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THE EFFECT OF IMAGERY ON CREATIVITY DURING DYADIC BRAINSTORMING: A COMPARISON OF MOTIVATIONAL AND COGNITIVE IMAGERY

Abstract

The present study examines the effects of a single guided imagery session involving different types of imagery (motivational and cognitive) on idea generation during interactive brainstorming. The research model is based on Paivio's model regarding the functions of imagery. A total of 128 university students were first randomly paired into 64 dyads, which were then randomly assigned to three different experimental conditions (motivational magery, cognitive imagery and control). The results showed that both motivational and cognitive imagery improved idea generation compared to control condition. Additionally, it was observed that participants in experimental conditions engaged in deeper thinking during the brainstorming task compared to those in control condition, although no significant difference was observed in flexibility. Furthermore, according to the mediation analysis performed, imagery increased participants' persistence, which in turn enhanced creativity indirectly. However, no such effect was observed for flexibility. These findings are discussed in relation to the relevant literature.

Keywords: Imagery, Brainstorming, Brainwriting, Idea Generation, Creativity.

İKİLİ BEYİN FIRTINASINDA İMGELEMENİN YARATICILIK ÜZERİNDEKİ ETKİSİ: MOTİVASYONEL VE BİLİŞSEL İMGELEMENİN KARŞILAŞTIRILMASI

Öz

Mevcut çalışma, çalışma, farklı türde imgeleme (motivasyonel ve bilişsel imgeleme) içeren tek bir rehberli imgeleme oturumunun etkileşimli beyin fırtınası sırasında fikir üretimi üzerindeki etkilerini incelemektedir. Araştırma modeli Paivio'nun imgelemenin işlevleri hakkında oluşturduğu sınıflandırmayı temel almaktadır. Toplam 128 üniversite öğrencisi önce rastgele 64 ikili gruba ayrılmış, daha sonra rastgele üç farklı deney koşuluna (motivasyonel imgeleme, bilişsel imgeleme ve kontrol) atanmıştır. Bulgular hem motivasyonel hem de bilişsel imgelemenin, kontrol koşuluna kıyasla fikir üretimini iyileştirdiğini göstermiştir. Ek olarak, deney koşullarındaki katılımcıların, kontrol koşulundakilere kıyasla beyin fırtınası görevi sırasında daha derin düşünme gerçekleştirdikleri gözlemlenmiştir, ancak esneklikte anlamlı bir fark gözlemlenmemiştir. Ayrıca, yapılan aracılık analizine göre imgeleme katılımcıların sebatlık düzeyini artırmış ve bu da dolaylı olarak yaratıcılığı geliştirmiştir. Bununla birlikte esneklik için böyle bir etki gözlemlenmemiştir. Bulgular ilgili literatürle ilişkilendirilerek tartışılmıştır.

Anahtar kelimeler: İmgeleme, Beyin fırtınası, Beyin yazımı, Düşünce üretimi, Yaratıcılık.

INTRODUCTION

Creativity is a key driver of success for both individuals and organizations and serves as the foundation for innovation, systemic problem-solving, and ideation. Consequently, fostering creative capacities has become a critical priority across many domains, including education, design, commerce, and technology. Researchers have examined creativity from a variety of perspectives for many years. Brainstorming is one of the most widely used techniques for assessing and promoting creativity. First formalized by Osborn (1953) in *Applied Imagination*, brainstorming is a problem-solving and idea-generation technique designed to produce a large number of ideas in a free and non-judgmental environment. Previous research has shown that brainstorming can facilitate creative thinking and enhance the generation of novel ideas, particularly when implemented in a structured manner (Paulus & Coskun, 2013), and these benefits have also been demonstrated in group settings (Paulus & Young, 2000). Nonetheless, individual differences in creative capacity persist, and the precise cognitive processes underlying brainstorming performance remain insufficiently understood. The aim of the current research is to reveal the effect of different types of imagery on creativity. The mechanism by which imagery affects creativity has not been sufficiently elucidated by studies in the literature. Nonetheless, creative capacity varies significantly not only due to individual differences but also as a result of mood states, task characteristics, and their complex interactions; furthermore, the precise cognitive processes underlying brainstorming performance remain insufficiently understood (Coşkun & Şenyurt, 2015; Gültepe et al., 2025).

