

# Emergent Knowledge in the Third Space of Art-Science

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## ABSTRACT

The locus of encounter between art, science and the public can be conceptualized as *third space*—a generative site of shared experience. This article reports on a group-based psychosocial method led by imagery and affect—the visual matrix—that enables researchers to capture and characterize knowledge emerging in third space, where disciplinary boundaries are fluid and there is no settled discourse. It presents an account of the visual matrix process in the context of an art-science collaboration on memory and forgetting. The authors show how the method illuminates aesthetic and affective dimensions of participant experience and captures the emerging, empathic and ethical knowing that is characteristic of third space.

## RESEARCHING THIRD SPACE

The notion of a third culture bridging science and the humanities has long been discussed [1–4]. We argue that the “third culture” of art-science, a heterogeneous field of collaborative scientific and aesthetic investigations [5–8], is distinguished by its intersection with the public and its capacity to connect audiences and stakeholders to researchers in ways that are mutually enhancing. Art-science takes the form of a “public experiment” [9] or “living laboratory” [10]. This paper discusses how a new method—the visual matrix—enables examination of the transdisciplinary “third space” that arises through interaction between art, science and the public (see Fig. 1). This third space is psychological, social and physical, requiring unique forms of research and support.

The topic is important for 21st-century cultural organizations that support and present art-science. While civic spaces of informal learning and cross-cultural encounter are often theorized as “third places” [11], we extend this notion of “thirdness” to encompass the epistemic role of third spaces as public sites of transdisciplinary knowledge production

[12,13], requiring new research methods that capture emergent knowledge [14]. Increasingly, cultural organizations seek to establish themselves as “epistemic organizations” for the production and representation of knowledge [15]. However, they struggle with public presentation of interdisciplinarity [16–18]; contextualization of transdisciplinary research [19,20]; and experimentation within new spheres of operation, formats of exhibition and models of engagement. To innovate, cultural organizations need to understand art-science research and its multiple points of engagement with community or interest groups.

Collaborators in art-science programs report that the value of such programs is significant [21], without being able to fully account for their impact. An ethnographic study of U.K. Arts and Science Research Fellowships reveals familiar narratives and conventional, oppositional distinctions between art and science in describing their integration [22]. We argue that since art-science arises in the interaction between

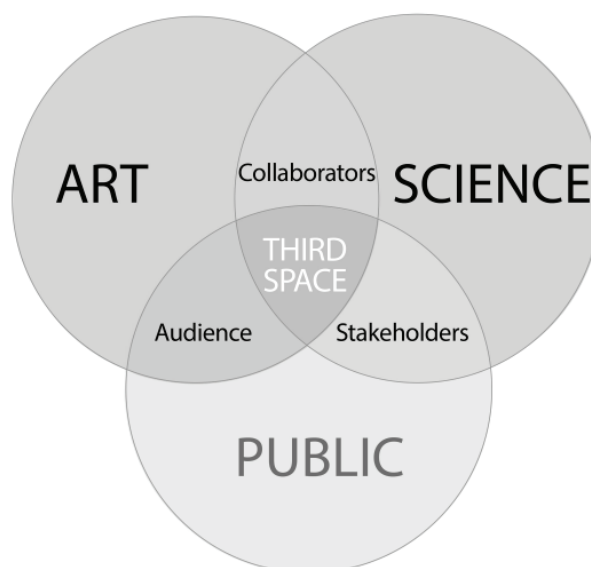


Fig. 1. Intersecting domains of third space. (© UNSW Art & Design)

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disciplines, methods for investigating it cannot be confined within disciplinary practices.

Here we report on the pilot study for Curating Third Space: The Value of Art-Science Collaboration, a research program funded by the Australian Research Council with a number of industry partners that applies a psychosocial method for researching aesthetic experience—the visual matrix [23]—to art-science exhibitions [24]. The visual matrix is a free associative group-based methodology led by imagery and affect that was designed for investigating the impact on participants' cultural imagery of aesthetic objects, events or processes [25, online supplement 3]. Psychosocial studies occupy a transdisciplinary space between social and psychological sciences and engage with arts and humanities to capture the situated complexity of human experience as felt, represented and reflectively processed [26,27 online supplement 1]. Psychosocial research responds to what is beyond awareness, investigating how social relations are internalized and reproduced, using methods attuned to the “unthought known” [28], where the not-yet-articulated is registered in the interactions and symbolic forms of social life. The visual matrix specifically investigates these forms in their affective and aesthetic dimensions as they arise (psychologically) in the minds of participants and are communicated (socially) in a group setting. The method is unique in that it creates its own third space in which the art-science encounter is reenacted, enabling researchers to witness new knowledge emerging.

