

The Creative Brain: Exploring the Connection Between Neuroscience and the Creative Process

Retno Ryani Kusumawati^{1*}, Akhmad Baidun², Dery Kurniawan³, Linus Kali

Palindangan⁴, Retika Najmamulat Asih⁵

Universitas Bina Bangsa Serang, Indonesia^{1,3}

UIN Syarif Hidayatullah Jakarta, Indonesia²

Universitas Esa Unggul Jakarta, Indonesia⁴

Kementerian Bidang Hukum HAM, Imigrasi dan Pemasarakatan⁵

Email: retno.rk@binabangsa.ac.id^{1*}, akhmad.baidun@uinjkt.ac.id²,

dery.kurniawan@binabangsa.ac.id³, linus.kali@esaunggul.ac.id⁴,

retikanajmamulatasih@gmail.com⁵

Keywords:

Creativity; neuroscience; brain tissue; divergent thinking; Creative Cognition

ABSTRACT

This research aims to explore and analyze the relationship between neuroscience and creative processes in order to gain a more comprehensive understanding of the neural mechanisms underlying human creativity. The method used was qualitative research with a descriptive approach through literature studies, with data collection techniques in the form of searching scientific literature from journal articles, academic books, and other credible sources, and analyzed using the stages of theme identification, data reduction, concept categorization, and inductive conclusion drawn. The results of the study show that creativity is a multidimensional neurocognitive process that involves dynamic interactions between various brain networks, especially the default mode network, executive control network, and salience network, which plays a role in the generation, evaluation, and implementation of ideas. In addition, creativity is also influenced by cognitive factors such as memory and thinking flexibility, as well as emotional and motivational factors such as mind wandering and flow conditions. These findings confirm that creativity is not singular or static, but rather the result of complex integrations between various neural systems and individual experiences. The implications of this research make an important contribution to the development of the theory of neuroscience of creativity and its application in the field of education and human resource development. Thus, this research strengthens the understanding that creativity can be studied scientifically and potentially developed through a neuroscience-based approach.

INTRODUCTION

Creativity is one of the most complex cognitive abilities that humans possess and plays an important role in the advancement of science, technology, and culture. In recent decades, the study of creativity is no longer limited to the perspective of psychology, but has grown rapidly in the realm of neuroscience. This approach allows for a deeper understanding of the biological mechanisms underlying the creative thinking process, including how the brain generates new ideas that are original and adaptive (Liu et al., 2024).

The development of neuroimaging technology such as functional magnetic resonance imaging has opened up great opportunities to observe brain activity directly during the creative process. Research shows that creativity is not the result of the work of one specific brain area, but rather involves complex interactions between large-scale neural networks. Networks such as default mode networks, executive control networks, and salience networks are known to play an important role in supporting various stages of the creative process (Huo et al., 2025).

Default mode networks are often associated with internal mental activities such as imagination, self-reflection, and mind wandering which are important foundations in the generation of creative ideas. This spontaneous activity allows individuals to access memory and connect seemingly unrelated concepts (Koelsch et al., 2021). On the other hand, the executive control network plays a role in evaluating and filtering ideas, resulting in relevant and applicable solutions.

The relationship between the two networks suggests that creativity depends not only on spontaneous processes, but also on directed cognitive control. The dynamic interaction between the default mode network and the executive control network has been shown to improve the ability to generate creative ideas through coordination between idea exploration and rational evaluation (Beaty et al., 2015). This shows that creativity is the result of a balance between freedom of thought and cognitive control.

In addition, recent research suggests that functional connectivity between brain networks can significantly predict an individual's level of creativity. Individuals with high creative abilities tend to exhibit more efficient and flexible connectivity patterns between different brain networks, especially in the frontal and parietal areas (Beaty et al., 2018). These findings reinforce the view that creativity is an integrated neurocognitive phenomenon.

In the context of cognitive processes, creativity is often associated with the ability to think divergently, which is the ability to produce various solutions from a single problem. These activities involve memory, attention, and complex semantic association skills (Takeuchi et al., 2020). In addition, flexibility in semantic memory structures allows individuals to connect distant, conceptually distant, thus resulting in new innovations (Hérault et al., 2024).

