Creativity as an Intervention

Subjects: Psychology

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Creativity is defined as the ability to produce novel and useful ideas. Being creative influences our achievements in various domains, from the invention of new technologies that facilitate our everyday life to the development of artistic output for our pleasure and entertainment. Given that creativity involves the ability to create original, useful, remote, and unusual associations between ideas, it may possibly trigger a broad style of thinking that is not stereotypical in its attitude toward outgroups. Thus, creative cognition may offer a new avenue for interventions aimed at diminishing group-related biases.

divergent thinking Creativity

1. Creativity: Definition and Brain Models

Creativity is defined as the ability to produce novel and useful ideas [1]. Being creative influences our achievements in various domains, from the invention of new technologies that facilitate our everyday life to the development of artistic output for our pleasure and entertainment. The houses we live in, the cars we drive, and the clothes we wear are all products of human inventiveness [2]. Creative ideas come from novel viewpoints offered by individuals in a specific situation [3].

Traditional approaches to creativity contend that creative thinking involves the arrangement of associative elements into new and useful combinations [4]. This process comprises two stages: idea generation, in which ideas are brought together in unusual ways to create an original product, and evaluation of these ideas for their appropriateness and novelty [1]. Building on this view, which is also known as the Two-Fold Model of Creativity, neuroimaging studies that examine the neural underpinnings of creativity link the default mode network (DMN) to creative thinking, and particularly to the generation phase of the creative process [5][6][7]. The DMN is a network of brain regions originally identified in functional magnetic resonance imaging (fMRI) studies during task-free trials [8]. It consists of the anterior cingulate cortex (ACC), the posterior cingulate cortex (PCC), the medial prefrontal cortex (mPFC), and the temporo-parietal junction (TPJ) [9][10]. Activity in the DMN is frequently associated with spontaneous cognitions and self-generated thought, including mind wandering, future thinking, memory retrieval, and divergent thinking [11][12][13][14]. Divergent thinking tasks, which measure the ability to come up with multiple solutions to an open problem [15][16], are considered valid tools for examining creative ability [9][17][18]. The DMN was found to be strongly activated among creative individuals, and this activation was associated with higher originality scores on divergent thinking tasks [5][19].

While the DMN was found to contribute to the generation phase of creativity, the executive control network (ECN) has been suggested as participating in the evaluation phase. The ECN is associated with cognitive processes grounded in different prefrontal regions, including the inferior frontal gyrus (IFG) and the dorsolateral prefrontal cortex (dlPFC) [20]. Evidence from neuroimaging and lesion studies suggests that damage to the left IFG, which causes reduced inhibitory control, leads to increased creative production [18][21]. Moreover, patients with frontotemporal dementia, which is characterized by damage in the left IFG, exhibit enhanced artistic creativity [22][23][24]. Further evidence from transcranial magnetic stimulation (TMS) studies demonstrated that temporary inhibition of the left IFG leads to higher originality scores as a result of less stringent evaluations [25]. Considering that the left IFG was shown to be active during idea evaluation [18][26][27], reduced activity in this region may, in fact, lead to less strict evaluations and, consequently, to increased creativity. These ideas are in line with a study suggesting that while right mPFC lesions were found to be associated with impaired creativity scores, patients with left IFG lesions exhibited high creativity scores [21].

Both the generation and the evaluation phases seem to be involved in overcoming stereotypes. Stereotypes represent an associated network that includes automatic and close associations, where the activation of one node automatically activates related nodes; for example, mechanic–male [28][29]. In order to overcome stereotypes, it is essential to form new and remote associations, an ability that involves the generation phase [4]. Given that this phase is associated with internally oriented cognition [14], it may contribute to experiencing emotions in a non-automatic way that is not influenced by external factors (e.g., experiencing more empathy toward the outgroup during conflicts instead of anger). It may also help in bringing ideas together in unusual ways to create a new and original perspective about the outgroup that may result in diminished biases. In addition, less strict evaluations of these associations are crucial for a mindset that involves openness and acceptance.

2. Creativity as an Intervention

One key component of creativity that may be important in the relationship between creativity and conflict resolution is flexible thinking. Cognitive flexibility is related to the ability to break old cognitive patterns, overcome functional fixedness [15] and switch from one perspective to another [30]. The flexibility of thought is essential for creativity as it allows for frequent switches among categories during the creative process [31] and, as a result, generates new associations between different concepts. Indeed, highly creative individuals were found to be more flexible in their thinking [32][33]. Furthermore, flexibility is essential for problem-solving in that it facilitates the ability to focus attention selectively, inhibits extraneous information, and allows for flexible shifts in attention across multiple elements during the process [14][34][35]. In the context of conflict resolution, cognitive flexibility may contribute to the ability to overcome automatic cognitive biases and to more easily generate creative solutions to the situation. Indeed, resolving a conflict in a constructive and cooperative manner facilitates the ability to recognize contradictions and maintain flexibility in processing contradictory information or viewpoints [36][37][38].

Another component of creativity that may affect intergroup biases and conflicts is originality, defined as the generation of associations that are uncommon, remote, infrequent, and rare relative to existing ones [15][39]. This component may contribute to experiencing emotions that differ from automatic outgroup-targeted emotions.

Additionally, creativity is positively associated with openness to experience [40], an ability that may facilitate experiencing novel and remote emotions. Greater openness may help in being able to explore new attitudes and emotions. In support of the hypothesis, studies have shown that people high in openness experience a broader range of emotions than people low in openness [41]. In line with this, open-minded individuals exhibit greater cognitive flexibility during conflict resolution, as they tend to use a wider range of ideas and more diverse strategies [42]. Interestingly, implicit theories within a conflict [43][44] suggest that individuals who are flexible in the belief that the outgroups' traits could change are more open to negotiation [45] and to cooperation [46] and experience more positive attitudes toward the outgroup [47]. One study manipulated the belief about the outgroup's changeability and found that participants in the changeable condition reported lower levels of anxiety and more willingness for intergroup contact than participants who believed that the outgroups are fixed [48]. Specifically, anxiety mediated the causal effect of changeability on the desire for contact. Given that hope is associated with cognitive flexibility [49], another study examined the role of hope in the effect of the changeability of a conflict on compromise in conflict. The findings indicate that changeability belief led to more compromise through the process of increased hope [50]. These findings suggest that during conflicts, people tend to have a rigid mindset [51][52][53] that affects emotions and attitudes experienced toward the outgroup and the conflict. Thus, training the mind to think more creatively and flexibly might help in experiencing more positive emotions and attitudes during conflicts.

Based on the above, components of creativity, including openness, flexibility, and originality, may possibly influence intergroup conflict by affecting conflict-related factors. Cognitive biases represent a systematic pattern of deviation from rational judgment.

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