### AMNESIA LAB

The focus for this study was the *Amnesia Lab* exhibition in Sydney in 2014, which displayed work on memory and forgetting by artist Shona Illingworth in collaboration with cognitive neuropsychologists Martin Conway and Catherine Loveday and visual media theorist/curator Jill Bennett. The long-term collaboration included Claire, a former nurse living with amnesia from a brain lesion, who worked with the team [29, online supplement 2].

The visual matrix focused on a particular experimental work-in-progress within the exhibition—a sound installation based on an electroencephalogram (EEG) measuring activity in Claire's brain. This comprised 32 speakers suspended in cranial formation corresponding to the placement of electrodes on Claire's skull during the EEG, emitting electronic sounds (Fig. 2).

### VISUAL MATRIX

The visual matrix [30, online supplement 3] involves a group-based setting for 8–25 participants to generate associative thinking in response to an aesthetic stimulus. In the *Amnesia Lab* matrix, 15 participants working in the field of art-science, with various disciplinary backgrounds, were invited. Having visited the exhibition, participants were seated in “snowflake formation” [31] to minimize eye contact and discourage group dynamics or any assumption that facilitators would lead the matrix. This “containing” [32] arrangement encouraged a free-associative process where *not-yet-thought* ideas

take shape. For 50–60 minutes participants offered verbal descriptions of images, thoughts and feelings *produced in them* by the exhibition and by the contributions of others, without formal turn-taking. If they began to analyze their experience, the facilitator offered an image, modeling associative thinking.

After the matrix, chairs were rearranged into a semicircle where participants began the process of analysis, to be completed later by the researchers. They “mapped” motifs, imagery and affective intensities, capturing the matrix substance and feeling as an interconnected whole (Fig. 3).

Previously this method had been used in public art and arts/health contexts, but not in art-science projects [33]. Our aim in this pilot was to assess how it captured shared experience generated by art-science in a public setting. The method addresses two problems in researching the experience of art-science: first, that qualitative methods generally fail to capture “in-the-moment” aesthetic experience as it unfolds, instead relying on “after-the-event” accounts; second, these same methods also often individualize experience. As Froggett et al. point out, art is largely appreciated in the context of social relationships and the shared space of the

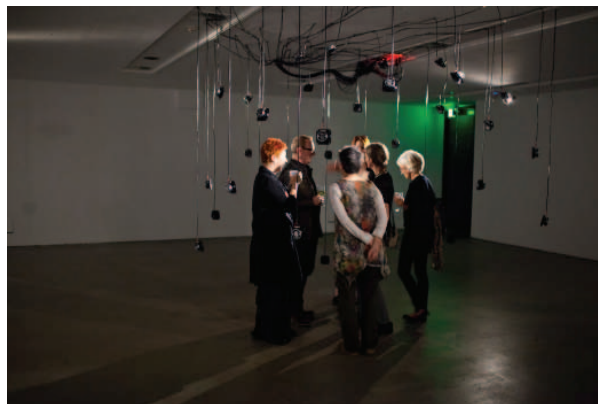


Fig. 2. Shona Illingworth, EEG sonification, University of New South Wales, 2014. Supported by the Wellcome Trust. (© Shona Illingworth)

