IMAGINATION

CONFERENCE

EXTREME

VIRTUAL CONFERENCE

10/21/21 10/22/21 10/23/21

I. Table of Contents

II. Welcome Address

Welcome to the Extreme Imagination 2021 Conference and Exhibition

We are pleased you could join us for the 2nd Extreme Imagination Conference and Exhibition (EICE21), and we welcome you to our digital event space. It is a distinct privilege for us to host this event and we look forward to your involvement. We believe the success of EICE stems from the rich diversity of the attendees, who despite differences in geographical location, educational background, and professional focus, come together as a commitment to advance this truly interdisciplinary field of imagery extremes. This year, EICE21 will bring together over 400 attendees from 29 different countries who boast a myriad of specializations, including psychologists, philosophers, theorists, computer scientists, artists, musicians, neuroscientists and more.

EICE21 continues the great tradition of blending world-class interdisciplinary research presentations with a stimulating art exhibition. On behalf of the organizing committee, the conference advisory board, and the conference staff and volunteers, we hope you enjoy your time over the three day virtual event. Please do not hesitate to ask if there is anything we can do to enhance your conference experience.

TomEbeyer

Sincerely,
Tom Ebeyer
EICE21 Conference Chair

Extreme Imagination Conference

III. Committees

A. The Aphantasia Network

The Aphantasia Network (Aphantasia Society) is a Canadian-based non-profit organization that aims to improve the lives of those who experience aphantasia through world-class research, transformative advocacy and compassionate support.

Aphantasia Network

B. Conference Organizers

Tom Ebeyer
Executive Director

Jennifer McDougall
Director of Experience

Mónica Aguado
Director of Events

Fiona Manning
Scientific Director

Jessica Jordao
Social Media Coordinator

Emma Jackson
Designer

Lili Emery
Communications Assistant

IV. Conference Information and Activities

A. Participant Overview

Participants at each registration tier will have numerous opportunities to access the latest insights into the extremes of human imagination. You will be able to log into the event portal to view all components of the conference according to your registration tier.

General Registration

General conference admission includes all Keynote talks, Research talks, live Artist discussion panels, new research opportunities, and more! The live stream can be accessed in the event portal's virtual Stage.

Exhibition Registration

Exhibition admission includes all of the General Registration features
+ Access to the virtual artist exhibition. Both an accessible version in the event portal and immersive experience in Gather are available for viewing the artist's works.
+ Access to the fully customized, interactive virtual networking space in Gather. Open 24 hours and provides a unique opportunity for meeting other like minds.

Networking Session and Artist Meet and Greet will be taking place in the immersive version of the artist exhibition.

All-Access Registration

All-Access admission includes all of the General and Exhibition Registration features
+ Creative Workshops led by various experts and breakout debriefing groups through Zoom
+ Access to Slack Discussion channel for additional networking opportunities
+ Free Sensory Imagination Assessment and Life-time Access to the new Imagination Spectrum platform

B. Keynote Talks

Five Keynotes Speakers will lead off the conference on Day 1 to offer a detailed overview of their work and new directions in mental imagery research. These researchers are some of the world-leading experts on aphantasia and hyperphantasia, mental Imagery, perception, and memory. These talks will be followed by a panel discussion with all five Keynote Speakers to discuss some of the biggest questions in extreme imagination.

Please see Appendix B for all Keynote bios.

Adam Zeman, BMBCh, MA, DM, FRCP
University of Exeter

Fiona MacPherson, PhD, FRSE, MAE
University of Glasgow

Brian Levine, PhD
Rotman Research Institute, Baycrest Health Sciences; University of Toronto

Jools Simner, PhD
University of Sussex

Joel Pearson, PhD
University of New South Wales

Tom Ebeyer, MMIE
Aphantasia Network

C. Research Presentations

We received numerous research talks submissions that were reviewed and selected by an external scientific committee. On Day 2 and 3, we feature this set of talks that highlight the latest findings across the field of imagination science and mental imagery. These presenters will share some of the newest emerging data and perspectives on critical areas of imagery research.

The research presentations focus on a number of imagery themes including untangling imagination vs. reality, auditory imagery and inner speech, altered states of consciousness, sensory sensitivity and learning differences, and much more. Short discussions will be interspersed throughout the day to reflect on the topics and allow presenters to answer questions.

Please see Appendix C for all Researcher bios.

D. Artist Exhibition

The Extreme Imagination 2021 exhibition hints at our hidden routes to creation and challenges the role of sensory imagination in creating art. Can you create without visual, sound, or other forms of sensory imagination? Is there a distinctly aphantasic or hyperphantasic type of art? This is the second exhibition of it's kind reflecting on these questions and challenging the assumed role of sensory imagination in creativity and the arts.

We received nearly 100 artist submissions through an open call. Of the 100, 25 artists who experience aphantasia and hyperphantasia were selected – including artwork by digital artists, painters, photographers, writers, musicians, sculptors and other mixed media art forms.

Both an immersive and accessible form of the Artist Exhibition are available.

Please see Appendix D for Artist bios.

V. Artist Panels

Select artists featured in the Artist Exhibition will join us live to discuss their creative process. They will reflect on their approaches using either an imagery or non-imagery perspective and how their individual perceptual experience impacts their method.

For example, Elina Cerla states:

"I don't start with an image but a sensation of where I want to go. Both formally—including how the paint is applied, colour choices, compositional structure, the play of light and dark—and with symbolic elements, gestures, how these interact and suggest fragments of stories. Sparks forming

an overall feeling and loose guide. As I cannot conjure images, I use references, ideally people and real objects. I enjoy the indeterminacy of the process and active feedback between the marks made and the sensation being met or not—and shifting. Pulling things together into a coherent whole. Aphantasia may play a part, as I don't start with clear images to pin down, yet I revel in the emergent quality of pigmented mud becoming something that carries meaning; so really I think it comes down to choice."

VI. Creative Workshops

All-Access registrants can access a number of creative workshops. There are a total 6 workshops to choose from, led by 5 different facilitators. Workshops will be hosted on Day 2 and Day 3 of the Conference Programme,. Details of the workshops can be found below.

WORKSHOP #1 Writing with Aphantasia led by Dustin Grinnell

This writing workshop isn't about the craft of writing. We won't discuss how to plot a story, character development, or the art of dialogue. We're going to talk about the intangibles of writing and how to get words on the page. Where do you get creative ideas? How do you develop them? How do you revise and know when you're finished? We'll talk about what it takes to be successful as a writer. Overcoming fear. Developing Courage. Being persistent. This workshop will involve several writing exercises, so you'll leave with a few pieces of writing.

