



MEMORY, FORGETTING, & ART



PRESERVING PERSONHOOD THROUGH ARTISTIC EXPRESSION

Long - Term Care Planning Conference – 4/26/2023

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DISCLOSURES



Art created in BATL

- Dr. Potts has received publishing royalties from publications relating to health care (minimal royalties for self-published books about dementia care giving, poetry related to care giving, etc.).
- Dr. Potts has a non-compensated relationship as President with Cognitive Dynamics Foundation (non-profit) that is relevant to this presentation.

OBJECTIVES



- Discuss the neuroscience of memory
- Describe changes in memory associated with Alzheimer's disease
- Explore artistic engagement for persons living with Alzheimer's and other dementias and creativity's effects on memory, personhood and narrative, highlighting the role of art therapy
- Identify autobiographical memory elements present in representative dementia art
- Highlight an art therapy program developed to enhance quality of life in persons living with dementia, to illicit and preserve life stories, and to build intergenerational relationships

MEMORY, FORGETTING, & ART



- **Memory:** Learning: the process of acquiring new information, the outcome of which is memory (Gazzaniga, M. S., et al, 2019)
- **Forgetting:** *“It is through the erosion of memory that time heals all wounds.”*—Lisa Genova
- **Art:** *“Art is an appeal against vanishing.”* —Lynn Casteel Harper



Art by Lester E. Potts, Jr.,
an artist who had Alzheimer's

TYPES OF MEMORY

(GAZZANIGA, M. S., ET AL, 2019)



- **Very brief sensory memory** - milliseconds - seconds
- **Short-term/working memory** (short-term information retention and capacity for performing mental operations on the content) - seconds - minutes
- **Long-term memory** – years - decades
 - **Declarative memory (explicit)** - conscious memory for learned facts (**semantic**) and experienced events (**episodic**); consciously accessed; verbally reported
 - **Nondeclarative memory (implicit)** - nonconscious memory that cannot be verbally reported, often expressed through the performing of procedures (**procedural**)

HOW ARE MEMORIES MADE?

(GENOVA, L., 2021)



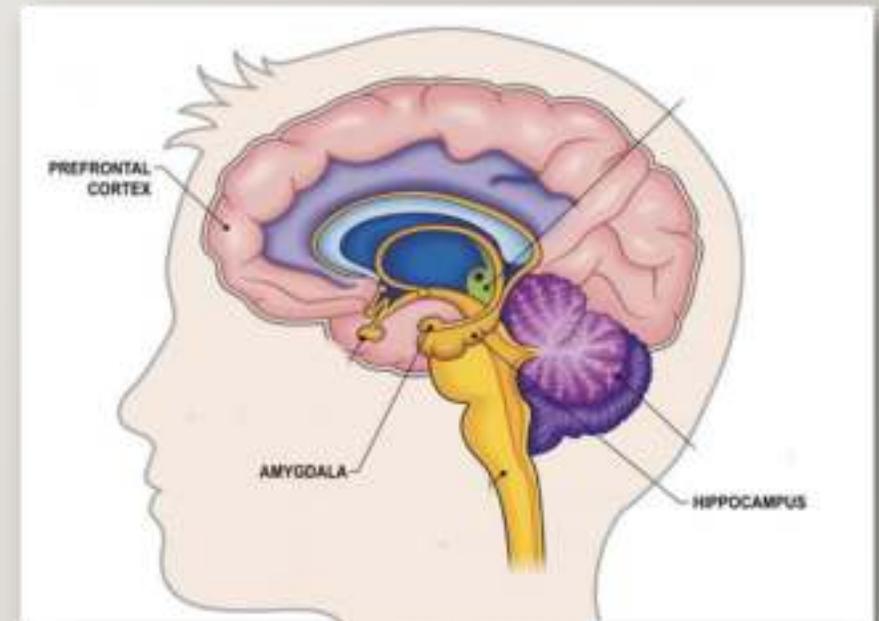
- **Encoding** - Sights, sounds, information, emotion, meaning of what has been perceived/paid attention to; translated into neural activity
- **Consolidation** – The brain weaves unrelated collections of neural activity into a single web of connections.
- **Storage** - Pattern of activity is maintained through persistent structural/chemical changes in neurons
- **Retrieval** – Connections of learned/experienced information can be reactivated, recalled, & recognized.

PRIMARY BRAIN REGIONS FOR MEMORY

(GAZZANIGA, M. S., ET AL, 2019; GENOVA, L., 2021)



- **Hippocampus** (“memory weaver,” “save button”)
 - Weaves who/what/where/when/why into a retrievable unit of associated data (memory)
 - Activates regions destined for long-term memory until rewiring produces a stable, connected pattern
 - Involved in spatial navigational learning
- **Pre-frontal cortex** (present moment)
 - Working memory – limited space for sights, sounds, smells, tastes, language, emotions
 - Holds 7 +/- 2 items for 15 to 30 seconds
- **Amygdala** (emotions, especially fear)
 - Activated by emotion/surprise
 - Alerts hippocampus to consolidate important incoming data into memory



MORE ON MEMORY

(GAZZANIGA, M. S., ET AL, 2019; GENOVA, L., 2021)



- **Meaning matters for memory**—interesting, meaningful, new, surprising, significant, emotional, consequential
- Storage occurs in the **same neural pattern** that was stimulated when first experienced.
- **Perception/attention** are essential for the process of remembering.
- **Hippocampus saves/consolidates** significant items from working memory to form long-term memories.
- **Autobiographical memory**—life story made up of most meaningful episodic memories
- **Reminiscence bump**—important episodic memories from ages 15 - 30

MORE ON MEMORY

(GAZZANIGA, M. S., ET AL, 2019; GENOVA, L., 2021)