Research has also shown that the search process in semantic memory plays an important role in creativity. Mechanisms such as clustering and switching in memory search allow individuals to move between different ideas flexibly and generate unique combinations of concepts (Ovando-Tellez et al., 2022). This process confirms that creativity involves the interaction between exploration and cognitive control.

On the other hand, emotional factors and mental states such as mind wandering also contribute to the creative process. Studies show that a free, unfocused state of mind can improve the ability to think creatively through the integration of various brain networks (Feng et al., 2024). This shows that creativity is not only influenced by cognitive factors, but also by affective dynamics.

Previous research has shown that the default mode network plays an important role in imagination, self-reflection, episodic memory, and mind wandering, all of which are closely related to the generation of creative ideas. Beaty et al. found that creative thinking depends on cooperation between spontaneous idea generation and executive control, while later findings emphasized that functional connectivity can predict individual creative ability. These studies

indicate that creativity is not merely an unconscious or spontaneous process, but also requires cognitive control to evaluate and organize ideas into meaningful outcomes.

Other relevant studies from neuroscience and cognitive psychology highlight the importance of divergent thinking, working memory, semantic association, and emotional states in the creative process. Research discussed in the manuscript shows that individuals with higher creativity tend to demonstrate flexible brain connectivity, efficient semantic memory search, and the ability to connect distant concepts. This evidence supports the view that creativity is a multidimensional neurocognitive process shaped by both brain mechanisms and individual experience.

However, existing studies still show several limitations. Many previous investigations focus separately on specific components, such as only the default mode network, only divergent thinking tasks, or only emotional factors. As a result, there is still a lack of integrated explanation regarding how brain networks, memory, cognitive control, emotions, motivation, and individual differences interact in a complete creative process. This research gap is important because fragmented explanations may limit the development of practical strategies for enhancing creativity in education and human resource development.

The specific issue addressed in this study is the need for a more comprehensive understanding of the relationship between neuroscience and creativity. Although creativity has been widely discussed in psychology and education, the neural mechanisms behind creative thinking still require deeper synthesis. This is particularly relevant because modern education and workplace systems increasingly demand creative thinking, while many institutions still lack scientific guidance on how creativity can be developed systematically.

The novelty of this research lies in its attempt to integrate findings on brain networks, cognitive processes, semantic memory, biological mechanisms, emotional dynamics, and individual variation into one conceptual explanation of creativity. Unlike studies that focus only on isolated neural regions or single creative tasks, this research emphasizes creativity as a dynamic interaction among multiple systems. This integrative perspective can provide a stronger theoretical foundation for designing creativity-based learning, training, and intervention programs.

The purpose of this research is to explore and analyze the relationship between neuroscience and the creative process in order to understand the neural mechanisms that support human creativity. Specifically, this research aims to map the role of the default mode network, executive control network, and salience network; synthesize findings related to memory, divergent thinking, emotion, motivation, and biological factors; and formulate theoretical and practical implications for creativity development.

This research is expected to contribute both theoretically and practically. Theoretically, it enriches the neuroscience of creativity by presenting creativity as an integrated neurocognitive phenomenon rather than a single mental ability. Practically, the findings can benefit educators, researchers, psychologists, and human resource practitioners by offering scientific insight into how creativity may be cultivated through learning design, cognitive training, emotional regulation, and neuroscience-based intervention. Thus, this study is relevant not only for advancing academic knowledge but also for supporting innovation-oriented education and human development.

METHODS

The research in this article used a qualitative approach with a descriptive design through a literature study. The qualitative approach was chosen because it is able to provide a deep understanding of complex phenomena such as the relationship between neuroscience and creative processes that cannot be explained quantitatively. Qualitative research emphasizes the exploration of meaning, interpretation, and contextual understanding of data obtained from various relevant scientific sources (Bingham, 2023). In addition, the latest development of qualitative methods also emphasizes the importance of transparency and systematics in the analysis process to increase the credibility of research results (Pratt, 2025).

