Evidence for a Left-Over-Right Inhibitory Mechanism During Figural Creative Thinking in Healthy Nonartists

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Abstract: As a complex mental process, creativity requires the coordination of multiple brain regions. Previous pathological research on figural creativity has indicated that there is a mechanism by which the left side of the brain inhibits the activities of the right side of the brain during figural creative thinking, but this mechanism has not been directly demonstrated. In this study, we used functional magnetic resonance imaging (fMRI) to demonstrate the existence of this inhibitory mechanism in young adults (15 women, 11 men, mean age: 22 years) that were not artists. By making comparisons between brain activity during creative and uncreative tasks, we found increased activity in the left middle and inferior frontal lobe and strong decreases in activity in the right middle frontal lobe and the left inferior parietal lobe. As such, these data suggest that the left frontal lobe may inhibit the right hemisphere during figural creative thinking in normal people. Moreover, removal of this inhibition by practicing artistry or through specific damage to the left frontal lobe may facilitate the emergence of artistic creativity. *Hum Brain Mapp* 34:2724–2732, 2013. © 2012 Wiley Periodicals, Inc.

Key words: creativity; the left frontal lobe; functional magnetic resonance imaging; inhibitory mechanism

INTRODUCTION

Creativity is the ability to bring into being something that did not exist before. It is an important factor in the

advancement of human civilization. Accordingly, it is of great value to explore the neural mechanisms that mediate this form of cognitive processing. Although researchers have attempted to address this issue using various

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techniques, and have made insightful findings [Fink et al., 2009; Jung et al., 2009a,b], to date, no consensus has been reached on how cortical areas interact or compete to achieve creativity. One assumption is that better interactions between cortical areas promote creativity. For example, using diffusion tensor imaging, Takeuchi et al. [2010] demonstrated that creativity is positively related to white matter strength in the bilateral prefrontal cortices, the body of the corpus callosum, and other areas. Interestingly, an alternative view speculates that relative isolation of specific cortical areas may lead them to function freely and thus facilitate the generation of novel and creative ideas. Pathological support from disconnected syndromes [Shenton et al., 2008] revealed that patients with bipolar disease and schizophrenia exhibited signs of high creativity [Strong et al., 2007]. Moreover, a study of normal subjects revealed that white matter integrity in the left frontal lobe was negatively related to creativity [Jung et al., 2010]. The fact that this body of work used a diverse set of creative domains may be one of reasons that have led to the discrepancies across these studies.

E.P. Torrance was a pioneer of creativity research that categorized creativity into figural, verbal and auditory creativity [Torrance, 1966]. In this study, we examined figural creativity, which has been considered to be a preferential function of the right hemisphere for several decades [Edwards, 1981]. Early beliefs regarding right hemispheric dominance in figural creativity were based on the left handedness of the great Renaissance artists Da Vinci, Michelangelo, and Raphael [Wright, 2007]. Decades ago, by studying split-brain patients, Sperry [1974] surmised that the left hemisphere is specialized for language whereas the right hemisphere was specialized for vision, music, art, and other abilities. In recent years, the function of the right hemisphere in creativity was supported by brain imaging evidence [Carlsson et al., 2000]. Indeed, right hemispheric dominance in artists may be a genetic predisposition for creativity.

Interestingly, some brain diseases [Giles, 2004], especially left brain lesions [Seeley et al., 2008; Shamay-Tsoory et al., 2010], seem to induce the sudden emergence of figural creativity. Fronto-temporal lobe dementia (FTD) may be closely connected to the emergence of figural creativity [Miller et al., 1998, 2000; Miller and Hou, 2004]. A right brain lesion can cause inaccuracies in drawings, whereas a left brain lesion can enhance artistic creativity [Mendez, 2004]. A study of patients with Parkinson's disease showed that suppressive deep brain stimulation of the left hemisphere facilitated artistic production [Drago et al., 2009]. Similarly, Seeley et al. [2008] demonstrated increased figural creativity in one patient with severe degeneration of the left inferior frontal cortex. These intriguing findings suggest that left brain lesions may facilitate creative behaviors.

