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Serotonin receptor gene (5-HT1A) modulates alexithymic characteristics and attachment orientation

Pingyuan Gong[a,b,1], Jinting Liu[a,1], She Li[b], Xiaolin Zhou[a,c,d,]

[a] Center for Brain and Cognitive Sciences and Department of Psychology, Peking University, Beijing 100871, China
[b] Laboratory of Medical Molecular Biology, Henan University of Science and Technology, Luoyang 471003, China
[c] Key Laboratory of Machine Perception (Ministry of Education), Peking University, Beijing 100871, China
[d] PKU-IDG/McGovern Institute for Brain Research, Peking University, Beijing 100871, China

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Summary Previous studies have indicated that alexithymia is associated with the availability of serotonin in the brain and with the insecure attachment orientation. Inspired by the "nding that the receptor 5-HT1A modulates the level of serotonin in the brain, this study investigated to what extent a polymorphism (C-1019G, rs6295) of 5-HT1A gene modulates individuals• alexithymic characteristics and attachment orientation in 504 Chinese Han people. Results showed signi"cantly higher total scores on the 20-item Toronto Alexithymia Scale (TAS-20) for individuals carrying the CG/GG genotype than for individuals carrying the CC genotype. Speci"cally, individuals with the CG/GG genotype reported greater dif"culty in identifying own feelings than individuals with the CC genotype. Results also showed that individuals carrying the CG/GG genotype seemed to be less comfortable with having close relationships to others than individuals with the CC genotype. These "ndings provide the "rst evidence for the link between 5-HT1A and the development of alexithymic characteristics and attachment orientation.

1. Introduction

Alexithymia is a cluster of sub-clinical symptoms characterized by dif"culties in identifying and describing one•s own emotions, lacking of imagination, and an externally oriented thinking style (Taylor, 1984). It is related to emotion dysregulation (Stasiewicz et al., 2012) and health-related quality of life (von Rimscha et al., 2013). It occurs in up to 50%of

Corresponding author at: Department of Psychology, Peking University, Beijing 100871, China. Tel.: +86 10 62756599; fax: +86 10 62761081.
E-mail address: xz104@pku.edu.cn (X. Zhou).
[1] Pingyuan Gong and Jinting Liu contributed equally to this work.

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psychiatric patients, such as those suffering from depression or somatoform pain (Fukunishi et al., 1992; Burba et al., 2006), and in about 8% of the general population (Honkalampi et al., 2009; Karukivi et al., 2010; Deng et al., 2013). Twin studies established that a large portion of individual differences in alexithymia can be attributed to genetic factors, with heritability of 30„42% (Honkalampi et al., 2009; Karukivi et al., 2010; Deng et al., 2013). A study associating the serotonin transporter promoter region (5-HTTLPR) in serotonin transporter gene (5-HTT) with alexithymia (Kano et al., 2012) demonstrated that, compared with individuals carrying the SS/LS genotype, individuals with the LL genotype registered higher scores on Toronto Alexithymia Scale (TAS-20) which is a commonly used self-report instrument assessing alexithymic characteristics (Bagby et al., 1994). It is possible that the level of serotonin in the brain affects individuals• alexithymic characteristics given that the signi“cant association between 5-HTT gene and alexithymia and the link between the higher activity of 5-HTT and a higher serotonin uptake rate and lower serotonin level in synaptic cleft (Linnet et al., 1995; Meyer et al., 2004).

The serotonin level in the brain is regulated not only by the serotonin transporter (Heils et al., 1996) but also by the serotonin receptor (Larisch et al., 2003; Le Francois et al., 2008; Trueta and Cercos, 2012). However, it is not clear to what extent individuals• alexithymic characteristics can be modulated by the genotype of serotonin receptor genes. In this study, we investigated the possible association between the receptor gene, 5-HT1A (HTR1A), and the level of alexithymia in a normal population.

5-HT1A is one of the most abundantly expressed serotonin receptors in the mammalian brain. It is a key component of the serotonin system, acting at both pre- and post-synaptic neurons in several brain areas (Drago et al., 2008). In cerebral cortex and hippocampus, the excitation of 5-HT1A receptors on the dendrites of 5-HT

2.3. Attachment test

Attachment components were measured with the Chinese version (

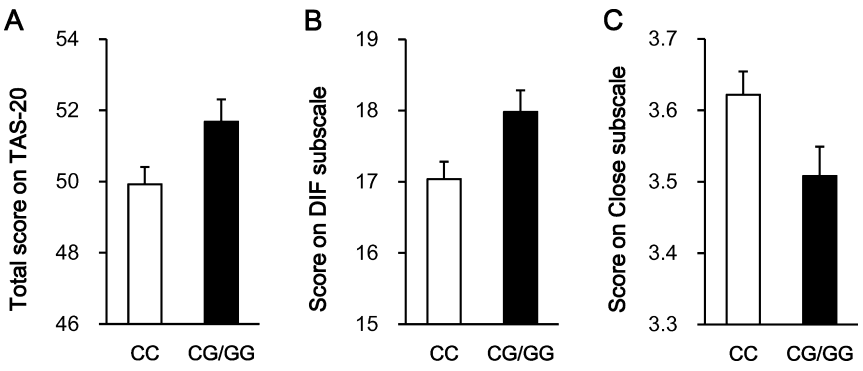

Figure 1 Effects of 5-HT1A C-1019G polymorphism on alexithymia and close attachment orientation. (A) Individuals with the CC genotype (N = 316) had a lower mean total score on the 20-item Toronto Alexithymia Scale (TAS-20) than individuals with the CG/GG genotypes (N = 188). (B) Individuals with the CC genotype reported a lower mean total score on the Dif"culty Identifying Feelings (DIF) subscale of TAS-20

Previous studies have shown that early family experiences, such as childhood abuse and parental bonding, are crucial for the development of alexithymia or insecure attachment (Wekerle and Wolfe, 1998; Wearden et al., 2003; De Pan"lis et al., 2008; Pedrosa Gil et al., 2008). Nevertheless, our results showed that the effects of 5-HT1A on alexithymia and attachment still hold after controlling for the effects of these factors. This suggeststhat 5-HT1A may play an important role in regulating the development of alexithymia and attachment orientation independently of early family experiences.

In conclusion, by differentiating individuals according to the polymorphism C-1019G of 5-HT1A and measuring them with the Toronto Alexithymia Scale and the Revised Adult Attachment Scale, we demonstrated for the "rst time the impact of 5-HT1A upon the development of alexithymic characteristics and attachment orientation. Clinical implications of targeting the 5-HT1A receptors as a way to treat alexithymia-related mood disorders may be investigated in further studies.

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Con"ict of interest

The authors declare that there is no con"ict of interests.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.psyneuen.2014.09.001.

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