- **Relational memory**—memory for relations among elements of an experience
- Representations of an event distributed throughout the cortex come together in the mesial temporal lobe, where the **hippocampus binds them**.
- **Consolidation:** repeated activation of memory creates connections (**No longer requires the hippocampus**)
- **Context**, external/internal, becomes part of memory; **activation of any part can trigger retrieval of others**
- **Remembering is reactivating, reconsolidating, rewriting, resaving.**

MORE ON MEMORY

(GAZZANIGA, M. S., ET AL, 2019; GENOVA, L., 2021)



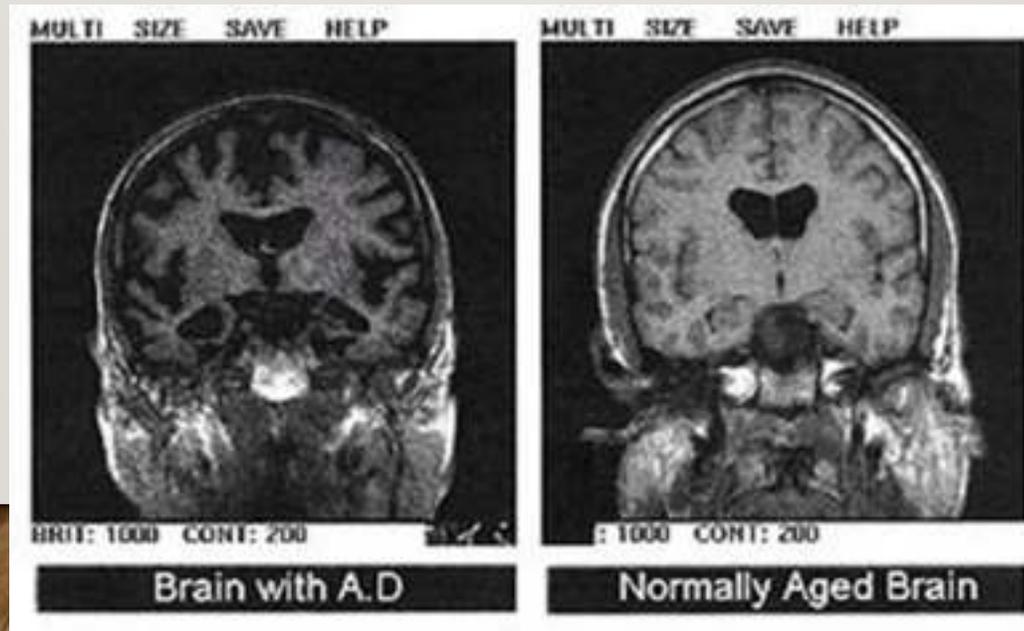
- Rehearsal, self-testing, visuospatial imagery, mnemonics, surprise, emotion, meaning improve memory.
- **Sleep saves newly-encoded memories.**
- 2 primary ways to resist effects of time: **repetition/meaning**
- Recalling life's most meaningful details (**autobiographical memory**) bolsters **sense of self, narrative, growth/relationships** with others.
- **Expressive arts/creativity access autobiographical memory.**



ALZHEIMER'S-ASSOCIATED MEMORY CHANGES

(WEINTRAUB, S., ET AL, 2012)

- Earliest - **episodic memory decline** due to ineffective consolidation/storage (hippocampal damage)
- Next - **semantic memory**—object naming, verbal fluency and semantic categorization decreases
- **Working memory decline** comes later.
- The extent of **atrophy** in the mesial temporal lobe correlates to deficits in episodic memory.