This paradoxical effect has been referred to as paradoxical functional facilitation (PFF) by Kapur [Kapur, 1996; Kapur et al., 2011]. Kapur proposed that PFF may be at-

tributable to an inhibitory mechanism based on competition among different brain areas or compensation enhancement resulting from neural plasticity. Under the inhibitory mechanism, the right hemisphere's predominance in creative thinking may be inhibited by the left part of brain in normal people, but it could be disinhibited after damage to the left brain [Miller et al., 1996, 1998]. Under compensation enhancement, part of the right hemisphere may subsume the functions of damaged areas, causing more information flow in localized brain areas, and thus boosting the original right brain functions.

Although figural creativity researchers tend to refer to the inhibitory mechanism to explain pathological findings [Bogousslavsky, 2005; Mendez, 2004], thus far no one has directly proved its existence. Do the brains of normal people have this spontaneous left-over-right brain inhibitory mechanism during figural creative thinking? Further, it remains to be clarified whether the right hemisphere is inhibited by the left frontal lobe or the left posterior cortices. While some evidence favors a role for the left frontal lobe [Seeley et al., 2008] in inhibition, other reports illustrate that lesions in the left PC [Shamay-Tsoory et al., 2010] or the left temporal lobe [Miller et al., 2000] are associated with elevated levels of originality. Therefore, a study in normal people that addresses these issues is warranted.

In this study, using functional magnetic resonance imaging (fMRI), we sought to investigate the left-over-right inhibitory mechanism during figural creative thinking in normal subjects who were not artists. To this end, we used the figural version of the Torrance Test of Creative Thinking (TTCT), a widely used psychometric test for creative behaviors [Kim, 2006], to evaluate visual imagination. The TTCT was developed by E. P. Torrance and is believed to reflect divergent thinking, a key element of creativity. The figural version of the TTCT requires the subjects to draw a novel picture based on simple line-art images. To disassociate brain activities elicited by creative thinking from those elicited by normal (uncreative) thinking, we adopted two visual completion tasks. In one task, the subjects were encouraged to imagine a unique and origination picture based on the figure clue. In the other task, they were required to just construct a common pattern. Their drawings were assessed according to the TTCT's criteria to ensure creative thinking.

METHODS

Subjects

Twenty-eight right-handed (Edinburgh Handedness Inventory) volunteers (13 men, 15 women, 22 ± 1 years) from Sichuan University were recruited for the present study. All participants were students at the School of Medicine that did not have a history of neuropsychiatric disorders or brain damage (self-report). None of the subjects had previously received professional training in art. Two

Figure 1.

Experimental paradigm. The subjects were instructed to imagine novel and interesting pictures based on the given clues in the creative condition, to figure out a common pattern that did not have to be unique in the uncreative condition, and to look at the cross in the center of screen in the fixation condition. We presented 12 different pictures in both the creative and uncreative conditions. Creative thinking was assessed according to the TTCT criteria. (K, key press to report whether the tasks have been completed.)

of them were excluded because they forget several images they imagined in the scanner during the recall session, which they suggested may have been related to being tired. All of the participants completed informed consent forms before any experimental procedures were initiated, and they all had normal or corrected-to-normal vision.

Experimental Tasks

Visual clues were displayed on a white background, presented using the E-prime 2.0 software package (<http://www.psnet.com/eprime.cfm>), and projected on a screen behind the scanner. The subjects viewed the visual stimuli through a mirror attached to a head coil. Creative, uncreative, and fixation conditions were used in this paradigm. As shown in Figure 1, in the first picture (creative), the subjects had 24 s to use the clue to construct a novel and interesting image. In the second picture (uncreative), they had 12 s to figure out a common pattern, which did not have to be novel. In the cross picture (fixation), they were instructed to watch the cross without thinking anything (12 s). As soon as each condition ended, the subjects had 2 s to report whether they had completed the tasks by pressing a key. A black screen was used to indicate the start of a new loop. An experimental run consisted of 12 creative conditions, 12 uncreative conditions, and 12 fixation conditions. All subjects were trained using a demo program before the scans, and they confirmed that they fully understand the procedures. The subjects were asked to recall the images they produced after the scan.