Dustin Grinnell is the author of The Genius Dilemma and Without Limits. His work has appeared in The Boston Globe, The Washington Post, New Scientist, Salon, VICE, and Writer's Digest, among many other popular and literary publications. He earned his MFA in fiction from the Solstice MFA Program of Lasell University, and his MS in physiology from Penn State. He grew up in the White Mountains of New Hampshire and now lives in Boston, Massachusetts.

WORKSHOP #2: Creativity: Embracing your Strengths in Photography led by Chris Wooley

Learn how to nurture your natural abilities to see, analyze, and adapt in new and unique ways to create creative artwork. Follow Master Photographer Chris Wooley as he guides you through his creative process when working on client and personal images - from concept to execution. You'll gain skills in conceptualization, creativity, and the artist process. Looking for a little inspiration to kick your creativity into gear? You've come to the right workshop!

Chris Wooley is a photographer and educator who holds the Master Photographer and Photographic Craftsman degrees and Certified Professional Photographer status. Chris has won numerous print awards, including multiple Fuji Masterpieces, and is a recipient of the prestigious "PPA National Award" for his contributions towards the photographic industry.

WORKSHOP #3: Drawing With Aphantasia led by Elina Cerla

Drawing is about realising that how we see for everyday functioning isn't how we need to see to draw; it is about learning a different way of seeing. Elina Cerla, professional artist and educator has taught "visual thinking" drawing and painting classes with a neurological twist to help people understand the why and not only the how. Similarly, knowing some of the whys of aphantasia could help you adapt the hows of drawing to best suit your own individual needs. In this workshop, you'll explore what happens when you imagine something and have an idea, how you translate that to making work and how the process of drawing takes place. For all levels (from absolute beginners to practicing artists).

Materials to bring:

- A3 sketchbook or various loose sheets of paper.
- Several different pencils (ideally, a range of harder to softer from HB to 6B).
- Eraser

Elina Cerla is a painter interested in pushing and exploring the expressive qualities of gesture, the human form and materials. Born in London, brought up speaking English and French, has a background in philosophy and cultural theory, and after too many moves, now works mainly between Barcelona, London and the virtual sphere.

WORKSHOP #4: Meditation for Non-Visualizers led by Chantal Garneau

Is visualization key to a successful meditation? It doesn't have to be. Join Chantal Garneau, meditation artist and peace activist for an interactive and experiential workshop exploring meditation techniques that do not require visualization. With over 20 years of personal experience and 15 years teaching experience Chantal knows how hard meditation can be, especially as a non visualizer. She will address common stumbling blocks, answer your questions and share some best practices. Be prepared to feel relaxed and inspired.

Chantal Garneau is a meditation artist + peace activist living in the Credit River watershed in Halton Hills, ON Canada. She facilitates meditations on compassion, universal love, and the web of life and shares them through a gift economy. Personal experience with chronic pain and mental illness shape her gentle, step by step process, making it easy for you to start where you are. You are invited to practice with her at www.becomingpresent.earth

WORKSHOP #5: Aphantasia as our Greatest Strength & Building a Sustainable Community led by Tom Ebeyer

How do you feel about living with aphantasia? In this session we will have a candid discussion about the challenges of non-visualization, and discuss some of the reasons we believe aphantasia can be a great source of strength

Tom Ebeyer is a social entrepreneur and founder of the Aphantasia Network. Tom was among the first 21 reported cases of "congenital aphantasia" mentioned in Zeman's original paper. His discovery story with aphantasia has been featured in the New York Times, the CBC and BBC Radio. His unique vision is shaping the global conversation around the power of image-free thinking.

WORKSHOP #6: Aphantasia as our Greatest Strength & Building a Sustainable Community led by Tom Ebeyer

Run on day 2, Saturday: Help us shape the future of Aphantasia Network. How do we expand our reach, bring in new energy and support the community better? In this workshop we will explore the big projects for 2022 and beyond.

Tom Ebeyer is a social entrepreneur and founder of the Aphantasia Network. Tom was among the first 21 reported cases of "congenital aphantasia" mentioned in Zeman's original paper. His discovery story with aphantasia has been featured in the New York Times, the CBC and BBC Radio. His unique vision is shaping the global conversation around the power of image-free thinking.

A. Networking Space

Our unique and custom-built Networking Space is specifically designed to enhance virtual networking and promote interactions between all of our conference attendees. Exhibition and All-Access registrants are invited to join our networking space in Gather to meet other like minds. The Gather platform allows guests to move around freely using the arrows on their keyboard, and interact with objects in the space by press "x" on their keyboard. When in proximity to another guest, you camera and microphone will automatically turn on so you can interact with others in the virtual space.

VII. Programme Overview

All times listed are in Eastern Time (ET).

Thursday October 21, 2021	Friday October 22, 2021	Saturday October 23, 2021
	9:00-9:15am Rebecca Keogh: Visual Imagery, Source Monitoring and 'False Memories': Insights from Aphantasia and Hyperphantasia	
	9:15-9:30am Nadine Dijkstra: *Dissociating Imagination and Reality*	
	9:30-9:45am Live Discussion with Rebecca Keogh and Nadine Dijkstra	
9:50-10:00am Welcome!	9:45-10:00am Zoë Pounder: *Auditory Imagery Performance in Aphantasia*	
10:00-10:50am Adam Zeman: *Blind Mind's Eye - The Science of Visual Imagery Extremes*	10:00-10:15am Jeremy Skipper: *Aphantasia and its relationship to the neurobiology of language, inner speech, and consciousness*	
	10:15-10:30am Live Discussion with Zoë Pounder and Jeremy Skipper	
	10:30-11:00am Break	
11:00-11:50am Fiona MacPherson: *What Is It Like to Have Visual Imagery?*	11:00-11:30am Tom Ebeyer: *Insights from a Global Community of Aphantasics*	11:00am-11:50am Extreme Imagination Artist Panel 1
	11:30-11:45am David Luke: *Are Non-Visual Visionary Experiences Possible? Psychedelics & Aphantasia*	