A descriptive approach is used in this study to systematically and accurately describe the phenomenon studied without manipulating variables. This approach allows researchers to comprehensively outline concepts, theories, and empirical findings related to creativity and neuroscience. In the context of qualitative research, descriptive design also provides flexibility in interpreting data and emphasizes the clarity of the methodological foundation so that research results can be scientifically accounted for (Doyle et al., 2019). This approach is also relevant for studying multidimensional phenomena such as creativity involving cognitive, neural, and affective aspects (Abraham & P, 2024).

The data sources in this study come from various credible academic literature, including scientific journal articles, academic books, and research reports relevant to the topic of neuroscience and creativity. Literature studies as the main method allow researchers to review, compare, and synthesize various existing scientific findings. Research shows that literature studies are an effective approach in integrating various scientific perspectives and mapping the development of research in a particular field (Granikov et al., 2020). In addition, the use of diverse literature sources also enriches the analysis and strengthens the validity of research findings (Bandaranayake, 2024).

The data collection technique is carried out through a systematic literature search of relevant academic sources. This process includes identifying, selecting, and collecting documents based on suitability for the research topic. The researcher uses a targeted search strategy to obtain up-to-date and high-quality literature, so as to be able to support the discussion comprehensively. Literature studies also allow for in-depth theoretical analysis of key concepts in neuroscience and creativity (Jimenez et al., 2024). Thus, this technique not only collects data, but also builds a strong conceptual framework.

The data analysis procedure in this study is carried out in stages through several main processes, namely theme identification, data reduction, concept categorization, and inductive conclusions. The analysis begins by identifying the main themes of the literature studied, then continues with a process of data reduction to filter out relevant information. Furthermore, the data is categorized into related concepts, thus forming a systematic pattern of understanding. This analytical approach is in line with the qualitative analysis model that emphasizes iterative processes and continuous development of meaning (Belotto, 2018). In addition, both deductive and inductive coding techniques are also used to strengthen the structure of the analysis (Fife & Gossner, 2024).

The inclusion criteria in this study include literature relevant to the topic of neuroscience and creativity, published in reputable scientific journals, and have significant theoretical and empirical contributions. Meanwhile, exclusion criteria include sources that

have no academic validity, are irrelevant to the research focus, or do not meet scientific standards. To maintain the validity of the data, this study applies source triangulation by comparing various references and ensuring the consistency of the findings. In addition, the validation process is also strengthened through a trail audit approach and systematically documented analysis (Kalpokaite & Radivojevic, 2018). Thus, this descriptive qualitative approach through literature studies is able to produce valid, reliable, and academically accountable findings (Vila-Henninger et al., 2022).

RESULTS AND DISCUSSION

The results of the literature review show that creativity is a complex neurocognitive process that involves dynamic interactions between brain networks, rather than a single activity in one specific area. Various studies show that creativity is supported by the integration between the default mode network, the executive control network, and the salience network. This network plays a role in the simultaneous idea generation, evaluation, and implementation stage (Huo et al., 2025). These findings confirm that creativity is the result of the coordination of brain systems that interact with each other flexibly.

One of the key findings is the dominant role of default mode networks in the creative thinking process, particularly in internal mental activities such as imagination, mind wandering, and episodic memory invocation. This networking activity allows individuals to combine past experiences with future possibilities in generating new ideas (Beaty et al., 2018). In addition, the default mode network is also involved in the process of self-referential thinking that enriches the creative perspective of individuals (Davey et al., 2016).

However, creativity does not depend only on such spontaneous processes. The executive control network has an important role in controlling, evaluating, and refining the resulting ideas. Research shows that the interaction between the default mode network and the executive control network is the main key in generating ideas that are not only original but also relevant and implementable (Beaty et al., 2015). In fact, increased connectivity between these two networks has been shown to causally improve individual creative performance (Luchini et al., 2025).