Assessment of Creativity

All participants reported the productions they made during the MR scans after the scans were completed. The productions were judged according to the TTCT criteria. The original scoring system was based on fluency, originality, elaboration, abstractness of the titles, and resistance to pre-

mature closure. We did not ask the subjects to think about the details of the imagined pictures in the scanner because we wanted them to focus on the originality of their productions. Creating titles was performed after the scans. Therefore, we examined fluency, which indicates the meaningfulness of creations, originality, which describe the degree of novelty, and resistance to premature closure, which reflects the mind's openness. One psychologist who is familiar with the TTCTs scoring system was invited to judge the creations. Since our tasks were only part of the TTCT inventory, standard scores could not be converted. We used raw subscores to test the statistical differences between the two conditions using paired *t*-tests.

fMRI Data Acquisition

Bold images were acquired using a Siemens 3.0T Trio scanner in the Huaxi MR Research Center (TR = 2,000 ms, TE = 30 ms, flip angle = 90°, 30 interleaved descending slices, voxel size = 3.8 × 3.8 × 5.0 mm³). Anatomical reference images were acquired after the functional imaging and were collected using a 3D, GRE T1-weighted sequence (TR = 1,900 ms, TE = 2.26 ms, flip angle = 9°, FOV = 256 × 256 mm², voxel size = 1 × 1 × 1 mm³). The participants were instructed avoid moving their heads and to focus their eyes at the center of the screen during scanning. Swallowing was only allowed during presentation of a black screen. Ear plugs were used to reduce noise in the scanner. A total scan for one person took 40 min. A Vitamin E capsule was attached to the right forehead for orientation verification. Head motions were evaluated on an MR workstation as soon as the scans ended.

fMRI Data Analysis

The fMRI data were analyzed using SPM8 (Wellcome Trust Centre for Neuroimaging, London, UK, [♦ 2726 ♦](http://</p>
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Figure 2.

A: Both visual completion tasks activated similar brain regions ($P < 0.05$, corrected). Red: Creative > Fixation, Yellow: Uncreative > Fixation, Orange: Both. **B:** Different brain activations between the Creative and Uncreative conditions. Red indicates increased activity in the Creative condition, whereas blue indicates decreased activity in the Creative condition relative to the Uncreative condition.

www.fil.ion.ucl.ac.uk/spm/). A total of 353 whole brain volumes were collected from each subject, with the first five volumes discarded. The remained images were corrected for slice timing with the middle slice as reference, realigned to remove head motion, normalized onto the echo planar imaging template image provided by SPM8, resampled with to a $3 \times 3 \times 3 \text{ mm}^3$ voxel size, and then smoothed using an 8 mm full width at half maximum Gaussian kernel. The creative, uncreative, and fixation conditions were defined to construct the general linear model. A 1/128Hz high pass filter was applied to remove low frequency signal drifts.

We first explored the comparisons between creative–fixation, uncreative–fixation, and creative–uncreative. Then, to determine whether areas that were activated during the uncreative tasks were deactivated during the creative tasks, a brain mask was constructed from the activations of the uncreative tasks, using the SPM extension toolbox MarsBar (<http://marsbar.sourceforge.net/>). The mask was then used to constrain the analysis of the contrast uncreative–creative. Small Volume Correction (SVC, within 10 mm of the peak point) was applied to those areas of activation that did not survive a whole brain correction.

Region of Interest Analysis

Our primary interest was to examine whether the left prefrontal lobe or the posterior lobes inhibit the right hemisphere. However, group analyses showed no positive activations in the posterior lobes, even at very low thresholds. Thus, we only performed ROI analysis within the left (sphere, MNI, $[-42 \ 32 \ 34]$, 10 mm) and right (sphere, MNI, $[42 \ 32 \ 34]$, 10 mm) frontal lobes (Brodmann Area,

BA9). Signal changes were computed in each condition for each subject, using MarsBar. Paired t -tests were performed to examine the group signal differences between the creative and uncreative conditions.

RESULTS

Behavioral Results

Subjects generally got higher scores in the creative tasks. There isn't significant difference on the fluency index between the two conditions ($P = 0.13$). They got higher originality scores in the creative tasks (6.38 ± 2.53) than they did in the uncreative tasks (3.08 ± 0.69 , $P = 0.00$). The scores on resistance to premature closure also showed statistical difference between the two conditions (creative: 13.69 ± 4.45 ; uncreative: 8.88 ± 2.70 ; $P = 0.00$). Hereby, we consider that our tasks had been properly completed during the scans.

Imaging Results

Both visual imagination tasks activated distributed brain areas, including the bilateral prefrontal lobes (PFC), temporal lobes, parietal lobes, occipital lobes, hippocampus, insula, and thalamus ($P < 0.05$, corrected, Fig. 2A). These are brain areas typically involved in figure construction.

