The Pygmalion Proposition

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DECLARATION

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To my supervisors, students, supporters and believers

– Thank you
CHAPTER ONE - INTRODUCTION

The world’s first mythic artist, Pygmalion, had retreated from society but was then driven to make the compelling art object ‘Galatea’. Through her creation he became an artist, perfecting and falling in love with his art, colouring it with his creativity and imagination and animating it through his fervent prayers and human longings.

Therefore the ‘Pygmalion Proposition’ is this: it is my intention to explore this ineffable need and compelling human drive to create, which has been evident among human beings throughout all time and in all cultures, from the core of our being to the outside world.

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1 Pygmalion and Galatea. ca. 1890. Oil on canvas, 35 x 27 in. (88.9 x 68.6 cm). Image copyright C. Permission to use this image has been granted by The Metropolitan Museum of Art. Image source: Art Resource, NY Gift of Louis C. Raegner, 1927 (27.200) Artist: Gerome, Jean Leon (1824-1904) Location: The Metropolitan Museum of Art, New York, NY, U.S.A.
This autoethnographic enquiry is therefore answered through my personal and professional responses, reasoning and resonances and an overview of current literature and research within the fields of human biology, psychology and the socio-cultural conditions of our world, that can enable (or hinder) creativity, the production of art and the role of ‘artist’. It therefore asks:

What are the elements and conditions that enable (or hinder) some human beings to be creative and make art? How can we develop and promote this creativity in individuals and in our society?

Figure 1 ii: Personifying ‘The Pygmalion Proposition’: That human beings have an ineffable need and compelling drive to create, which has been evident through all time and in all cultures and which emanates from the core of our being to the outside world. After a life-time’s pursuit of my own creativity and art-making, I am now also trying to ignite the creative ‘spark’ in others.

The Spark the Ignited This Research

I come to this autoethnographic research, as I have my art, having spent many years both creating and teaching (from early childhood to adult education). I now run one of the region’s (very few) private teaching studios, with my youngest student being aged 4 and my oldest, 93. My students range from raw beginners, to enthusiastic and dedicated amateurs and professional artists, each pouring their creativity and passion into all forms of artmaking, from watercolour kittens, to traditional oils or contemporary sculpture. Therefore I have experienced, both as artist and art teacher, how incredibly important such creativity and art activity is to these individuals, groups, this community and our society, while also being
painfully aware of how marginalised, poorly paid and poorly recognised the majority of our society’s artists are. Therefore artists appear to be, beyond the economic imperatives that control our contemporary society, driven to pursue this almost ineffable human activity.

But to get to this point in my life – where I am now creating my own art as a professional artist and doing the best teaching I have ever done - has been a long, tumultuous personal journey, both a relief and a return to a burning, abiding love. I not only epitomise the ebullient ‘sea-change’ and the precarious personal/professional ‘make-over’ of middle age in our unpredictable, economically-driven society, I also exemplify the unquenchable, driving, human need to create and explore the deeply personal search for meaning, fulfilment and the ineffable.

Therefore, to survive in both the economic ‘real world’ and the creative ‘art world’ I both make my own art and teach a myriad of art skills to others. I also watch my students come in the door wondering if they are able to create and wanting to fill their life with something other than work and the shallowness of shopping. They too express an almost inexplicable craving to create and want to find the means to express themselves, hoping to fill a deep well of longing with a life-enhancing activity. They want to feel ‘creative’, make art and, for some, endeavour to become ‘an artist’.

However the other, and sometimes more disconcerting, response to their artmaking is the emotion that often wells up, with wistful regrets about not having pursued their art, or recalling memories of the teachers or family members who have either inspired or crushed them. So it seems that ‘doing art’ is not just as simple as learning to draw, sculpt or paint. People are also often anxiously returning to this creative need before, during or after their professional life, with a relentless chattering internal voice that taunts: “You’re probably not going to be very good at this” and “You’re not a genius, so why are you even bothering?”

Now, having established my own teaching studio, I am able to both observe and talk with my students and network with creative colleagues (across the arts). I have found that, much to my surprise, there are many common experiences and resonances, including: the way we have been brought up on the myths of ‘creativity’ as being only accessible to those with ‘natural’ talent; the perceptions of ‘art’ as largely a recreational pursuit but outside the realities, economic imperatives and status of a ‘real’ job; being drilled at school in the ‘three R’s’ with art (and the arts) pushed to the margins of learning; the way our society perceives us as either ‘real artists’ or merely hobbyists and amateurs, based on our access and entree to
the ‘big A’ Art World; how (except with teachers in schools) this incredibly well-educated, creative, enterprising, hard-working professional group is also the most poorly paid and recognised in our society; the paradox of society both lauding and dismissing art in our culture; and how, in spite of all hurdles and discouragement, we are ‘driven’ to create, and so continue to pursue our creative side, speaking about the search for deeper meaning and the wider ‘need’ to participate in the creative and cultural process. Therefore it would seem that, while the drive may be compelling, with the path to ‘success’ hazardous and steep, the personal, professional and creative outcomes are often multi-layered and complex. It has been startling. I thought I was the only one.

Then, looking through the lens of these personal insights, wider understandings and a lifetime of experiences, one evening, just by chance, I glanced at a reproduction of Jean-Léon Gérôme’s painting, ‘Pygmalion et Galatea’. It was turned upside down, having been cast aside (...well, thrown actually...) while trying to resolve the frustration of an entirely different thesis question. And there I saw the image of Pygmalion, flawed human being and self-taught artist, reaching out to the beautiful Galatea (his creation, his idea of perfection and the embodiment of his life’s meaning) with such desperation and longing that, to me, it epitomised the singular, focused and driven passion of a working artist...and my current research question was ‘revealed’.

In the story and image of Pygmalion was the myth, metaphor and analogy. For the first time I really ‘saw’ Pygmalion as first artist of mythology, and recognised this myth as both the metaphor for ‘becoming’ an artist and the analogy of an artists’ practice. Pygmalion was no longer the misguided misogynist carving his obsession and creating a passive victim under the capricious eye of the gods. Instead, I saw a creative human being driven to undertake a uniquely human pursuit, beyond survival and logic.

The story tells how Pygmalion works obsessively, progressively falling in love with his creative object, longing for a deep connection to it and all the while praying to the Gods (and reliant on their benevolence) that his work might be so perfect that his creation could come alive. Suddenly, given this new literal and figurative viewpoint, I saw in this image not just the analogy for the sculptor’s art, but also the searing pathos and bathos of being a flawed, creative human being and an evolving ‘artist’. There, as Pygmalion reaches up, with aching

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2 Reference will be made throughout this document to the ‘little a’ and ‘big A’ ‘Art World’. This artificial designation is my endeavour to differentiate between the current professional artworld, which includes the art institutions, collectors, critics, media, art markets and so forth that support an elevated, often elite, art market and relatively small pool of artists and artworks that have reached the stratosphere of fame and fortune. The use of ‘little a’ art therefore denotes the ‘lesser’ known, unknown or un-recognised artists and art works at a local or regional level, including the local galleries, hobbyist magazines, societies or art groups, community art events, local audiences and collectors, as well as the teachers, recreational artists and occasional creators in the community etc.

3 Ed. Green Pauline Paris in the Late 19th Century Catalogue of the National Gallery, Australia, pp. 74-75, 1997
passion and creative zeal, was the mythic evidence of the biological drive and the psychological obsession, over-laid with the philosophical questions and social forces of culture, time and place, that had driven his creativity and shaped the object of his desire. And there too was the metaphor, endlessly repeated throughout history, of what it means to be flawed, to be human, to try to be creative and pursue this most irrational, fascinating, frustrating and capricious human activity.

Making this art object was compulsive and obsessive, neither guaranteeing satisfaction, perfection, nor perhaps even the happiness he sought. He just had to do it. As self-made artist, he was creating, with a desperation beyond reason, trying to bring life, warmth and colour to the inanimate object of his own imagining and making. Both the story and the image had such longing, absurdity, joy, obsession and erotic, creative agony, that it was now so very obvious - this had every element of the human condition and the creative drive, endlessly repeated across all time and all cultures.

Therefore, just as both the myths of creation and metamorphosis have the power to reflect, reveal and communicate, and artists have the power to draw on their imaginations to create something outside themselves to reveal meaning, so the topic, with its myriad of intriguing ideas (about what drives human beings to create, what we create and how we create ourselves as ‘artists’) suddenly leapt off the page. From this serendipitous spark has come this research, which, I am now satisfied, is a richer, deeper, more far-reaching and personally meaningful search and may, I hope, also have a potentially functional, fruitful outcome.

Having undergone my own personal and professional metamorphosis, from ‘ordinary human’ and teacher to ‘artist’ and art teacher, I now also have the delicate, pleasurable and sometimes worrying job of igniting (or re-igniting) the creative ‘spark’ in my students. From my own artist’s practice, I know that ‘art’ may not only be the extraordinary alchemy of inspiration, effort and materials to manifest an idea or emotion in an artwork, but that it can also be the embodiment and truest expression of ‘self’, with meaning, messages and life-long learning. On the other hand, it can also be the most intensely frustrating, impoverishing, disappointing and difficult activity and profession, subject to many criticisms and endless competitive and unsupportive hurdles. However, ‘Pygmalion-esque’, I have felt compelled to pursue it.

From my earliest memories, ‘art’ has not only been part of my persona, my activities and my search for answers to the ‘big questions’, it is increasingly pivotal to my endeavour to find deep personal and professional satisfaction, to achieve something meaningful in life and also my diffident attempt to leave something significant behind. So it is important, elemental and driven. It is my raison d’etre and may well become my memento mori. Therefore I have often
had to examine what I have encountered in my own art-journey, learned from my own artmaking and experienced in my interactions with society and the ‘art world’, that I now need to impart to my own students. I have also had to question what more I need to know about the well-spring of creativity and art, beyond just skills, materials and technique, so that this ‘ignition’ in others can best be done. Therefore, by examining this Pygmalion Proposition I have tried to answer the questions about why we, as ‘artists’ (from beginner, hobbyist, student to professional artist), are driven to be creative and how we, from an individual interacting with a teacher, to an artist interacting with the whole-of-society, can do it better.