ART

"No day shall erase you from the memory of time."—Virgil



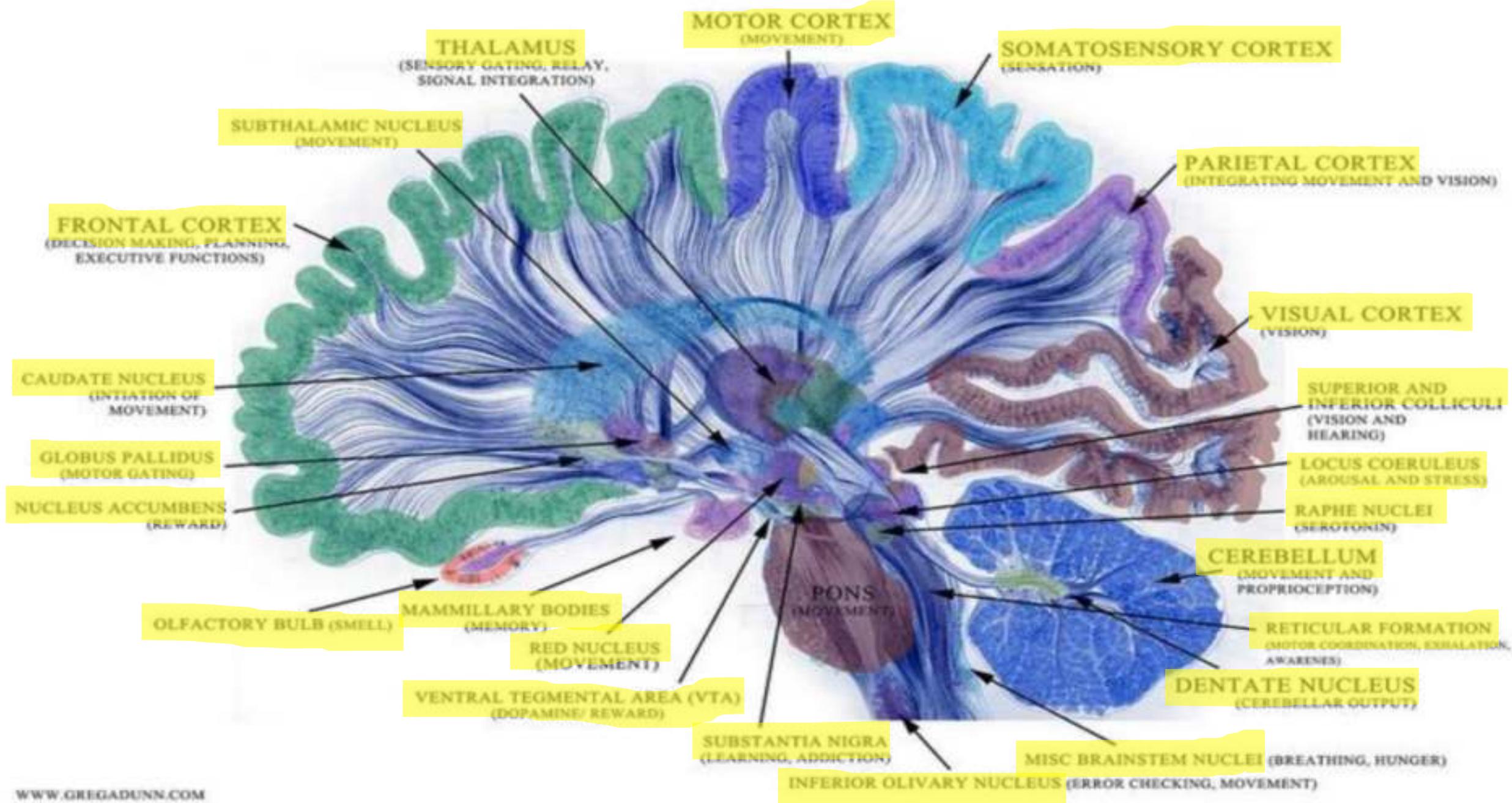
BRAIN BENEFITS OF ART

(WWW.NPR.ORG/SECTIONS/HEALTH-SHOTS/2020/01/11/795010044/FEELING-ARTSY-HERES-HOW-MAKING-ART-HELPS-YOUR-BRAIN)



“Creativity is chocolate for the brain”—Gene Cohen, MD

- Facilitates the development/preservation of **visuospatial** and fine motor skills
- Increases one’s ability to create **abstractions** and process concepts in abstract
- Helps to lessen brain effects of **stress**
- Helps to preserve **patience, attention** and **self-regulation**
- Makes **connections** between unrelated things and fosters **communication**
- Activates the **reward (pleasure)** centers of the brain
- Engenders a **flow state**, associated with a sense of **well-being**



WWW.GREGADUNN.COM

ARTISTIC ENGAGEMENT IN DEMENTIA

(ZEISEL, J., 2009)



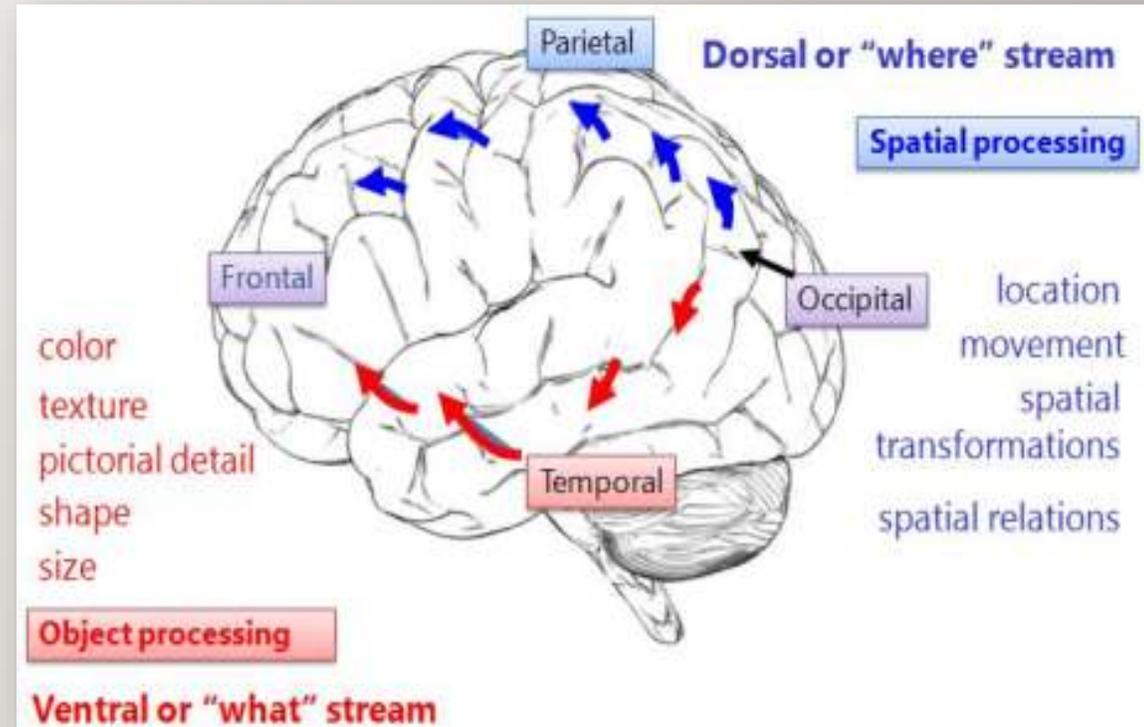
- Artistic engagement can provide **meaning** for persons living w/dementia.
- Art connects people to their **culture** and **community**.
- Alzheimer's/dementia brings an **openness to art** that is realized through artistic engagement. **(Short-term memory is not a requirement for meaningful engagement.)**
- “*The expressive arts engage the brain in a more profound way than most other activities,*” **linking separate brain locations** in which memories and skills lie, **bypassing single-location deficits**.
- **Dementia does not seem to dampen the desire to create.**

VIEWING, PROCESSING, CREATING VISUAL ART

“Art is about meaning, as understood through its social and historical context.” —(Chatterjee, A., 2014)



- **Occipital/parietal lobes** register/attend to visual stimuli. **Temporal lobes** provide meaning. Actions in response to art come primarily from the **frontal lobes**.
- The visual system processes different elements in 2 streams:
 - **Dorsal stream (“where”)**
 - **Ventral stream (“what”)**



(<https://www.nmr.mgh.harvard.edu/mkozhevnlab/?tag=visualization-processes>)

VIEWING, PROCESSING, CREATING VISUAL ART

(MENDEZ, M. F., 2004; ROSE, F. C., 2007)



“When you observe...art you are potentially **firing the same neurons as the artist did** when they created it.”