One of our major interests was the comparison between the creative and uncreative conditions. In the creative–uncreative contrast (Fig. 2B), higher brain activities were found in the left middle prefrontal cortex (mPFC), the left inferior frontal gyrus (IFG), and the right middle occipital lobe ($P < 0.05$, SVC corrected, Table I). As for the

TABLE I. Differential activations among the three conditions

	Cluster Size	Areas	Peak MNI coordinate	BA
Creative>Uncreative (SVC, $P < 0.05$)	16	Left middle frontal gyrus	−24 26 −20	11,47
		Left inferior frontal gyrus		
	302	Left middle frontal gyrus	−42 23 19	9,46
		Left inferior frontal gyrus		
Uncreative>Creative ^a (FWE, $P < 0.05$)	42	Left precentral gyrus		
		Right middle occipital gyrus	15 −100 13	18
	15	Right middle frontal gyrus	39 38 25	10,46
	6	Left inferior parietal lobule	−45 −49 49	40
Uncreative>Fixation (FWE, $P < 0.05$)	3,171(Right)	Left/right superior occipital gyrus	33 −85 7 (Right)	2,3,5,7,17,18,
	3,019(Left)	Left/right middle occipital gyrus	−51 −58 −14(Left)	19,37,39,40
		Left/right inferior occipital gyrus		
		Left/right lingual gyrus		
		Left/right fusiform gyrus		
		Left/right superior parietal lobule		
		Left/right inferior parietal lobule		
		Left/right supramarginal gyrus		
		Left/right postcentral gyrus		
		Left/right middle temporal gyrus		
		Left/right inferior temporal gyrus		
		Left/right calcarine gyrus		
	4,556	Left/right caudate	−48 8 25	6,8,9,10,13,24,27, 32,38,44,45,46,47
		Left/right inferior frontal gyrus		
		Left/right middle frontal gyrus		
		Left superior frontal gyrus		
		Left/right hippocampus		
		Left/right insula		
		Left/right precentral gyrus		
		Left/right thalamus		

^aA brain mask constructed from the result of uncreative–fixation was used to constrain this analysis.
SVC, small volume correction; FWE, family-wise error rate correction.

uncreative–creative contrast (masked with uncreative–fixation), we found robust clusters in the right middle frontal lobe (rmPFC) and the left inferior parietal cortex ($P < 0.05$, corrected).

ROI analysis revealed significant signal changes in the bilateral mPFC (BA9) when changing from uncreative tasks to creative thinking (Fig. 3). Specifically, the left mPFC exhibited elevated activations during creative thinking (paired t -test, $n = 26$, $P = 0.000$), whereas the rmPFC showed decreased activity (paired t -test, $n = 26$, $P = 0.000$).

DISCUSSION

This study was designed to investigate a possible brain inhibitory mechanism during figural creative thinking in subjects who were not artists. The results demonstrated that the left mPFC, the left IFG, and the right middle occipital lobe were significantly activated during creative tasks relative to uncreative tasks. Meanwhile, the right mPFC and the left inferior parietal lobe, which were involved in uncreative figure construction tasks, showed decreased

activities in the creative condition. This brain activation pattern is in accordance with our hypotheses. Although the increase in the left frontal lobe and the decrease in the right frontal lobe may indicate left-over-right inhibitory control, other possibilities remain.

Activation and Deactivation in Frontal Lobes

We found that the left mPFC and IFG were more activated during creative tasks. The cluster in the left mPFC fell in BA9, which is a major area of the dorsolateral prefrontal cortex (dlPFC). Previous studies have suggested that the function of the left dlPFC is general executive control [MacDonald et al., 2000; Wood and Grafman, 2003]. Cognitive control is required when an input stimulus is ambiguous, or when there are possible conflicts among the different responses [Derrfuss et al., 2005]. As our tasks have all of these features, the activation of dlPFC is predictable. The left IFG is involved in semantic selection [Moss et al., 2005]. Although some early studies suggested that its role might be semantic retrieval [Demb et al., 1995], the findings of Thompson-Schill indicated that this area was specifically involved in semantic selection and

Figure 3.