This embodied knowing and personal experience then lead me to ask these questions:

- **What** is it that drives human beings to be creative, make art and want (against all economic and cultural odds) to become ‘an artist’?

- **Therefore** what are the elements and conditions (from the very core of our biology to the society and times we live in) that drive this need and enables us to be creative, make art and be/become ‘an artist’?

- **Then** how can (and why should) we promote and develop creativity and art in individuals and our society?

Which I have now encapsulated as:

“**What are the elements and conditions that enable (or hinder) some human beings to ‘be/become’ artists and create?”** and **“How can we develop and promote this creativity in individuals and our society?”**

I have then attempted to answer these questions through this qualitative, analytic, autoethnographic research. Having found the topics of ‘creativity’, ‘art’ and the human drive to achieve both, being vested in discrete domains within current research and literature (e.g. education, medicine, art, psychology and so on), I have chosen to gather this diverse and scattered information together to give artists, students and teachers a more three-dimensional overview of the elements and conditions, which I have experienced as being significant to creativity and artmaking at this time and in this place.

Choosing to examine these elements and conditions from the inside-out, I begin by exploring our human biology (the brain and senses), as the locus of our being, which enable us to think, move and create and which consequently influences our psychology, our disposition and our ability to create and make. Then lastly, I examine the elements and conditions that exist in the socio–cultural conditions of our world and the ‘art world’. Being aware that ‘creativity’ and ‘art’ have become largely marginalised as serious contributions in our wider society and
as core subjects within our education system, I have sought out these elements and conditions to try to discover what can enable or hinder a person’s ability to be creative and/or an artist within our education system, our contemporary society and the art world and how we can develop, enhance and promote creativity, the arts and creativity in the individual in all of these areas.

From this overview I finally, in circular fashion, argue the need for creativity and good art (and arts) education, in the hope that it might offer my students, myself, other artists and art teachers a significant, more well-rounded and encapsulated insight into this irrational, compelling human drive. In turn I also hope this might then prompt us to examine our own creativity, the drivers and importance of creativity in our lives and the need for ‘creativity’ in our education and creative excellence in our teaching.
CHAPTER TWO - METHODOLOGY

‘I never thought I would be able to do this!  
I just love every moment...’

Echoes from a former scientist, now parent and aspiring artist

Having undergone a personal and Pygmalion-esque metamorphosis, from ‘ordinary human’ to creative human and ‘artist’ I now have the delicate, pleasurable and sometimes worrying task of igniting ‘the creative spark’ in both myself and my students. But I often question what I need to know and how this can best be done. By using this myth as both metaphor for ‘being/becoming’ an artist, and Pygmalion and Galatea’s metamorphoses as an analogy for artist’s practice, this research received divine(?) intervention from the image of Jean-Léon Gérôme’s painting of ‘Pygmalion et Galatea’ causing this long search for the elements and conditions that may enable or hinder creativity and making art.

From Mythology to Methodology

Throughout history and in all cultures there has been an irresistible drive within certain human beings to create objects and ideas outside themselves and their immediate need for survival. Just as myths of creation and metamorphism have had the power to reflect, reveal and communicate, so artists have the extraordinary capacity to see things in unusual ways, the power to create ‘autonomous life’ from ‘intractable, inanimate matter’ and the ability to use their art to communicate, reflect and reveal both meaning and message.5

From my own artist’s practice, I have both known and experienced this extraordinary alchemy of inspiration, effort and materials to manifest an idea or emotion in the form of an artwork. I also know that my art is both the embodiment and truest expression of ‘self’, being both the quest and agency for creative exploration and self-development. I have experienced it as a ‘calling’ and see it as a process of life-long learning. It has offered me a work-life balance and self-discovery and has been the agent of meaning and signifier of ‘worth’.

5 Gross, Kenneth The Dream of the Moving Statue The Pennsylvania State University Press University Park Penn 2006 p. 19
The Rationale For The Research

In a recent interview with Edward De Bono⁶, exploring the nature of ignorance, knowing and the getting of wisdom, he proposed that: “Wisdom is two things: one is experience, but even more importantly it’s the perception to look at things differently, connect things up and so on.........you need a shallow PhD., where instead of going deeper and deeper you relate the subject to many other subjects, and wisdom is that. The relating of things to each other and looking at things differently so it depends both on experience and your habits of looking at experience............”. He later illustrates this further by saying: “Imagine a juggler, standing with six balls. Truth and knowledge are the balls: the juggler’s skill is wisdom”

Therefore as a human being who has ‘metamorphosed’ (Pygmalion-like) into artist and educator, this autoethnographic inquiry is my attempt to use both experience and research skills to understand and relate the elements and conditions of being creative and making art, to the everyday practicalities of becoming an artist, being more creative and my obligation to teach creativity and art well.

As suggested by De Bono, this research has therefore deliberately attempted to be an interconnected, multi-facetted and ‘shallow’ (but ultimately more comprehensive) juggling-act. It traverses diverse subjects (from the workings of the brain to the myths of genius), intersects different academic domains (from education and fine arts, to sociology and medicine) and integrates methodologies (ethnography and autobiography, literature review and personal experience in the form of an analytic authoethnography).

In an area of research where the elements and conditions of ‘creativity’ and ‘art’ are more generally analysed in segregated domains (for example, in terms of either neurology or psychology) or as discrete subjects (for example as being a matter of ‘aesthetics’ or ‘colour perception’), this research therefore attempts to ‘connect things up’, in order to give a more holistic and three-dimensional view of these elements and conditions, that can singularly or collectively enable or disable creativity and the ability to be or become an artist. All of this has been done in order to find the relationship, interconnection and commonalities that might help me –and hopefully others – look at creativity, art and teaching both differently, more comprehensively and more creatively.

Then, in the hope of gaining wisdom, by employing dexterity with connectivity, judgement with insight, and the intimate sensitivities of personal experience juxtaposed with other’s experience and research, I have chosen to apply the diversity and flexibility enabled by autoethnography, as my research methodology. I have also added an ‘analytic’ element by

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supporting the first-person narrative with current literature and research to avoid this becoming a self-indulgent autobiography and to also enable me to analyse the research, experiences and voice of ‘others’ more comprehensively.

Over the last twenty years, with acknowledgement of the subjective, experiential qualities of research in the humanities and social science, and with the exploration of ambiguity and the nature of generalised knowledge in postmodern theory, ‘autoethnography’ has become an innovative genre in qualitative research and writing. Such writing allows for both the writer’s immersion in the field and visibility in the text. It also allows for subjective exploration of values, feelings, beliefs and the subtle insider-knowledge gained from personal experience, ‘knowing’ the subject matter and being part of the group studied. Such exploratory writing therefore draws on personal insight to inform broader social understanding and can become the intersection between identity, emotion, embodied knowing and lived experience that can help connect the personal to the cultural. It is a means of extrapolating intimate ‘real life’ experience and insider interpretation to reveal broader social structures and processes, therefore enabling scholarly understanding.

As already stated, this research therefore examines: What are the elements and conditions that enable (or hinder) some human beings to ‘be/become’ artists and create, and how can we develop and promote this creativity in individuals and our society?

The question has been born from, and prompted by my lived experience, being a direct reflection of my personal journey toward ‘becoming’ an artist, my experience of both art and teaching, my endeavour to teach art (well) to my students and my daily wrangling within the complexities and survival both in the world and the ‘art world’. It therefore establishes the research as autoethnographic, as I try to make sense of these complex phenomena as they play out in my personal world, professional life, social world and the ‘art world’.

Rather than traditional positivist research, with an invisible objective observer, this autoethnographic research attempts to straddle the role of observer and participant with full acknowledgement of the perceived ‘contaminants’ of drawing from one’s experience, the use of rhetoric, the lack of empiricism and the personal interpretation, subjectivity and prejudices born of personal experience. However, such means and validation of ‘knowing’ also draws from postmodernist theory which ‘distrusts abstract explanation and holds that

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research can never do more than describe, with all descriptions equally valid....’ and that ‘any researcher can do no more than describe his or her personal experiences’.

Therefore this inquiry incorporates such accepted autoethnographic elements as: personal introspection and reflective recount of experience; dialogue with and including the ‘voice’ of others; subjective experience; rhetoric and subjective language to construct meaning, gain insight, develop argument and create values; exposure of self as a visible and engaged spectator and personally engaged participant; and multiple focus and layers of writing style, from the personal, evocative and subjective to the ‘analytic’ and ‘academic’.

From the ‘analytic’ elements provided by the literature review, this research then draws on the inspiration and information I have gathered from authors who have also wondered what drives the creative urge in human beings and who then ponder how we can best harness and foster creativity toward being more fulfilled human beings in a better world. Then, from my intuition affirmed by their experiences, research, writings and wisdom, this has allowed me to argue that fostering such creativity might also lead us to become more fulfilled human beings with a more sustainable, positive future and it also prompts further questions, for future research, into the need for human creativity, quality education and creative teaching.

**The Terminology**

For the purposes of this research the terms used throughout, that might otherwise be subject to divergent interpretation, are defined here as their meaning is intended by the author

**Art** – as I am addressing the drive to create and make art across all time and cultures I am also aware of debates regarding the notion of ‘art’, as referenced and defined by Western culture, but largely unknown to ancient or primitive cultures, art being so deeply embedded in ‘life’. However for the purposes of this research my use of the term ‘art’ will refer to all manner of artefacts, creative processes, materials, aesthetic effects, decorations, skills and so forth, without direct or implied reference to their effects or evaluation.

