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Response to Cognitive impulsivity and the behavioral addiction model of obsessive–compulsive disorder: Abramovitch and McKay (2016)

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In our recently published article, we investigated the behavioral addiction model of obsessive–compulsive disorder (OCD), by assessing three core dimensions of addiction in patients with OCD healthy participants. Similar to the common findings in addiction, OCD patients demonstrated increased impulsivity, risky decision-making, and biased probabilistic reasoning compared to healthy controls. Thus, we concluded that these results support the conceptualization of OCD as a disorder of behavioral addiction. Here, we answer to Abramovitch and McKay (2016) commentary on our paper and we support our conclusions by explaining how cognitive impulsivity is also a typical feature of addiction and how our results on decision-making and probabilistic reasoning tasks reflect cognitive impulsivity facets that are consistently replicated in OCD and addiction.

Keywords: OCD, impulsivity, behavioral addiction

In our recently published article, we investigated the behavioral addiction model of obsessive–compulsive disorder (OCD), by assessing three core dimensions of addiction in 38 patients with OCD and 39 healthy participants (Grassi et al., 2015). Similar to the common findings in addiction, OCD patients demonstrated increased impulsivity, risky decision-making, and biased probabilistic reasoning compared to healthy controls. Thus, we concluded that these results support the conceptualization of OCD as a disorder of behavioral addiction.

Abramovitch and McKay (2016) argued that this conclusion is untenable by suggesting that (a) our finding of increased cognitive impulsivity and non-planning impulsivity on the Barratt impulsiveness scale (BIS-11) in OCD patients may support cognitive impulsivity, but not behavioral impulsivity that is typical for addiction and (b) risky decision-making on the Iowa gambling task (IGT) and fewer draws to decision on the Beads Task in our OCD patients may be accounted for by doubting and risk avoidance, rather than the typical risk-taking behaviors of addiction.

Here, we support our conclusions by explaining how cognitive impulsivity is also a typical feature of addiction and how our results on decision-making and probabilistic reasoning tasks reflect cognitive impulsivity facets that are consistently replicated in OCD and addiction.

First, our OCD patients indeed had significantly increased impulsivity scores on the cognitive (attentional and non-planning) subscales of the BIS-11, but not on the subscale for motor impulsivity. This finding is consistent with other studies that showed predominantly increased cognitive impulsivity in OCD patients (Benatti, Dell'osso, Arici, Hollander, & Altamura, 2014; Ettelt et al., 2007; Sohn, Kang, Namkoong, & Kim, 2014). Moreover, our two other results, risky decision-making on the IGT and fewer draws to decision on the Beads Task might also reflect impulsivity predominantly on a cognitive reflective level (Voon et al., 2015). These results do not seem to contradict our behavioral addiction model. In fact, increased cognitive impulsivity on the cognitive subscales of the BIS-11 is a well-replicated finding in substance and behavioral addictions, such as gambling disorder and internet addiction (Choi et al., 2014; Marazziti et al., 2014; Zhou, Zhou, & Zhu, 2016). Moreover, previous studies showed similar results of increased reflection impulsivity using the same (Beads) task in a range of addiction-related disorders, such as substance use disorders, gambling disorder, binge drinking, and Parkinson's disease with medication-induced behavioral addictions (Banca et al., 2016; Djamshidian et al., 2012, 2013).

Second, Abramovitch and McKay (2016) argued that higher scores on the BIS-11 cognitive subscales in our OCD group could be simply explained by excessive doubting, and therefore contradict the behavioral addiction model of OCD. However, we also found increased cognitive impulsivity on the Beads Task, which could not be explained by excessive doubting as patients accumulated significantly fewer evidence prior to decision than controls, reflecting overconfidence rather than excessive doubting. In addition, our patients demonstrated impaired decision-making performances on the IGT under ambiguous conditions, which did not improve during the task and therefore suggests a preference toward immediate reward despite negative future consequences rather than excessive doubting and risk avoidance. Moreover, impaired decision-making is a well-replicated result in OCD samples

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(Cavedini, Gorni, & Bellodi, 2006; Cavedini, Riboldi, D'Annucci, & Bellodi, 2002) and is also present in unaffected OCD relatives (Cavedini, Zorzi, Piccinni, Cavallini, & Bellodi, 2010) who do not suffer from obsessive–compulsive symptoms, discarding the suggestion that these impairments are better explained by difficulties in planning due to obsessions. Our results of a preference toward immediate reward despite negative future consequences are in line with a recent study that found increased delay discounting rates in OCD patients (Sohn et al., 2014), which is a common finding also in addiction.

Nevertheless, the absence of prominent motor impulsivity in our OCD sample might also be explained by the limits of the BIS-11 in capturing the clinical expressions of motor impulsivity, rather than to the absence of behavioral impulsivity in OCD per se. In fact, the previous studies consistently showed deficits in motor response inhibition on the stop-signal tasks, which is a reliable proxy for behavioral impulsivity (Chamberlain, Fineberg, Blackwell, Robbins, & Sahakian, 2006; Chamberlain et al., 2007). Moreover, these results have been replicated in OCD siblings suggesting that motor impulsivity could represent an endophenotype of OCD (Chamberlain et al., 2007; de Wit et al., 2012). Finally, OCD patients performing the stop-signal task demonstrated abnormal activation of inferior frontal gyrus and supplementary motor area (de Wit et al., 2012), which is also found in substance and behavioral addictions, suggesting a common neural substrate of motor impulsivity in OCD and addiction (de Ruiter, Oosterlaan, Veltman, van den Brink, & Goudriaan, 2012; Schmaal et al., 2013).

In conclusion, our study supports the presence of cognitive impulsivity in OCD patients as has also been observed in addictive disorders, and therefore supports the behavioral addiction model of OCD. Further longitudinal studies are needed to elucidate if these dysfunctions have a causal role in the development of OCD, as it is supposed for addictive behaviors, or if they are consequences of a broader fronto-striatal network dysfunction.

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