— Jacob Devane, Natural Blaze website

Separate visual features → **occipital lobe**

Visuospatial organization → **parietal lobe** (dorsal stream)

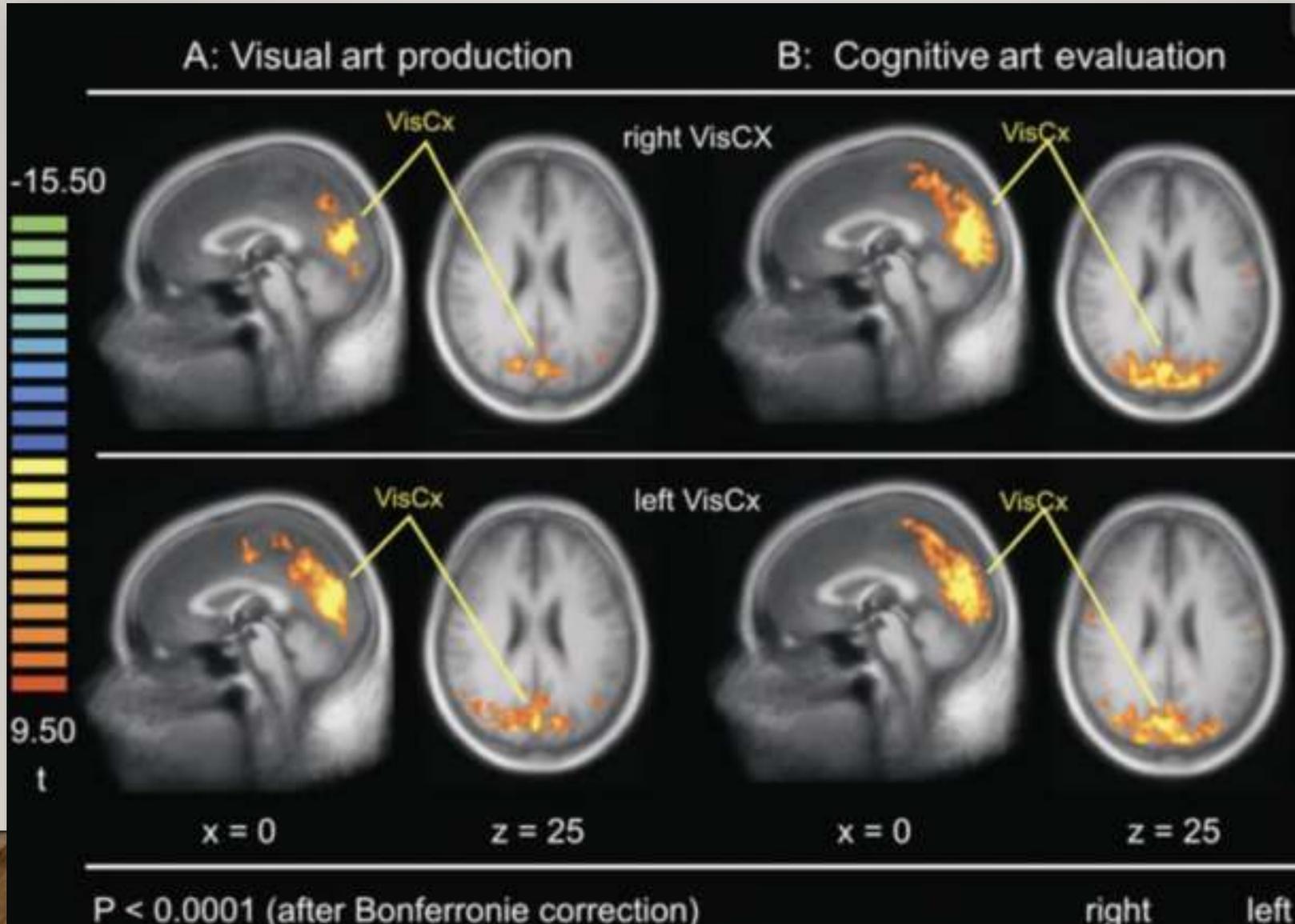
Meaningful scene organization → **right temporal lobe** (ventral stream)

The ventral stream forms idealized prototypes (recognition network).

- The intuitive artistic sense is in the right hemisphere.
- The right hemisphere **lives in the moment** of the experience.
- The left hemisphere **analyzes/interprets** the experience linguistically.

VIEWING, PROCESSING, CREATING VISUAL ART

(BOLWERK, A., ET AL, 2014)



ART, MEMORY, SELFHOOD & NARRATIVE

A PHILOSOPHICAL APPROACH (AUMANN, A., 2019)



According to philosopher, Søren Kierkegaard:

- The true self is discovered by **turning inward**.
- Humans seek **coherence**: alignment of past and future.
- **The self is a work of art** (a story) to be shaped; life narrative/story determines identity. **Inner unity** is required to make sense of life narrative/story. **Art and creativity help to provide that unity**.
- Art matters primarily because it **assists with the “project of selfhood,”** the shaping of life narrative/story.
- Art offers lenses through which to more clearly see selves and the world. **Art is a mirror** for life.

This function of art may be particularly important in persons living with Alzheimer’s and other dementias.