**Artmaking; artwork; autoethnography/autoethnographic** – for the purposes of this research, having no prescriptive spelling precedents that I have been able to verify, these terms will be spelled as single words throughout the text

**Art World** – this text makes an artificial distinction between ‘big A’ and ‘little a’ art which are both incorporated within, and related to, the broader term ‘Art World’. The definition of the

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9 Harris, J Art History Routledge Oxon, 2006 p 20
term ‘Art World’ evolved in the twentieth century to denote all visual arts production, commercial exchange, exhibition, consumption and critical interpretation in its entirety, distinctiveness and interconnectedness. It describes these practices, forms and artists as being both diverse and global and also includes the agents and institutions making up the contemporary economic art market. However, as Western plurality, complexity, ideologies, usage and contradictions of the terms overlap, create hierarchies and exclusions, often in spite of the pluralism of post-modern thought, language and ideology, the use of ‘big A’ and ‘little a’ has been an invented terminology and a pragmatic decision. For the purposes of this research it has been necessary to draw a more nuanced distinction between the diverse aspirations, promotion, pursuits, opportunities, markets and institutions within the ‘art world’. I therefore refer to the creativity and practice of ‘art’, where it is a creative pursuit for its own sake (which may have personal, local or regional significance, profile and marketing) by referring to it as ‘little a’ art. This is in order to distinguish it from the broader, global, institutional, commercial and/or exhibition circuits that would be exemplified by museums, biennales, galleries, magazines and the art market, which I denote as ‘big A’ art. This is done as an attempt to clarify meaning, to avoid such historic, pejorative terminologies as ‘high and ‘low’ art and also to draw the dichotomous distinction between the elite market-driven art of capitalist societies and the more modest and everyday inspirations, aspirations and activities of the majority of people making and creating in the community.

**Being and becoming** – having read diverse philosophies (from Plato and Aristotle, to Nietzsche and Deleuze) on the nature of ‘being’, ‘to be’ and ‘becoming’ I have chosen the dictionary definition of ‘being’ as ‘existing, surviving and being present, and ‘becoming’ as turning into, developing, converting or growing into’.

**Creativity** – Acknowledged in Routledge’s Art History as ‘One of the most complex and important ideas in art history’, being ‘more often implied than explained’ will be a term that is frequently used and is intended to encompass the meaning given to it by Ken Robinson, in his book ‘The Element’, that is: ‘Creativity is a step beyond imagination because it requires that you actually do something rather than lie around thinking about it. It’s a very practical process of trying to make something original. It may be a song, a theory, a dress, a short story, a boat, or a new sauce for your spaghetti. Regardless, some common features pertain.” Whereupon he further elaborates that it is: a process; it generates new ideas, possibilities and options; it is work that always involves using media of some sort to

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10 Harris, J Art History Routledge Oxon, 2006 p 25
12 Harris, Jonathan Art History, Routledge London, 2006
14 Robinson, Ken *The Element* – How finding your passion changes everything Allen Lane / Penguin Books Camberwell Victoria 2009 p.71
develop ideas; it often taps into various talents to make something original; that it is enjoyed by the creative people who participate in it; that it involves a diversity of media, intelligence and ways of thinking; and that it is important to develop the practical skills involved in the creative process and production.

The Autoethnographic Methodology

As an increasingly popular form of qualitative research over the last 15 to 20 years, autoethnography has encompassed many forms of research, including: autobiographic ethnography; personal ethnography; auto-observation, auto-anthropology; reflexive autoethnography; evocative narrative; evocative ethnology; analytic auto-ethnography; self-narrative; autobiographical ethnology; personal sociology; realist ethnography; ethnographic memoir; post-modern ethnography; participatory action research; critical autobiography; or autoanthropology; among many other terms.

Having originated from traditional sociological research, and particularly experimented with at the University of Chicago since World War I (exhorting students to explore sociology in terms of local, personal and self-identified research), all of these terms generally describe a more recent method and new form of qualitative research that has largely evolved from Post Modern philosophy and critical theory. With the propositions of such prominent philosophers as Derrida and Foucault questioning the rhetoric of science and altering how we previously understood the connections between author, readers, text and meaning (or in this case, artist, medium and audience) there is now in research, broader interpretative spaces, multiple perspectives and meaning and the use of plural voice. Knowledge that was local, feminine, marginalised or critical against universal claims was now able to be regarded as legitimate and could provide insight into the particular, the unique and the marginalised with claims to legitimacy, validity and importance. Such writings and subject matter within the arts could now address issues such as race, disability, sexuality and the concrete experiences of their authors and artists’ personal lives and experience.

This then opened up the possibilities for more experimental, autobiographical and complex texts that were (and still are) often belittled as unscholarly and unscientific. Such debate

16 Bochner, Arthur, P. Criteria Against Ourselves Qualitative Inquiry, Volume 6 Number 2, 2000 pp266-272 Downloaded from http://sagepub.com at University of Newcastle on May 6th, 2010 -05-05
17 Anderson, Leon ‘Analytic Autoethnography’ Ohio University August 2006 Electronic download from http://jce.sagepub.com at University of Newcastle on April 12, 2010p375
19 Bochner, Arthur, P. Criteria Against Ourselves Qualitative Inquiry, Volume 6 Number 2, 2000 pp266-272 Downloaded from http://sagepub.com at University of Newcastle on May 6th, 2010-05-05

perceived a lack of scientific rigour, with, among many perceived flaws, criticism of there being description and no analysis, generalisations, being unrepresentative, mundane, trivial or self-conscious20. Autoethnography challenged the conventions of methodology, academic writing and approach. Research, which traditionally required unbiased objectivity and the imperceptible presence of the researcher, was now subject to question and experimentation with a multiplicity of ‘voice’, writing style, reflexivity and methodology.

Such contemporary debate posited that researcher invisibility and scientific objectivity was a nearly impossible task, because numbers, analysis and clinical rhetoric could also be subject to interpretative bias, dominant values and social constructs and that, ultimately, the researcher was never entirely objective nor removed from context or the group. Therefore these arguments acknowledged the inextricable connections and interactions ignited by a researcher’s presence, due to their effect on, or being a member of the group. They also argued the importance of context, the form of the enquiry and the knowledge, identity and experience that is inevitably brought to all of these by the researcher. These debates and forms of research therefore recognised the dynamics and complexities of researching people and their lives. They explored and authenticated the many ways of ‘knowing’, as well as the many valid and diverse ways ethnography could be studied, experienced, interpreted and reported. Autoethnography (being: auto(self) ethnos(culture) and graphy (writing)21) now had such diversity within the fields of sociology and the humanities that the common thread now became its connecting of the personal to the social and cultural, in a plethora of different ways.

Personal experience was now front-and-centre, exposing the personal to reveal social and cultural relevance and this was also able to be expressed through writings, performances, images, poetry and diverse, multi-facettted, multi-layered forms. Real issues, ordinary lives and everyday people, known to and often including the researcher, were now described with intimate, empathetic knowing through a myriad of literary styles and this now also opened up a range of research areas, theories, strategies and reportage.

These new forms of research and writings demonstrated that traditional academic enquiry was neither dominant nor diminished by such diversity and that knowledge could be gained, merged and shared in multiple ways. Critical theory and scientific enquiry now had a range of strategies and was no longer constrained by forms of social control, marginalisation or

deviations from the canon of ‘academic and scientific research’. Such research could now explore what constitutes ‘knowing’ and could also include such things as personal experience, subjectivity, group membership, empathy, diverse and dynamic process, autobiographical content and the female view, and they could also address the power imbalance and singular (often privileged, male-oriented and competitive) normative goals of traditional positivist methodology. Such emancipation from long-held traditions was not intended to extinguish rigour, rationality or authenticity but to introduce unique, subjective, evocative and intimate ways of understanding the social world and allow authors to express their findings and understandings in more personalised styles, drawing on their experience and linking embodied knowing to cultural phenomena.

Such research strategies have become more inclusive, although ‘proof’ and ‘truth’ often continue to be subject to on-going academic debate. However, by eschewing assumptions of ‘universal’ truth, this methodology has allowed for more personal, evocative, subtle, complex and meaningful understandings of the social world. As with other autoethnographic research, it proclaims that the subject matter, knowledge and experience of the researcher is not only a significant and authentic contribution, but that it is knowing and it does matter. Therefore this research also combines multiple literary genres, interdisciplinary scope and structure and seeks ‘other voices’ in a bid to reveal a wider view and more personal insight into this topic. Such research is described by Leon Anderson as ‘analytic’ autoethnography in a ‘realist’ tradition, placing the researcher as a full, deeply identified and visible member of the group they are researching, as well as being focussed on improving theoretical understandings of the broader social phenomena.

Anderson outlines this more ‘analytic’ form of inquiry as having five key features:

- The researcher is a member and participant of the group and setting they are studying
- There is analytic reflexivity which expresses the researcher’s awareness of the interaction between themselves, their informants and the context
- There is high visibility of the researcher within the text, indicated by recounting one’s own experiences and thoughts (showing an awareness of personal opinions, values and constructed meaning) and not shying away from difficult issues, including subjective experience and narrative in a complex, fluid social world

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23 Sarah Wall An Autoethnography on Learning about Autoethnography. International Journal of Quantitative Methods 5(2) June 2006 Downloaded from http://sagepub.com at University of Newcastle on April 12, 2010-05-05
24 Anderson, Leon  Analytic Autoethnography’ Ohio University Journal of Contemporary Ethnography Vol 35. No 4 August 2006 Electronic download from http://jce.sagepub.com at University of Newcastle on April 12, 2010
25 An Autoethnography on Learning about Autoethnography Sarah Wall. International Journal of Quantitative Methods 5(2) June 2006 Downloaded from http://sagepub.com at University of Newcastle on April 12, 2010-05-05
26 Ibid
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- Being alert to, and maintaining a balance, between, self-absorption and detachment in order to understand the complex social world of which the researcher is a part
- Having appropriate analysis and not just documenting personal experience or simply evoking reader response, with a focus on improving the theoretical understandings of the broader social phenomena. This could be done in combination by using: empirical evidence; refining and emphasising understandings of the social processes being studied; referencing personal experience and the wider world to reveal social structures and processes; proposing debatable conclusions; and/or contributing refinements, elaborations, propositions and further research to current understandings.

The Methodological Elements And The Form Of This Inquiry

As an analytic autoethnographic researcher I will draw on multiple ways of knowing. Beginning with my personal experience and pointing to the visible evidence of my creative output and professional expertise, I will also include throughout the text the voice of ‘other’ (denoted as ‘echoes of’, which are cited at the beginning of each chapter), through the recollected anecdotes and echoed experiences, insights and observations of my students and colleagues, the affirmation gained from current research and literature, as well as recounting the life-long practice and events accrued throughout a professional career and personal creative journey.

