

Theoretical Perspectives

Beerse, M. E., Van Lith, T., Pickett, S. M., & Stanwood, G. D. (2020). Biobehavioral utility of mindfulness-based art therapy: Neurobiological underpinnings and mental health impacts. *Experimental Biology and Medicine*, 245(2), 122-130. <https://doi.org/10.1177/1535370219883634>

Chong, C. Y. J. (2015). Why art psychotherapy? Through the lens of interpersonal neurobiology: The distinctive role of art psychotherapy intervention for clients with early relational trauma. *International Journal of Art Therapy*, 20(3), 118-126. <https://doi.org/10.1080/17454832.2015.1079727>

Hass-Cohen, N. (2008). CREATE: Art therapy relational neuroscience principles (ATR-N). In N. Hass-Cohen, R. Carr (Eds.). *Art therapy and clinical neuroscience* (pp. 283-309). Jessica Kingsley Publishers.

Hass-Cohen, N. (2016). Secure Resiliency: Art Therapy Relational Neuroscience Trauma Treatment Principles and Guidelines. In *Art Therapy, Trauma, and Neuroscience* (1st ed.). Routledge.

Hinz, L. D. (2019). *Expressive Therapies Continuum: A Framework for Using Art in Therapy* (2nd ed.). Routledge. <https://doi.org/10.4324/9780429299339>

Hinz, L. D., Rim, S., & Lusebrink, V. B. (2022). Clarifying the Creative level of the Expressive Therapies Continuum: A different dimension. *The Arts in Psychotherapy*, 78, 101896. <https://doi.org/10.1016/j.aip.2022.101896>

- Hinz, V. B. L., Lisa D. (2021). The Expressive Therapies Continuum as a Framework in the Treatment of Trauma. In *Art Therapy, Trauma, and Neuroscience*. Routledge.
- Kagin, S. L., & Lusebrink, V. B. (1978). The expressive therapies continuum. *Art Psychotherapy*, 5(4), 171–180. [https://doi.org/10.1016/0090-9092\(78\)90031-5](https://doi.org/10.1016/0090-9092(78)90031-5)
- King, J. L. (2018). Summary of Twenty-First Century Great Conversations in Art, Neuroscience and Related Therapeutics. *Frontiers in Psychology*, 9, 1428. <https://doi.org/10.3389/fpsyg.2018.01428>
- King, J. L., Kaimal, G., Konopka, L., Belkofer, C., & Strang, C. E. (2019). Practical Applications of Neuroscience-Informed Art Therapy. *Art Therapy*, 36(3), 149–156. <https://doi.org/10.1080/07421656.2019.1649549>
- Lusebrink, V. B. (2004). Art Therapy and the Brain: An Attempt to Understand the Underlying Processes of Art Expression in Therapy. *Art Therapy*, 21(3), 125–135. <https://doi.org/10.1080/07421656.2004.10129496>
- Lusebrink, V. B. (2010). Assessment and Therapeutic Application of the Expressive Therapies Continuum: Implications for Brain Structures and Functions. *Art Therapy*, 27(4), 168–177. <https://doi.org/10.1080/07421656.2010.10129380>
- Lusebrink, V. (2014). Art Therapy and the Neural Basis of Imagery: Another Possible View. *Art Therapy*, 31(2), 87–90. <https://doi.org/10.1080/07421656.2014.903828>
- Lusebrink, V. B., & Hinz, L. D. (2020). Cognitive and Symbolic Aspects of Art Therapy and Similarities With Large Scale Brain Networks. *Art Therapy*, 37(3), 113–122. <https://doi.org/10.1080/07421656.2019.1691869>

- Lusebrink, V. B., Mārtinsone, K., & Džilna-Šilova, I. (2013). The Expressive Therapies Continuum (ETC): Interdisciplinary bases of the ETC. *International Journal of Art Therapy, 18*(2), 75–85. <https://doi.org/10.1080/17454832.2012.713370>
- Malhotra, B., Jones, L. C., Spooner, H., Levy, C., Kaimal, G., & Williamson, J. B. (2024). A conceptual framework for a neurophysiological basis of art therapy for PTSD. *Frontiers in Human Neuroscience, 18*, 1351757. <https://doi.org/10.3389/fnhum.2024.1351757>
- Nan, J. K. M., Hinz, L. D., & Lusebrink, V. B. (2021). Chapter 42 - Clay art therapy on emotion regulation: Research, theoretical underpinnings, and treatment mechanisms. In C. R. Martin, L.-A. Hunter, V. B. Patel, V. R. Preedy, & R. Rajendram (Eds.), *The Neuroscience of Depression* (pp. 431–442). Academic Press. <https://doi.org/10.1016/B978-0-12-817933-8.00009-8>
- Strang, C. E. (2024). Art therapy and neuroscience: Evidence, limits, and myths. *Frontiers in Psychology, 15*, 1484481. <https://doi.org/10.3389/fpsyg.2024.1484481>
- Rastogi, M., Strang, C., Vilinsky, I., & Holland, K. (2022). Intersections of neuroscience and art therapy. In *Foundations of Art Therapy* (pp. 123–158). Academic Press. <https://doi.org/10.1016/B978-0-12-824308-4.00014-4>
- Vaisvaser, S. (2021). The embodied-enactive-interactive brain: Bridging neuroscience and creative arts therapies. *Frontiers in Psychology, 12*, 634079. <https://doi.org/10.3389/fpsyg.2021.634079>