ART, MEMORY, SELFHOOD & NARRATIVE

THE ROLE OF ART THERAPY

(ABRAHAM, R., 2005; HASS-COHEN, N., FINDLAY, J. C., 2015)



Art Therapy—integrative mental health/human services profession that enriches lives/communities through active art-making, creative process, applied psychological theory, and human experience within a psychotherapeutic relationship...
—(American Art Therapy Association, 2021)

- Art therapy supports **meaning** and bypasses verbal aspects of brain function, aiding in communication.
- Art therapy can provide a means of **expressing emotions**, bolstering **self-image**.
- The novel, positive aspects of art can excite the formation/updating of **autobiographical memory**.
- Art making, associated with parietal, temporal, limbic and right hemisphere functions, **synthesizes and integrates psychological/emotional/cognitive functions**.

ART, MEMORY, SELFHOOD & NARRATIVE

THE ROLE OF ART THERAPY

(ABRAHAM, R., 2005; HASS-COHEN, N., FINDLAY, J. C., 2015)



- Art therapy likely promotes **neuroplasticity** in brain regions that contribute to psychological **wellbeing**. Brain plasticity, through learned happiness/compassion, builds **resiliency**.
- Art therapy, including its relational aspects, can activate and mend **attachment wounds**, helping to limit **emotional reactivity**, stabilize **affect** and update/rewrite **autobiographical memory**.
- Art therapy can facilitate creation of a new **meaningful narrative** involving negative or traumatic memories, resulting in a **transformed sense of self** and renewed autobiographical memory.

ART, MEMORY, SELFHOOD & NARRATIVE

THE ROLE OF ART THERAPY

(ABRAHAM, R., 2005; HASS-COHEN, N., FINDLAY, J. C., 2015)



“The process transforms the space and canvas into symbolic self-spaces. Art reveals the interior space of the artist.”

- R hemisphere holds nonverbal autobiographical memories; the L integrates them with a verbal story.
- **R hemisphere holds the social-emotional self**, & orbitofrontal structures integral to the **interpersonal sense of self**. Image-making may directly access this area of the brain. **Brain regions associated with the social-emotional self are less adversely affected by Alzheimer’s pathology.**
- **Music** and **color/sensory stimuli** can provide a gateway to the R hemisphere. Color and **movement** in painting can inspire personal insights.
- *“Adding color, associated with expression of emotion, to pencil drawings helps integrate cognitive and emotional brain centers while consolidating a more expressive understanding of the self.”*

ART, MEMORY, SELFHOOD & NARRATIVE

THE ROLE OF ART THERAPY

(ABRAHAM, R., 2005; HASS-COHEN, N., FINDLAY, J. C., 2015)



“You must know that there is nothing higher and stronger and more wholesome for life in the future than some good memory, especially a memory of childhood, of home.”—Fyodor Dostoyevsky

- Recollection of early memories is associated with aspects of wellbeing (**self-esteem/self-control**).
- Memories from childhood/adolescence may present as **stand-alone visual images/stories**.
- Meaning is made by linking memories to the way the self is currently understood (**compassionate listener**) (**compassionate “container”**) (**memory keeper**).
- The **default mode network** (DMN) engenders wandering thoughts (~meditation), associated with creativity, and has been associated with psychological resiliency. Oscillation between frontal left-brain areas & DMN in the temporoparietal lobes likely forms the **foundation of creativity**.

ART, MEMORY, SELFHOOD & NARRATIVE

THE ROLE OF ART THERAPY

(ABRAHAM, R., 2005; HASS-COHEN, N., FINDLAY, J. C., 2015)



“Persons w/dementia have an interior, subjective world. Persons w/dementia, overwhelmed by loss of verbal skills, can give voice to this inner world through art.”—Ruth Abraham

- **When disability limits language, images become significant** both as a means to communicate emotional material and as a means to heal.
- L ant. temporal lobe degeneration enhances critical R hemisphere functions causing heightened activity.