In terms of the methodological elements, as outlined above:

- I am deeply identified and visible within the group called ‘artists’ and ‘teachers’ and I also endeavour to remain transparent and open within the limitations of the research and methodology
- I have drawn on my own experience of being creative, an artist, a teacher and an art colleague, to both reflect on and express such intimate personal and professional knowing. As a keen observer of self, art, students and other artists, I have also used a mix of self-narrative and the observations, ‘voice’ and anecdotal evidence of others.

27 Evidenced throughout this document by: the supportive exhibition for this thesis; the additional photographs from my teaching; and images from my own artist’s practice; to give some insight into my creative pursuits, abilities, art making and art teaching, to directly link these to my personal drive, experience, embodied knowing and the findings of this research.

28 These insights are dispersed throughout the text as bracketed ‘echoes’ of other’s voices to reflect conversations and writings. Although they are a true reflection of actual conversations, quotes, emails, enquiries, surveys and anecdotes from students and colleagues from my teaching studio and have been collected, remembered or written down over years of teaching, they are only vaguely identified (for the purposes of both asserting their authenticity and protecting their privacy) and have no direct referencing or attribution as they are not direct/verbatim quotes (having been paraphrased and therefore written in my voice). Some also represent a common or collective experience and therefore are the distillation of several voices being coalesced to encapsulate a single and oft-repeated feeling or experience.
I have included multiple forms of data through the writing genres, layered text and diverse images.

I have applied reflexivity as evidenced by: personal and professional insights; the production, outcomes, exhibition and images of my own artworks; the inclusion of other images, interposed within the text, in order to ‘illustrate’ a point, tell a story, support arguments or give further insight into this unique human experience and phenomena...

which sometimes both provides and requires ‘data’ beyond words.

The Organisation Of The research

This research begins with the question: What are the elements and conditions that enable (or hinder) some human beings to 'be/become' artists and to create.

And then asks: how can we best develop and promote this creativity in individuals and our society?

This research therefore begins with the question:

What are the elements and conditions that enable (or hinder) some human beings to 'be/become' artists and to create?

Then it moves from human biology to psychology and outward into the socio-cultural world, until it finally asks (in an attempt to imagine how the world could be different):

How can we best develop and promote creativity in individuals and our society?
Described by Denscombe\(^29\) as a ‘humanistic style of research’ this form of research has therefore enabled me to tap into embodied knowing and personal experience to seek answers from the inside-out. Beginning with the most fundamental elements and conditions of our biology (from the brain as the locus of all human activity to the senses as its receptors), then moves to our human psychology (which is the interface between the internal and external world) and finally to the social and the cultural conditions that can either enable or disable our creativity and ability make art, with this search leading from one to the other, in an ever-widening circle of discovery (like ripples in a pond – as graphically illustrated here) using personal experience as the catalyst, while repeating these questions within each domain.

The Elements and Conditions of Creativity

![Diagram of The Elements and Conditions of Creativity](image)

Figure 3: The Elements and Conditions of Creativity

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As illustrated above, the chapters therefore proceed outward, from biology, to psychology, to the world, with the structure of each chapter repeated by: opening with a personal insight ('Resonance'), then inclusion of the ‘analytic’ literature research ('Reasoning') and closing with reflexive analysis ('Reflection').

Therefore these layer personal experiences and ‘other voices’30, with current research, literature review, and finally analysis and response (being the received and current ‘truth’, the norms, values, politics, power, knowledge and historic legacies). Then as additional layers of visibility and human agency, the quotes, images from teaching and samples of my own art work are included to demonstrate ‘knowing’, ‘enactment’ and ‘evidence’. Ultimately, all layers are intended to articulate, from my experience and point of view, how things are, could be, or could be different, as such intertwining is intended to move the research outside mere representation, to offer multiple viewpoints and bring both personal experience and the ‘real world’ into play.

To ensure this analytic autoethnographic research has a more systematic approach and ‘analytic’ interpretation than other forms of autoethnography (i.e. it does not entirely consist of opinion and self-absorbed narrative) I have emulated Spry31, with her change of font and the discursive dissection of her research performance and discourse (which she denotes as ‘Being Here’ and ‘Being There’) to indicate the performative elements and scholarly analysis, by introducing into each of my chapters the headings: Resonance, Reasoning and Reflection. Intended to converge these multiple sources of evidence and link personal experience to the broader theoretical concepts, this format has been adopted in order to not only more fully answer the research question but also to both reference and reflect the messy, chaotic, multi-layered and complex ‘real world’ in a ‘provocative weave of story and theory’32

Introducing ‘Resonance’

In order to synthesise the data33 at the beginning of each chapter there is an introduction, denoted as ‘Resonance’, being a life ‘vignette’ which reflects my personal experience and places myself as visible actor, agent and group member. It describes, in the form of storytelling, the embodied knowing, lived experience and everyday encounters as artist and

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30 Being the bracketed reflections and insights throughout the text, expressing the paraphrased ‘echoes’, observations and anecdotes of students and colleagues. These are superficially identified for the purposes of both asserting their authenticity and protecting their privacy and have no direct referencing or attribution as they are not direct/verbatim quotes and have been paraphrased and therefore written in my voice.

31 Qualitative Inquiry, Volume 7 Number 6, 2001 706-732 Spry, Tami Performing Autoethnography: An Embodied Methodological Praxis Downloaded from http://sagepub.com at University of Newcastle on April 13, 2010

32 Qualitative Inquiry, Volume 7 Number 6, 2001 706-732 Spry, Tami Performing Autoethnography: An Embodied Methodological Praxis Downloaded from http://sagepub.com at University of Newcastle on April 13, 2010 p.713

teacher, that have prompted the research. Described in the first-person as a narrative truth, sometimes with emotional recall and layered text, it eschews concerns over traditional issues of reliability, subjectivity and validity, as such representations and commentary are the product of recall, impressions, conversations, resumes, diary entries, teaching notes and memos etc. and are therefore interpretative and naturalistic in approach.

**Introducing ‘Reasoning’**

Each chapter will then integrate ‘analytic’ autoethnographic data under the heading ‘Reasoning’, by including current literature and research to identify, compare and analyse the common structures and to gain an understanding of the world in order to both study others and to better understand self.

**Introducing ‘Reflection’**

Each chapter will finally conclude with autoethnographic reflexivity entitled ‘Reflection’, again being a mix of objective and subjective analysis, experience, images and summary.

**The Reasons Why I Have Chosen to Use This Methodology**

Being aware of the possible ideological challenges and criticisms provoked by this form of qualitative research (which opposes more conventional methodologies, with their academic imperatives, stylistic forms and analysis of received ideas) I have chosen autoethnographic methodology because it allows me to more intimately, uniquely and effectively ‘shape’ my research. Using this methodology I have been able to examine and integrate multiple subject areas to form an academic ‘overview’, then interleave these with layers of personal reflection, commentary, anecdote, quotes and imagery. I have also been able to show how the complexities of living as a human being, artist and teacher at this time and in this place, have not only provoked such research in the first place but may also call into question the received meanings and values of the world, ‘art world’ and education. It has also allowed a more colloquial form of writing, sometimes resembling story-telling, to enable accessibility, familiarity and ‘readability’ for my intended and anticipated ‘audience’, revealing both ‘self’ and my distinctive style and persona, as well as integrating more traditional orientations of mainstream academic writing. This has therefore enabled me to embed my personal experience, philosophies, values, thoughts and practical background, as human being, artist and teacher within the research, bringing to bear the personal and professional and linking both to the social, cultural, the theoretical and real life.
I have further chosen to pursue this research in the form of ‘analytic’ authoethnography, as it represents a more ‘conservative’ approach than other contemporary forms of auto-ethnography, offering a way to integrate formal research with the personal and narrative, balance ‘academic’ with ‘existential’ and provide a means of making sense of experience within more empirical accounts of reality. The hallmarks of presence and agency are still evident, but to be ‘analytic’ I have also tried to organise the information more systematically (rather than writing in a more narrative form) and then analyse and construct meaning from the personal, the researched and the observed.

This methodology has enabled me to include images, layer text and write in multiple ‘styles’, from the ‘academic’ to the anecdotal, to give accessibility and insight through a variety of lenses. I have been able to look underneath the formal research to reveal the ‘personal truths’ of embodied knowing and lived experience. I have attempted to both objectively analyse and subjectively respond to the cultural scripts that can sometimes impose limitations and resist change. Then by being able to write in both a formal and conversational way, I have been able to weave the ‘subjective’ into the objective in order to understand, feel and describe the subject matter. This methodology has therefore allowed me to explore a complex topic (that has had little cohesion or attention until the last few years) by developing an ever-widening circle of careful research which has helped broaden my understanding. Then I have been able to interleave this research with subjective knowing and anecdotal ‘evidence’ to make the important connections between personal and professional meaning, human complexity, ‘real life’ experience and wider social and cultural implications.

Auto-ethnographic methodology has therefore allowed me to:

- Construct meaning from my experiences (including my experience of doing this research)
- Use this research model to include both ‘self’ and ‘other’ as a source of data, by exploring and incorporating a variety of ‘voices’ and presentations, including both objective and subjective writing and creative imagery.
- Weave together the more usually disparate domains of the arts, education, medicine, psychology and sociology as they each contribute their small, but vital piece to the ‘creativity’ jigsaw.
- Consider, align and express this information in relation to both current knowledge and my personal ideology.
- Link personal experience to issues within the social groups to which I belong (as artist, teacher, female, citizen of Australia), then use this information, as an ‘insider’ (for whom
it has the deepest and most direct effect) to see the relevance and connection between
the personal and cultural, then extrapolate all these issues to the wider society.

- Apply, in a direct and practical fashion, this information to my artist's practice and
within my own teaching practice.
- Explore the complexities of creativity and the unique, exceptional and consuming
experience of 'becoming' and 'being' an artist through these creative abilities, which also
gives voice to a seldom heard perspective of artists, art teachers and students and
reveals unexpected implications for our wider society.
- Provide an insight into 'creativity', making art and 'being an artist' that I hope is both
' readable' and accessible for its intended audience, being evocative, provocative and
interesting, so that it can become a vehicle for new social parameters and new research
questions
- Affirm that my findings have wider resonance, as they have already contributed to my
personal body of knowledge, intrigued other teachers, helped my students and found
parity and resonance among my colleagues in both art and teaching.
- Make discoveries, explore arguments and propose questions that might suggest further
research toward future social action

**The Discoveries, Arguments And Questions That Arose From The Research**

Both the thesis, the exhibition, my teaching and my own artist's practice have not only
enacted the very processes this research discusses, they have also prompted discovery, debate
and generated new questions for further research.