In addition, studies on divergent thinking show that creativity is closely related to working memory activity and cognitive flexibility. Individuals with high levels of creativity showed greater activation of the attention system as well as decreased deactivation of the default mode network during cognitive tasks (Takeuchi et al., 2020). This shows that creative individuals are able to maintain a balance between external focus and internal processes.

Other findings suggest that creativity is also influenced by semantic memory dynamics, specifically the ability to associate widely distant, concepts that are far apart. This process involves memory search mechanisms such as clustering and switching, which allow individuals to flexibly explore a variety of possible ideas (Ovando-Tellez et al., 2022). This ability is the basis for generating innovative and unconventional ideas.

From a neurobiological perspective, creativity is also related to genetic factors and neurotransmitters, specifically dopamine. Studies show that creative activity is associated with a dopaminergic system that affects motivation, cognitive flexibility, and exploration of ideas (Liu et al., 2024). This indicates that creativity is not only a cognitive process, but is also influenced by more fundamental biological mechanisms.

In addition to cognitive and biological factors, mental conditions such as mind wandering and emotions also play a role in the creative process. Research shows that free mind wandering can enhance creativity through the integration of various brain networks (Feng et al., 2024). On the other hand, positive and negative emotions can both enhance the originality of ideas through different neural mechanisms (Khalil et al., 2025).

Individual variation is also an important finding in the study of creativity. Research suggests that differences in brain functional connectivity may explain differences in creative abilities between individuals. Individuals with high creativity exhibit more flexible and complex connectivity patterns than individuals with low creativity (Li et al., 2025). This confirms that creativity is unique and influenced by the neural characteristics of each individual.

To clarify the main findings, the following is a summary table of research results:

Table 1. Summary of Key Findings of Neuroscience and Creativity

Creativity Aspect	Key Findings	Source
Brain Tissue	Integration of DMN, ECN, and SN supports creativity	(Huo et al., 2025)
Cognitive Processes	A combination of imagination and cognitive control	(Beaty et al., 2015)
Memory	The role of episodic and semantic memory	(Beaty et al., 2018)
Divergent Thinking	About working memory and flexibility	(Takeuchi et al., 2020)
Semantic Associations	Clustering and switching in creative ideas	(Ovando-Tellez et al., 2022)
Biological Factors	The role of dopamine and the neural system	(Liu et al., 2024)
Emotional Factors	Emotions and mind wandering increase creativity	(Feng et al., 2024)
Individual Variant	Differences in brain connectivity affect creativity	(Li et al., 2025)

Source: Compiled from previous studies (Huo et al., 2025; Beaty et al., 2015; Liu et al., 2024).

When compared to previous studies that tended to see creativity as a function of one hemisphere of the brain or one specific area, the new findings suggest a more holistic approach. Creativity is now understood as the result of dynamic and contextual multi-network interactions. In addition, recent research also places more emphasis on integrative approaches that combine cognitive, emotional, and biological aspects simultaneously (Cubillos-Pinilla et al., 2025).

Overall, the results of this literature study show that creativity is a multidimensional phenomenon that involves various brain systems, cognitive processes, as well as biological and emotional factors. These findings provide a solid basis for further discussion of how neuroscience mechanisms can be harnessed to enhance creativity in a variety of life contexts.

DISCUSSION

The main findings of this literature study confirm that creativity can no longer be understood as a function of one specific brain region, but rather as the result of dynamic coordination between large-scale neural networks. Theoretically, these results are in line with a paradigm shift in the neuroscience of creativity from a localizationist approach to a network approach. While in early studies creativity is often associated with the dominance of a specific hemisphere or a certain frontal area, more recent findings suggest that creativity involves integrated work between the default mode network, executive control network, salience network, sensorimotor network, and reward system (Beaty et al., 2015). Thus, creativity is more accurately understood as an integrative process that brings together idea generation, idea evaluation, and idea execution simultaneously.