ART, MEMORY, SELFHOOD & NARRATIVE

“All paths lead to the same goal: to convey to others what we are.”—Pablo Neruda

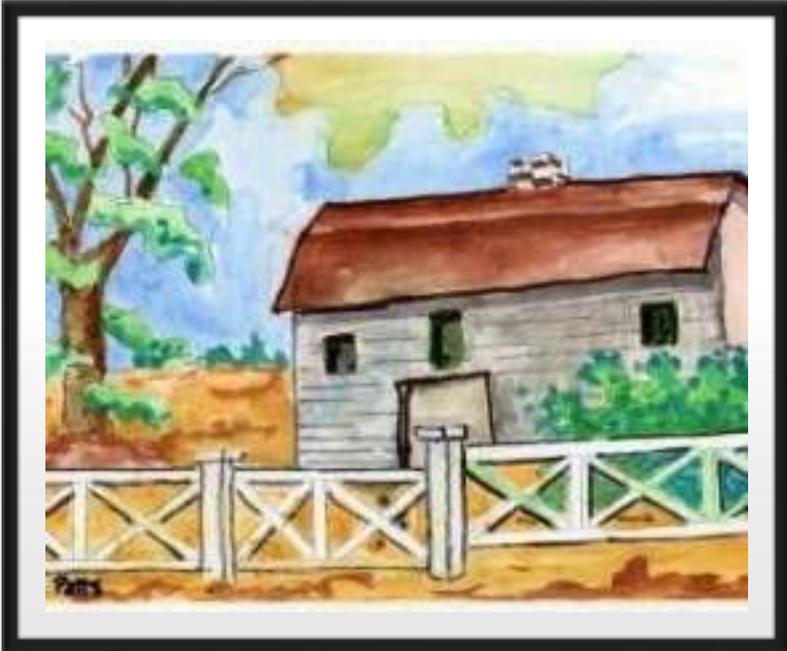


Illustration by Geoff McFetridge

“Visual art will reflect its maker.” –Ruth Abraham

BIRDHOUSES

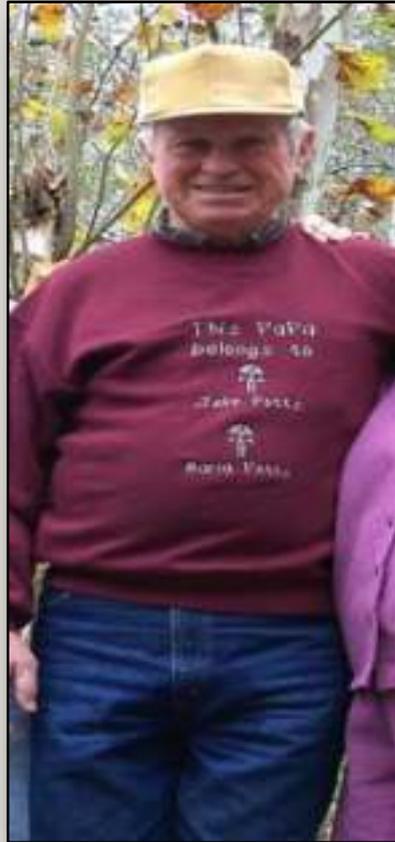




FENCES

BROTHERS FROM SAWMILLING DAYS

A life-long friendship was forged of sinews, sweat and sawdust between Lester and Albert Corder, seen here in both life and art.