Through analysis of these multiple view-points I speculate that, because creativity has been
an essential human trait throughout all time and in all cultures, human beings need creativity
in their lives. I therefore question such long-held beliefs as 'creativity'\(^{34}\) and 'art ability' as the
preserve of only those with 'talent' and 'genius' and assert that if a person is intelligent they
are capable, to varying degrees, given motivation and application, across many domains, of
being creative.

I then contend that, as the brain is the locus of all human thought, aspiration and the unique
human activity of 'being creative' and making art, our brains need careful consideration and
development, from the earliest age and continuing throughout our lives, through excellent
arts and creativity-centred education.

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\(^{34}\) Jonathan Art History – *The Key Concepts* Routledge, London, 2006  Definition of 'Creativity' - Variousely described as products, ideas or qualities
of the mind, being complex innovative, inspirational, visionary, meaningful Harris,
I further propose that creativity and the arts have become largely estranged from our lives with the intervention of technological diversions, busy lives, hierarchical expertise and that creativity and the arts are now also being perceived as being less academic. Therefore I propose that we need to reconnect with our creativity, art and the arts as I argue they can offer us the fullest expression of our humanity and our creative potential.

To do this I finally make the case that we need to consider all the elements and conditions outlined within this thesis, so that creativity, art and the arts can once again become important and embedded in our lives, to be enjoyed, supported and participated in, which in turn will contribute to the welfare and future of both the individual and the whole of society.

The Chapter Outlines

The research chapters move in a progression, from examination of the fundamental elements of creativity and art-making from the core of our biology, in an evolving examination outward into the world, with the social/cultural conditions of our time and place, to make the case about what drives our innate human predisposition and need to be creative, as well as arguing what individual, social and cultural benefits this brings to us as human beings.

Starting at the core of our being and working from the ‘inside-out’, chapters three and four draw on my experience as an early childhood teacher, being aware of the importance of early human development. It addresses the biological drivers of creativity and art-making, focusing on the brain as the locus of all human activity and the senses as our means of functioning, responding, surviving and striving in the world.

Chapter five then reflects on my lived experience as a human being and artist and examines the psychological elements and conditions that derive from these biological predispositions and experiences of the world, that then can either enable or disable creativity and art-making and therefore contribute (or not) to our sense of wellbeing, fulfilment and purpose. This chapter also argues that, in view of our rapidly changing world, we need to address education to enable our children to be creative and to build healthy, happy creative societies and a positive, dynamic future.

Chapter seven then finally coalesces both my experience as human being, teacher and artist and brings together the elements of biology and psychology, with the socio-cultural elements and conditions of creativity and the arts, as they are experienced in the world and the ‘art world’. It argues that, through its evolution, Western culture and the art world has now inherited myths of creativity that have shaped (and still shape) ‘art’, artists and the art world. It proposes there are also artificial hierarchies, which can skew and/or marginalise creativity and the arts in everyday life, society and education. From all of these issues, it then raises
questions as to how we can enhance creativity and art in our Australian culture, particularly through education, arguing that they are vital to our humanity, wellbeing and progress (from the individual to the whole of society) both now and into the future.

**Including Images And Making Artworks**

The exhibition works and images interleaved in each chapter have been an important part of this research. This integration of word and image uses examples from praxis (being my own art practice, experience of the ‘art world’ and my art teaching) to support the theoretical concepts, as both are explored in a parallel process, making the exhibition not only a narrative and a creative response to the theory but also the very embodiment of the findings within this thesis. By making and creating both for the exhibition and within my own artist’s practice I am enacting the very processes (from brain activity to ‘being’ and artist in the world) of which I write.

Rather than conclude the research with a more conventional fine art exhibition (although many of the works have also been in fine art exhibitions), which would only allude to the elaborate evolutionary process they have required, from neuronal activity to the complexities of being a working artist, these artworks have been deliberately used as tools, illustrative evidence and tangible ‘proof’ of my experience, observations and research discoveries and are therefore also the external evidence and verification of this Pygmalion Proposition.

By undertaking the process of artmaking, in direct relation to the subject matter, I have attempted to both generate the ‘product’ of creativity and also enact and reflect on the very processes of artmaking which are discussed within the research. Therefore, as explained in the exhibition submission, the artwork labelling and in the opening night speech of the exhibition, these artworks represent further layers of meaning within this research, as they are: at the most superficial level, an ‘illustration’ of the information; the summation and evidence of my artistic abilities, skills, experience and inspiration; they stand for and embody my innate creativity and professional artist’s practice; and finally, they are the visible proof of all the elements and conditions that are required – from brain to bravery, negotiation and presentation in the art world - for a human being to be creative, make art and be an artist.

Therefore, from the innate and learned integration of brain and senses, to the psychology of the creator (with the disposition, inspiration and tenacity required to undertake such a project) I finally, through all these works, bring together all the socio-cultural elements and conditions necessary to be an artist in the ‘art world’ (where I seek both the functional support and cultural agency that enables them to be hung and then subjects them to critique). Therefore these artworks, from both the exhibition, my teaching and from my
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The artist’s practice, are both a vehicle for the claims of the research and also offer further data, emphasis and ‘proof’, as well as helping to enliven, enrich and substantiate the propositions it puts forward.

Consequently this research then comprehensively supports and reflects the realm, spirit and signal of creativity in its multiple layers and forms. Within the flexible format of autoethnography it rejects traditional forms of presentation, with claims to generalised knowledge and analysis and presents this interdisciplinary scope and structure to provoke further questions and ultimately, to reveal to me, my students and professional colleagues, a wider view and more personal insight in order to give a more comprehensive view of this phenomena.

Such multiple layers of ‘evidence’ are also an attempt, as a human being, artist and educator, to understand, encapsulate and inform others about the complex determinants, agents and interconnections of creativity and art-making. Therefore it also includes the whispers and ‘echoes’ of ‘other voices’, being the paraphrased quotes of students, other artists and teaching colleagues35. By sprinkling the text with their reflections on the nature of art, life, creativity, education and the creative experience, their thoughts, ideas and personal journeys resonate throughout, especially as they are so shared and familiar, so frequently repeated, so long-considered and so obviously deeply-felt.

Ultimately, by the thinking, sensing, imagining and making required to both write this thesis, make the artworks, teach art, ‘be’ an artist and an art researcher, I have enacted these creative processes, produced external evidence of the internal phenomena and processes, and personified all the evolving elements and conditions that ‘creativity’ and ‘being an artist’ (and teacher) both entail and impose - which includes, in the examination of both thesis and exhibition, the eternal socio-cultural search for personal answers and professional approbation.

Therefore in answering the questions posed by this research, as well as generating both a new perspective and the questions arising from it, I see this as a unique opportunity to contribute to both the fields of art and education and have therefore written with this ‘audience’ in mind, in the hope that, with greater insight, they too may enhance these metamorphic, creative processes in others.

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35 These insights and paraphrased quotes are bracketed and dispersed before or after headings and subheadings throughout the text. Although they are not direct quotes, having been paraphrased and written in my voice (therefore not having direct referencing or attribution), they are none-the-less a true reflection of actual conversations, quotes and anecdotes from students and colleagues from my teaching studio.
The brain is organised into a complex profuse web of many branches of connecting filaments of neurons. This is what it might look like if viewed through a microscope. It is this electrical activity and neuronal interconnectedness that has enabled me to think about, plan, make and exhibit this artwork.
This chapter will metaphorically ‘get inside Pygmalion’s head’ to explore the workings of the brain, to better understand how an artist like Pygmalion not only imagined Galatea but was also able to metamorphose neuronal activity into creative thought, inert matter into an artwork and an obsessive man into a creative artist. It will therefore lay the foundation of the many elements and conditions that enable some human beings to be creative and make art, by exploring the phenomenon and complexities of the human brain. It will not only marvel at our brain’s ability to think, create and make art, but in understanding the workings and importance of the brain, it will also highlight the significance of external elements, such as environment and education, in enhancing the brain’s capacity and growth, from our earliest days into our old age, to fulfil our extraordinary creative capacity and potential.

Resonance

Until recently, research in neurobiology and neurology had only a relatively elementary insight into understandings of the brain and how it enables the facility of the senses, the functioning of the body and formation of the mind of a human being, be they ‘ordinary’ or ‘creative’. But it is now well understood that it is the brain that is the primary site of all human functions, aspirations and endeavours and that there is a part of the brain (or in some cases multiple parts of the brain) overseeing every function in our existence, from responses to pain, to sorting tax, to chatting, breathing, creating an artwork or just feeling happy. Now, having undertaken this research, I know that my brain is astounding. Not because it’s so very special in and of itself, but because it is the most profoundly complex, fascinating, dynamic, delicate organism that I own and operate...or that operates me, which even now is trying to ‘think’ of itself in those terms, gather together the words to cogently do so, and then help my fingers type them out for all to see.

My brain not only helps propel me through space, cook food, solve problems and make lists, it also sends dreams, while unconsciously operating my heart and consciously deciding which word to use and how to move my mouth to form them – or hold them back in response to social nuance and complex concepts such as ‘diplomacy’. And then, in an extraordinary display of human ability and imaginative prowess, my brain also helps me express emotion, see colour, move my hands and create artworks – from phantom image in the imagination to finished product on the wall. But, up until now, I have largely taken it

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for granted. I find its endless ‘chattering voice’ inside my head a source of irritation, its learned doubts, memory lapses and mathematical inadequacies disappointing, but then I’m suddenly astounded at the flights of fancy, humour, odd connections, insights, feelings of joy, good answers and the ability to ‘feel alive’ or enjoy a creative surge a daily miracle that often goes unacknowledged for its profundity – by myself and others. So, in an odd conundrum of both close self-examination and lack of self-awareness, my brain has obviously wanted to bring the insights of this research to other brains. Both an odd thought and an interesting proposition.