Imagery refers to the mental representation of a stimulus even in the absence of its physical presence. Ancient Greek philosophers, including Plato and Aristotle, were among the first to explore the relationship between imagery, cognition, and action (Pelaprat & Cole, 2011). In psychology, the first systematic empirical investigation of imagery was conducted by Galton (1880), who asked participants to visualize the breakfast table at which they had been sitting earlier that morning. For many years, the dominance of behaviorism largely excluded imagery from mainstream empirical research. This situation persisted until Paivio (1986) revitalized interest in the field through his seminal dual-coding theory. Following the development of this theory, scholarly interest in mental imagery expanded considerably, giving rise to a wide range of conceptualizations. For example, imagery has been defined both as a cognitive envisioning process (Feltz & Riessinger, 1990) and as a developmental capacity to synthesize neural elements (Vygotsky, 2004). Extending these perspectives, Gibb (2004) characterized imagery as an internal experiential phenomenon emerging from the complex interaction among memory, perception, emotion, and conceptual metaphors.

Imagery has become an important topic of research across numerous disciplines, including the arts, creativity research, and in particular sport psychology, where it is widely used to enhance performance. Its effectiveness in improving athletic performance has been extensively documented in the literature (e.g., Lu et al., 2020; Munroe-Chandler & Hall, 2004). Examining the functional dimensions of mental imagery, Paivio (1985) identified two primary functions: motivational and cognitive. He further proposed that imagery operates at both specific and general levels of behavior. Within this framework, he identified four distinct imagery functions. General-motivational imagery regulates arousal levels, whereas general-cognitive imagery facilitates strategy development. Meanwhile, specific-motivational imagery promotes goal-directed behavior, and specific-cognitive imagery supports technical skill acquisition and execution. Although this comprehensive framework has become highly influential in sport psychology, its application in other domains of imagery research remains relatively limited.

Since the seminal work of Osborn (1953), *Applied Imagination*, empirical exploration into the direct relationship between imagery and creativity has remained relatively limited. A few studies that have addressed this connection often conceptualize imagery merely as a subordinate component of creativity (Duch, 2007). For instance, Karwowski and Soszynski (2008) highlighted imagery as one of five core dimensions of creativity, alongside discrete thinking, flexible thinking, fluency, and originality. Finke et al. (1992) highlighted the critical importance of mental imagery in the process of visual creativity. Conversely, Pelaprat and Cole (2011) sought to delineate these constructs, proposing that while imagery and creativity are conceptually distinct, they operate as interdependent processes. Additionally, it has been argued that high-quality imagery is a prerequisite for creative output, with varying levels of imagery capacity corresponding to different degrees of creativity (as cited in Czernecka & Szymura, 2008). One of the seminal frameworks in the study of creativity, the "Geneplore model" developed by Ronald A. Finke and colleagues (1992), posits that creative thinking is a cyclical process that alternates between two fundamental phases and that mental imagery plays a central role in this process. In particular, the *preinventive structures* generated during the initial phase of the process frequently emerge in the form of mental images. Moreover, Benedek et al., (2014) presented some evidence to support these claims. The results showed that the left inferior parietal cortex region of the brain is intensely activated during the generation of new and original ideas. This region is also the center where imagery processes are managed. In other words, the key to improving performance in brainstorming is the activation of the mental imagery mechanism.