Signal changes from the Fixation to the imagination tasks in the left and right frontal lobes. The average intensity within the region of interest was computed for each subject and paired *t*-tests were used to evaluate the signal difference between the Creative and Uncreative conditions.

not retrieval [Thompson-Schill et al., 1997]. This area is also important for language learning [Sakai et al., 2009], sentence comprehension [Friederici et al., 2003], and other processes. In the present study, the activation of the left IFG may reflect the involvement of verbal selection processing. Our subjects may have used a language-thinking strategy to decide which product is more desirable.

The deactivated area, the rmPFC, is important for figural thinking. Compared with solving matching and analytic problems, figural thinking mainly induces activation in the rmPFC [Prabhakaran et al., 1997]. This area participates in mental rotation [Gauthier et al., 2002], object representation [Takahama et al., 2010], and other processes. Hypometabolism in this area can cause hallucinations in patients with Parkinson's disease [Sanchez-Castaneda et al., 2010]. The rmPFC has also been frequently related to creativity [Kowatari et al., 2009]. Damage to this area may hamper creativity [Shamay-Tsoory et al., 2010]. Although a recent review challenged this idea [Dietrich and Kanso, 2010], another meta-analysis supported the importance of the right hemisphere for creative thinking [Mihov et al., 2010], regardless of the task design and creativity measure. Besides, studies on the domain of figural creativity are highly consistent [Bhattacharya and Petsche, 2005; Kowatari et al., 2009; Solso, 2001].

At least superficially, it seems that these activations and deactivations were just simple reflections of alterations between different ways of thinking. While the left part of brain has predominance in language thinking [Frost et al., 1999], the right part is more competent for figural thinking [Prabhakaran et al., 1997]. However, if the rmPFC was spontaneously involved in figure imagination even during uncreative tasks, it could certainly contribute to creative tasks. Although this area may be crucial for figural creativity, there is no immediately apparent reason for the deactivation of the rmPFC. A possible explanation here is that

the dominance of the left hemisphere may lead to decreased activities in the right hemisphere.

The two brain hemispheres are anatomically connected via the corpus callosum and are typically in constant communication in normal subjects. However, they can work independently, as in patients with split brains [Gazzaniga, 1975]. In some aspects, they may cooperate to perceive emotions [Tamietto et al., 2006] and avoid false memories [Bergert, 2008]. In other aspects, they compete for dominance and inhibit the contralateral hemisphere [Daskalakis et al., 2002]. A remarkable finding by Sprague [1966] showed that cat's left superior colliculus inhibits the right hemisphere after the resections of the right visually responsive cortex. This inhibition can cause left visual loss that can be recovered by removing the left superior colliculus. A similar acoustic "Sprague effect" has also been found [Lomber et al., 2007]. Suppression on one side of the primary motor cortex (M1) can facilitate the contralateral M1, thus boosting functions of the ipsilateral hand movements [Kobayashi et al., 2009]. When one side predominates, the other is suppressed. It may also be understood as a dynamic balance.

Thus, in this study, the dominance of the left PFC in creative tasks may have led to the inhibition of the right PFC. However, it is important to note that the left hemisphere does not always predominate. A previous study suggested that artists mostly use the right PFC to deal with figures [Solso, 2001]. Their long-term training facilitates the dominance of the right PFC, suppressing interference by the left PFC [Kowatari et al., 2009]. A similar process may occur for language, as language thinking is more frequently used in modern society and more people are left-handed nowadays. It has been suggested that the left hemisphere's language predominance may interfere with the right hemisphere's specializations [Mendez, 2004].

This theory has found substantial support in past studies. A famous child savant called Nadia showed early extraordinary drawing skills, but showed artistic retrogression after she began to acquire verbal comprehension skills [Selfe, 1995]. A scientist called Anna showed a reverse pattern [Seeley et al., 2008]. It was found that her progressive dyslexia resulted in a sudden increase of figural creativity, which may be due to disinhibition. In comparison with dementia patients without musical or visual abilities, patients who displayed these abilities performed worse on verbal tasks [Miller et al., 2000]. A recent study showed that patients with semantic dementia performed better on visual search tasks than normal people [Viskontas et al., 2011]. Interestingly, Da Vinci and Picasso may have had dyslexia [Chakravarty, 2009]. These cases demonstrate that dynamic changes can occur in the relationships between figure ability and language ability.