The involvement of the default mode network in the results of this study reinforces the concept that creativity is rooted in internal mental processes such as imagination, future simulation, episodic memory retrieval, and mind wandering. These findings are consistent with the view that network mode defaults favor constructive processing, i.e. the ability to reconstruct past experiences into new combinations of ideas (Beaty et al., 2018). In this context, creativity is not only born from spontaneity, but from the brain's capacity to reconstruct experiences, symbols, and semantic associations into new possibilities. This interpretation is also reinforced by studies showing the involvement of the hippocampus and parahippocampal gyrus in the creative thinking process, particularly when individuals combine memory with mental simulations to generate unprecedented ideas (Beaty et al., 2018).

However, the results of the study also show that creativity is not solely driven by spontaneous activities by default mode networking. The role of the executive control network emphasizes that creative ideas require a process of selection, monitoring, inhibition of dominant responses, and evaluation. This means that effective creativity is born from a balance between freedom of association and cognitive control. This relationship theoretically supports the dual process model in creativity, which places spontaneous processes and deliberative processes as two complementary components. Evidence that the coupling between the default mode network and the executive control network supports the production of creative ideas suggests that creativity is not a contradiction between spontaneity and control, but rather the result of the synergy of the two (Beaty et al., 2015). In fact, causal evidence through neurofeedback shows that strengthening the connectivity of these two networks can increase the originality of ideas, thereby strengthening the validity of the integrative model (Luchini et al., 2025).

This interpretation also explains why research results on divergent thinking often show the involvement of working memory, attention, and cognitive inhibition. Creativity is not only the ability to generate a lot of ideas, but also the ability to keep ideas in mind, to divert attention flexibly, and to reject associations that are too prevalent. The finding that originality is related to working memory activity and reduced task induced deactivation at the default mode network suggests that creative individuals are able to maintain access to internal processes while still executing external task demands (Takeuchi et al., 2020). This expands the classical view that considers creativity to be a product of free thought. On the contrary,

the results of this study support the idea that high creativity actually demands efficient cognitive coordination.

On the other hand, the findings regarding semantic memory enrich the interpretation that creativity is strongly influenced by the knowledge structure that individuals have. Studies highlighting clustering and switching in the search for semantic memory show that the creative process depends on the ability to explore categories of meaning while moving flexibly between association paths (Ovando-Tellez et al., 2022). This is in line with the theory of creativity associations which states that ideas are born when distant concepts are successfully connected meaningfully. Recent findings even suggest that creative individuals tend to assess distant concepts as more related, and this has to do with the involvement of default networks, controls, and semantic control networks (Hérault et al., 2024). Thus, creativity is not only a product of inspiration, but also a reflection of a flexible and efficient memory architecture.

The results of the study also show that affective and motivational factors have an important contribution to the creative process. Findings on mind wandering, emotion, reward, and flow show that creativity develops optimally when the brain is in a state that allows the exploration of ideas without too much evaluative pressure, but still maintains direction and purpose. Free-moving mind wandering has been shown to correlate with creativity through the dynamic integration of several brain networks (Feng et al., 2024). In addition, flow conditions exhibit unique configurations, namely reduced excessive self-monitoring, increased focus, and better connectivity between the default mode network and the executive control network, which together support creativity and emotion regulation (Barnett & Vasiliu, 2026). These findings suggest that creativity is not only a matter of cognitive capacity, but is also influenced by a mental atmosphere that supports exploration and affective stability.

Another important contribution of the results of this study is the recognition of individual variation. Creativity does not have one neural pattern that is uniform for everyone. Studies on the variability of functional connectivity show that differences between individuals in intra network and inter network connectivity are related to different levels of creativity (Li et al., 2025). The interpretation is that creativity cannot be reduced to one universal neural fingerprint. Factors such as experience, domain expertise, thinking habits, cognitive styles, and possible genetic factors contribute to how brain networks are organized to support creativity. These findings are particularly important because they challenge the assumption that increased creativity can be achieved through one equal intervention for all individuals.