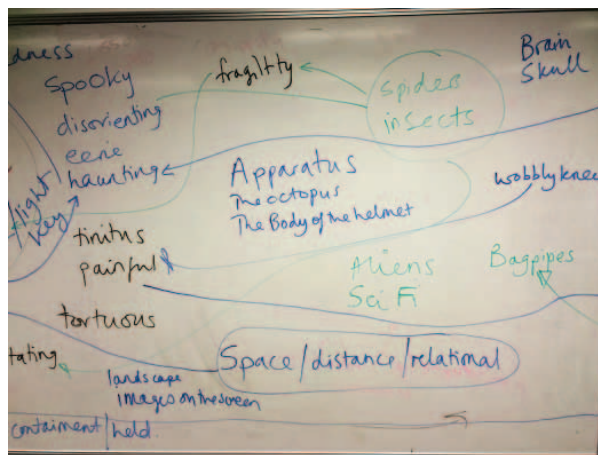


Fig. 3. Post-matrix “mapping,” University of New South Wales, 2014. (© Lizzie Muller)

public realm [34]. Art-science is collaborative and hence dependent on shared space and on the public as interlocutors in establishing its significance. As Froggett has argued:

Between the metrics of participation and . . . the intrinsic nature of an artwork lies an area that poses particular challenges for research—that of audience experience in its sensory, emotional, aesthetic and cognitive aspects. This is the ground where individuals and communities can be moved or transformed by a process, object or concept [35].

The visual matrix enables participants to symbolize aesthetic experience imagistically and affectively. Participants' contributions take shape by associating *first* to a visual stimulus (the exhibition) and then to one another, producing an interwoven “collage” of images, thoughts and feelings through “in-the-moment” linguistic expression rather than talking *about* experience. Instead of individualized impacts, it enables deepened, shared engagement.

### ANALYSIS

Interpretation of the transcript draws on Bion's theory of thinking, where ideas linked to bodily states require symbolization to become thinkable [36]. Personal experiences of participants interweave in a *shared* process. Symbolization depends upon capacity for “thirdness” in the thinker—produced out of creative interaction between self and object [37]. The matrix supports thirdness and hence development of new imagery and language.

Because the matrix is a collaged, interwoven, “rhizomatic” whole, associations generate clusters of imagery, ideas and affective intensities that form “nodes” of experience from which new associations arise [38]. The analysis interprets the significance of rhizomatic connections and shifting moods of the matrix. Here we demonstrate the analytical process using transcript extracts of matrix and post-matrix discussion. Verbalizations are not attributed to individual speakers in the transcripts, as contributions form a collaborative whole. In early stages of analysis, researchers read the transcript aloud, immersing themselves in the matrixial flow, returning intermittently to the audio recordings for affect and rhythm.

In the opening to the *Amnesia Lab* matrix, participants found themselves troubled by an installation that did not immediately yield its meaning. Eventually a “searching for Claire,” and for the quality of *her* experience, is configured. The first words frame the elaboration of ideas that unfolds:

*Tracing. Tracing.*

*Tracing.*

*Mmm.*

*. . . inside the EEG, was reminiscent of being inside some kind of buzzing hive, or swarm of insects . . .*

*. . . brought to mind insect activity, scurrying, whining . . .*

*. . . like screaming. It had a sense of pain to it . . .*

*. . . there was something quite spider-like, actually, about the speakers hanging on the wires.*

*Spider-web.*

*Spiders' legs.*

*Octopus for your head.*

Participants are discerning something hidden whose contours can barely be deciphered. Aversion is expressed through imagery of insect infestation and invasion. This passage is “experience near” [39]. Associations to “leggy” creatures are prompted by trailing wires seemingly transmitting buzzing and swarming. There is a disquieting sense of the alien—invoking an engulfing monster/machine and decentered “hive mind,” where consciousness disperses into electrical impulses. The scurrying and whining are poised on the edge of a scream. “Legginess” associates to “octopus,” an unseen creature of the depths who, like the spider, lives by entrapment. “Octopus for your head” associates to the mind's depths and its outward extension. Slowly, a curious mood emerges:

*I found the sound very intriguing, quite disturbing, uncanny, spooky. But the more time I spent in it, the more I began to find it quite musical—waning on the edge of sleep.*

*Yeah, I, at one point, was thinking—it sounds wrong, like a slightly mistuned radio signal.*

*Mmm.*

*Almost could hear something.*

With “waning on the edge of sleep” and “mistuned radio” the matrix begins searching for Claire:

*. . . this presence of Claire, she—I—she's—she's not—you know, you can't see her, she's a kind of ghost, or specter, or something in your experience of that exhibition, I kept trying to picture her and think what she might be like, and does she have agency in this experience? What's her—my relationship to her in this moment?*

The matrix traces a haunting, tentatively apprehended through the technology, along with the reality of memory loss: uncanny, elusive and out of focus.

