across the continuum. *British Journal of Clinical Psychology*, *45*(1), 19–31.

Combs, D. R., & Penn, D. L. (2004). The role of subclinical paranoia on social perception and behavior. *Schizophrenia Research*, *69*(1), 93–104.

Combs, D. R., Penn, D. L., Michael, C. O., Basso, M. R., Wiedeman, R., Siebenmorgan, M., … Chapman, D. (2009). Perceptions of hostility by persons with and without persecutory delusions. *Cognitive Neuropsychiatry*, *14*(1), 30–52.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*(1), 113–126.

Dimaggio, G., Lysaker, P. H., Carcione, A., Nicolò, G., & Semerari, A. (2008). Know yourself and you shall know the other … to a certain extent: Multiple paths of influence of self-reflection on mindreading. *Consciousness and Cognition*, *17*(3), 778–789.

Epley, N., & Waytz, A. (2010). Mind perception. In D. T. G. S. T. Fiske & G. Lindzey (Eds.), *The handbook of social psychology* (5th ed., pp. 498–541). New York: Wiley.

Fenigstein, A., & Vanable, P. A. (1992). Paranoia and self-consciousness. *Journal of Personality and Social Psychology*, *62*(1), 129–138.

Freeman, D. (2007). Suspicious minds: The psychology of persecutory delusions. *Clinical Psychology Review*, *27*(4), 425–457.

Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science*, *315*(5812), 619–619.

Gray, K., Jenkins, A. C., Heberlein, A. S., & Wegner, D. M. (2011). Distortions of mind perception in psychopathology. *Proceedings of the National Academy of Sciences*, *108*(2), 477–479.

Gray, K., Knickman, T. A., & Wegner, D. M. (2011). More dead than dead: Perceptions of persons in the persistent vegetative state. *Cognition*, *121*(2), 275–280.

Green, M. F., Penn, D. L., Bentall, R., Carpenter, W. T., Gaebel, W., Gur, R. C., … Heinssen, R. (2008). Social cognition in schizophrenia: An NIMH workshop on definitions, assessment, and research opportunities. *Schizophrenia Bulletin*, *34*(6), 1211–1220.

Hamm, J. A., Renard, S. B., Fogley, R. L., Leonhardt, B. L., Dimaggio, G., Buck, K. D., & Lysaker, P. H. (2012). Metacognition and social cognition in schizophrenia: Stability and relationship to concurrent and prospective symptom assessments. *Journal of Clinical Psychology*, *68*(12), 1303–1312.

LoBue, V. (2010). What's so scary about needles and knives? Examining the role of experience in threat detection. *Cognition and Emotion*, *24*(1), 180–187.

Lysaker, P. H., Bob, P., Pec, O., Hamm, J., Kukula, M., Vohs, J., … Dimaggio, G. (2013). Synthetic metacognition as a link between brain and behavior in schizophrenia. *Translational Neuroscience*, *4*(3), 368–377.

Lysaker, P. H., Carcione, A., Dimaggio, G., Johannesen, J. K., Nicolò, G., Procacci, M., & Semerari, A. (2005). Metacognition amidst narratives of self and illness in schizophrenia: Associations with neurocognition, symptoms, insight and quality of life. *Acta Psychiatrica Scandinavica*, *112*(1), 64–71.

Montag, C., Heinz, A., Kunz, D., & Gallinat, J. (2007). Self-reported empathic abilities in schizophrenia. *Schizophrenia Research*, *92*(1), 85–89.

Öhman, A., Flykt, A., & Esteves, F. (2001). Emotion drives attention: Detecting the Snake in the grass. *Journal of Experimental Psychology: General*, *130*(3), 466–478.

Pankow, A., Friedel, E., Sterzer, P., Seiferth, N., Walter, H., Heinz, A., & Schlagenhauf, F. (2013). Altered amygdala activation in schizophrenia patients during emotion processing. *Schizophrenia Research*, *150*(1), 101–106.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731.

Raine, A., & Benishay, D. (1995). The SPQ-B: A brief screening instrument for schizotypal personality disorder. *Journal of Personality Disorders*, *9*(4), 346–355.

Rosset, E. (2008). It's no accident: Our bias for intentional explanations. *Cognition*, *108*(3), 771–780.

Sergi, M. J., Rassovsky, Y., Widmark, C., Reist, C., Erhart, S., Braff, D. L., … Green, M. F. (2007). Social cognition in schizophrenia: relationships with neurocognition and negative symptoms. *Schizophrenia Research*, *90*(1), 316–324.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*(4), 422–445.

Van Donkersgoed, R. J., De Jong, S., Van der Gaag, M., Aleman, A., Lysaker, P. H., Wunderink, L., & Pijnenborg, G. H. M. (2014). A manual-based individual therapy to improve metacognition in schizophrenia: Protocol of a multi-center RCT. *BMC Psychiatry*, *14*(1), 1–8.

Vauth, R., Rüsch, N., Wirtz, M., & Corrigan, P. W. (2004). Does social cognition influence the relation between neurocognitive deficits and vocational functioning in schizophrenia? *Psychiatry Research*, *128*(2), 155–165.

Vorontsova, N., Garety, P., & Freeman, D. (2013). Cognitive factors maintaining persecutory delusions in psychosis: The contribution of depression. *Journal of Abnormal Psychology*, *122*(4), 1121–1131.

Wickham, S., Sitko, K., & Bentall, R. P. (2015). Insecure attachment is associated with paranoia but not hallucinations in psychotic patients: The mediating role of negative self-esteem. *Psychological Medicine*, *45*(7), 1495–1507.