Considering its positive activations, the left IFG is a possible source of this inhibitory control. The left IFG has been reported to have a role in inhibitory control [Swick and Ashley, 2008]. In this study, Swick and Ashley found that patients with damage to the left IFG exhibited greater error rates when performing Go/No-Go tasks, a classic test for cognitive inhibition. Hamilton [Cris Hamilton and Martin, 2005] found loss of inhibitory control of language tasks in a patient with a left IFG lesion. Zhang and Li [2011] performed an ICA analysis to extract the independent components when subjects were doing response inhibition tasks. They found that the left IFG was linked to inhibitory control. Although the right IFG has also been related to response inhibition [Aron et al., 2003, 2004], some recent studies ascribed its role to attention [Hampshire et al., 2010; Zhang and Li, 2011]. Many suggest that different modules of inhibitory control may involve different brain areas [Chao et al., 2009; Ford et al., 2005]. In this study, the left IFG may have been activated because of its involvement in language thinking.

Posterior Cortices

Activities in the left parietal lobe were lower during the creative tasks relative to the uncreative tasks. The fronto-parietal network is important for artistic creativities. A previous study has reported a negative correlation between figural creativity and activities in the parietal lobe [Kowatari et al., 2009]. They suggest that visuospatial processing may interfere with figural creativity. It has also been proposed that this area is deactivated to allow inhibition of attentional shifts toward task-irrelevant stimuli during top-down creative thinking [Berkowitz and Ansari, 2010].

The right occipital lobe (BA18) was activated during the creative tasks. Lying on the visual pathway, the occipital lobe is important for artistic creativity [Jung et al., 2009b]. Petsche [1996] revealed using electroencephalography that acts of creative thinking were characterized by more coherent activity increases between occipital and fronto-

Figure 4.

Inhibition and disinhibition of figural creativity. The data reported in the present study suggest that a left-over-right inhibitory mechanism exists in nonartists during figural creative thinking. Data presented in previous studies suggest that the release of inhibition can facilitate the emergence of creativity, as shown in patients who have suffered lesions in the left frontal lobe and in artists who have received long-term artistic training in the use of the right hemisphere. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

lar electrode sites. These activations suggest the presence of an early novel-detection mechanism in the visual system or top-down control of the construction of novel images.

Relation to Previous Studies: A General Scheme on Hemispheric Dominance and Figural Creativity

Previous studies have provided substantial support for this theory, although they all suggested disinhibition. Damage to the left frontal lobe may remove the source of inhibitory control, thus releasing the right hemisphere's potential in creative thinking [Miller et al., 1996; Seeley et al., 2008]. In professional artists, the long-term training to make art may allow for right hemisphere dominance and even inhibition of the left hemisphere [Kowatari et al., 2009]. The findings of this study indicate the presence of this inhibitory mechanism in normal people. As shown in Figure 4, these data provide a general model of how brain organization impacts figural creativity. However, we wish to clarify that this model does not imply that anyone with left hemisphere damage can become an artist. Indeed, the model suggests that only those with artistic potentials mediated by the properties of the right hemisphere have this capacity.

Limitations of the Study

In this study, we did not examine the subjects' intelligence. Some studies have indicated that there is a relationship between creativity and intelligence [Jung et al., 2009a; Takeuchi et al., 2011]. It is important to note, however, that a relationship between creativity and intelligence is debatable. In this regard, the strength of this relationship varies with different test methods for creativity and

intelligence and different creativity domains. With the TTCT, Torrance found a minor correlation of $r = 0.21$ between verbal creativity and intelligence and a weak correlation between figural creativity and intelligence ($r = 0.06$) [Torrance, 1967]. Indeed, it is well known that artistic creativity can be achieved in subjects that are not particularly intelligent [Gordon, 2005]. Therefore, we consider that this relationship is very low. In addition, we demonstrated generated data that are consistent with the left-over-right inhibitory mechanism. However, a causal link cannot be established using the current experimental design and data analyses. It may be valuable to address this issue in future studies because it is not only important for creativity but also for the brain organization that underlies complex cognitive tasks.

CONCLUSIONS

In this study, we found a possible brain inhibitory mechanism in normal people that is engaged by figural creative tasks. Together with previous studies, this phenomenon has found support in various contexts. We suggest that this inhibitory control may be the result of hemispheric competition. As we do not yet know the mechanism underlying this inhibitory control, further studies are warranted.

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