When compared to previous research, the results of this literature study show a noticeable shift. Previous research has tended to focus on specific activation sites, while more recent research has begun to emphasize connectivity, temporal dynamics, and relationships between networks. Cross-domain meta-analysis shows that there are indeed general domain mechanisms, such as working memory, conventional idea inhibition, interoception, and internal goal orientation, but there are also domain-specific mechanisms that distinguish linguistic, musical, and visual creativity (Cubillos-Pinilla et al., 2025). Thus, the results of this study contribute to bridging two old poles in the literature, namely the view that creativity is general and the view that creativity is highly domain-dependent. His findings suggest that both are true to some extent.

The theoretical implications of this result are quite broad. First, the study reinforces an integrative neurocognitive model that places creativity as a product of interactions between

memory, cognitive control, emotions, motivation, and brain tissue dynamics. Second, these results support the need to redefine creativity in neuroscience research, from a mere divergent thinking score to a multidimensional construct that includes originality, usability, flexibility, domain context, and affective factors. Third, these results add weight to the argument that creativity can be learned and perhaps enhanced through interventions that target specific neural mechanisms, such as neurofeedback, divergent thinking training, or structured aesthetic experiences (Luchini et al., 2025). The practical implication is that education, talent development, cognitive therapy, and creative professional training can utilize neuroscience insights to design more targeted strategies.

However, there are a number of factors that can affect the outcome and need to be critically discussed. First, the heterogeneity of the methods between studies is quite high, both in terms of creativity instruments, types of tasks, brain imaging modalities, sample sizes, and the domain of creativity studied. Second, many studies still use tasks such as the powerful Alternative Uses Task to measure ideation, but may not yet capture the entire spectrum of real-world creativity (Cubillos-Pinilla et al., 2025). Third, some evidence about intercellular relationships is still correlational, although neurofeedback studies are beginning to provide causal support (Luchini et al., 2025). Fourth, the influence of factors such as age, gender, skill level, culture, emotional atmosphere, and training experience has not been fully integrated into one consistent model. Fifth, some studies themselves acknowledge that neurochemical underpinnings such as dopamine, as well as the role of individual differences in flow or plasticity tendencies, still require stronger longitudinal evidence (Barnett & Vasiu, 2026).

The limitations of research in this literature study also need to be noted. Because this article is based on a literature review, the strength of the conclusions depends heavily on the quality, scope, and consistency of the studies being reviewed. In addition, the dominance of laboratory experimental studies makes some findings at risk of under-representation of creativity in natural and collaborative situations. Some reviews also highlight certain methodological biases, for example the dominance of frontal stimulation in tDCS studies and the limitations of cross-domain or cross-population generalization (Chan et al., 2025). Therefore, suggestions for future research are to expand the use of longitudinal design, involve a more diverse sample, integrate a multimodal approach, differentiate creativity by domain in more detail, and test how training interventions or aesthetic experiences affect brain plasticity in the long term (Arkhipova et al., 2026). Future research also needs to explore creativity more in social, ecological, and collaborative contexts to make the neuroscience picture of creativity more complete.

Overall, this discussion shows that the relationship between neuroscience and the creative process is very close, complex, and multidimensional. Creativity arises from working together with various brain networks that allow individuals to access memory, build new associations, control evaluations, manage emotions, and execute ideas in specific contexts. The main contribution of this study is to show that creativity is not just an abstract talent, but a neurocognitive phenomenon that can be explained scientifically and potentially grown through the right approach. Thus, this article provides a solid conceptual basis for the development of research, education, and practical interventions based on the neuroscience of creativity.

CONCLUSION

This study shows that creativity is a complex and multidimensional neurocognitive phenomenon that does not depend on a single brain area, but on the dynamic interaction of various neural networks such as the default mode network, executive control network, and salience network that work synergistically in the process of generating, evaluating, and implementing creative ideas. Through a descriptive qualitative approach based on literature studies, the results of this study confirm that creativity not only involves cognitive aspects such as memory, attention, and thinking flexibility, but is also influenced by emotional, motivational, and semantic memory structures of individuals. These findings reinforce and expand on previous theories by emphasizing the importance of inter-brain network integration and the role of individual variation in determining creative capacity. Academically, this research contributes to enriching the conceptual framework of neuroscience creativity, while practically providing implications for the development of neuroscience-based education and training strategies. However, this study has limitations because it relies on a diverse literature and there is still limited longitudinal evidence. Therefore, it is recommended that further research use an empirical approach, triangulation of methods, and explore contextual factors in order to produce a more comprehensive and applicable understanding. Thus, the research objectives of mapping the role of key brain networks, integrating cognitive, biological, and affective findings, and drawing practical implications for the development of neuroscience-based creativity have been achieved through a comprehensive literature synthesis. However, further empirical research and longitudinal design are needed to further test the proposed integrative model and evaluate the effectiveness of neuroscience-based interventions in the context of education and human resource development.