Research Methodologies

King, J. L., & Kaimal, G. (2019). Approaches to Research in Art Therapy Using Imaging Technologies. *Frontiers in Human Neuroscience*, 13.

<https://www.frontiersin.org/articles/10.3389/fnhum.2019.00159>

King, J. L., & Parada, F. J. (2021). Using mobile brain/body imaging to advance research in arts, health, and related therapeutics. *European Journal of Neuroscience*, 54(12), 8364–8380. <https://doi.org/10.1111/ejn.15313>

Meta Analysis/ Systematic / Mini Reviews

Beerse, M. E., Van Lith, T., Pickett, S. M., & Stanwood, G. D. (2020). Biobehavioral utility of mindfulness-based art therapy: Neurobiological underpinnings and mental health impacts. *Experimental Biology and Medicine*, 245(2), 122-130.
<https://doi.org/10.1177/1535370219883634>

Griffith, F. J., & Bingman, V. P. (2020). Drawing on the brain: An ALE meta-analysis of functional brain activation during drawing. *The Arts in Psychotherapy*, 71, 101690. <https://doi.org/10.1016/j.aip.2020.101690>

Malik, S. (2022). Using neuroscience to explore creative media in art therapy: A systematic narrative review. *International Journal of Art Therapy*, 27(2), 48-60.
<https://doi.org/10.1080/17454832.2021.1998165>

Experimental Research

Physiological measurements (e.g., heart rate variability [HRV]; cortisol level; blood glucose; skin conductance)

Czamanski-Cohen, J., Galili, G., & Allen, J. J. B. (2020). Examining Changes in HRV and Emotion Following Artmaking with Three Different Art Materials. *JoVE (Journal of Visualized Experiments)*, 155, e60376. <https://doi.org/10.3791/60376>

Haiblum-Itskovitch, S., Czamanski-Cohen, J., & Galili, G. (2018). Emotional response and changes in heart rate variability following art-making with three different art materials. *Frontiers in Psychology*, 9, Article 968. <https://doi.org/10.3389/fpsyg.2018.00968>

Kaimal, G., Ray, K., & Muniz, J. (2016). Reduction of cortisol levels and participants' responses following art making. *Art Therapy: Journal of the American Art Therapy Association*, 33(2), 74-80. <https://doi.org/10.1080/07421656.2016.1166832>

Loudon, G. H., & Deininger, G. M. (2017). The physiological response to drawing and its relation to attention and relaxation. *Journal of Behavioral and Brain Science*, 7(3), 111-124. <https://doi.org/10.4236/jbbs.2017.73011>

Rankanen, M., Leinikka, M., Groth, C., Seitamaa-Hakkarainen, P., Mäkelä, M., & Huotilainen, M. (2022). Physiological measurements and emotional experiences of drawing and clay. *The Arts in Psychotherapy*, 79, 101899. <https://doi.org/10.1016/j.aip.2022.101899>