There have been some attempts to present the direct effect of imagery on creativity. For example, Palmiero et al., (2011) found positive correlation between vividness of visual imagery and practicality which is an important component of creativity but no relationship with originality. In a longitudinal study May et al. (2020) indicated that dance students who participated in the imagery workshops exhibited a significantly greater increase in flexible thinking scores one-year post-training compared to the control group. Besides, guided imagery is an also technique where scenarios are used to direct individuals to visualize and imagine themselves within a specific setting (Utay & Miller, 2006). A recent study (Drake et al., 2025) experimentally tested the effect of guided imagery sessions on divergent thinking and brainstorming. Following imagery training, participants' brainstorming performance was measured using the Alternate Uses Test. The results showed that visualization directly increased the quality and originality of the ideas generated. Although some of the studies mentioned above exist, to date, no empirical investigation has examined the effects of Paivio's (1985) framework on brainstorming performance within interactive dyads, particularly regarding cognitive processing or task-related outcomes.

During brainstorming, individuals not only generate ideas but also engage in the mental visualization of potential products, solutions, and scenarios—a process that directly aligns with the cognitive imagery functions conceptualized by Paivio (1985). Concurrently, sustaining the motivation required for continuous idea generation can be understood through the lens of motivational imagery functions. Despite these theoretical intersections, the specific impact of mental imagery utilized during brainstorming on overall creativity remains under-investigated within the context of Paivio's (1985) dual-function framework.

To address this gap, the primary objective of the present study is to examine the effects of imagery applied during the brainstorming process on creative outcomes, operationalized through Paivio's (1985) cognitive and motivational imagery model. In the present study, Paivio's (1985) imagery model was selectively applied by focusing exclusively on its functional dimensions. Specifically, this research integrates Paivio's (1985) functional imagery framework with the Dual Pathway to Creativity Model (De Dreu et al., 2008), exploring how specific imagery functions activate distinct creative processes. According to the Dual Pathway to Creativity Model (De Dreu et al., 2008), creative outcomes are achieved through two distinct cognitive pathways: flexibility and persistence. Flexible thinking entails examining a problem from diverse perspectives and generating new ideas by switching between categories, whereas persistence involves conducting a deep, concentrated analysis of the issue (De Dreu et al., 2008). Thus, individuals with higher persistence tend to produce more ideas within fewer conceptual categories.

We hypothesized that (H1) participants in the imagery conditions would generate more unique ideas than those in the control condition. Consistent with the first hypothesis, our second hypothesis proposes that (H2) the effect of imagery on the number of unique ideas will be mediated by persistence and flexibility. This prediction assumed that imagery promotes greater persistence and cognitive flexibility during brainstorming. We further hypothesized that (H3) participants exposed to motivational imagery would generate a greater number of unique ideas than those exposed to cognitive imagery. This expectation reflects the nature of brainstorming, which depends heavily on sustained idea generation and therefore requires both motivational and cognitive resources. Because participants may experience a decline in motivation over time, maintaining motivational engagement may be particularly important. Furthermore, brainstorming relies on the retrieval of information from working and long-term memory and encourages the free generation of numerous ideas rather than skill acquisition. In line with this, motivational imagery is hypothesized to exert more robust effects than cognitive imagery.

Whereas previous research has largely treated imagery as an internal component of creativity, the present study investigates whether experimentally manipulating imagery as an independent variable can enhance creative performance in interactive dyads. In doing so, this research seeks to address an important gap in the literature and provide new insights into the mechanisms through which different imagery functions influence brainstorming performance.

METHOD

Participants and Design

A total of 128 (86 women and 42 men; M_{age} = 19.15, SD = 1.18) undergraduate psychology and sociology students participated in the study and received course credit. Participants were grouped into 64 interactive dyads; both the experimental manipulations and the experimental tasks were administered at the dyadic level. Dyads were randomly assigned to one of three conditions: motivational imagery (MI), cognitive imagery (CI), or a control condition in which they performed a neutral, non-imagery task. Participation was voluntary, and ethical approval for the study was obtained from the Human Research Ethics Committee of Abant İzzet Baysal University prior to data collection (Protocol no: 2015/150).