### THE “MIND” OF THE MATRIX

A working visual matrix enters a daydream-like state described by Bion as “reverie,” which “digests” experience emotionally [40]. The containment fosters “negative capability.” Bion adopted this idea from Keats, who described the state as “when a man is capable of being in uncertainties, mysteries, doubts without any irritable reaching after fact or reason” [41]. This allows participants to stay with the lived experience of memory loss, engaging with the unknown in the face of an unwelcome sense of the alien.

In “finding Claire,” participants begin to form an empathic and ethical relation to her as she becomes ever more present, demanding recognition as a center of subjective experience rather than a haunting.

*. . . I felt really—a sense of loss, in her soundscape I was listening to hear where she was sort of firing . . .*

*. . . the accessibility of her to me was also me to her, and there was this blockage there, and I thought I was engaged with her amnesia . . .*

When consciousness of searching for Claire stabilizes, the inquiry gains confidence. Participants begin contrasting “inside” and “outside” perspectives.

*I stepped outside when I was inside, and I was on the right side of the helmet, and then I stepped back inside and it's like you—I—I had this feeling of moving inside and outside of—of her brain . . .*

In conducting the analysis, the research team stays close to the imagery and affective shifts of the matrix in apprehending its emergent object. The process of analysis moves slowly outward from the matrix in a series of panel discussions, sequentially asking, “What is presented?” “How is it presented?” and “Why is it presented thus?”

“What” refers to content: insects, spideriness, haunting. “How” relates to quality of expression, tone, rhythm—a halting “mmm, mmm” slows the associative flow, fostering a meditative mood. Early on, this matrix achieves a containment that accommodates the disturbing ideas it generates. There is no rush; it takes time to struggle with the material. This is a transmission of affect from the installation itself, which defies rapid assimilation, demands attunement and yields a gradual transformation.

“Why” questions imply context and serve as a reminder that art can create conditions in which the human subject is recognized through technological mediation. They raise an ethical question—can one access the experience of another?

*I found it almost excessively intimate, as if I was inside this woman's brain, and she didn't give me permission to be there, and I was wondering what I was listening to. I thought to myself maybe I'm a thought inside her brain.*

Because a visual matrix moves constantly between experiences of individuals and the group, it generates a search for empathic connection and ethical questions relating to the locus of experience and its knowability. There is subject/object reversal here that turns the “normal” audience member with stable identity/memory into a thought within Claire's encompassing brain. The inside/outside motif also alludes to distinctions between art and science: knowledge that depends on empathy, identification and aesthetic sensibility (art) and the attempted objectivity of a knower positioned as external to its object (science).

A further question arises from the idea of being a thought inside another's brain—whether subjectivity is unitary and bounded, or dispersed and permeable; and if the latter, then what can be “held” in a mind? The transdisciplinary encounter produces knowledge poised between the lure and the risk of approaching the other.

### IN-BETWEEN EXPERIENCES

In art-science, knowledge becomes unsettled. Led by imagery rather than discourse, the visual matrix elicits figurative language as it develops in-between domains. In a collaging of interrelated imagery, the matrix holds together contradictions and differences, while mapping affective intensities that cumulatively reveal shared experiences.

Expert knowledge is vital but restricts participants' horizons. The matrix encourages “third position thinking.” Psychoanalyst Ron Britton describes this as the capacity to observe the self, while being oneself, and from this position and one's own point of view to hold self and other continuously in mind [42]. Thirdness does not efface individuality in the service of collectivity, or vice versa. Associations may originate in personal or disciplinary knowledge but, paraphrasing Britton, participants can view other disciplines from the perspective of their own and, holding art and science continuously in mind, allow a third perspective to emerge.

The visual matrix was originally developed to help those without expert knowledge to articulate their experience of artworks. This pilot suggests it may also help experts articulate experiences beyond their professional stance, thus allowing formative as well as summative evaluation, and supporting transdisciplinary knowledge.