I have been a teacher for more than 30 years, teaching all ages and subject-matter, from Early Childhood to Adult Education. Over this time, after a great deal of experience, I have learned how to break information down into digestible ‘chunks’, with appropriate use of language, concepts, analogies, metaphors, examples, humour and achievable tasks, so that what I teach can be learned across any age group. I now also know how to transmit ideas and information to meet the needs, age, anxieties and abilities of the receiver or elevate the lesson by creating a challenge, provocation, intrigue or insight so that I can stimulate interest and learning in a finely nuanced balance between anxiety and understanding. And my brain has had to learn and remember all that and move me around to do it as well.

However, I think it would be fair to say that I received the most invaluable teaching/learning experiences while working in Early Childhood, because there I was able to see human beings evolve – I mean really pay attention to the minutiae of detail that is required to fulfil the role of a good teacher and oversee the development of a young life. It is an experience and understanding I wish all teachers (from Early Childhood to University) could undertake to better understand the needs of learners and teachers. I believe in so doing they would then understand the need for good brain training, an individual’s learning needs and the personal attributes that evolve from child to adult, because it was here that I realised (for the first time and in spite of my formal teacher training and bringing up my own children) how desperately important the early years of a child’s upbringing, experiences and learning are. It was all very well for such pedagogic issues to be lightly discussed in the abstract during my teacher training, but to truly recognise that everything I said, did, talked about and deliberately taught was one of many essential ‘foundation stones’ in a child’s life and ability to learn was a revelation, a weighty responsibility and a sobering thought. And one that is given a lot of lip-service within our society and education system but in actuality, is more often treated as lightweight in relation to the more serious considerations of ‘academic’ learning later in life.

This ‘truth’ then finally came home to me – with real evidence – when I had the extraordinary opportunity to be witness to an informal ‘longitudinal study’ of my own making. I had taught a small group of children aged 3 and 4 at preschool and then, by a series of moves and changes in career I re-taught many of them again at 10 years old and was startled by the fact that the things I had observed, predicted, recorded, taught, talked and written about at the time (such as difficulties, dispositions and potentials) had ‘come to pass’ over the intervening years. It was then that I really knew how much the early years, with growing bodies and fast-developing brains, really mattered and how important caring adults and good teaching are within those years. The learning did not ‘really’ start when they went to school. They were very well formed, sometimes pre-disposed and
certainly full of potential even before they got there. Nor, I know now, does our ability to learn and ‘grow’ finish with work or the retirement home.

I now know, through this research, that the brain is more ‘plastic’ and capable of growth and change throughout life than had previously been thought. So training the brain greatly matters - at every age. I therefore still frequently use the same ‘small steps’ teaching techniques, working from unknown to known, working hard to create interesting subject matter, weaving novelty in with repetitions and careful instruction with rephrasing to move my students (young and old), from the anxiety of the unknown to those “Ah Ha!” moments that are the pleasure and purpose of teaching.

Therefore I wanted to find out more about an ‘ordinary’ brain, to know what really goes on inside it, so that then I would know how it can be moved, trained and inspired to become a more creative brain. In doing so I also wanted to be able to understand what I need to know to be able to help build the connections within the brains of my students and to be able to explain its workings to them. I wanted to know how I can be the conduit whereby they could find skills, techniques and subject-matter that will enable them to learn, have confidence, experience creativity, develop imagination, hone skills and ultimately, to also find the courage to make the art of their choosing, find pleasure in what they do, have a means of unique self-expression and find a deeper well of self-discovery, fulfilment and pleasure.

Now, as I explain concepts, give instructions, pose problems, relay information and so on, I need (my brain needs) to be mindful that the brains I must reach and teach will often need to be trained or re-trained to think and see differently and persist until the ‘ah ha!’ moment arrives. So it’s important for me to keep in mind my role in actively igniting the electrical pulses that build neurons, that can then lead to thoughts, that create ideas, that trigger emotions, that help make connections, that develop concepts, improve motor skills, form the language to describe and discuss them, lay down memories, shape perceptions and develop the complex connections — often called ‘imagination’ — that all help enable creativity and the making of art.

This chapter therefore lays the foundation of my understanding by exploring the many elements and conditions that enable some human beings to be creative and make art, due to the phenomenon and complexities of the human brain. It not only marvels at our brain’s ability to think, create and make art, but in understanding the workings and importance of the brain, it also highlights the significance of such external elements as our environment and education, in enhancing the brain’s capacity and growth, from our earliest days into our old age, to fulfil our extraordinary capacity and creative potential.

37 In my studio all teachers refer to our clients – especially our infants and primary children – as ‘artists’. For them, being an artist and working in a ‘real’ art studio (where other artists work) not only elevates the experience, the rights and the responsibilities, it also creates ‘possibility’ for them as well. We find that by even using such a simple but respectful device, as naming what they are doing and “being”, giving it dignity and authority, they start to care, attend, do and think like ‘artists’ — as indicated by the first quote!

38 The word ‘create’ is derived from the Latin *creare* and was used to mean something produced or made, with links to creative myths. It is used throughout this research to denote a more general and modern notion of a capacity for conscious and/or unconscious thought that enables ability, qualities and capacity to generate something new, to be innovative, imaginative, inventive and often unique across a wide range of abilities and interests. Such capacity often has utility and novelty, however it does not necessarily infer ‘genius’, giftedness or talent as necessary or precursors to ‘being’ creative.

39 The word ‘art’ (unless specified as ‘contemporary art’, art product or philosophy etc) will be used throughout this thesis to denote the products or expressions of human creativity, whether concept, object or representation, singly or collectively, across all media, genres, historic periods and cultural groups.
‘Oh! I didn’t know I could do that!
Well...I think I’m rather pleased with myself!’

Echoes from a ‘mature-aged’ student and delighted, excited hobbyist

Reasoning
Without the brain humans cannot function. Therefore this research starts with the most fundamental, universal driver, across all time, all cultures and all humanity: the brain.

By exploring the brain as the core of our being and locus of all human activity and our creativity, this chapter examines the fundamental elements and conditions within our biology that enable (or hinder) some human beings to ‘be/become’ artists and create. It is also acknowledged here that many researchers eschew such analysis of the creative/artistic process as being a ‘mechanistic’ and ‘reductionist’ view of creativity. They have argued that it is the phenomenology of aesthetic experience that is more important than the biology or anthropologic history of cognitive processing and art. However, in an attempt to be thorough, multi-dimensional and comprehensive, this research intends to coalesce the usually more disparate domains of research into human creativity. Consequently, I will, as in any good story, ‘begin at the beginning’, arguing that before genius is bestowed or The Muse can even strike, it is the brain that is the locus of all human activity, which in turn drives our psychology, affects our lives, creates our philosophies, our societies and our cultures, which all (in complex connections, processes and progressions) then can enable or disable our creative abilities and drive to make art.

A Short History of the Human Brain
Throughout our 40,000-year ‘modern’ human history and occurring independently in all cultures throughout the world, there has been an irresistible urge within certain human beings to create objects outside themselves and their immediate need for survival. This need to pursue art as a means of expression seems an endeavour to both reflect and transcend the limitations of culture, time and all the frailties of being human.

Human beings have developed a unique front-heavy brain, with enlarged cerebral hemispheres, allowing complex interactions between images, symbols and language. This elaborate ability allowed early humans to see simulacra (e.g. seeing an animal’s head in the

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40 Onians, John Neuroarthistory Yale University Press New Haven 2007 Preface
formations of a cloud) and then have the ability to translate this into a facsimile (e.g. by transforming an animal-looking rock into the painted and chiselled resemblance of that animal). In biological terms, creativity and art, with the ability to see, internalise information, then create external images, symbols and objects, is a significant evolutionary act, even though the creation of something external and useless to the immediate needs of human survival could be variously described, in evolutionary terms, as vain, playful, parasitic or simply ‘biologically frivolous’. Art, music or dance could not extend life or enhance the hunt for food, and in comparison with the immediate usefulness of vision, language and physical prowess for survival, the capacity for creative activities was comparatively useless and, according to cognitive scientist Steven Pinker, should have vanished without trace. But the arts have been at the core of human community across time and all cultures. Therefore such creative pursuits must have had an adaptive advantage and compelling human value. Beyond the hedonistic pleasure-purpose, creative activities, with the ‘capacity to see something new that others could not’, have helped develop internal mental images and a superior way of thinking, that has not only enhanced our survival, our attractiveness, our sociability, our bonding and social networking, our intelligence, material capital and cultural capacity, but has also enhanced the very meaning and quality of our lives.

The brain tries to extract essential, reliable information from an ever-changing world and a kaleidoscope of information, some of which is vital for survival. For humans, this extraction is done in the perplexing endeavour of trying to get to the truth about the way the world really is, so the brain can then recognise, identify, categorise, process and think about the world. Artists too use their brains to recognise, identify, categorise, process and think and then they also use this information, connect this information and elaborate the ideas, meaning and images to decipher, depict or describe the world in a creative art form.

Although we can see our ancestral reflection in the abilities of primates and know there also exist aesthetic sensibilities in other species e.g. the Australian Bower Bird, it is this ability to recognise external images, connect these images with symbols, language and thought and then externally represent, use and discuss them, that are both unique and quintessential human attributes and activities. It is these complex interactions and processes that are central features of the brain and human intelligence and are among man’s greatest attainments. It has also conferred huge advantages for humans by determining our

41 Pinker, S How the Mind Works as in Journal of Consciousness Studies, 6 No. 6 – 7, 1999 p.7
42 Pinker, S in Levitin, Daniel This is Your Brain on Music – Understanding A Human Obsession Atlantic Books, London 2007 p. 249
44 Dorn, C Mind In Art – Cognitive Foundations in Art Education Lawrence and Erlbaum Associates, Mahwah, N.J. 1999 p. 121
46 Zeki, Semir Artistic Creativity and the Brain Science Journal Vol 293 6th July, 2001 p. 51
escalating evolution. This ability has created cultures, enriched human societies and contributed to humans’ creative urges and infinite creative variability across aeons of pages, stages, stories, buildings, instruments, science labs, social structures, technological advances, scores, inventions, screens and canvasses. But where did this all start?