	11:45am-12:00pm Varg Thore Königsmark: *Delusions of the mind's eye: Pseudo-hallucinations and the link to mental imagery ability*	
12:00-12:50pm Brian Levine: *Severely Deficient Autobiographical Memory (SDAM) and the Normal Spectrum of Individual Differences in Episodic Recollection*	12:00-12:15pm Paulina Trevena: *Aphantasia and Hypnosis: Can you Hypnotise if they can't Visualise?*	12:00-12:15pm Guess Who?
	12:15-12:45pm Live Discussion with David Luke, Varg Thore Königsmark, Paulina Trevena, and Reshanne Reeder	12:15-1:00pm Wilma Bainbridge: *Drawing as a Window into Variations of Imagery*
	12:45-1:00pm Break	
1:00-1:30pm Break	1:00-1:15pm Carla Dance: *Sensory Imagery and Sensory Sensitivity: Insights From Aphantasia*	1:00-1:30pm Matthew MacKisack: *How can a Visual Artist not Visualise?*
	1:15-1:30pm Jenel Cavazos: *Visual Mental Imagery and Learning Strategies: Does Vividness Matter?*	
1:30-2:20pm Jools Simner: *Are People with Aphantasia Verbal Thinkers?*	1:30-1:45pm Live Discussion with Carla Dance and Jenel Cavazos	1:30-2:20pm Extreme Imagination Artist Panel 2 + closing remarks
2:30-3:20pm Joel Pearson: *Measuring Aphantasia and its Impact*	2:00-4:00pm Creative Workshops for All Access	2:30-4:00pm Exhibition & All Access Artist Meet & Greet
3:30-4:20pm Keynote Panel Discussion		4:00-6:00pm Creative Workshops for All Accesd
4:30pm Exhibition & All-Access Networking		

VIII. Presentation Abstracts

Blind Mind's Eye - The Science of Visual Imagery Extremes

Adam Zeman, BMBCh, MA, DM, FRCP
University of Exeter, UK

Abstract

Although the existence of people lacking a mind's eye was recognised in the 19th century, the phenomenon lacked a name or sustained scientific study until 2015. The naming of 'aphantasia' proved to be pivotal, leading to intense public interest, and a wave of recent research. This suggests that imagery extremes – aphantasia and its converse, hyperphantasia - have contrasting occupational, cognitive, behavioural and neurophysiological characteristics, run in families, and are heterogenous. I will tell the story of the rediscovery of aphantasia and the research that has ensued, placing these in the context of our understanding of imagery more broadly, and identify some key unanswered questions.

Bio

Prof. Zeman trained in Medicine at Oxford University Medical School, after a first degree in Philosophy and Psychology, and later in Neurology in Oxford, at The National Hospital for Neurology in Queen Square, London and Addenbrooke's Hospital, Cambridge. He moved to Edinburgh in 1996, as a Consultant and Senior Lecturer (later Reader) in the Department of Clinical Neurosciences and to the Peninsula Medical School (now University of Exeter Medical School) in September 2005 as Professor of Cognitive and Behavioural Neurology. His specialised clinical work is in cognitive and behavioural neurology, including neurological disorders of sleep. His main research interests are disorders of visual imagery and forms of amnesia occurring in epilepsy. He has an active background interest in the science and philosophy of consciousness, publishing a wide-ranging review of the field in Brain (2001; 124:1263-1289) and an accessible introduction to the subject for a general readership (Consciousness: a user's guide, Yale University Press, 2002). In 2008 he published an introduction to neurology for the general reader, A Portrait of the Brain (Yale UP), and in 2012, Epilepsy and Memory (OUP) with Narinder Kapur and Marilyn Jones-Gotman.

What Is It Like to Have Visual Imagery?

Fiona MacPherson, PhD, FRSE, MAE
University of Glasgow, UK

Abstract

What is it like to have visual imagery? How does it differ from what it is like to have a perceptual experience? Is perceptual experience more "vivid" than visual imagery? How can we best communicate to people who have (congenital) aphantasia what it is like to have visual imagery? In this paper, I argue that there are problems with the standard answer that imagery is less "vivid" than perceptual experience. I articulate some features of imagery. I try to communicate what it is like to have visual imagery to those who have never experienced it by comparing imagery to a variety of unusual visual phenomena that those with aphantasia can experience, and through which they may come to know better what it is like to have visual imagery.

Bio

Fiona Macpherson, FRSE, MAE, is Professor of Philosophy at the University of Glasgow where she is also Director of the Centre for the Study of Perceptual Experience. Her work focuses on the nature of perception, illusion, hallucination and imagination, and she has a special interest in virtual and augmented reality. She has written almost 40 papers on these topics for both philosophical and scientific journals, and has edited eight influential volumes, most recently, The Routledge Handbook of Philosophy of Colour, (Routledge 2021) with Derek Brown and Sensory Substitution and Augmentation (Proceedings of the British Academy, Oxford University Press, 2018). Macpherson is a member of the Eye's Mind Project, led by Prof Adam Zeman, working on extremes of imagination. She is also President of the British Philosophical Association, a member of the Arts and Humanities Research Council and the UKRI Creative Industries Advisory Group, and a trustee of the Kennedy Memorial Trust.

Severely Deficient Autobiographical Memory (SDAM) and the Normal Spectrum of Individual Differences in Episodic Recollection

Brian Levine, PhD
Rotman Research Institute, Baycrest Health Sciences; University of Toronto, Canada

Abstract

Severely Deficient Autobiographical Memory (SDAM) is a syndrome in which healthy people report a failure to re-experience or recollect specific events from their past, although memory for factual information about themselves and the world is intact. For example, they know that they went on a trip to Norway, but they lack a richly detailed and vivid recollection of any events from that trip. In this talk, I will summarize behavioral and brain imaging results addressing the following questions: (1) Is autobiographical recollection of past events expressed as a trait that varies across the population, with SDAM reflecting the extremes (as is the case in developmental disorders or personality)? (2) What is the relationship between autobiographical recollection and visual imagery? and (3) How do people with SDAM function well in spite of their deficient autobiographical recollection?

Bio

Dr. Brian Levine obtained his Ph.D. in 1991 from the University of South Florida and completed fellowships in clinical neuropsychology at McLean Hospital in Boston and cognitive neuroscience at the Rotman Research Institute. He has published over 150 peer reviewed scientific articles and chapters on memory, frontal lobe function, traumatic brain injury, aging, dementia, and rehabilitation as well as Mind and the Frontal Lobes: Cognition, Behavior, and Brain Imaging (2012, Oxford University Press) and Goal Management Training® intervention for executive deficits (with Ian Robertson and Tom Manly). He is a fellow of the American Psychological Association and Association for Psychological Science and recipient of the 2015 International Neuropsychological Society's Benton award for mid-career research achievement. His research has been funded by federal agencies (CIHR, NIH) continuously for the past 20 years. Dr. Levine, a board-certified neuropsychologist, is clinically active, providing expert opinions in cases involving brain injury, dementia, and psychiatric disorders. Dr. Levine is frequently called upon to communicate research findings to health professionals and the general public. He has appeared in the New York Times, the Washington Post, CBC radio, USA Today, Psychology Today, Scientific American Mind, Wired, New York Magazine, and Discovery Health.

Are People with Aphantasia Verbal Thinkers?

