

Letter to the Editor

Context influences social cognitive judgments in paranoid individuals with schizophrenia

Dear Editors,

We previously presented a study investigating neural activation during judgments of trustworthiness in non-paranoid individuals with schizophrenia (NP-SCZ), paranoid individuals with schizophrenia (P-SCZ), and healthy individuals (CON) (Pinkham et al., 2008). During functional neuroimaging, participants viewed photos of faces and made dichotomous decisions of trustworthiness (i.e. trustworthy or untrustworthy) for each image. Analysis of these behavioral responses, provided in the original publication, demonstrated that P-SCZ, as compared to the other groups, rated significantly more faces as untrustworthy. However, individuals were also asked to make trustworthiness judgments about the same stimuli immediately following the MRI session. These additional ratings utilized the Likert-scale from -3 (not at all trustworthy) to $+3$ (very trustworthy) implemented in the original Trustworthiness/Approachability Task developed by Adolphs et al. (1998). Our goal was to obtain ratings that would allow for a parametric examination of neural responses that increased or decreased according to varying levels of trustworthiness. While not our primary motivation, these ratings also permit examination of the potential role of testing context on behavioral responding by comparing ratings provided in the scanner to those provided out of the scanner. Effects of context on reaction time have previously been observed in imaging studies utilizing cognitive paradigms (Barch et al., 2001), but to our knowledge, no studies have examined this issue in regard to social cognitive tasks or distinctions between paranoid and non-paranoid individuals with schizophrenia.

To assess the effects of context, out-of-scanner data were first dichotomized by recoding all stimuli with negative ratings as untrustworthy and all stimuli with positive ratings as trustworthy. Stimuli receiving ratings of zero were omitted. The percent of faces rated as trustworthy was then calculated for both in-scanner and out-of-scanner responses, and these values were entered into a repeated measures ANOVA with context (in-scanner vs. out-of-scanner) as the within-subject variable and group (P-SCZ vs. NP-SCZ vs. CON) as the between-subject variable.

Analyses revealed a main effect of context; across groups more faces were rated as trustworthy outside the scanner ($F(1, 33) = 8.99$, $p = .005$). In contrast to our previous results, the main effect of group was not significant indicating no overall difference between ratings provided by each group. However, a significant context by group interaction ($F(2, 33) = 5.62$, $p = .008$) emerged demonstrating that only P-SCZ showed a significant effect of context. Follow-up *t*-tests indicated that CON and NP-SCZ rated the same percentage of faces as trustworthy both in- and out-of-scanner (CON: $t(11) = 1.18$, $p = .26$; NP-SCZ: $t(11) = .12$, $p = .91$) whereas P-SCZ rated significantly more faces as trustworthy outside the scanner ($t(11) = 5.02$, $p < .001$; Fig. 1).

It is difficult to draw definitive conclusions about what caused this change in P-SCZ, but we believe there are several intriguing possibilities that may prompt future research. First, given that in-scanner responses were registered via button press but out-of-scanner responses were provided verbally to an experimenter, the current finding may speak to the abilities of paranoid individuals to manage the impressions they make on others. Such reasoning is in line with studies demonstrating that individuals with schizophrenia were able to adjust their report of symptoms to appear healthy or sick (Braginsky and Braginsky, 1967) and to adjust task performance to be consistent with healthy or sick presentations (Price, 1972). Our findings suggest participants with paranoia may be adept at managing impressions and provide evidence for some level of intact social cognitive ability among this group. Second, it may be possible that the scanning environment itself influenced participants in a way that made the P-SCZ group more suspicious, which was then reflected in ratings. In healthy individuals, experimentally increasing state anxiety and stress contributes to increased paranoid ideation, particularly among individuals who demonstrate vulnerability by endorsing sub-clinical symptoms of psychosis (Lincoln et al., 2009; Lincoln et al., 2010). A similar process may have occurred here. Finally, this shift in responding raises questions about the validity of data collected under different testing conditions (i.e. scanner vs. typical testing environments) that may be relevant to the schizophrenia imaging community.

Differences in the available response options between sessions might have contributed to our findings. However, groups did not differ in the number of faces included in the analyses ($F(2, 33) = .28$, $p = .76$) indicating that implementation of the zero option cannot be responsible for the present results. Likewise, mean percent agreement per image between in- and out-of-scanner responses was high for each of the groups (CON: 86%, NP-SCZ: 74%, P-SCZ: 71%) suggesting that random responding across sessions is unlikely to explain the changes in the paranoid group. Thus, we believe these incidental

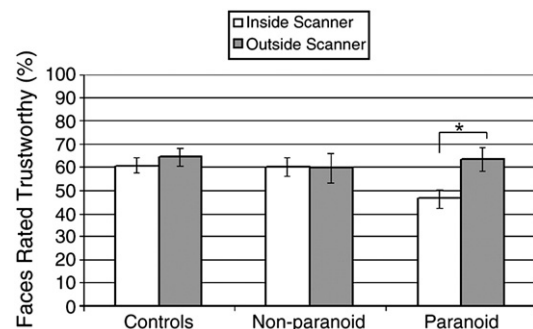


Fig. 1. Effect of context on social judgments. Mean (\pm SE) percent trustworthiness for each group both in-scanner and out-of-scanner. Asterisks denote significant between context differences at $p < .001$.

findings have strong heuristic value with both phenomenological and methodological implications for the study of paranoia and schizophrenia more generally.

Role of funding source

Funding for this project was provided by the National Alliance for Research on Schizophrenia and Depression (D. Penn), Johnson and Johnson Pharmaceutical Research and Development, LLC, USA (D. Penn), National Institute of Mental Health grant R01 MH66034 (J. Hopfinger). These sources had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

Contributors

All authors contributed to study design and the final version of the manuscript. AEP analyzed the data and wrote the first draft of the manuscript. All authors have approved the final manuscript.

Conflicts of Interest

All authors report no conflicts of interests.

Acknowledgements

The authors would like to thank all the individuals who participated in this study.

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16 September 2011