**Author’s response to reviews**

**Title:** Saccadic eye movements in different dimensions of schizophrenia and in clinical high-risk state for psychosis

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Reviewer reports:

Francesco Bartoli, MD, PhD (Reviewer 1): This article compares saccadic eye movement tasks in (i) individuals with schizophrenia (and subgroups according to predominant symptoms), (ii) those with high risk of psychosis, and (iii) healthy volunteers.

Although the investigated topic is interesting and may deserve additional research, the manuscript has several issues requiring major revisions.

**ABSTRACT**

* The abstract is not totally clear and a bit disorganized. The authors should significantly edit it, including specific hypotheses, information on high risk of psychosis group and healthy volunteers in methods subparagraph, number of subjects recruited in different groups. Moreover, the abstract conclusions are completely focused on individuals with high risk of psychosis, highlighting the potential role of eye movement alterations as possible markers of this condition. These conclusions seem arbitrary, selective and not totally supported by study aims and findings, and should be thus tempered.
BACKGROUND

* The first paragraph of background section is based on general statements on schizophrenia and the importance of relevant biomarkers, thus requiring more authoritative references than those chosen by the authors, e.g., Belbasis et al., 2018; McGorry et al., 2014; Owen et al., 2016, etc.

Methods

* More details on sampling procedures are needed. It is unclear if subjects with schizophrenia or high risk of psychosis were consecutively recruited or if a convenience sample was selected. A flow chart describing the selection process should be considered. Moreover, the overall
participation rate should be reported. Similar data should be possibly provided also for healthy volunteers, reporting also information on setting and source of recruitment. In addition, sample characteristics (size, mean age, gender, etc.) should be placed in the results section, rather than in methods one. More generally, the authors should strictly refer to the STROBE guidelines to report observational studies (von Elm et al., 2008).

-We corrected it and added Figure 1 with a flow chart describing the selection process. Line 133-143.

* More details on statistical analysis should be provided. The authors should describe in an ordered and structured way the three-step approach they used, to compare saccadic performance i.e., (1) comparison between subjects with schizophrenia and healthy controls; (2) comparison between schizophrenia subgroups; (3) post-hoc pairwise comparisons if p-value from ANOVA was significant. In addition, the acronym LSD (Fisher's least significant difference?) should be explained the first time it appears in the text.

-We added more details. Line 199-207.

done

RESULTS

* Regarding the first sentence of results section, showing data (mean and standard deviation) on differences, though not significant, between schizophrenia and controls in terms of reflexive and predictive saccades velocity, may be useful.


* Figures 1 to 3 should report the p-values of each subgroup as compared with healthy controls, in order to be more informative.

done
DISCUSSION

* The authors reported as a study limitation that "Differences in terms of eye movement recording techniques, as well as differences in target stimuli displacement and timing have been posited to account for the possible contradictions between these and other findings". However, this issue should be clarified and better explained.

-Now we presented it more clearly. Line 333-339.

* An important study limitation the authors should deal with, is the lack of a sample size calculation and the use of arbitrary sample sizes for selected groups, preventing any evaluation on the statistical power adequacy.

-done. Line 333-339.

* The authors included subjects with schizophrenia treated with antipsychotics. However, they should discuss if antipsychotic treatment may influence saccadic performance, representing thus a potential confounder. Indeed, recent studies selected antipsychotic-naïve/free individuals, in order to prevent this issue (Subramian et al., 2018).


* There is a lack of discussion on clinical and pathophysiological implications of findings of this study, as well on possible open questions needing further research. The authors should complement the conclusions paragraph with this information.

-Now we discussed it revised manuscript with references. Line 350-355.

References
C. Rummel-Kluge (Reviewer 2): The manuscript is written well and is about a study on an interesting Topic, the saccadic eye movements in different dimensions of schizophrenia and in clinical highrisk state for psychosis.

Overall the study is prescribed well and the manuscript is explaining adequately what the authors were doing. I have only some minor issues:

Please specify other limitations of the study in more detail and put more emphasis on the conclusions as now these are mainly a summarization of the results. Possible future research ideas could be mentioned as well.

-We presented other limitations of the study and emphasized major points of conclusions. Line 333-339.