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To the Editor

How statistics killed the cat

This is in response to the article by Solmi *et al.* on cat ownership as a risk factor for psychosis (Solmi *et al.* 2017). The authors are to be commended for trying to replicate the four previous studies that reported a positive association between cat ownership in childhood and the later development of schizophrenia. We are aware of three other replication studies in progress and would encourage our colleagues to undertake others. The authors of the present study clearly note that 'there is good evidence to support an association between *T.gondii* infection and later risk of developing psychosis', thus it is not the association that is being questioned, but rather the mode of transmission of the *T.gondii* parasites.

We have two problems with the study. First, using self-reports of psychotic-like experiences in adolescence as a proxy for the later development of actual psychosis is not ideal, as the authors are aware. The vast majority of adolescents who report such experiences do not later develop psychosis.

Second, the author's initial univariable result showed a significant association between cat ownership at ages 4 and 10 and self-reports of psychotic-like experiences at age 13 (OR 1.23, 95% CI 1.04–1.46). The authors then corrected for 'relevant confounders' such as household crowding and social class which, for reasons not known, have been identified as risk factors for developing schizophrenia.

However we would suggest that one reason household crowding and social class may be risk factors for developing schizophrenia is that in such living

situations, children have more contact with cats and cat feces. For example, in poor, crowded neighborhoods children often play in sand and dirt piles, which have been used by their cat for defecation, resulting in *T.gondii* infectious oocyst concentrations of 1 00 000 or more per square foot of sand or dirt (Torrey & Yolken, 2013). By contrast, children from more affluent neighborhoods are more likely to play in a cat-free sandbox in a protected preschool. Thus some of the 'confounders' that the authors are controlling for are not true confounders at all but rather are integral to the disease process. As the authors would surely agree, it would be incorrect to adjust for variables that are on the causal pathway between cat ownership and psychotic experiences since that would be very likely to result in a dilution of the associating between exposure and outcome. When the authors used a multivariable adjustment for such 'confounders', the odds ratio decreased from 1.23 to 1.18 and was no longer statistically significant. Under this scenario, it was not curiosity that killed the cat but rather statistics that did it.

References

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