The third space of art-science fosters collaborative thinking in an encounter between different epistemic perspectives and domains of study. The challenge is to keep open a space of dialogue between scientific and artistic modes of thought, in a setting that supports thirdness, thus overcoming disciplinary encampments that serve as an intellectual defense against the unknown.

In revealing complexity of experience as it is reenacted, the matrix can also illuminate how artistic intention is transformed into audience reception. Artist Shona Illingworth participated in the matrix and first-stage research analysis, observing:

*As an artist you have very little access to the experience that people have in your work . . . there's a big space that's missing that gets filled with opinion. . . . [The matrix asks] not just “did it work”—but about a deeper engagement with the concept.*

Conventional evaluation assumes that audiences encounter the finished work and then report on impact. In *Amnesia Lab* the visual matrix was part of an ongoing research collaboration exploring the complexities of living with memory loss and aiming at public engagement in a subject little understood by either science or art. The visual matrix facilitated this engagement, enabling understanding of its aesthetic process.

A proposition to explore is whether a visual matrix produces knowledge characteristic of all third space: emergent, empathic, searching, infused with sensory and affective experience, at ease with uncertainty. It is also relational, presuming a provisional standpoint that holds the other continuously in mind. The third space is not “collective” but is shared, effacing neither individuality nor disciplinarity, but nevertheless creating conditions in which new knowledge can emerge.

