

## Correspondence

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### Disentangling cause and effect in the relationship between cannabis and psychosis: are we there yet?

The debate over the role of cannabis in promoting psychosis is an important one because it concerns a potential risk factor that could be specifically targeted in early treatment interventions. It is therefore with great interest that we read the recent article by Kraan *et al.* (2016) in *Psychological Medicine* reporting the results of a meta-analysis on the association between cannabis use and transition to psychosis in individuals at ultra-high risk. Aggregating data from seven studies that collectively included >1000 subjects, the authors report that overall lifetime cannabis use was not related to transition to psychosis. Subsequently, Kraan *et al.* (2016) performed a second meta-analysis on a subset of five of the initial seven studies and concluded that current cannabis abuse or dependence predicted psychosis.

After perusing the five studies used in the second meta-analysis, we are left with several methodical questions. The authors' main focus is on elucidating the impact of a current diagnosis of cannabis abuse and dependence on the transition to psychosis. However, at least based on the available published material, the time-frame of Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) abuse and dependence in relation to transition to psychosis is sufficiently specified in only two of the pertinent five studies (Phillips *et al.* 2002; Buchy *et al.* 2014). It should also be noted that the two studies by Auther *et al.* (2012, 2015) contain overlapping samples and that Valmaggia *et al.* (2014) do not provide a DSM-IV diagnosis of dependence in their report.

The authors interpret their results as evidence for a dose-response relationship between cannabis use and transition to psychosis because current cannabis dependence rather than lifetime cannabis use was associated with transition. However, an alternative explanation of this finding could be that higher transition rates reflect the cumulative result of problem behaviours generally associated with drug addiction. Impairments linked with drug addiction may include reduced problem solving, lack of social support and failure to fulfill major role obligations, all of which

are all likely to be important risk factors for the transition to psychosis (e.g. Collip *et al.* 2013). Importantly, the amount of substance consumption – and thereby the amount of exposure to the toxic agent – is itself not a criterion for a DSM-IV diagnosis of abuse or dependence. We would also like to note that important confounding factors such as use of other drugs (e.g. Power *et al.* 2013; Giordano *et al.* 2015) were not sufficiently taken into account by the authors. Unfortunately, even the confounder alcohol (Auther *et al.* 2015) was not included in the analysis, although five of the studies used in the analysis report having recorded data on alcohol use.

Taken together, the relationship between cannabis use and psychosis remains complex and in need of further research. Moreover, we see the risk of overestimating the effects of cannabis on progression to psychosis if other important risk factors are neglected or not properly controlled for.

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### Declaration of Interest

None.

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J. RENTZSCH, K. KOLLER AND G. KRONENBERG

Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin Berlin, Campus Mitte, Charitéplatz 1, 10117 Berlin, Germany

Address for correspondence: J. Rentzsch, M.D., Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin Berlin, Campus Mitte, Charitéplatz 1, 10117 Berlin, Germany.  
(Email: johannes.rentzsch@charite.de)