REFERENCES

- Abraham, D., & P, P. (2024). A methodological framework for descriptive phenomenological research. *Western Journal of Nursing Research*. <https://doi.org/10.1177/01939459241308071>
- Arkhipova, A., Hok, P., Janata, P., & Hlušík, P. (2026). Brain plasticity in response to artistic and non-artistic training aimed at promoting creativity. *Frontiers in Human Neuroscience*. <https://doi.org/10.3389/fnhum.2026.1632331>
- Bandaranayake, P. (2024). Application of grounded theory methodology in library and information science research. *Sri Lanka Library Review*. <https://doi.org/10.4038/sllr.v38i2.70>
- Barnett, K., & Vasíu, F. (2026). Enhanced functional connectivity between the default mode network and executive control network during flow states may facilitate creativity and emotional regulation, and may improve health outcomes. *Frontiers in Behavioral Neuroscience*. <https://doi.org/10.3389/fnbeh.2025.1690499>
- Beaty, R. E., Benedek, M., Kaufman, S. B., & Silvia, P. J. (2015). Default and executive network coupling supports creative idea production. *Scientific Reports*, 5, Article 10964. <https://doi.org/10.1038/srep10964>
- Beaty, R. E., Kenett, Y. N., Christensen, A. P., Rosenberg, M. D., Benedek, M., Chen, Q., et al. (2018). Robust prediction of individual creative ability from brain functional

- connectivity. *Proceedings of the National Academy of Sciences*.
<https://doi.org/10.1073/pnas.1713532115>
- Beaty, R. E., Thakral, P. P., Madore, K. P., Benedek, M., & Schacter, D. L. (2018). Core network contributions to creative thinking. *Journal of Cognitive Neuroscience*.
<https://doi.org/10.1162/jocna.01327>
- Belotto, M. (2018). Data analysis methods for qualitative research. *The Qualitative Report*.
<https://doi.org/10.46743/2160-3715/2018.3492>
- Bingham, A. (2023). From data management to actionable findings. *International Journal of Qualitative Methods*. <https://doi.org/10.1177/16094069231183620>
- Chan, M. M., Cho, E., Lambon Ralph, M. A., & Robinson, G. A. (2025). The cognitive and neural bases of creative thought: A cross-domain systematic review and meta-analysis of transcranial direct current stimulation studies. *Neuroscience & Biobehavioral Reviews*, 171, Article 106237. <https://doi.org/10.1016/j.neubiorev.2025.106237>
- Cubillos-Pinilla, L., Hadida, A. L., Baez, S., Hernandez, H., & Kizilyamac, M. (2025). Neural foundations of creativity: A voxel-based meta-analysis of the activations and deactivations underlying creativity across linguistic, musical, and visual domains. *Neuroscience & Biobehavioral Reviews*, 172, Article 106354. <https://doi.org/10.1016/j.neubiorev.2025.106354>
- Davey, C., Pujol, J., & Harrison, B. (2016). Mapping the self in the brain's default mode network. *NeuroImage*. <https://doi.org/10.1016/j.neuroimage.2016.02.022>
- Doyle, L., McCabe, C., Keogh, B., Brady, A., & McCann, M. (2019). An overview of the qualitative descriptive design. *Journal of Research in Nursing*.
<https://doi.org/10.1177/1744987119880234>
- Feng, Q., Weng, L., Geng, L., & Qiu, J. (2024). How freely moving mind wandering relates to creativity. *Brain Sciences*. <https://doi.org/10.3390/brainsci14111122>
- Fife, S., & Gossner, J. (2024). Deductive qualitative analysis. *International Journal of Qualitative Methods*. <https://doi.org/10.1177/16094069241244856>
- Granikov, V., Hong, Q., Crist, E., & Pluye, P. (2020). Mixed methods research in library and information science. *Library & Information Science Research*.
<https://doi.org/10.1016/j.lisr.2020.101003>
- Hérault, C., Ovando-Tellez, M., Lebuda, I., Kenett, Y. N., Béranger, B., Benedek, M., & Volle, E. (2024). Creative connections. *Communications Biology*.
<https://doi.org/10.1038/s42003-024-06493-y>
- Huo, C., Li, C., & Ding, K. (2025). Mapping the brain networks underlying creativity enhancement via aesthetic experience. *European Journal of Medical Research*.
<https://doi.org/10.1186/s40001-025-03155-5>
- Jimenez, S., Berbegal-Mirabent, J., & De La Torre, R. (2024). University libraries and research process. *The Journal of Academic Librarianship*.
<https://doi.org/10.1016/j.acalib.2024.102930>
- Kalpokaite, N., & Radivojevic, I. (2018). Demystifying qualitative data analysis. *The Qualitative Report*. <https://doi.org/10.46743/2160-3715/2019.4120>
- Khalil, R., Frühholz, S., & Godde, B. (2025). Emotion and creativity. *Human Brain Mapping*.
<https://doi.org/10.1002/hbm.70182>

