Author's response to reviews

Title: SPEM Dysfunction and General Schizotypy as Measured by the SSQ: A Controlled Study

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Author's response to reviews:

Reviewer 1

General problems

1. Page 4, lines 20 – 24, Page 5, lines 1 – 7. We included text to explain the reason that we used RMSE.

2. At pages 9 and 10 under section Oculomotor assessment (lines 5 – 12) there are some additional lines addressing the issue of the low sampling frequency.

3. Page 4, lines 10 - 19. Page 5, line 8 - Page 6, line 11. Page 14, lines 3 – 9. In the revised version of the paper we clearly indicate that negative as well as positive schizotypy may be associated with SPEM dysfunction and with the genetic predisposition to schizophrenia. We agree that the relationships are stronger with negative schizotypy. However, this is reflected by higher factor loadings on the general SSQ factor of the negative SSQ scales. By accidental scales we mean scales that, although perhaps demonstrating good psychometric qualities, are not based on a validated model of schizotypy.

4. The relation between schizotypy and pursuit indices appears neither confounded by neuroticism (Ettinger et al., 2005) nor by anxiety and depression (Smyrnis et al. (Exp. Brain Res. 2007, page 406). In the light of this evidence for the specificity of the relation of eye-tracking dysfunction and high schizotypy, we did not covary for other personality variables in order to obtain the most reliable measure of the strength of this relationship.

Specific comments

1. Whittaker company and reference is included at page 9 under Oculomotor assessment.

2. In accordance with the recommendation of the reviewer we removed all correlation measures and only report the ANOVA.

3. We did not remove our results concerning the separate ANOVAs following the repeated measurements. As the absence of any interaction effect does not mean that groups differ under each target speed condition the post-hoc univariate ANOVAs enable us to report that for each target speed groups show a
significantly different RMSE. In addition, they provide us the opportunity to present the effect size for each target speed condition.

Reviewer 2

Major issues

1. Page 4, first lines. We included the studies of O’Driscoll et al., 1998, Gooding et al., 2000 and Smyrnis et al., 2007 in our manuscript (References 28 – 30). They are indeed valuable additional studies on SPEM disorders in general population subjects. The reviewer states that our literature is old but studies cited in these three reports are also quite dated. New literature on SPEM dysfunction seems scarce (see also Allen et al 2009). At the end of the Background some lines are included to address the novelty aspect of the study. In addition, the recent article of van Kampen et al. (2009) on the SSQ is included (reference 50).

2. Pages 9 and 10, section Oculomotor assessment (lines 5 – 12). Indeed, a sampling frequency of 50 Hz is generally considered not to be suited for measuring fast eye movements. However, there is recent evidence that video eye trackers sampling at 50 Hz may be appropriate for measuring pursuit gain and saccades. We included the concerning literature in the text.

Minor comments

1. Page 3, lines 17 – 19. From the review of Calkins et al. the single gene hypothesis appears to be still under debate. In this review it is stated (see page 456) that “no EMD related genes have been definitely identified” and also that “evidence has been presented that single major genes may especially impact particular endophenotypes” (page 456). However, they express the notion that it is unlikely “that the genetic basis of endophenotypes is monogenic rather that polygenic. We addressed this issue and included the review of Calkins et al 2008.

2. Page 5, first lines. We address this issue by referring to the finding of the study by O’Driscoll and Callahan 2008 that RMSE yielded larger effect sizes than specific measures.

3. By accidental scales we mean scales that, although perhaps demonstrating good psychometric qualities, are not based on a well-validated model of schizotypy. All over the text we tried to indicate the well-validated nature of the SSQ. The theoretical background of the SSQ and the justification to use the general SSQ factor is made clearer in the manuscript. We cite Kwapil (reference 39) to illustrate what is needed for a psychometric identification of specific risk for
schizophrenia. Other reasons to choose for the general SSQ factor are also more thoroughly explained.

4. We feel that the elaboration on the theoretical background of the SSQ (see under point 3) provides the arguments to choose for the general factor of the SSQ. The SSQ model is based on 12 schizotypy components. These components appear to constitute a general factor that is more strongly associated with negative than with positive schizotypy. This reflects the imbalanced nature of the concept of schizotypy itself instead of the invalidity of the instrument.

5. Page 7, 6 bottom lines. Results first lines page 11 and 12. Discussion page 13, lines 16-20. Indeed the distribution of the General Schizotypy scores is not normal. This is now addressed in the text under Subjects and Procedure, Results and Discussion. As we did compare less extreme groups as for instance Gooding et al, the findings we present are more conservative and may be considered to be quite robust. The additional correlations we presented (and now removed) show similar results as the ANOVA. Therefore a relationship between General schizotypy and SPEM dysfunction seems adequately be established by the way we divided our groups.

6. See above under Major issues.

7. Page 11. The specific parameters of the pursuit procedure are described under Data analysis.

8. Results Page 12, lines 4-6. Although groups were defined as high or average scorers the presentation of their mean scores and the significant difference pertaining to the large effect size d seems useful to provide evidence that our distinction has lead to quite different groups.

9. We removed Figure 2. We like to maintain Figure 1 as well as Table 1 because the Figure nicely shows the pattern of progressively increasing RMSE with increasing target speed while the Table gives more precise statistical values.

10. The correlational analyses are removed.

11. This part of the Discussion is removed.

12. We feel that the choice of the General score for schizotypy is thoroughly addressed now all over the paper.

13. Page 5, lines 1-6. Page 15, line 5. We indicated in the text that SPEM dysfunction may be partly due to the inability to suppress saccades, not excluding other underlying disturbances. In the Background we address the issue of global versus specific measures.

14. Page 15, 5 bottom lines. In the Discussion additional text is included with respect to the network involved in pursuit function as reviewed by Lencer and Trillenberg 2008.

The manuscript has been totally revised and the language is edited throughout the whole article.