Jools Simner, PhD
University of Sussex, UK

Abstract

In this talk I will address a common misconception, that people with aphantasia (i.e., weak or absent visual imagery) must necessarily be 'verbal thinkers'. I describe data from our lab showing that people with aphantasia report less (not more) verbal thinking styles (using the Clarity of Auditory Imagery Scale; Willander & Biraldi, 2010; and the Internal Representations Questionnaire; Roebuck & Lupyan, 2020). Their low visual/verbal thinking-style might initially suggest that people with aphantasia have thinking deficits – however in multiple studies we found this was not the case: people with aphantasia were not impaired by these differences and were were just as accurate – or better -- than controls in a number of visual and verbal tasks (e.g., colour memory, spelling, factual recall). Nonetheless, our results do raise the question of how people with aphantasia think, if it is neither strongly verbally nor visually. Importantly, we were able show that their thinking simulating the qualities of real-world objects (i.e., their thinking is iconic). Hence, contrary to received wisdom, people with aphantasia do not have a "blind mind's eye", or even a "deaf mind's ear". Instead, they have a knowing mind's eye/ear which possesses knowledge of (and even mimics) visual and auditory information, but simply does not express this as imagery.

Bio

Dr. Jools Simner is a Professor of Neuropsychology, specialising in adults and children with sensory and imagery differences. Her education and career have taken her to the Universities of Oxford, Toronto, Edinburgh and Sussex, and she currently runs the MULTISENSE and SUSSEX IMAGERY labs. Her work focusses on the psychology and neuroscience of special populations including those with aphantasia, synesthesia, misophonia, savantism, objectophilia, and sensory sensitivities. She is the Science Officer for the UK Synaesthesia Association, Director of the ERC-funded SYNTOOLKIT project, and Director of the REAM-funded Misophonia-hub. Her research has been profiled in newspaper, TV and radio reports worldwide, including by the BBC, New York Times, The Guardian, CBC, Psychology Today, Times of India, New Zealand Herald etc. Jools Simner has aphantasia.

Measuring Aphantasia and its Impact

Joel Pearson, PhD
University of New South Wales, Australia

Abstract

Here I will first talk through the different ways we measure imagery objectively and reliably, then give an overview of the impact having aphantasia has on thinking. Historically research into mental imagery and hence Aphantasia, has suffered criticism and lacked scientific traction due to a lack of objective methods of measurement and an over-reliance on questionnaires. We now have more than three different methods to measure visual imagery objectively, cheaply, and easily, without needing to rely on someone's opinion about the vividness of their imagery. I will then cover the cognitive implications of having aphantasia, how it affects short-term and life-long memory, control of thoughts, emotions, and creativity. The emerging picture is that if an activity involves mental simulation, then it is likely done differently in Aphantasia.

Bio

Joel is a National Health and Medical Research Council fellow and Prof. of Cognitive Neuroscience at the University of New South Wales, Sydney Australia. He is the founder and Director of Future Minds Lab (UNSW), a multidisciplinary agile Cognitive Neuroscience research group that does fundamental research, consults with companies, artists and designers on brain science - a world first, hands on human-centered research lab working on the Psychology and Neuroscience of innovation and entrepreneurship, the future of work, human and AI interactions, applying nudges for good, mental health of company founders, Pearson also heads up MindX a boutique company that was spun out of the lab in 2016 to apply psychology and cognitive neuroscience to the world of advertising and marketing. Joel started his career studying art and filmmaking at one of Australia's top fine arts school, Collage of Fine Arts, University of New South Wales. However, he then decided to apply his creative discovery techniques to the scientific mysteries of human consciousness and the complexities of brain. He completed his science PhD in 2 years, while fitting in several around the world trips and invited conference and university talks, alongside several publications. An internationally recognised leader in human consciousness research, Pearson's group takes an innovative, agile, first principles approach to developing new methods to measure dimensions of human experience previously thought to be immeasurable. A few examples are the group's novel methods to measure the human imagination, intuition and hallucinations, using objective, reliable, neuroscientific methods. This work spans from fundamental science to helping individuals in the clinic – translational cognitive neuroscience.

Visual Imagery, Source Monitoring and 'False Memories': Insights from Aphantasia and Hyperphantasia

Rebecca Keogh, PhD
Macquarie University, Australia

Abstract

Our ability to faithfully assess the veracity of our memories is vitally important, however sometimes the source of our memories can be confused and results in a 'false memory'. It has been posited that visual imagery plays a role in source monitoring failures, such that imagining something very vividly can result in confusion as to whether something occurred in reality or was merely imagined. Here we investigated the role imagery plays in monitoring the source of memories using a basic source monitoring task in 3 different populations with different visual imagery abilities: undergraduate students (normal imagery distribution), aphantasic individuals (participants with no visual imagery) and hyperphantasic individuals (participants with photorealistic imagery). In the source monitoring task participants were presented with either words in isolation or a word plus a picture and performed a basic categorisation task. After a 6 min break, participants completed a surprise memory test where they had to indicate whether each of the words in the categorisation task had been presented as a word only or a word plus a picture. We found evidence that aphantasic individuals were less likely to falsely remember a word being presented as a picture compared to undergraduate students. Using signal detection theory, we found that aphantasic and hyperphantasic individuals were more sensitive on this task than undergraduates and there were also differences in decision criterion for all 3 groups. The results of this experiment are discussed in relation to current theories of visual imagery and memory.

Bio

I am a Postdoctoral research fellow based at Macquarie University in Sydney, Australia. My research investigates different types of visual cognition (e.g. visual memory, visual imagery, visual attention) and abnormal vision (e.g. visual hallucinations), and how variations in neural structure and function influence these cognitive functions.

Dissociating Imagination and Reality

Nadine Dijkstra, PhD
University College London, UK

Abstract

During this talk I will discuss to what extent mental imagery relies on the same brain processes as perception and whether that overlap leads to confusion between imagination and reality. I will first present several brain imaging studies done by us and others that show which brain processes are similar during perception and imagery. After this, I will show the results of a series of psychophysical experiments we did that show that imagination and perception are intermixed at the level of subjective experience. Finally, I will present a novel model that integrates both of these observations and suggests that perceptual reality monitoring - deciding what is real and what is imagined - might partly be achieved simply by evaluating the sensory strength of a perceptual signal.

Bio

Dr. Nadine Dijkstra currently works as a senior research fellow at University College London in the United Kingdom. Prior to her current post, she completed her PhD in computational cognitive neuroscience at the Donders Institute in the Netherlands. Her work focuses on the neural overlap between mental imagery and perception and how we can dissociate between the two.