Materials

Imagery Scenarios. Two distinct imagery scenarios were developed for the experimental conditions, with script lengths standardized to between 99 and 115 words to ensure consistency. At the beginning of the experimental phase, participants received the following standardized instruction to ensure procedural consistency: "*I would like you to focus as deeply as possible and follow the upcoming prompts carefully. I will provide instructions for the visualization task. Please refrain from interacting with others until the session has concluded."* Participants were then instructed to close their eyes and engage as fully as possible with the multisensory imagery experience.

Participants assigned to the motivational imagery (MI) condition received the following standardized script: *"Imagine that you are at a university. You are walking around the campus. Try to visualize the people, objects, and surroundings in as much detail as possible. Explore your environment and find a comfortable place on campus where you can relax."* In contrast, participants in the cognitive imagery (CI) condition received the following script: *"Imagine that you are responsible for the development of the university. Your task is to prepare a development plan. You begin by reviewing renovation proposals, examine projects submitted by the architect with whom you are working, and take the necessary steps to implement your selected plan."* The imagery session lasted approximately 3.5 minutes in both active experimental conditions. The imagery session lasted approximately 3.5 minutes in both active experimental conditions.

Participants in the control condition did not complete any imagery or alternative tasks, thereby serving as a no-treatment control condition.

Procedure

Participants arrived at the laboratory at times corresponding to their assigned experimental conditions. Upon arrival, they were informed about the general purpose of the study and provided written informed consent. Experiment was conducted in a controlled, sound-attenuated laboratory setting, where participants were seated side by side to form interactive dyads. Both members of each dyad were assigned to the same imagery condition.

At the beginning of the session, a 2-minute typing test was administered to assess baseline typing speed and minimize the potential influence of participants' mood states (Gültepe et al., 2025). Participants were then randomly assigned to the experimental conditions and exposed to the corresponding experimental manipulations and imagery scripts. During the 3.5-minute imagery session, participants in the experimental groups were instructed to close their eyes and refrain from communicating with one another to avoid distraction. Participants in the control condition completed a neutral task consisting of reading a standard text that did not involve imagery-related content. Following the manipulation, participants completed a three-item manipulation check assessing imagery depth ("*How deeply did you visualize the scene?*"), focus ("*To what extent did you focus on the imagery?*"), and perceived control ("*To what extent was the imagery under your control?*").

Prior to the brainstorming phase, all participants were briefed on the task instructions. The experimenter read aloud the four fundamental rules of brainstorming, which were also provided in written form: (1) do not criticize your ideas, (2) record every idea that comes to mind, (3) prioritize quantity over quality, and (4) combine and build upon previous ideas. Participants were then informed that they would have 12 minutes to generate ideas for improving the university. Ideas were exchanged within dyads using standardized paper slips. The brainstorming session ended after exactly 12 minutes. Upon completion of the study, participants were thanked for their time and cooperation and were given the opportunity to receive information about the study's findings.

FINDINGS

Coding

Before the main analyses, two independent raters coded the complete pool of generated ideas to identify and exclude redundant or repetitive responses, thereby establishing the final count of non-repetitive (unique) ideas. The raters were researchers with expertise in creativity research and were blind to participants' experimental group assignments and followed a predefined coding protocol. The inter-rater reliability—operationalized via the intraclass correlation coefficient (ICC)—was found to be robust at $\rho = .99$ for both repetitive and non-repetitive idea counts. The raters categorized each unique idea across ten pre-defined thematic dimensions related to university improvement: (1) classroom environments, (2) facility infrastructure and buildings, (3) campus grounds, (4) social activities, (5) health and sports, (6) housing and dormitories, (7) transportation, (8) academic activities (e.g., seminars, courses, and conferences), (9) dining and cafeteria facilities, and (10) miscellaneous/other categories. The persistence score was calculated as the ratio of fluency to flexibility. The inter-rater consensus coefficient for this categorical sorting task was $\rho = .96$. All subsequent statistical analyses were performed using these consolidated, highly reliable metrics. The experimental manipulations exercised a significant effect on the depth of consideration, degree of focus, and perceived control over the imagined scenarios, $F(2, 61) = 4.56$, $p = .014$, $F(2, 61) = 3.75$, $p = .029$, and $F(2, 61) = 7.21$, $p = .002$, respectively.