## Acknowledgments

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## References and Notes

- 1 C.P. Snow, *The Two Cultures: A Second Look* (Cambridge, U.K.: Cambridge Univ. Press, 1998).
- 2 A. Miller, *Colliding Worlds* (New York: Norton, 2014).
- 3 C. Raffl, "The Two Cultures: A Third Look," in R. Trappl, ed., *Cybernetics and Systems* (Vienna: Austrian Society for Cybernetic Studies, 2006) pp. 318–323.
- 4 G. Ortolano, *The Two Cultures Controversy: Science, Literature and Cultural Politics in Postwar Britain* (New York: Cambridge Univ. Press, 2009).
- 5 G. Born and A. Barry, "Art-Science," *Journal of Cultural Economy* **3**, No. 1, 103–119 (2010).
- 6 B. B. Wilson, B. Hawkins and S. Sim, eds., *Art, Science and Cultural Understanding* (Champaign, IL: Common Ground, 2014) pp. 4–29.
- 7 Art-science has long been promoted through *Leonardo*; see for example B. Root-Bernstein et al., "ArtScience: Integrative Collaboration to Create a Sustainable Future," *Leonardo* **44**, No. 3, 192 (2011).
- 8 J. Bennett, "Transdisciplinary Aesthetics," in M. Kelly, ed., *Oxford Encyclopaedia of Aesthetics* (Oxford, U.K.: Oxford Univ. Press, 2014).
- 9 Born and Barry [5].
- 10 L. Muller and E.A. Edmonds, "Living Laboratories for Interactive Art," *CoDesign* **2**, No. 4, 195–207 (2006).
- 11 R. Oldenburg, *The Great Good Place: Café, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts, and How They Get You Through the Day* (St. Paul, MN: Paragon House Publishers, 1989).
- 12 Born and Barry [5].
- 13 Muller and Edmonds [10].
- 14 Data in this paper are taken from the pilot of Curating Third Space: The Value of Art-Science Collaboration, a project funded by the Australian Research Council.
- 15 R. Miettinen and J. Virkkunen, "Epistemic Objects, Artefacts and Organisational Change," *Organisation* **12**, 437–456 (2005).
- 16 B. Arends and D. Thackara, *Experiment: Conversations in Art and Science* (London: Wellcome Trust, 2003).
- 17 L. Muller, "Learning from Experience," in L. Candy and E. Edmonds, eds., *Interacting: Art, Research and the Creative Practitioner* (Faringdon, Oxfordshire, U.K.: Libri Publishing, 2011).
- 18 C. Christov-Bakargiev, "Worldly Worldling: The Imaginal Fields of Science/Art," *Mousse Magazine* (2014): [www.moussemagazine.it/arolyn-christov-bakargiev-claire-pentecost-2014](http://www.moussemagazine.it/arolyn-christov-bakargiev-claire-pentecost-2014) (accessed 24 January 2018).
- 19 H. Nowotny, *Re-Thinking Science* (Cambridge, U.K.: Polity Press, 2001).
- 20 Raffl [3].
- 21 In the Wellcome Trust's Sciart scheme, 82% of grant recipients interviewed reported "new insights"; scientists spoke of "intangible value and speculative benefit." P. Glinkowski and A. Bamford, *Insight and Exchange* (London: Wellcome Trust, 2009) p. 71.
- 22 J. Leach, "Constituting Aesthetics and Utility," *HAU: Journal of Ethnographic Theory* **2**, No. 1, 247–268 (2012).
- 23 This method was developed at University of Central Lancashire (funded by Arts and Humanities Research Council, U.K.).
- 24 See Curating Third Space [14].
- 25 L. Froggett, J. Manley and A.N. Roy, "The Visual Matrix Method: Imagery and Affect in a Group-Based Research Setting," *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* **16**, No. 3 (2015).
- 26 P. Stenner and D. Taylor, "Psychosocial Welfare: Reflections on an Emerging Field," *Critical Social Policy* **28**, No. 4, 415–437 (2008).
- 27 L. Froggett, "Psychosocial Research," in Becker, Bryman and Ferguson, eds., *Understanding Research for Social Policy and Social Work: Themes, Methods and Approaches* (Bristol, U.K.: Policy Press, 2012) pp. 179–186.
- 28 C. Bollas, *Psychoanalysis of the Unthought Known* (London: Free Association Books, 1989).
- 29 C. Loveday and M. Conway, "Using SenseCam with an Amnesic Patient: Accessing Inaccessible Everyday Memories," *Memory* **19**, No. 7, 697–704 (2011); Claire is referred to as CR.
- 30 Froggett, Manley and Roy [25].
- 31 Psychosocial Research Unit, "The Visual Matrix," a project funded by the Australian Research Council: <https://youtu.be/ttHHtyof7Pg> (accessed 21 January 2018).
- 32 Containment supports capacity to withstand uncertainty; symbolic systems themselves provide containers for processing experience. W. Bion, *Attention and Interpretation* (London: Karnac, 1970).
- 33 It has since been used in *The Barometer of My Heart*—a Wellcome Trust-funded collaboration between artist Mark Storer and endocrinologist Leighton Seal; L. Froggett, J. Manley and J. Wainwright "The Barometer of My Heart: Visual Matrix Research and Evaluation Project" (Preston, U.K.: University of Central Lancashire, 2017).
- 34 L. Froggett et al., "Public Art and Local Civic Engagement," Final Report, Arts & Humanities Research Council (2014): [https://clock.uclan.ac.uk/10961/1/AHRC\\_CV20RDA\\_TOC\\_FINAL\\_2.pdf](https://clock.uclan.ac.uk/10961/1/AHRC_CV20RDA_TOC_FINAL_2.pdf) (accessed 21 July 2017).
- 35 Froggett et al. [34], p. 9.
- 36 Froggett et al. [25].
- 37 R. Britton, "Subjectivity, Objectivity and Triangular Space," *Belief and Imagination* (London: Routledge, 1988).
- 38 The method draws on Deleuze and Guattari on the affect/experiential primacy of image, and on Lorenzer on "scenic understanding." See G. Deleuze and F. Guattari, *A Thousand Plateaus* (London: Continuum, 1988); A. Lorenzer, "Tiefenhermeneutische Kulturanalyse," in A. Lorenzer, ed., *Kultur-Analysen: Psychoanalytische Studien zur Kultur* (Frankfurt: Fischer, 1986) pp. 11–98. Here, the focus is on third space and symbolization.
- 39 C. Geertz, "From the Native's Point of View," *Bulletin of the American Academy of Arts and Sciences* **28**, No. 1, 26–45 (1974).
- 40 Froggett et al. [25].

- 41 J. Keats, "On Negative Capability," *Keats: Complete Works* (Cambridge, MA: Houghton Mifflin, 1817) p. 227.
- 42 Britton [37].

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