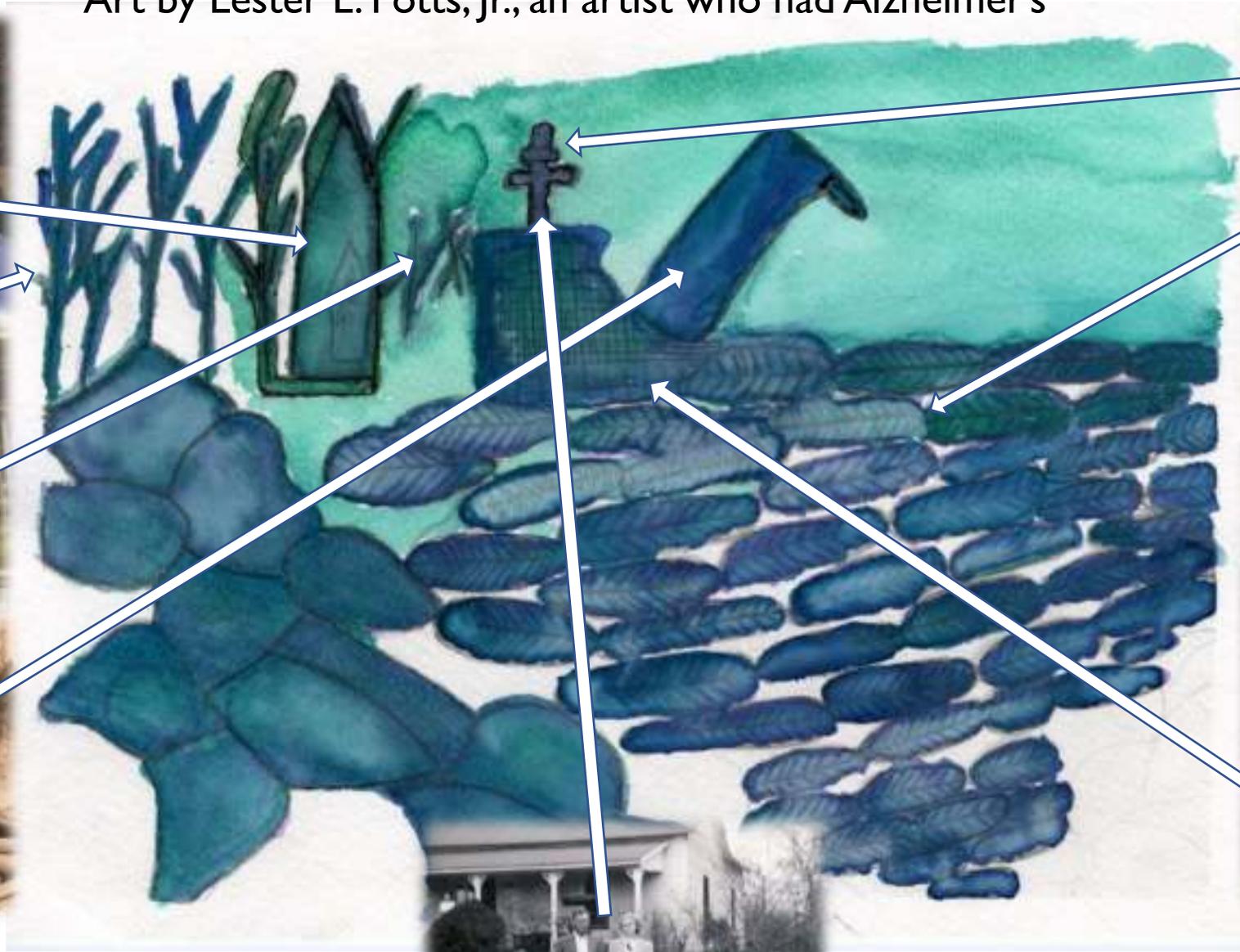
LESTER AND ALBERT





THE BLUE COLLAGE

Art by Lester E. Potts, Jr., an artist who had Alzheimer's



ARTISTIC ANALYSIS: WILLIAM UTERMÖHLEN & LESTER POTTS

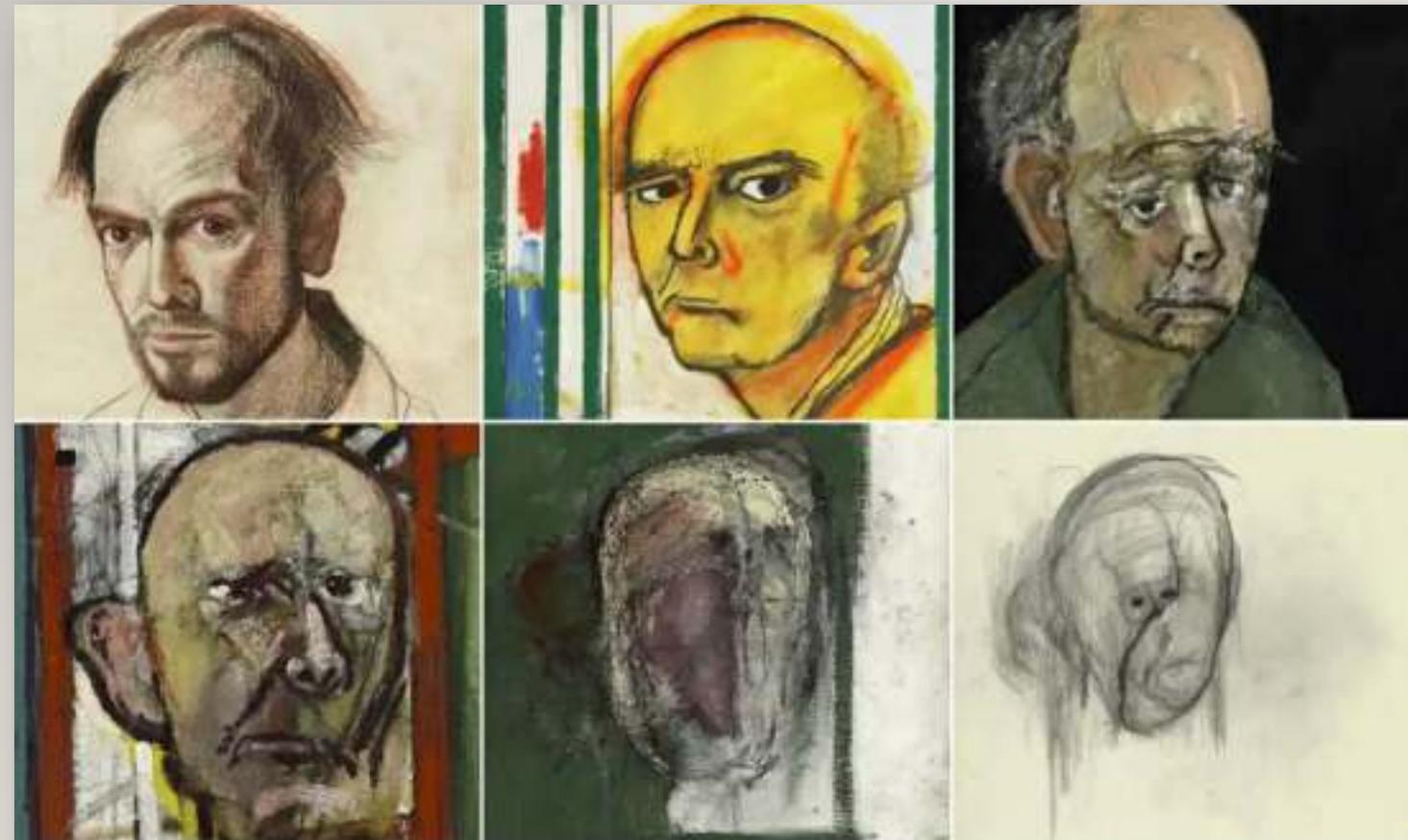
(Van Buren, B. Bromberger, B., et al. **Changes in Painting Styles of Two Artists with Alzheimer's Disease.** Psychology of Aesthetics, Creativity, and the Arts. 2013 American Psychological Association 7((1):89–94.)



- Paintings of both artists (w/disease progression)
- became more abstract and more symbolic
 - displayed less precision & attention to spatial relationships
 - were less depictively accurate & less realistic

Paintings of Lester Potts showed (w/disease progression)

- more color saturation
- warmer hues
- less complexity
- less emotion

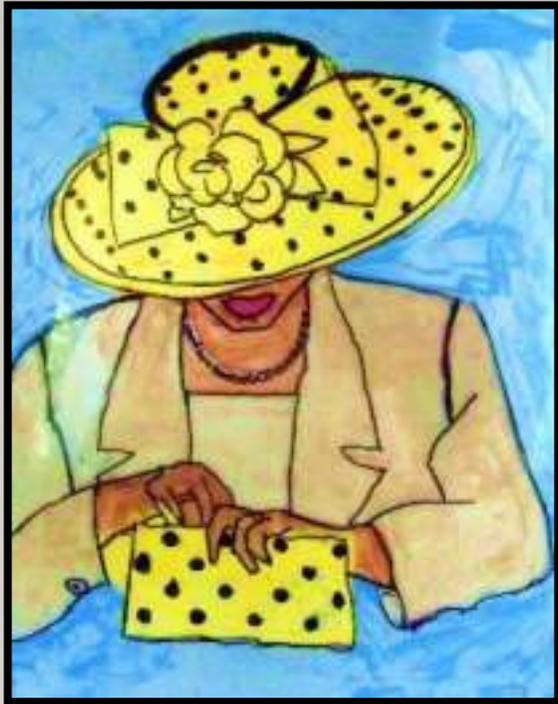


▲ Details from William Utermohlen's self-portraits, the first, made in 1967, the rest from 1996 the year following his diagnosis of Alzheimer's disease, to 2000, charting his decline. Photograph: Images courtesy of the artist's estate and GVArt Gallery, London

IN AN ESSAY ON HER LATE HUSBAND'S LAST WORKS, PATRICIA UTERMOHLEN WROTE THAT THE SELF-PORTRAITS WERE A WAY OF "ADDRESSING HIS FEARS AND EXPLORING HIS ALTERED SELF;" "NECESSITATING A NEW FORM, NEW TOOLS, EVEN A NEW STYLE." "THE GREAT TALENT REMAINS, BUT THE METHOD CHANGES."