Auditory Imagery Performance in Aphantasia

Zoë Pounder, PhD
University of Westminster, UK

Abstract

Current studies investigating aphantasia have primarily focused on the visual domain and have only explored non-visual sensory experiences within self-report measures. In particular, one sensory domain that has not been explored objectively in aphantasia is that of audition. Within the current study, the performance of individuals with aphantasia who self-report an absence of auditory imagery on the Bucknell Auditory Imagery Questionnaire was examined within two auditory tasks: a musical imagery pitch task and a voice identification task. The musical imagery pitch task was adapted from the seminal auditory imagery tasks by Halpern (1988). It involved two conditions, one condition whereby participants used imagery to compare the pitch of lyrics within well- known songs and a matched perceptual tone condition. Results showed no significant difference in accuracy or response time between aphantasic and control participants in either of the two conditions. The voice identification task investigated the ability to generate internal auditory representations of different vocal identities. The results showed that individuals with aphantasia were able to summon equivalently sharp representations of the two voices, indicating that they had formed well-specified internal auditory images of the speakers' voices. Together, these results suggest that despite self-reporting a lack of auditory imagery, there is no evidence to suggest that the performance exhibited by individuals with aphantasia differs to individuals with typical imagery.

Bio

Zoë has undertaken a PhD in aphantasia at the University of Westminster, UK, where she explored the nature of aphantasia in visual and non-visual domains, using objective measures and matched samples. From this work, Zoë is particularly interested in the variation of auditory (sound) imagery experiences and how we may represent this information in our mind.

Aphantasia and its relationship to the neurobiology of language, inner speech, and consciousness

Jeremy Skipper, PhD
University College London, UK

Abstract

A mostly forgotten theory of consciousness proposed by Wilder Penfield in the 1950s might help explain the relationship among language, inner speech, and mental imagery. He electrically stimulated the exposed brain of awake patients undergoing surgery for epilepsy. Surprisingly, patients had very detailed multisensory, motor, and emotional experiences that they could not normally access. Penfield suggested that these memories are stored to guide behaviour through comparison. If they were accessible, our conscious perceptual experience would be overwhelmed, and we would be incapacitated to act. More recent neurobiological research suggests a similar model applies to language comprehension. That is, when we hear words and sentences, they unconsciously activate associated multisensory, motor, and emotional memories. These guide our linguistic understanding, necessary because speech is inherently ambiguous and conveys only surface level meaning. Language comprehension would be impossible if our conscious 'reality' was overrun by the re-experience of those memories. Individual differences in the flexibility or entrenchment of the underlying neurobiological connections between brain regions involved in word representations, associated autobiographical memories, and their selection to guide understanding might help explain the human continuum of mental imagery. That is, relative differences in connection weights might lead to individuals who experience less (aphants), more (hyperphants), and aberrations of imagery (schizophrenics) during language and inner speech. Psychedelic drugs produce neuroplasticity in the underlying neural systems described and can be used to alter these weightings. More generally, aphantasia by this model is closer to the end of the continuum of human imagery that is evolutionarily adaptive.

Bio

After living nomadically in a car for years, Jeremy I Skipper got a PhD and became an associate professor at University College London. After another bout of living nomadically on a narrowboat, his current research uses neuroimaging and psychedelics to examine the relationship between the neurobiology of language, inner speech, and consciousness. With his abundant spare time, he will be writing a popular science book about all the above.

Insights from a Global Community of Aphantasics

Tom Ebeyer, Founder of Aphantasia Network
Aphantasia Network, Canada

Abstract

Aphantasia is more than just an interesting research subject; it's a unique human experience that can speak to our identity and impact our well-being. In this talk Tom will share some insights from the global community at Aphantasia Network, and discuss some of the big priorities for our community going forward.

Bio

Tom Ebeyer is a social entrepreneur and founder of the Aphantasia Network. Tom was among the first 21 reported cases of "congenital aphantasia" mentioned in Zeman's original paper. His story has been featured in the New York Times, the CBC and BBC Radio. His unique vision is helping shape the global conversation around the power of image-free thinking.

Are Non-Visual Visionary Experiences Possible? Psychedelics & Aphantasia

David Luke, PhD
University of Greenwich, UK

Abstract

Research into the nature of consciousness and the development of treatments for mental health conditions through the use of psychedelic substances is currently receiving a renaissance of interest within academia. However, while psychedelics are known to induce intense, colourful, florid and explosive visual fireworks (with both eyes open and closed) for most people, very little research has considered how these powerful consciousness changing substances are experienced by people with aphantasia. This paper will explore the nature of psychedelic experiences among aphantasics by drawing on the limited range of cases studies, experimental data and survey reports that exist, mostly collected by our laboratory, and consider the implications of these findings for various avenues of consciousness research and for people with aphantasia

Delusions of the mind's eye: Pseudo-hallucinations and the link to mental imagery ability

Varg Thore Königsmark
Otto von Guericke University Magdeburg, Germany

Abstract

Mental imagery is one of the most ubiquitous, yet hard to grasp, capacities of the mind. The fact that natural abilities to visualize span a wide spectrum, ranging from aphantasia to hyperphantasia, has re-attracted the question of the origins of such extreme variability. One fruitful approach to this question is the interplay that these variabilities might show in a wider set of cognitive functions and perception. Clinical reports as well as behavioral studies suggest that enhanced imagery abilities are related to higher sensitivity of experiencing anomalous percepts, including visual hallucinations. Using an online visual flicker experiment, which we termed Ganzflicker, we investigated whether people with varying imagery abilities show (1) distinct probabilities of seeing flicker-induced hallucinations and (2) experience those on different levels of complexity, ranging from moving forms and colors to real-world objects and scenes. Our results indicate that imagers show a higher probability of reporting hallucinatory experiences while also seeing more complex objects, such as faces or entire landscapes. On the other hand, aphantasics show a clearly reduced probability of hallucinatory events which can be interpreted as a natural buffer against anomalous percepts. Future research should focus on understanding the mechanisms that govern our reported differences as well as investigate whether aphantasia research bears also on understanding the origins of clinical hallucinations.

Bio

I'm Varg, a doctoral researcher in cognitive neuroscience at the Otto-von-Guericke University Magdeburg, Germany. I'm interested in our ability to generate mental images and how individual differences of this ability impact the way we perceive and enact our sensory environment. I'm also a passionate runner.

Aphantasia and Hypnosis: Can you Hypnotise if they can't Visualise?

Paulina Trevena
University of Glasgow, UK

Abstract

'Aphantasia and hypnosis: (How) can you hypnotise if they can't visualise?' is an independent study led by Dr Paulina Trevena. It is based on a case study of 24 qualified hypnotherapists who have aphantasia or poor visual imagery and aims to address two research questions:

• How does having aphantasia impact on hypnotherapists' experiences both as hypnotic subject and as hypnotherapy practitioner?