It is estimated that humans have been on the earth for more than 100,000 years\(^7\). Over this time, with upright locomotion and dietary changes, the human brain enlarged, increasing the density and depth of folding on the cortex of the brain. This in turn changed neural networking and the development of a nervous system that could perceive, store and process vast amounts of information\(^8\). This was now a brain that could be adaptive, learn from experience and be aware of past knowledge and future possibility, beyond mere coping and survival. This evolution of neural circuitry, with its incredible computational powers\(^9\), has had invaluable adaptive value for humans. The structure of the brain now allowed for an expanded cognitive capacity with many thoughts able to be processed simultaneously, in parallel and often unconsciously. It could now process a complex, spontaneous interplay of images and insert symbolic transactions into sensory reality. It was a brain that would evolve to have the intelligence to imagine, envision and symbolise and it also gave humanity the ‘exquisite gift’\(^50\) of being able to be creative and to think about, produce and enjoy art.

There is some evidence of nascent technological and cognitive sophistication and aesthetic sensibilities in the Neanderthal periods, evidenced as far back as 300,000 years ago\(^51\) with grave goods, collection of ochres and aesthetic considerations given to tools. However, by recording the evolutionary changes in the skull and deducing what type of brain would have been necessary for the physical evidence of their existence\(^52\), archaeologists generally agree that from the time of Homo Erectus to Homo Sapiens Sapiens\(^53\), the most obvious and significant surge of artistic creativity, symbolism, cultural behaviour and language probably evolved in the western European Upper Palaeolithic period (35 to 40,000 years ago)\(^54\). Even without written records about the appearance of modern humans, the evidence that within these earliest groups of people some were outstandingly creative, lies in the sudden appearance of surprisingly sophisticated rock art and artefacts\(^55\), giant stones in precise mathematical configurations, technological advances in tools, aesthetic artefacts, and marks and symbols that enabled these creative human beings to understand, cope with, express,

\(^{49}\) Solso, R. *Ibid* p 59
\(^{50}\) Solso, op cit. p 41
\(^{51}\) Bradshaw, John L. *Human Evolution – A Neuropsychological Perspective* Psychology Press Hove U.K. 1997 p.59
\(^{54}\) Bradshaw, Op cit p 60; Humphrey, N. ‘Caves Art, Autism and the Human Mind’ p 121 Journal of Consciousness Studies, 6 No. 6 – 7, 1999
\(^{55}\) Appendix B - List of Art through the Ages as evidence of developing brain 77,000 years ago to today
recreate or record the world around them. From these advances it is evident that humans could now: imagine; remember; project; think of things that did not exist; observe; recognise beauty and try to emulate it; ponder mysteries; study nature and the ways of the world; organise into functional social groups with moral codes; record their own existence; celebrate their lives; grieve for their dead; and begin to record and shape their world. The spark of human creativity was ignited.

With the ‘modern’ human brain, humans could now see cause and effect, express symbolically and solve practical, technological and creative problems, enabling them to invent tools, create art and develop language. However, while both spoken and written language and creative expression are exclusive to our species, they are also some of the most debated and least understood functions of the human brain.

In making the link between body, mind and creative output, according to Harth: Plato thought painting and thinking to be autonomous; Descartes proposed the philosophy of a discrete mind-body split; art historians have largely described creativity in terms of incremental aesthetic; and with cultural time-lines entirely avoiding their origins, biologists mostly interpret thought and creativity as a developmental progression of neural interactions, while anthropologists consider the evidential relationship between evolution and the decorative artefacts of people’s lives. However, it is often uncomfortable (especially for the creative among us) and often tersely argued to be mechanistic and reductionist, to consider that our lofty ideas, unique thoughts, creative attributes and inspired artistic outcomes might fundamentally be driven by, and the result of, the evolutionary increments of human biology and both the universal and the individual physical processes of the brain.

Until the last twenty years the brain has generally been poorly understood, with the repeated idea, embedded by these ‘scientific’ and philosophical predecessors, that it had fixed and localised functions, with many areas preordained and immutable from birth. However now there are new understandings of the importance of the developing brain, its ‘plasticity’ throughout our lives and the realisation that any one area of the brain may not only be a pathway, or have a predominant function, but may also be integrated with other areas of the brain.

All of these findings have been able to be proved, with the most recent advances in neuroscience (the discipline that most comprehensively studies the processes of the brain)

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56 Andreasen, Nancy C, op cit., p. 4
57 Zeki, S. As cited in Art and the Brain Journal of Consciousness Studies, 6 No. 6 – 7, 1999. p 97
58 Harth, Eric The Emergence of Art and Language in the Human Brain. Journal of Consciousness Studies, 6 No. 6 – 7, 1999
59 i.e. dichotomous
60 Requiring greater attention in terms of nurturing and educating from the earliest years into our old age
61 That is, having the ability to change and develop
and new technology, such as the use of functional Magnetic Resonance Imaging (fMRI) and Positron Emission Tomography (PET) both of which scan the brain to enable examination of its neural activity. It is now known that, while the anatomical organisation of the brain is hierarchical, the operational organisation is collaborative, as it integrates widely separate parts of the brain to carry out its myriad of functions. Although the brain is less than 20 percent of the body’s mass, because it is vital and constantly active, it uses approximately 25 percent of the body’s oxygen and 20 percent of our daily intake of calories, in the form of glucose. The brain is also in a constant process of change. So while we learn, move, create, remember and even sleep, it is a busy, dynamic, self-organising, living organ that never rests.

From conception to adulthood the brain and body change in size, complexity and efficiency. Because the brain is adaptive and versatile, with not everything pre-wired or ‘hard wired’, as once supposed, developing neuro-tissue learns a lot from its environment and can constantly over-write the information and experience it receives over a lifetime and especially so when a human is young and developing. While it is known that some of the changes in the brain are biological (due to growth, age and disease) and some are related to behaviour (e.g. learning, remembering, creating and so on), science still has to resolve such conundrums as: to what extent we can compensate for sensory or cognitive deprivation (e.g. with disease or brain damage). Whether the mind runs the brain or the brain runs the mind; whether our internal representations in words, images or symbols are the primary tools of thought (or if the brain ‘thinks’ in its own neurological language before it translates thought back into these forms); whether changes in the brain cause advances in thinking or thinking causes advances in the brain; if we shape our brain and experiences or if our brain shapes us; and where the sites are, and what are the preconditions and processes in the brain that are necessary for imagination and creativity? All of which are still not fully answered, as they are the subject of on-going research with both brain science, and the technology to measure it, are still evolving.

It is not yet fully known how the brain monitors and orchestrates all human thought and activity and itself, although it is known to be: self-organising (i.e. it perceives, processes, participates and acts on events and information from the present and past); non-linear (i.e. it generates multiple complex solutions, not just single solutions based on cause and effect); dynamic (i.e. it is subject to frequent change); but it is not thought to have a single

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62 Bloom, F., Lazerson, A. Brain, Mind and Behaviour W.H. Freeman & Co. N.Y. 1988 p 21
63 Solso, Robert The Psychology of Art and the Evolution of the Conscious Brain The MIT Press, Cambridge, Mass., 2003 p. 110 – Solso also argues that it uses 70% of the body’s glucose and is less than 2% of the entire body
64 Solso R, Ibid p. 61
65 Op cit p. 61
67 Ibid., p. 40
monitoring site (even though such theories as a governing ‘homunculus’\textsuperscript{69} \textsuperscript{70}, ‘black box’\textsuperscript{71} or ‘sketch-pad model’\textsuperscript{72} of functioning have been posited). Nor is it known where so many complex functions and human attributes are located e.g. ego, consciousness or creativity.

For centuries it had been thought that the heart was the site for central control of human life, then that there was a discrete hemisphere or ‘sidedness’ in the brain (as propounded in some ‘right brain / left brain’ art teaching books,\textsuperscript{73}), however, although it is now known there are some hemispheric distinctions and proclivities in the brain (e.g. when dealing with new technology) the presumption that language is left and creativity right-brained, has now been proved to be both exaggerated and simplistic, more useful as a metaphor than as an accurate description of the way the brain is organised and operates.

Such theories of the ‘scientific’ left and ‘creative’ right side of the brain were developed largely from early split-brain surgery (where the brain was damaged by war injury or ‘split’ as a ‘cure’ for epilepsy). However it is now known that although both are subtly different in function, both hemispheres are also highly interconnected\textsuperscript{74}. When information is being processed, it has been discovered there is usually a two-sided processing partnership that is sometimes an unequal but also a complementary contribution from both sides of the brain.

For example, while language may be considered ‘left-brained’ in terms of the production of speech, its grammar and the understanding of words, but meaning, determining the tone of voice and inferring emotion within what is being said (which may be an even more important contribution of language), comes from the right hemisphere of the brain. We also need various components across the entire brain, for different performance skills in the creative process (e.g. to be motivated, find inspiration, store memories, retrieve information, apply expertise and perceive what needs to be done, then perform, create and move, followed by a personal evaluation of the creative process and outcome). As expertise in one area increases, depending on the creative domain, there may also be an increase in some hemispheric localisation (beyond innate circuitry or genes). Different subcomponents may also be related to individual ability e.g. the development of left brain skills of language for writing (whereby left-brain damage can be catastrophic for a writer) or related to complexity, such as with music, which seems to require activity across the whole brain. Although drawing is thought to be largely controlled by the right half of the brain, with the hand movements that form the drawing controlled by the left half, as with music, it has actually been found that both

\textsuperscript{69} Tokoro, M. & Mogi,(Ed) K. Creativity and The Brain World Scientific New Jersey, 2007 p. 96
\textsuperscript{70} Stein, Kathleen The Genius Engine John Wiley & Sons, Inc Hoboken New Jersey, 2007 p 7
\textsuperscript{72} Harth, Eric The Emergence of Art and Language in the Human Brain p 97Journal of Consciousness Studies, 6 No. 6 – 7, 1999
\textsuperscript{74} Sawyer, K. Explaining Creativity Oxford University Press, N.Y. 2006 pp. 78-83
hemispheres of the brain are required\textsuperscript{75}. The left hemisphere grasps details and analyses them and the right hemisphere captures the overall image and gains a holistic perception of the information. The development of these subcomponents of ability in different parts of the brain is related to the domain in which the creative individual is operating (e.g. drawing, dance, music), related to their ability or expertise and then it is also applied to different effect depending on whether they are trained or untrained. That brain damage can reduce or end creative expression underlines this constant ‘dialogue’ between the two hemispheres\textsuperscript{76} as well as supporting it with evidence such as an expert artist, whose brain was separated, still being able to draw well, because the brain then compensated, allowing the task to be performed from either hemisphere\textsuperscript{77}.

