Interaction between oxytocin receptor polymorphism and interdependent culture values on human empathy

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Recent evidence suggests that the association between oxytocin receptor polymorphism (OXTR rs53576) and emotion-related behavioral/psychological tendencies differs between individuals from East Asian and Western cultures. What remains unresolved is which specific dimension of cultural orientations interacts with OXTR rs53576 to shape these tendencies and whether such gene × culture interactions occurs at both behavioral and neural level. This study investigated whether and how OXTR rs53576 interacts with interdependence—a key dimension of cultural orientations that distinguish between East Asian and Western cultures—to affect human empathy that underlies altruistic motivation and prosocial behavior. Experiment 1 measured interdependence, empathy trait and OXTR rs53576 genotypes of 1536 Chinese participants. Hierarchical regression analyses revealed a stronger association between interdependence and empathy trait in G allele carriers compared with A/A homozygotes of OXTR rs53576. Experiment 2 measured neural responses to others' suffering by scanning A/A and G/G homozygous of OXTR rs53576 using functional magnetic resonance imaging. Hierarchical regression analyses revealed stronger associations between ele carrierecarr6ing7.2(colh.of)-25neural stsponses ste

Stimuli and procedure

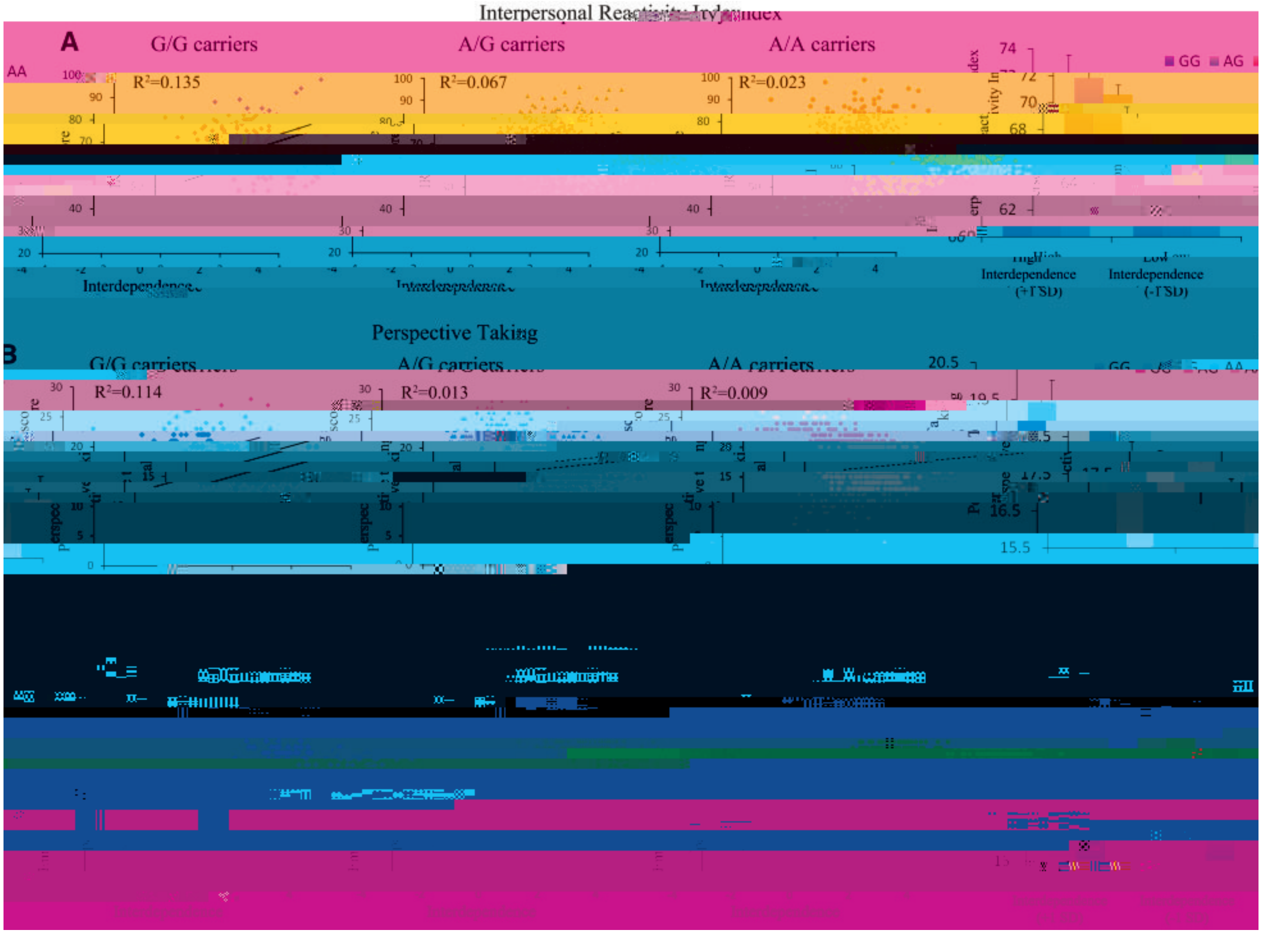

Fig. 1 Illustrations of the results in Experiment 1. **(A)** The association between IRI total score and interdependence in the variants of OXTR rs53576. **(B)** The association between the score of perspective taking subscale and interdependence in the variants of OXTR rs53576. **(C)** The association between the score of empathy concern subscale and interdependence in the variants of OXTR rs53576. The bar chart in the right column illustrates the mean scores of empathy measures in the high and low interdependence groups.

Experiment 2: neuroimaging investigation

Table 1 Brain activations shown in the moderation analyses of the contrast of painful *vs* non-painful in Experiment 2

Brain region	Cluster size	*t*-value	MNIcoordinates		
			x	*y*	*z*
Right amygdala	612	5.17	26	−12	−24
Left amygdala	2063	4.88	−24	−6	−14
Left insula		4.69	−38	−4	−6
Right insula	1201	4.81	40	12	−10
Left STG	238	3.98	−42	−28	8
Right STG	103	3.75	50	−14	6