EEG/qEEG

- Belkofer, C. M., & Konopka, L. M. (2008). Conducting art therapy research using quantitative EEG measures. *Art Therapy: Journal of the American Art Therapy Association*, 25(2), 56-63. <https://doi.org/10.1080/07421656.2008.10129412>
- Belkofer, C. M., Van Hecke, A. V., & Konopka, L. M. (2014). Effects of drawing on alpha activity: A quantitative EEG study with implications for art therapy. *Art Therapy: Journal of the American Art Therapy Association*, 31(2), 61-68. <https://doi.org/10.1080/07421656.2014.903821>
- Kang, S-J., Kim, H-S., & Baek, K-H. (2021). Effects of nature-based group art therapy programs on stress, self-esteem and changes in electroencephalogram (EEG) in non-disabled siblings of children with disabilities. *International Journal of Environmental Research and Public Health*, 18(11), 5912. <https://doi.org/10.3390/ijerph18115912>
- Kang, S-J., Pei, C-Z., Lee, D-H., Ha, J-E., & Baek, K-H. (2023). A pilot randomized clinical trial of biomedical link with mental health in art therapy intervention programs for alcohol use disorder: Changes in NK cells, addiction biomarkers, electroencephalography, and MMPI-2 profiles. *PLoS ONE*, 17(5), 1–22. <https://doi.org/10.1371/journal.pone.0284344>.
- King, J. L. (2017). Cortical Activity Changes after Art Making and Rote Motor Movement as Measured by EEG: A Preliminary Study. *Biomedical Journal of Scientific & Technical Research*, 1(4). https://www.academia.edu/36984814/Cortical_Activity_Changes_after_Art_Making_and_Rote_Motor_Movement_as_Measured_by_EEG_A_Preliminary_Study

Kottlow, M., Praeg, E., Luethy, C., & Jancke, L. (2011). Artists' advance: Decreased upper alpha power while drawing in artists compared with non-artists. *Brain Topography*, 23(4), 392-402. <https://doi.org/10.1007/s10548-010-0163-9>

Kruk, K. A., Aravich, P. F., Deaver, S. P., & de Beus, R. (2014). Comparison of brain activity during drawing and clay sculpting: A preliminary qEEG study. *Art Therapy: Journal of the American Art Therapy Association*, 31(2), 52-60. <https://doi.org/10.1080/07421656.2014.903826>

Pénzes, I., Engelbert, R., Heidendael, D., Oti, K., Jongen, E. M. M., & van Hooren, S. (2023). The influence of art material and instruction during art making on brain activity: A quantitative electroencephalogram study, 83, 102024. <https://doi.org/10.1016/j.aip.2023.102024>

Tang, Zhichuan, Xintao Li, Dan Xia, Yidan Hu, Lingtao Zhang, and Jun Ding. "An Art Therapy Evaluation Method Based on Emotion Recognition Using EEG Deep Temporal Features." *Multimedia Tools and Applications* 81, no. 5 (February 1, 2022): 7085–7101. <https://doi.org/10.1007/s11042-022-12002-2>.

fMRI

Walker, M.S., Stamper, A. M., Nathan, D. E., & Riedy, G. (2018). Art therapy and underlying fMRI brain patterns in military TBI: A case series. *International Journal of Art Therapy*, 23(4), 180-187. <https://doi.org/10.1080/17454832.2018.1473453>

fNIRS

Kaimal, G., Ayaz, H., Herres, J., Dieterich-Hartwell, R., Makwana, B., Kaiser, D. H., & Nassar, J. A. (2017). Functional near-infrared spectroscopy assessment of reward perception based on visual self-expression: Coloring, doodling, and free drawing. *The Arts in Psychotherapy, 55*, 85-92.

<https://doi.org/10.1016/j.aip.2017.05.004>

Art Therapy for Neurorehabilitation

- Batubara, S. O., Saragih, I. D., Mulyadi, M., & Lee, B.-O. (2023). Effects of art therapy for people with mild or major neurocognitive disorders: A systematic review and meta-analysis. *Archives of Psychiatric Nursing*, 45, 61–71.
<https://doi.org/10.1016/j.apnu.2023.04.011>
- Guay, M. (2018). Impact of group art therapy on the quality of life for acquired brain injury survivors. *Art Therapy: Journal of the American Art Therapy Association*, 35(3), 156-164. <https://doi.org/10.1080/07421656.2018.1527638>
- Jones, J. P., Walker, M. S., Drass, J. M., & Kaimal, G. (2018). Art therapy interventions for active duty military service members with post-traumatic stress disorder and traumatic brain injury. *International Journal of Art Therapy*, 23(2), 70-85.
<https://doi.org/10.1080/17454832.2017.1388263>
- Kaimal, G., Jones, J. P., Dieterich-Hartwell, R., & Wang, X. (2021). Long-term art therapy clinical interventions with military service members with traumatic brain injury and post-traumatic stress: Findings from a mixed methods program evaluation study. *Military Psychology*, 33(1), 29-40.
<https://doi.org/10.1080/08995605.2020.1842639>
- Kline, T. (2016). Art therapy for individuals with traumatic brain injury: A comprehensive neurorehabilitation-informed approach to treatment. *Art Therapy: Journal of the American Art Therapy Association*, 33(2), 67-73.
<https://doi.org/10.1080/07421656.2016.1164002>