Main Analyses

Because the experimental tasks and manipulations were conducted at the dyad level, the dyad was treated as the unit of analysis. We used dyadic scores—calculated as the total performance of both members within each pair—as the primary unit for all subsequent statistical analyses (N = 64).

The main effect of experimental conditions on the number of unique ideas was statistically significant, $F(2, 61) = 5.54$, $p = .006$, $n^2 = .15$ Since Levene's test of homogeneity of variances was non-significant (p = .79), a Tukey post-hoc comparison was conducted. The Tukey test revealed that participants in both the CI condition (M = 53.37) and MI condition (M = 50.86) generated significantly more unique ideas than those in the control condition (M = 40.48). However, no statistically significant difference was observed between the two active experimental conditions (CI vs. MI).

The main effect of the imagery on flexibility was not statistically significant, $F(2, 61) = 2.99$, $p > .05$. Ideas generated by participants in the CI condition (M = 9.11), MI condition (M = 8.73), and the control condition (M = 8.35) were not significantly different.

For persistence (i.e., deeper ideas), the effect of imagery was statistically significant, $F(2, 61) = 3.51$, $p = .036$. Given that the assumption of homogeneity of variances was met ($p > .05$), a Tukey post-hoc analysis was performed. Results indicated that participants in the CI (M = 5.83) and MI (M = 5.88) conditions produced significantly deeper ideas compared to the control group (M = 4.85), but no significant variance was found between the two imagery groups.

Table 1. Descriptive statistics of participants' unique ideas, flexibility, and persistence

Conditions	N	Unique Ideas *Mean (SD)*	Flexibility *Mean (SD)*	Persistence *Mean (SD)*
Control	23	40.48(11.59)	8.35(1.07)	4.85(1.29)
CI	19	53.37(15.54)	9.11(.94)	5.83(1.46)
MI	22	50.86(13.57)	8.73(1.08)	5.88(1.61)

A mediation analysis was conducted to examine whether the effects of different types of imagery (CI & MI) on unique ideas are mediated by persistence. The experimental conditions were dummy-coded, with the control group serving as the reference (baseline) category. The statistical significance of the indirect effects was evaluated using the Maximum Likelihood (ML) estimation method with a 5000-replication percentile Bootstrap procedure (95% Confidence Interval [CI]).

Examination of the direct paths within the model revealed that the mediator, persistence, exerted a positive and highly significant direct effect on the number of unique ideas (B = 8.34, SE = 0.63, z = 13.22, $p < .001$, 95% CI [6.89,9.39]). Compared to the control group, both the cognitive imagery condition (*B* = 0.98, *SE* = 0.43, z = 2.30, $p = .021$, 95% CI [0.13,1.82]) and the motivational imagery condition (*B* = 1.03, *SE* = 0.43, z = 2.37, $p = .017$, 95% CI [0.22,1.91]) significantly predicted higher levels of persistence among participants. Compared to the control group, the cognitive imagery condition had a statistically significant indirect effect on the number of unique ideas by persistence (B = 8.15, SE = 3.71, z = 2.20, p = .027 .05, 95% Bootstrap CI [1.15,15.55]). Because the bootstrap confidence interval did not include zero, the mediation effect was empirically supported. Furthermore, after accounting for the mediator (persistence), the direct effect of cognitive imagery on unique ideas remained statistically significant (B = 4.74, SE = 1.75, z = 2.71, p = .006, 95% CI [1.67,8.44]). Compared to the control group, the motivational imagery condition also yielded a statistically significant indirect effect on unique ideas through persistence (B = 8.59, SE = 3.58, z = 2.40, p = .016, 95% Bootstrap CI [1.97,16.31]). However, when persistence was included in the model, the direct effect of motivational imagery on unique ideas became statistically non-significant (B = 1.80, SE = 1.68, z = 1.07, p > .05, 95% CI [−1.70,5.02]). Table 2 shows mediator analyses.