• How can we adapt hypnosis techniques and language for people with poor visual imagery to facilitate hypnotherapy?

Imagination and mental imagery play a key role in hypnotherapy and many hypnosis techniques are heavily based on guided visualisation. Consequently, some techniques and language commonly used in hypnosis may be difficult for people with aphantasia. This can be an issue for both aphantasic clients seeking hypnotherapy and hypnotherapists working with such clients. The aim of this experimental study is to explore the links between aphantasia and hypnosis and develop best practice for working with people who are poor visualisers.

This experimental qualitative study consists of two stages. In Stage 1 we carry out focus group discussions to explore the experiences of aphantasic hypnotherapists with undergoing and carrying out hypnosis. Stage 2 builds on the results from Stage 1 and is methodological – in collaboration with world-renowned hypnotherapist Mr. Freddy Jacquin, we will run experiments to test how selected hypnosis techniques can be best adjusted for working with aphantasics.

In her talk, Dr Trevena will present some preliminary findings from the study, which was launched in September 2021.

Bio

Dr Paulina Trevena is a social scientist and researcher at the University of Glasgow, United Kingdom. Paulina is also a certified hypnotherapist who has aphantasia. Paulina will soon be bringing her passion for research, personal development and healing together in her educational and well-being brand 'No Woo Woo Hypnosis.'

Sensory Imagery and Sensory Sensitivity: Insights From Aphantasia

Carla Dance, PhD
University of Sussex, UK

Abstract

Visual imagery is the ability to build a mental picture in the mind's eye. Being able to form mental images is an essential part of life for many people, but this capability varies from person to person. For some, visual imagery is exceptionally strong and nearly as vivid as real-life perception, whereas for others it is virtually or completely absent, a condition known as aphantasia. As well as differing in how sensory information is imaged, people also vary in how sensory information makes them feel. Some people have a comfortable tolerance for incoming sensory stimuli from the outside world, while others have sensory sensitivities (i.e., under- or over-responsiveness to sounds, smells, tastes etc.). This talk will present findings from a recent study which examined – for the very first time – the relationship between mental imagery and sensory sensitivity. We will show that imagery vividness predicts sensory sensitivity: people with aphantasia not only report weaknesses in imagery across multiple senses (rather than simply vision), but they also experience lower sensory sensitivities (in questionnaire and behavioural paradigms). This association between imagery and sensitivity was also evident in the general population. I will discuss our findings in relation to the broader mental imagery, aphantasia, and sensory sensitivity literature, and propose that aphantasia (weakness in visual imagery) may be more accurately defined as a subtype of a broader imagery condition we name dysikonesia, in which weak or absent imagery occurs across multiple senses.

Bio

I conduct research into aphantasia and mental imagery as a doctoral researcher at the University of Sussex. My research examines how aphantasia influences numerous sensory, perceptual, and cognitive processes, including sensory sensitivity, face perception, and worry/catastrophising, and also how aphantasia intersects with other neurodevelopmental traits such as synaesthesia and autism.

Visual Mental Imagery and Learning Strategies: Does Vividness Matter?

Jenel Cavazos
The University of Oklahoma, USA

Abstract

Many studies have focused on the role of visualization, or mental imagery, in learning. However, most studies have treated imagery as a manipulated variable, typically by employing a pretest/posttest design with students assigned to visualization/no visualization conditions. It is only recently that research has begun to examine mental imagery as an individual difference variable that exists along a continuum, ranging from an inability to voluntarily generate mental images (aphantasia) to extremely vivid visualization (hyperphantasia). This research is so new, in fact, that many individuals with aphantasia and hyperphantasia have no awareness that they are unique.

Because of the established association between mental imagery and learning, it is especially interesting that the ability to visualize has not been linked to differences in intelligence and academic performance (i.e., GPA, ACT/SAT, IQ scores). It is likely that this lack of difference is due to the use of compensation strategies rather than an actual null effect, but it is unknown exactly what these strategies may be.

To investigate studying and learning strategies in those with varying levels of mental imagery, participants at a large midwestern university were given a questionnaire including a variety of measures to assess visual imagery, study behaviors, and approaches to studying and learning. Vividness of mental imagery predicted the use of a wider variety of study behaviors, deeper learning strategies, strategic studying (e.g., better use of time and resources), higher self-efficacy, and better semantic and episodic memory. Explanations for these trends and areas of future research will be discussed.

Bio

Dr. Jenel Cavazos is an Associate Professor of Psychology at the University of Oklahoma. As the Introductory Psychology Program Coordinator, she teaches an average of 1500 students per year, maintains the program curriculum, and conducts a teaching mentor program. Her research interests include the scholarship of teaching and learning and the impact of mental imagery on study habits and memory.

Drawing as a Window into Variations of Imagery

Wilma Bainbridge
University of Chicago, USA

Abstract

Those with aphantasia report a surprising combination of abilities—while they are able to see and recognize familiar images just fine, they have difficulty conjuring an image from memory when they aren't seeing it. This suggests a potential underlying difference in how their memories are represented in the brain. However, until now, we have not had methods to pull out and quantify what is actually in that visual memory. Here, I present a large-scale study of aphantasia using drawing to understand what is in one's visual memory for an image. Sixty-one aphantasics and matched controls saw photographs of scenes, and then were asked to draw them from memory. They also copied the images during viewing, allowing us to see how memory drawings differ from general drawing ability. To objectively analyze these drawings, we then crowd-sourced scoring of the drawings with 2,795 online scorers who judged the drawings for object details, spatial details, and false memories. We found that aphantasic drawings contained less detail and color, and more text, showing a reliance on verbal strategies. Interestingly, aphantasic individuals' memories were just as spatially accurate as those of controls, and they showed significantly fewer false memories. These results show the first characterization of how the content of aphantasic memories may differ from those with typical imagery. These also reveal the different types of memory—visual, spatial, and verbal—that exist across people.

Bio

Wilma A. Bainbridge joined the University of Chicago faculty in January 2020 as an Assistant Professor in the Department of Psychology. She received her B.A. in Cognitive Science from Yale University, studying both visual neuroscience and human-robot interaction. After a year-long research internship on robotics at the University of Tokyo, she completed her Ph.D in Brain & Cognitive Sciences at the Massachusetts Institute of Technology, studying vision and memory. She then completed postdoctoral training at the National Institute of Mental Health before coming to the University of Chicago.

