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Response

Reply to 'Letter in reference to de la Fuente-Sandoval, C *et al*. Neuropsychopharmacology 36, 1781–1791, 2011'

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We thank Drs Maddock and Buonocore (2012) for their comments and interesting arguments in relation to our article (de la Fuente-Sandoval *et al*, 2011). In their letter, Maddock and Buonocore raised a concern about our report. They suggested that limitations in the quantitative methods used in this paper appear to invalidate the conclusions. There are some reasons, however, to argue against this possibility.

First, all spectra were water-scaled and processed identically. Water scaling is automatically done by using the LCModel with a GE single-voxel phased array (LCModel manual, version 6.2-3, p 122). Our data were acquired in a 3-T GE scanner (Signa Excite HDxt) with a phase-array antenna and a high-resolution eight-channel head coil. We apologize that this detail in the analysis was not explicitly stated in the original manuscript.

Second, systematic differences in MRI and subject's head volume and position would affect not only glutamate or *N*-acetyl-aspartate, but also likely all the measured metabolites. In addition, these MRI system and subject factors would affect both studied voxels (dorsal caudate and cerebellum) rather than just one brain region (dorsal caudate for glutamate).

Finally, although creatine normalization is a commonly employed method in ^{1}H-MRS studies, we avoided it, as some studies have reported altered levels of creatine in both prodromal and first-episode patients (Bustillo *et al*, 2002, 2008; Wood *et al*, 2003; Stone *et al*, 2009).

Regardless of these arguments, we do acknowledge the inherent limitations of this imaging technique (Lahti and Reid, 2011). Longitudinal studies with larger samples are needed to determine whether glutamate alterations can truly predict conversion to psychosis.

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DISCLOSURE

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REFERENCES

Bustillo JR, Rowland LM, Jung R, Brooks WM, Qualls C, Hammond R *et al* (2008). Proton magnetic resonance spectroscopy during initial treatment with antipsychotic medication in schizophrenia. *Neuropsychopharmacology* **33**: 2456–2466.

Bustillo JR, Rowland LM, Lauriello J, Petropoulos H, Hammond R, Hart B *et al* (2002). High choline concentrations in the caudate nucleus in antipsychotic-naive patients with schizophrenia. *Am J Psychiatry* **159**: 130–133.

de la Fuente-Sandoval C, Leon-Ortiz P, Favila R, Stephano S, Mamo D, Ramirez-Bermudez J *et al* (2011). Higher levels of glutamate in the associative-striatum of subjects with prodromal symptoms of schizophrenia and patients with first-episode psychosis. *Neuropsychopharmacology* **36**: 1781–1791.

Lahti AC, Reid MA (2011). Is there evidence for neurotoxicity in the prodromal and early stages of schizophrenia? *Neuropsychopharmacology* **36**: 1779–1780.

Maddock RJ, Buonocore MH (2012). Comment regarding Increased striatal glutamate in schizophrenia. *Neuropsychopharmacology* **37**: 1067–1068.

Stone JM, Day F, Tsagaraki H, Valli I, McLean MA, Lythgoe DJ *et al* (2009). Glutamate dysfunction in people with prodromal symptoms of psychosis: relationship to gray matter volume. *Biol Psychiatry* **66**: 533–539.

Wood SJ, Berger G, Velakoulis D, Phillips LJ, McGorry PD, Yung AR *et al* (2003). Proton magnetic resonance spectroscopy in first episode psychosis and ultra high-risk individuals. *Schizophr Bull* **29**: 831–843.

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