Smith, D., Wright, C. J., Lakhani, A., & Zeeman, H. (2017). Art processes: A research tool for acquired brain injury and residential design. *Arts & Health, 9*(3), 251-268.
<https://doi.org/10.1080/17533015.2017.1354899>

Cognitive Neuroscience / Neuropsychology / Other Disciplines: Research on Art Making, Creativity

EEG

Bhattacharya, J., & Petsche, H. (2005). Drawing on mind's canvas: Differences in cortical integration patterns between artists and non-artists. *Human Brain Mapping, 26*(1), 1-14. <https://doi.org/10.1002/hbm.20104>

Dietrich, A., & Kanso, R. (2010). A review of EEG, ERP, and neuroimaging studies of creativity and insight. *Psychological Bulletin, 136*(5), 822. <https://doi.org/10.1037/a0019749>

Kottlow, M., Praeg, E., Luethy, C., & Jancke, L. (2011). Artists' Advance: Decreased upper alpha power while drawing in artists compared with non-artists. *Brain Topography, 23*(4), 392-402. <https://doi.org/10.1007/s10548-010-0163-9>

Stevens Jr., C. E., & Zabelina, D. L. (2019). Creativity comes in waves: An EEG-focused exploration of the creative brain. *Current Opinion in Behavioral Sciences, 27*, 154-162. <https://doi.org/10.1016/j.cobeha.2019.02.003>

fMRI

Bolwerk, A., Mack-Andrick, J., Lang, F. R., Dörfler, A., & Maihöfner, C. (2014). How art changes your brain: Differential effects of visual art production and cognitive art evaluation on functional brain connectivity. *PLOS ONE, 9*(7), e101035. <https://doi.org/10.1371/journal.pone.0101035>

Gowen, E., & Miall, R. C. (2007). Differentiation between external and internal cuing: An fMRI study comparing tracing with drawing. *Neuroimage*, 36(2), 396-410.

<https://doi.org/10.1016/j.neuroimage.2007.03.005>

Likova, L. T. (2012). Drawing enhances cross-modal memory plasticity in the human brain: A case study in a totally blind adult. *Frontiers in Human Neuroscience*, 6,

44. <https://doi.org/10.3389/fnhum.2012.00044>

Makuuchi, M., Kaminaga, T., & Sugishita, M. (2003). Both parietal lobes are involved in drawing: A functional MRI study and implications for constructional apraxia.

Cognitive Brain Research, 16(3), 338-347.

[https://doi.org/10.1016/S0926-6410\(02\)00302-6](https://doi.org/10.1016/S0926-6410(02)00302-6)

Schaer, K., Jahn, G., & Lotze, M. (2012). fMRI-activation during drawing a naturalistic or sketchy portrait. *Behavioral Brain Research*, 233(1), 209-216.

<https://doi.org/10.1016/j.bbr.2012.05.009>

Perspectives & Reviews

Bosnar-Puretić, M., Roje-Bedeković, M., & Demarin, V. (2009). The art: Neuroscientific approach. *Acta Clinica Croatica*, 48(3), 367-370.

<https://pubmed.ncbi.nlm.nih.gov/20055265/>

Demarin, V., Bedeković, M. R., Puretić, M. B., & Pašić, M. B. (2016). Arts, brain, and cognition. *Psychiatria Danubina*, 28(4), 343-348.

<https://pubmed.ncbi.nlm.nih.gov/27855424/>

Heilman, K. M., & Acosta, L. M. (2013). Visual artistic creativity and the brain. *Progress in Brain Research*, 204, 19-43.

<https://doi.org/10.1016/B978-0-444-63287-6.00002-6>

Fetz, E. E. (2012). Artistic explorations of the brain. *Frontiers in Human Neuroscience*, 6, 9. <https://doi.org/10.3389/fnhum.2012.00009>

Pepperel, R. (2018). Art, energy, and the brain. *Progress in Brain Research*, 237, 417-435. <https://doi.org/10.1016/bs.pbr.2018.03.022>

Trojano, L., Gross, D., & Flash, T. (2009). Cognitive neuroscience of drawing: Contributions of neuropsychological, experimental, and neurofunctional studies. *Cortex*, 45(3), 269-277. <https://doi.org/10.1016/j.cortex.2008.11.015>

Zaidel, D. W. (2010). Art and brain: Insights from neuropsychology, biology, and evolution. *Journal of Anatomy*, 216(2), 177-183.
<https://doi.org/10.1111/j.1469-7580.2009.01099.x>