Art-Making and Imagery Experience

Matthew MacKisack
University of Exeter, UK

Abstract

It may be hard to believe that Glen Kleane, the Disney animator who drew characters such as the Little Mermaid, has aphantasia. How can Keane draw a picture of Ariel, we might wonder, but not be able to 'picture' her? This talk, based on our multi-disciplinary study of artists with 'extreme imagination', suggests how. Aphantasic artists, we have found, tend to compose their work 'externally', by manipulating material, rather than within their mind's eye, as artists with imagery can do. Rather than starting with a blank surface, aphantasic artists make rough marks or employ pre-existing images which they can then alter. Instead of knowing what the work will look like before they make it, aphantasic artists will recognise what they want - but couldn't 'bring to mind' - in those marks or the object as they make it. Just as there is no correct way to think, there is no single, 'right' way to create art: a visual artist need not be able to visualise; aphantasia need not be a barrier to creative activity.

Bio

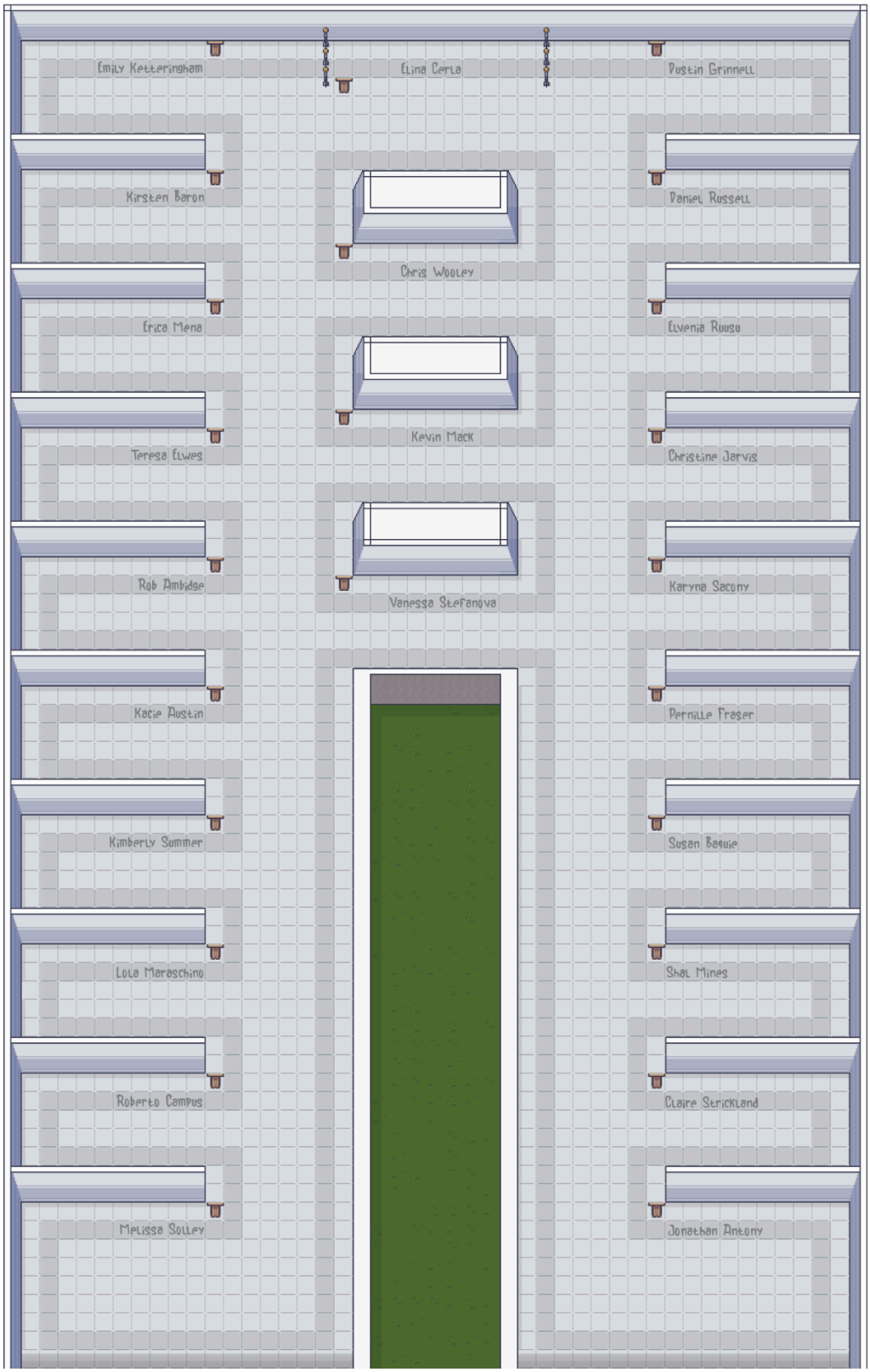
Matthew MacKisack is a cultural historian interested in the relationships between modernity, artistic practice, and the mind. He is a Guest Research Fellow at China Academy of Art, Hangzhou and Honorary Associate Research Fellow at the University of Exeter Medical School. He co-curated the exhibition Extreme Imagination: Inside the Mind's Eye, which opened in Glasgow in 2019.

IX. Appendix

A. Virtual Venue Maps

Main Hall

Exhibition Map



B. Artist Bios

Kevin Mack

Kevin Mack is a pioneer of immersive art, computer graphics and visual effects. He received the Academy Award for Best Visual Effects for his work on WHAT DREAMS MAY COME (1998). Mack's work is inspired by transcendent visions, nature, and technology, and is informed by neuroscience research.

Elina Cerla

Elina Cerla is a painter interested in pushing and exploring the expressive qualities of gesture, the human form and materials. Was born in London, brought up speaking English and French, gained a degree in Philosophy then a Masters in Cultural Theory, lived for 10 years in Madrid and after a short stay in Paris now works between Barcelona, London and the virtual sphere.

Chris Wooley

Chris Wooley is a photographer and educator who holds the Master Photographer and Photographic Craftsman degrees and Certified Professional Photographer status. Chris has won numerous print awards, including multiple Fuji Masterpieces, and is a recipient of the prestigious “PPA National Award” for his contributions towards the photographic industry.

Vanessa Stefanova

Art is life. I often leave places or conversations saying "I have to go paint". I like to finish one painting and one digital artwork a week and label them as completed. Whether the result reflects my best efforts or not doesn't phase me (just a bit), they reflect my moods and environment at the time the artwork was created. I've also created a series of coloring in books based on the best pieces.

Claire Strickland

Claire Strickland is a theatrical milliner based in London. After training in sculpting, design and fabrication for theatre and performance, Claire graduated from The London College of Fashion in 2007 and has been making hats and headdresses ever since. Her creations have been seen in English National Opera, Doctor Who, The Globe, Secret Cinema, various feature films and many more.