Table 2. Regression Coefficients and Bootstrap Confidence Intervals for the Mediation Model

	Estimate	SE	z	p	95% CI
Direct Paths (a and b alternatives)					
Persistence→Unique Ideas (b path)	8.34	0.63	13.22	.000	[6.89, 9.39]
Cognitive Imagery→Persistence (a1 path)	0.98	0.43	2.30	.021	[0.13, 1.82]
Motivational Imagery→Persistence (a2 path)	1.03	0.43	2.37	.018	[0.22, 1.91]
Total and Direct Effects on Unique Ideas					
Total Effect: Cognitive Imagery	12.89	4.09	3.15	.001	[4.96, 21.39]
Direct Effect: Cognitive Imagery (c1′ path)	4.74	1.75	2.71	.007	[1.67, 8.44]
Total Effect: Motivational Imagery	10.39	3.94	2.64	.008	[3.37, 17.97]
Direct Effect: Motivational Imagery (c2′ path)	1.80	1.68	1.07	.285	[-1.70, 5.02]
Mediation (Indirect) Effects (a×b)					
Cognitive Imagery→Persistence→Unique Ideas	8.15	3.71	2.20	.028	[1.15, 15.55]
Motivational Imagery→Persistence→Unique Ideas	8.59	3.58	2.40	.016	[1.97, 16.31]

DISCUSSION

The present study aimed to investigate whether imagery enhances creativity. Overall, the findings provided substantial evidence addressing the research question. Consistent with the first hypothesis (H1), the results demonstrated that imagery positively influenced creative performance during brainstorming tasks, regardless of whether the imagery intervention was cognitive or motivational in nature.

Participants who underwent the imagery intervention exhibited significantly higher levels of persistence than those in control condition. Consequently, one of the principal findings of the present study is that imagery promotes deeper thinking, which in turn facilitates greater creativity. In other words, persistence appears to serve as a mediating mechanism linking imagery to creative performance. These findings further suggest that motivational imagery enhances creative output primarily by increasing task-directed persistence, indicating a pattern of full mediation. In contrast, cognitive imagery appears to be a more versatile intervention, increasing the number of unique ideas both indirectly through persistence and directly, possibly by activating structural cognitive schemas independently of effort. Taken together, these findings provide partial support for the second hypothesis (H2).

The findings are also consistent with the Dual Pathway to Creativity Model (De Dreu et al., 2008), which proposes two primary routes to creativity: flexibility and persistence. In the present study, persistence was operationalized as the generation of a greater number of in-depth ideas within a particular category, a measure that may also reflect individual motivation.

Although previous research, particularly in sport psychology, has documented positive associations between imagery and performance (Beauchamp et al., 2002; Driskell et al., 1994; Munroe-Chandler et al., 2012), empirical investigations of this relationship in social psychology remain limited. Nevertheless, contrary to the prediction of the third hypothesis (H3), which posited that participants engaging in motivational imagery would generate more unique ideas, the present study found no significant difference between motivational and cognitive imagery in the production of unique ideas. Future research should examine the physiological mechanisms through which imagery may influence creative performance, including the potential roles of neurotransmitter activity, hormonal responses, and neural processes. Future studies could also investigate whether individual differences in imagery ability (e.g., as measured by the Vividness of Visual Imagery Questionnaire or the MIQ-3) moderate these effects. Because individuals differ in their capacity for visualization, such differences may have contributed to the observed variability within experimental groups.

Previous literature has suggested that imagery may enhance motivational processes. For instance, some scholars have argued that imagery facilitates the attainment of an optimal level of arousal and may increase arousal by directing individuals' attention toward positive performance outcomes (Weinberg & Gould, 2007). Although this explanation may lead to the expectation that cognitive imagery would enhance flexibility, the present study did not provide evidence supporting this assumption. Instead, the findings indicated a general effect of imagery on creativity through persistence. This suggests that assigning participants responsibility for university development may itself have increased their motivation. In other words, the responsibility or role given to participants may have functioned as an independent motivational source.