—(URQUHART, E. (2020))





BRINGING ART TO LIFE

GIVING BACK
PAYING IT FORWARD

2011 - present



BRINGING ART TO LIFE



Bringing Art to Life (BATL) is a service-learning program for students & persons living w/dementia (PWD) in which **intergenerational relationships** are fostered through **art therapy & narrative**.

EDUCATIONAL & TRAINING ELEMENTS OF BATL



- **Neuroscience** of memory & common types of dementia, including research updates on emerging diagnostic and treatment paradigms
- **Virtual Reality** training on the lived experience of dementia
- **Person-centered care & communication** techniques
- **Care giving & impact** of dementia on family systems
- **Art therapy & other expressive arts therapies** and their use in dementia care
- **Mindfulness**, present moment centeredness, self-discovery & cultivating **gratitude**

BRINGING ART TO LIFE RESEARCH SUMMARY

KEISHA CARDEN, CANDICE REEL, DR. REBECCA ALLEN,
ALABAMA RESEARCH INSTITUTE ON AGING

- **Students show increased empathy and improved attitudes toward older adults and persons living with dementia**
- **Existential awareness** fosters **mindfulness** and **empathy** that subsequently facilitates change in ageist attitudes
- **Engagement with the present moment** with other group members versus meaningful engagement with art was a more powerful predictor of relationship building, conversations regarding purpose-and meaning-in-life, and subsequent shifts in ageist attitudes
- Total engagements were significantly higher in **morning sessions** than in afternoon sessions
- Two emergent themes within the verbal engagements were identified: **validation of personhood** and **reminiscence of family ties**

Bringing Art to Life Chicago (w/Chicago Methodist Senior Services)



BATL Chicago sensory garden & end-of-semester gathering



Bringing Art to Life Birmingham (w/Birmingham-Southern College & McCoy Adult Daycare)



Bringing Art to Life Relationships



Bringing Art to Life Art





“I ask myself if memory can be contained exclusively, discretely, in the mind of one person, or if it might be a more collective experience than most of us perceive.” – Eileen Delehanty Pearkes



SUMMARY



- The neuroscience of memory reveals a complex, multimodal, multipathway, neuroplastic system which integrates diverse brain regions and promotes not only human surviving and thriving, but also the expression of selfhood and the making of meaning in personal, social and cultural contexts.
- Memory changes associated with Alzheimer's disease include progressive declines, first, in episodic, then semantic and working memory.
- For persons living with Alzheimer's and other dementias, the making of meaning, the bolstering of selfhood, the expression of emotions, the facilitation of communication, the recollection of narrative, the generation of mindfulness and flow, and the preservation of relationships are among the most important effects of engagement in art and creativity.
- Expressive arts programs can foster creativity, tap autobiographical memory, grow empathy, bolster personhood, build relationships and increase self-awareness in other individuals and in the human community at large.

SOURCES

1. Abraham, R. (2005). *When Words Have Lost Their Meaning*. Praeger.
2. Aumann, A. (2019). *Art and Selfhood*. Lexington Books.
3. Basting, A. D. (2020). *Creative Care*. Harper One.
4. Bolwerk, J. et al. How Art Changes Your Brain: Differential Effects of Visual Art Production and Cognitive Art Evaluation on Functional Brain Connectivity. 2014 PLoS ONE 9(12): e116548. doi:10.1371/journal.pone.0116548
5. Chatterjee, A. 2014. *The Aesthetic Brain*. Oxford University Press.
6. Crutch S. J. et al. Some Workmen Can Blame Their Tools: Artistic Change in an Individual with Alzheimer's Lancet. 2001 Jun 30;357(9274):2129-33.
7. Gazzaniga, M. S., et al. (2019). *Cognitive Neuroscience: The Biology of the Mind*. W.W. Norton & Company.
8. Genova, L. (2021). *Remember: The Science of Memory and the Art of Forgetting*. Harmony Books.
9. Hass-Cohen, N., Findlay, J. C. (2015). *Art Therapy and the Neuroscience of Relationships, Creativity and Resiliency*. W.W. Norton & Company.
10. Hogue, D.A. (2003). *Remembering the Future-Imagining the Past*. WIPF & Stock.
11. Iyengar, S. How Creativity Works in the Brain: Insights from a Santa Fe Institute Working Group. National Endowment for the Arts. 2015 July; 1–43.
12. King, J., Kaimal, G. Approaches to Research in Art Therapy Using Imaging Technologies. 2019 Front Hum Neurosci 13:159
13. Mendez, M. F. Dementia as a window to the neurology of art. 2004 Medical Hypotheses 63 (1):1-7.
14. Rose, F. C. (2007). *Neurology of the Arts*. Imperial College Press.
15. Urquhart, E. (2020). *The Age of Creativity: Art, Memory, My Father and Me*. House of Anansi Press, Inc.
16. Van Buren, B. Bromberger, B., et al. Changes in Painting Styles of Two Artists with Alzheimer's Disease. Psychology of Aesthetics, Creativity, and the Arts. 2013 American Psychological Association 7(1):89–94.
17. www.npr.org/sections/health-shots/2020/01/11/795010044/feeling-artsy-heres-how-making-art-helps-your-brain
18. Weintraub, S., et al. The Neuropsychological Profile of Alzheimer Disease. 2012 Cold Spring Harb Perspect Med 2:a006171
19. Zeisel, J. (2009). *I'm Still Here: A Breakthrough Approach to Understanding Someone Living With Alzheimer's*. Penguin Group.

THANK YOU!

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