Roberto Campus

On a mission to add more traditional beauty to the chaos of the modern world, Roberto Campus creates bold, primal and adventurous fantasy-inspired illustrations in a variety of mediums. As a professional illustrator, over the last 25 years, Roberto worked on dozens of book covers, comic books, trading card games and videogame for clients such as Lucas Arts, Marvel, DC, and Penguin Books.

Dustin Grinnell

Dustin Grinnell is the author of The Genius Dilemma and Without Limits. His work has appeared in The Boston Globe, The Washington Post, New Scientist, Salon, VICE, and Writer's Digest, among many other popular and literary publications. He earned his MFA in fiction from the Solstice MFA Program of Lasell University, and his MS in physiology from Penn State. He lives in Boston, Massachusetts.

Kimberly Summer

Kimberly Summer is an independent Melbourne-based director, producer and founder. She draws heavily on her experiences of cultural and socio-economic challenges in her deeply collaborative video work with a wide range of performance artists. Through her practice, she aims to widen perspectives, foster appreciation for the arts and educate audiences.

Erica Mena

Erica Mena is a Puerto Rican poet, translator, and book artist. They hold an MFA in poetry from Brown University, an MFA in literary translation from the University of Iowa, and an M.Phil in Criticism and Culture from the University of Cambridge. They currently live in Fiskars, Finland.

Emily Ketteringham

Emily Ketteringham is a screen-printer and maker living and working in Bristol, with a studio at Centrespace in the heart of the Old City. Emily's work is about layering and precision, it is often inspired by walking, geology and rocks. The overarching theme that unites all her work is her love and exploration of colour.

Kirsten Baron

Kirsten Baron works primarily in paint, printmaking, collage, and assemblage. She was born in Hamburg, Germany, but has been living in the UK for most of her adult life. Kirsten has a BA (Hons) in Graphic Design & Illustration from the Surrey Institute of Art & Design (now UCA); is currently working on illustrations for a volume of poetry; and also teaches part-time in Alternative Provision.

Daniel Russell

Software Engineer by day and artist by night, Daniel Russell has managed to marry two passions into one with generative (or AI-guided) art. Recent advances in machine learning have paved the way for powerful AI models trained on millions upon millions of images and text gathered from the internet. Daniel creates and modifies tools that allow us to harness the power of these large language models to imagine new media.

Lola Maraschino

Residing in Nottingham UK, Lola is a multi-faceted contemporary artist. As a child, her father taught her engineering and technical design. She achieved a BA(Hons) in Screen-Based Graphics and has worked for Ikea and Chanel. Presently, Lola uses her skills to realize her dreams in traditional and digital art.

Melissa Solley

Melissa Solley is a life-long artist and creative. She expresses herself as a singer, actor, writer, and visual artist living in the Pacific Northwest. Prior to committing to her calling as a creative, Melissa worked for the State of California, specializing in forms and publications, content editing, and writing policy and procedure for nearly 9 years. Though successful, Melissa found this path did not fulfill her innate creativity and chose instead to fully embrace each of her artistic facets.

Kacie Austin

In true Darwin form Kacie lives a dual life. As a psychologist from 9 - 5 and an artist after dark, it is her love of people and their intricate, surprising, and raw stories that invigorates and inspires her. Always looking for the next memory to frame, Kacie spends her spare time creating and capturing in Australia's Top End.

Rob Ambidge

Rob is a recent photography graduate who is still finding his way in an (almost) post-pandemic world. With a firm grasp on a wide range of photographic techniques, Rob loves to learn and experiment with both analogue and digital, sometimes a mix of both. Since the birth of his daughter last year, he has slowed down to focus on her, and continuing an expansion of his graduation project when he can.

Teresa Elwes

I started as a letter designer, trained to be a forensic psychologist, worked as the director of a human rights foundation for 12 years and then became a press photographer specialising in dance. I had no idea that internal visualisation was possible until my late 30's.

Shal Mines

Shal Mines is a mixed media, sculpture and portrait artist. Driven by objects and materials that are discovered when walking around antiques fairs, charity shops, car boot sales, markets or even things left in the street. She often thinks about the life of the object, was it loved? Was it just a necessity? If it could talk, what stories would it tell? Then she begins to wonder what she could create with it.

Jonathan Antony

'The inspiration for my work derives from my design and build background, encompassing sculpture, architecture and product design. Concrete, metal, glass and ink are the 'go to' materials which underpin the majority of my work. Regardless of scale or form my fascination with how these materials interact remains a constant'.

Pernille Fraser

Pernille is based on the South East coast of England. Originally trained in textiles, Pernille initially worked in Fashion, Finance, and Teaching before moving across to establish her art practice. She is also Visual Arts Editor for Ought: The Journal of Autistic Culture. An international bi-annual publication.

Elvenia Ruusu

Elvenia Ruusu is a researching artist, visual artist, originally a dance artist. The focus of Elvenia's artistic research and expression is plant movements that are associated with dance and movements of bodily emotion in humans. In her art, Elvenia imagines herself as a plant.

Susan Baquie

Born 1944 in Melbourne, Susan lives in Queensland. Beginning with an early (incomplete) study in art teaching, she explored Art extensively until her Doctor of Visual Arts in 2013 with its focus on Janus and humour and violence in art (available online). Exhibiting now mainly online, her life includes family, reading, and writing poetry.

Karyna Sacony

Karyna Sacony was born in Montreal, and while studying at Dawson College, in their Professional Photography program (2015-2018) began exploring portraiture photo narrative, and mixed media art montage. Karyna often takes an editorial approach to her work, and believes that the emotion or feeling which an image can provoke in a viewer is more overpowering in comparison to its technical aesthetic.

Christine Jarvis

Christine Jarvis is a mixed media recycle addict who specializes in acrylics and found objects. Often she can be seen digging through piles of discards looking for just the right accent for a piece. In college, she specialized in Forensic Sculpture. Currently, she can be found working on several pieces simultaneously while plugging away at her online business

Alison Wilder

Alison Wilder is a multi-instrumentalist, composer, singer, and songwriter. Her work explores the coalescence of sound and story. Her most formative experiences include graduate studies in music theory/cognition, co-founding a music tech start-up, writing for, performing with and producing the art-rock band Voodoo Economics, and her current studio-based musical experiments as Blix Byrd

Chantal Garneau

Chantal Garneau is a meditation artist + peace activist living in the Credit River watershed in Halton Hills, ON Canada. She facilitates meditations on compassion, universal love, and the web of life and shares them through a gift economy. Personal experience with chronic pain and mental illness shape her gentle, step by step process, making it easy for you to start where you are. You are invited to practice with her at www.becomingpresent.earth