Although the findings demonstrated that the imagery influenced brainstorming performance, there were no significant difference between two imagery condition (CI vs MI). The cognitive component of imagery may be more effective in other task domains, such as athletic performance. For example, Munroe-Chandler et al. (2012) reported that cognitive-specific imagery improved athletes' performance. Therefore, the discrepancy between the findings of the present study and those of previous research may be explained by differences in task characteristics and by the task-dependent effects of imagery types, as proposed by Paivio (1985).

Future research should address several methodological issues in order to clarify the effects of imagery and imagery types on creativity more comprehensively. In the present experiment, the duration of the imagery session was relatively short, lasting only 3.5 minutes. Therefore, future studies should compare the effects of short-term and longer imagery interventions. Moreover, considering that participants may not have had sufficient knowledge or experience regarding how to engage in imagery effectively, providing extensive imagery training prior to the imagery sessions may lead to more effective implementation.

Despite these limitations, the present study has several strengths. To the best of our knowledge, this is the first study to examine the effect of imagery on brainstorming performance in interactive dyads using a control condition. In sum, these data underscore the potential of imagery as a strategic tool for enhancing individual creativity. Traditional literature in this domain has frequently collapsed imagery and creativity into overlapping conceptual frameworks, seldom investigating the former through rigorous experimental manipulation. By employing a controlled design to establish causality, this study addresses a significant gap in literature, providing robust and distinct evidence that imagery actively drives creative performance.

The findings of this study may have practical implications for various fields, including sports, health, education, and clinical psychology. Applying imagery-based interventions in these contexts may contribute to improved performance and adaptive outcomes. For example, imagery may enhance children's performance or achievement in educational settings, support recovery processes and reduce discharge time in healthcare contexts, improve athletic performance, and increase motivation for behavioral change within therapeutic settings.

REFERENCES

Benedek, M., Jauk, E., Fink, A., Koschutnig, K., Reishofer, G., Ebner, F., & Neubauer, A. C. (2014). To create or to recall? Neural mechanisms underlying the generation of creative new ideas. *NeuroImage*, *88*(100), 125–133. https://doi.org/10.1016/j.neuroimage.2013.11.021.

Beauchamp, M. R., Bray, S. R., & Albinson, J. G. (2002). Pre-competition imagery, self-efficacy and performance in collegiate golfers. *Journal of sports sciences*, *20*(9), 697–705. https://doi.org/10.1080/026404102320219400.

Coşkun, H., & Şenyurt, A. Y. (2015). Kişilik ve yaratıcılık ilişkisini inceleyen çalışmaların kullanılan ölçme araçlarına göre değerlendirilmesi. *Kalem Uluslararası Eğitim ve İnsan Bilimleri Dergisi*, *5*(2), 35-65.

Czernecka, K. & Szymura, B. (2008). Alexithymia – Imagination – Creativity. *Personality and Individual Differences, 45,* 445–450. https://doi.org/10.1016/j.paid.2008.05.019.

De Dreu, C. K. W., Baas, M., & Nijstad, B. A. (2008). Hedonic tone and activation level in the mood–creativity link: Towards a dual pathway to creativity model. *Journal of Personality and Social Psychology, 94,* 739-756.

Drake, A. C., Hasan, F., Gibson, A., & Kam, J. W. Y. (2025). The effect of nature on creativity through mental imagery. *PloS one*, *20*(1), e0315141. https://doi.org/10.1371/journal.pone.0315141.

Driskell, J. E., Copper, C. & Moran, A. (1994). Does mental practice enhance performance? *Journal of Applied Psychology, 79*(4), 481-492.

Duch, W. (2007) Intuition, Insight, Imagination and Creativity. *EEE Computational Intelligence Magazine, 2*(3), 40-52. doi: 10.1109/MCI.2007.385365.

Feltz, D. L. & Riessinger, C. A. (1990). Effects of in vivo imagery and performance feedback on self-efficacy and muscular endurance. *Journal of Sport and Exercise Psychology*, 12, 132-143.

