Letter to the Editor

Response to: Breastfeeding and bigger brains.
What comes first?

To the Editor,

We thank Verd and Ginovart (2013) for their insightful comments on our paper highlighting associations between exclusive breastfeeding and brain development within the first 2 months of life, most specifically the diameter of the gangliothalamic ovoid, a structure rich in docosahexaenoic acid, which encompasses the basal ganglia and thalamus (Herba *et al.* 2013). They critiqued our inability to tease apart the mechanisms underlying associations between breastfeeding practices and early brain development. Indeed, this is an inherent limitation of quasi-experimental designs. However, it must be noted that our investigation was conducted within the context of a large-scale prospective longitudinal study, with in-depth data on a large range of variables collected from the prenatal period onwards. Thus, we were able to adjust our analyses for a number of important factors reflecting the child's family environment as well as basic biological indices that could influence a woman's choice or ability to breastfeed her baby, including factors that could influence the quality or composition of breast milk (such as smoking during pregnancy and adherence to a Mediterranean dietary pattern).

Verd *et al.* (2013) highlighted the role of prenatal smoking in both milk production (Andersen *et al.* 1982) and brain development, and questioned how smoking might have affected the associations we found between exclusive breastfeeding and early brain development. They also questioned how smoking might influence head circumference, before the onset of breastfeeding. In our study, we did indeed find that rates of maternal smoking during pregnancy were significantly lower among those women who exclusively breastfed their babies (6.6%) compared to babies who were bottle-fed at 2 months of age (19.4%). Previous work within the Generation R study has demonstrated that smoking is associated with reduced fetal health growth (Roza *et al.* 2007). Thus, we considered this an important factor to adjust for in all of our analyses, and adjusted for continued smoking throughout the pre-

natal period. It must also be noted that our analyses examining links between breastfeeding and brain structures of interest were adjusted for head circumference. Thus, although prenatal smoking could have played a role in the composition of breast milk, as well as early brain development, it is unlikely that it explains our findings.

We do agree with Verd and Ginovart (2013) that future studies should aim to develop this area further by delving more deeply into studying mechanisms that underlie the associations between breastfeeding practices and early brain development. In our article, we acknowledge a number of limitations of our study that could potentially influence the links between breastfeeding and early brain development, ranging from intellectual ability, to social interaction, to the molecular composition of the milk itself. Longitudinal studies of breastfeeding and early brain development using community samples of healthy babies (mainly born at term) are still lacking. Careful documentation of breastfeeding practices, in addition to biological samples of milk obtained could help to address these questions.

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