- Koelsch, S., Andrews-Hanna, J., & Skouras, S. (2021). Tormenting thoughts. *Human Brain Mapping*. <https://doi.org/10.1002/hbm.25686>
- Li, J., Huang, R., Liu, M., Zhang, D., & Liang, B. (2025). Beyond the uniform creative brain. *Neuroscience*. <https://doi.org/10.1016/j.neuroscience.2025.02.018>
- Liu, C., Zhuang, K., Zeitlen, D. C., Chen, Q., Wang, X., Feng, Q., et al. (2024). Neural, genetic, and cognitive signatures of creativity. *Communications Biology*. <https://doi.org/10.1038/s42003-024-07007-6>
- Luchini, S. A., Zhang, X., White, R. T., Lührs, M., Ramot, M., & Beaty, R. E. (2025). Enhancing creativity with covert neurofeedback: Causal evidence for default-executive network coupling in creative thinking. *Cerebral Cortex*. <https://doi.org/10.1093/cercor/bhaf065>
- Ovando-Tellez, M., Benedek, M., Kenett, Y. N., Hills, T., Bouanane, S., Bernard, M., Belo, J., Bieth, T., & Volle, E. (2022). An investigation of the cognitive and neural correlates of semantic memory search related to creative ability. *Communications Biology*, 5, Article 920. <https://doi.org/10.1038/s42003-022-03547-x>
- Pratt, M. (2025). Evolution of qualitative methods in organizational research. *Annual Review of Organizational Psychology and Organizational Behavior*. <https://doi.org/10.1146/annurev-orgpsych-111722-032953>
- Takeuchi, H., Taki, Y., Nouchi, R., Yokoyama, R., Kotozaki, Y., Nakagawa, S., Sekiguchi, A., Iizuka, K., Hanawa, S., Araki, T., Miyauchi, C., Sakaki, K., Sassa, Y., Nozawa, T., Ikeda, S., Yokota, S., Magistro, D., & Kawashima, R. (2020). Originality of divergent thinking is associated with working memory-related brain activity: Evidence from a large sample study. *NeuroImage*, 216, Article 116825. <https://doi.org/10.1016/j.neuroimage.2020.116825>
- Vila-Henninger, L., Dupuy, C., Van Ingelgom, V., Caprioli, M., Teuber, F., Pennetreau, D., Bussi, M., & Gall, C. (2022). Abductive coding. *Sociological Methods & Research*. <https://doi.org/10.1177/00491241211067508>