Genetic Profiles of the OXTR Gene Modulate Moral Acceptability in Insurance Brokers

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In recent years, several studies have investigated the genetic underpinnings of decision-making processes underlying human moral choices (Marsh et al., 2011; Walter et al., 2012; Bernhard et al., 2016; Pellegrini et al., 2017). Conflicting results have linked the same allelic variants of the oxytocin receptor gene (*OXTR*) to both altruistic and utilitarian moral choices (Israel et al., 2009; Walter et al., 2012; Bernhard et al., 2016; Shang et al., 2017). Based on these findings and on previous association studies that linked *OXTR* single nucleotide polymorphisms (SNPs) to specific components of moral behavior, such as empathy and prosociality (Laursen et a., 2014; Uzefovsky et al., 2015; Crist et al., 2016), we decided to investigate whether *OXTR* polymorphisms predispose toward utilitarian behavior. We enrolled 129 insurance brokers, a peculiar sample as they are professionally trained to exert volitional control on their emotions and to routinely adopt rational choices, and 109 matched control subjects. Each participant was asked to answer to 27 written moral dilemmas and three candidate SNPs, located in the *OXTR* gene - rs53576, rs2268498 and rs1042778 - were genotyped in all the enrolled subjects. None of the selected SNPs, singularly analyzed, appeared to influence the responses to moral dilemmas. Instead, by combining the variants in multilocus genetic profiles, we observed that those combinations of SNPs associated in literature with higher levels of empathy, prosociality and enhanced oxytonergic neurotransmission, increased the moral acceptability of brokers compared to controls ($p_{uncorrected}$= 0.009; $p_{Bonferoni-corrected}$= 0.036). We hypothesize that the increased oxytonergic neurotransmission might promote the utilitarian reasoning in brokers by increasing their prosocial behavior toward the group, intended as the specie, instead of the single individual.

Our data also suggest that the analysis of multilocus genetic profiles instead of the single variants represents a promising strategy for the identification of weak genetic influences, like those exerted by the oxytocinergic receptor on moral behavior, as SNP combinations are more representative of the overall genetic effect.

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