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### **Authors' reply to 'On the existence of a linguistic distance in schizophrenia'.**

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We are grateful to Alherz (2020) for his important comments on our paper on linguistic distance, social disadvantage and psychosis (Jongsma et al., 2020), in his response titled 'On the existence of a linguistic distance in schizophrenia'. His response highlights a number of important areas for further research resulting from our study into the role of both social disadvantage and linguistic distance in the aetiology of psychotic disorders.

Our study was, to the best of our knowledge, the first to formally investigate a possible role for differences in linguistic distance between people who had and had not experienced a first episode of a non-organic psychotic disorder. In this context, we theorised that linguistic distance might, for some migrant groups, represent a proxy construct for cultural distance from the majority ethnic group in a given setting, and exert its effects on psychosis risk via a process of psychosocial disempowerment, which has been strongly associated with other gradients and inequalities in physical and mental health (Marmot, 2015). Although the causes remain unknown, the persistent inequalities in psychosis risk by migrant status and ethnicity which have been observed for more than a century require urgent investigation, identification and public health intervention.

We share Alherz's position on the difficulties of measuring linguistic distance, and we are unaware of validated tool on this issue. In our study, we made several strong assumptions about the theorised role linguistic distance may play in the aetiology of psychosis. These provided a starting point for exploration of a complex issue, and the signals we confirmed suggest that more research is now warranted to understand the mechanisms which underpin the relationship between linguistic distance and psychosis. This will require the development of validated measures of linguistic distance,

cultural (and structural) factors, the role of discrimination and racism, and operationalised measures of psychosocial disempowerment, and their application to ethnically diverse, representative and longitudinal datasets to confirm or refute our findings.

Our analyses were broadly conceived to be able to examine both social disadvantage and linguistic distance in the same dataset, and the EU-GEI study was not designed to investigate the role of linguistic distance as a primary hypothesis. As a result, we acknowledge that many of the measures we used remained relatively superficial. In particular, loss of information resulting from the decisions to amalgamate language distance and fluency in the majority language and reducing this to a binary summary measure of linguistic distance is a major limitation of the study. We wholeheartedly concur that a higher resolution approach is needed in the future.

This notwithstanding, there are two issues raised by Alherz (2020) that we would briefly like to respond to. First, Alherz is correct that a design feature of the EU-GEI study case-control work package was that participants were excluded from the study if their fluency in the majority language was insufficiently low to be able to complete the assessments (Gayer-Anderson et al., 2020). This decision would have meant it was more likely that we excluded migrants with low language fluency, and also more likely to exclude cases than controls. This effectively would have led us to underestimate the association between linguistic distance and psychotic disorders. We recommend future studies should include people with low fluency in the majority language through for instance the use of translators. Secondly, we agree that acquisition of multiple languages is not universally disadvantageous. In our theoretical approach, we would have expected fluency in multiple languages to be associated with (socioeconomic) advantage and reduced psychosocial disempowerment and lack of fluency in the majority language with socioeconomic disadvantage. Here too, we require more detailed future investigations on this issue.

We are grateful to Alherz (2020) for responding thoughtfully to our work. The ethnic inequalities in psychosis are some of the most pervasive and preventable problems faced in current clinical psychiatry. In many ways, our work raising more questions than it answers, including on the importance of linguistic concepts, and we hope it serves to catalyse discussion and investigation on the complexities and sensitivities on this vital topic.

## Bibliography

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