Finke R. A., Ward T. M. & Smith S. M. (1992). *Creative Cognition: Theory, Research, and Applications*. MIT Press.

Galton, F. (1880). Statistics of mental imagery. *Mind*, *5*(19), 301-318.

Gibb, S. (2004). Imagination, Creativity, and HRD: An Aesthetic Perspective. *Human Resource Development Review, 3*(1), 53-73.

Gültepe, B., Akben, C., Şenyurt, A. Y., & Coşkun, H. (2025). Variability in the Effects of Mood and Cognitive Stimulation on Creative Generation: A Task-Dependent Perspective. *The Journal of Creative Behavior*, *59*(2), e1533. https://doi.org/10.1002/jocb.1533.

Karwowski, M. & Soszyńsk, M. (2008). How to develop creative imagination? Assumptions, aims and effectiveness of Role Play Training in Creativity (RPTC). *Thinking Skills and Creativity, 3,* 163–171.

Lu, F. J., Gill, D. L., Lee, Y. C., Chiu, Y. H., Liu, S., & Liu, H. Y. (2020). Effects of visualized PETTLEP imagery on the basketball 3-point shot: A comparison of internal and external perspectives. *Psychology of Sport and Exercise*, *51*, 101765. https://doi.org/10.1016/j.psychsport.2020.101765.

May, J., Redding, E., Whatley, S., Łucznik, K., Clements, L., Weber, R., ... & Reed, S. (2020). Enhancing creativity by training metacognitive skills in mental imagery. *Thinking Skills and Creativity*, *38*, 100739. https://www.doi.org/10.1016/j.tsc.2020.100739.

Munroe-Chandler, K. J., & Hall, C. R. (2004). Enhancing the collective efficacy of a soccer team through motivational general-mastery imagery. *Imagination, Cognition and Personality*, *24*(1), 51-67. https://doi.org/10.2190/UM7Q-1V15-CJNM-LMP4.

Munroe-Chandler, K., Hall, C., Fishburne, G., Murphy, L., & Hall, N. D. (2012). Effects of a cognitive specific imagery intervention on the soccer skill performance of young athletes: Age group comparisons. *Psychology of Sport and Exercise, 13*(3), 324-331. doi: 10.1016/j.psychsport.2011.12.006. [DOI] [Google Scholar]

Osborn, A. F. (1953). *Applied imagination: Principles and procedures of creative problem solving.* Charles Scribner's Sons.

Paivio, A. (1985). Cognitive and motivational functions of imagery in human performance. *Canadian Journal of Applied Sport Sciences, 10,* 22S-28S.

Paivio, A (1986). Mental representations: a dual coding approach. *Oxford University Press.*

Palmiero, M., Cardi, V., & Belardinelli, M. O. (2011). The Role of Vividness of Visual Mental Imagery on Different Dimensions of Creativity. *Creativity Research Journal*, *23*(4), 372–375. https://doi.org/10.1080/10400419.2011.621857

Paulus, P. B., & Coskun, H. (2013). Creativity. In J. M. Levine (Ed.), Group processes (pp. 215–239). Psychology Press.

Paulus, P. B., & Yang, H. C. (2000). Idea generation in groups: A basis for creativity in organizations. *Organizational Behavior and Human Decision Processes, 82*(1), 76–87.

Pelaprat, E., & Cole, M. (2011). Minding the gap: Imagination, creativity and human cognition. *Integrative Psychological and Behavioral Science, 45*(4), 397–418. https://doi.org/10.1007/s12124-011-9176-5.

Utay J. & Miller M. (2006) Guided Imagery as an Effective Therapeutic Technique: A Brief Review of its History and Efficacy Research. *Journal of Instructional Psychology, 33*(1), 40–43.

Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian and East European Psychology, 42*(1), 7–97.

Weinberg, R. S., & Gould, D. (2007). *Foundations of sport and exercise psychology* (4th ed., pp. 296–317). Human Kinetics.