**How The Brain Drives The Mind and The Mind Drives Creativity**

To create and creatively problem-solve, there is a need to think, make judgements and decisions, see complexities and patterns, evaluate, name, reason, symbolise, use language, make choices, contemplate, emote, conceptualise and convey meaning. Then begins the manual work of the body, requiring a different set of integrated skills to translate all this inspiration into a (hopefully) satisfactory creative outcome. So, the stereotypical view of artists’ work, that ‘being creative’ is the easy (sometimes lazy?) work of innate genius, could not be further from the truth. As the world is full of objects, language and information, artists must capture all these stimuli by the body and all its senses and then translate these, through patterns of neural impulses, into a means of being understood by the nervous system and brain, so they can then be translated back into the world as creative outcomes.

For humans generally, and creative humans in particular, functioning in the world requires selection from the massive amounts of information stored, received, enhanced and reinforced through the senses. Selections are then made from this received sensory information, developed into perceptions of the world and inserted into specific electric neural pathways to form concepts, thought, ‘knowing’, self-awareness, memory and actions. It is these perceptions, memories and selections that then allow humans - and particularly artists - to recognise visual stimuli, discriminate between objects, make judgements and complex connections and then, in reverse, translate these complex creative ideas back into the world as visual objects. The whole process involves both the universal, hard-wired and specialised modules of the brain, which have evolved to help us survive in the world, and the slow evolution of individual memory and perceptions e.g. the aesthetic perceptions built from

\textsuperscript{75} Sawyer, K. *Explaining Creativity* Oxford University Press, N.Y. 2006 pp. 78-83  
\textsuperscript{76} Ibid  
\textsuperscript{77} Case study by Michael Gazzaniga as cited in *The Social Brain* as quoted by Evans, P. and Deeham, G. in *The Keys to Creativity* Grafton Books London, 1988
evaluation, mimicry, creating new ideas, observation, experience, experimenting, building information and also absorbing and elaborating on the influences of previous generations. All these perceptions are then used to create new ideas and objects – a process which can be seen in the incremental development of art throughout history. Described by arts-science researcher, Sian Ede, as a process whereby we effectively ‘sculpt’ our view of the world, by laying down unique personal neural pathways that are shaped by our own views of the world, our history and our cultural environments, they are all the elements which also drive the individual creative urge and output.

There are four areas in the brain, called the association cortices, that make connections across and within the brain. Through research conducted by American neuroscientist and psychiatrist Nancy Andreasen, by imaging the ‘resting’ and ‘active’ brain of creative individuals, it became obvious that there was no actual ‘resting’ period for the brain as it was always working. On debriefing the subjects of this research it was further theorised that during the creative process, the ‘rest’ period (where there was no specific, task-oriented activity required) may actually help enhance the free-association of ideas, so that they float, collide and connect, becoming important, trivial or original. Such activity also indicated that perhaps those with well-developed associative cortices may be more creative, being better able to make such connections.

As yet, there has been no objective, definitive scanning of the ‘creative’ brain in action. However, French neuroscientist Pierre Changeux schematically proposes that for artists, the creative process within the brain evolves in the following manner: firstly as a result of the processes of trial and error; from our evolutionary predispositions; then from contributions due to epigenesis (i.e. the gradual changes in the brain that have taken place during our development); with preparation and incubation periods where fragmentary images or sketches, representations and pre-representations come up spontaneously and transiently; then from memory and current perception, where objects are associated and dissociated until a recombination ‘wins out’. From there, through moments of ‘enlightenment’ or selection of object/s, in a halting, constantly renewing process of invention, modelling or early design, the imagination engages in a selection-by-evaluation mechanism. After this selection, the limbic system and its outposts are brought into play, to flood the synapses of the relevant neuronal group with neurotransmitters, modifying and enhancing their efficiency and carrying the

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80 Changeux, J. As in P.; Damasio, A.R.; Singer, W. Christen, Y. *Neurobiology of Human Values* Springer Berlin, 2005 p.2
81 ibid. Changeux p.3
creative ‘thought’, which then produces a material trace for the brain’s long-term memory...which can then be retrieved and recycled in the creative process once again.

The Artist’s Eye, Heart and Brain

From tentative research findings, American professor of experimental psychology, Robert Solso suggests\(^\text{82}\) that, according to their specific function, each of the arts may engage various areas of visual-cognitive processing in emphatic ways: e.g. literature in the left hemisphere (where 70 to 90 percent of the population have language specialisation\(^\text{83}\)); music in the auditory cortex; poetry with metre, in both hemispheres; visual arts largely in the occipital lobe; and dance in the motor cortex. However it is also known that processing also occurs in other areas, for example with music, there may be right hemisphere activity for the ‘unskilled’ enjoyment and emotional response, as well as left hemisphere for skilled analysis of the intricacies of the work. There is also some evidence artists may engage more rudimentary cerebral sites for the production of abstract art (with their bold lines and simple geometric design), whereas realists may engage more expansive sites, seeking association across memory systems.

As the eye scans and moves, focussing, reading and analysing each piece of information within an art work, the cerebral synapses transmit, combine and store information all around the artwork until it is ‘seen’, interpreted, understood and responded to. To view and analyse an artwork, the cognitive sequence is more like reconstructing the work inside one’s head, component by component, while simultaneously engaging in higher-order processing of the information to evaluate the meaning and significance of the work. For example, seeing an abstract work involves evoking the higher-order parts of the cortex (e.g. the frontal regions) for processing the information and drawing on the imagination. Starting with the simple reception of light as visual stimuli and movement of the eyes by the motor cortex (i.e. the brain attends to the specific visual information from the surrounding clutter and the eye then scans to ‘see’ paint within a frame), then begins the increasingly entangled higher-order functions of the brain. Moving from simple recognition at the back of the brain, units of information are streamed and analysed. For example, colour and line are processed within the occipital lobe, while another stream of visual information analyses motion. This is then followed by processing more complex perceptual units to classify the objects (e.g. a ‘woman’ or a ‘face’ is processed in the visual cortex and the image is then referred to other parts of the brain, such as moving the signals to the temporal lobes in the lower-middle of the brain). For

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\(^{82}\) Changeux, J. As in P.; Damasio, A.R.; Singer, W. Christen, Y. *Neurobiology of Human Values* Springer Berlin, 2005 p.128
\(^{83}\) Sawyer, K. R. *Explaining Creativity* Oxford University Press, N.Y. 2006 p. 78
example, to recognise the artwork as Leonardo’s Madonna or to analyse its triangular composition the eye ‘sees’ the object, the colour, the movement (and in which direction), commits this to memory or recalls it from memory, then uses the left hemisphere of the brain for such things as pattern recognition and so forth. Therefore the neural connections add more specialised knowledge, interpretation, preconceived ideas, bias, aesthetic and cultural meaning, which also activate specialised regions, such as the limbic system and frontal lobes, until the artwork is fully examined. With this interpretation undertaken, long-term memory, stored in long-term memory cells, may then also be required to filter, recall, analyse and give greater meaning to the work (e.g. knowledge and memory of the symbolism within the work, or the aesthetics of the Leonardo and the Renaissance period). Then individual perceptual-cognitive experiences may overlay specific, individual and subjective interpretation and individual emotions might also be evoked by the subject matter or the provenance of the work (e.g. as when I cried standing in front of a ‘real’ Monet).

All of these more specialised sites appear to be distributed across and within the brain and it is currently difficult to accurately locate them and to track their intricate connections. It is at this point that the artist and/or viewer then decides to take action, by spending time scanning the work to absorb all its details, quietly enjoying the pleasure of the work, take action and move on, discuss the work, or, in the artist’s case, begin to make changes - all of which involves a whole new sequence of cognitive, sensory and motor activity.

**From Creative Components To Crystallisation**

Although yet to be fully understood, recent research by Solso suggests\(^\text{84}\) that, whether artists or a ‘master’ of any creative domain, ‘experts’ in the arts (or any specialised domain) may develop proficiency by efficiently ‘chunking’ pertinent information into conceptual units, then processing the information at higher (and/or deeper) levels of cognitive abstraction than novices e.g. painting a portrait indicates greater activation of right prefrontal areas rather than slavishly copying features. Therefore a master-artist appears to have the ability to not only ‘see’ the features as more than superficial characteristics, but also to convey subtle information about more than the surface of the face, going to the character and the personality traits beneath\(^\text{85}\).

Harth proposes\(^\text{86}\) that it is when such processes are externalised beyond the confines of the individual that they move from being creative ideas to become creative output. As thinkers and manipulators of objects, creative humans have developed and enlarged a more

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\(^{85}\) Ibid

\(^{86}\) Harth, Eric. *The Emergence of Art and Language in the Human Brain* p 97; *Journal of Consciousness Studies*, 6 No. 6 – 7, 1999 p107
permanent brain ‘sketchpad’\textsuperscript{87}. This internal ‘sketchpad’ model of processing constantly repeats interactions between central integrated symbols and peripheral images (i.e. creative humans are intensive users of mental imagery) to help guide their actions and perform sophisticated creative tasks. Harth describes this as a constant repetitive process, leading from images and symbols received, then reduced, modified, spontaneously interconnected and bound together in a delicate balance of either random and/or systematic connections, which becomes a trajectory of thought, which is consistently explored in the creative brain. This repeats until these thoughts and symbols can then, in a reverse process, be externally, imaginatively, recreated as original information, innovative objects, inspired artistic devices or imaginative images. With the creative act generally being a solitary activity (in that it is generally a private dialogue between the artist and their medium) and also an enhanced way of thinking, it therefore not only changes images and symbols from the ‘ordinary’ embedded mental images and working memory, but it can, in an add-on hierarchy of cerebral functioning, manipulate, supplement and change them so they become enhanced images and ideas and the innovative creative output of artists, called ‘artworks’.

In an endeavour to find out how the brain has evolved, to explain the neural mechanisms involved and how the brain responds to making and viewing art, the Director of the Centre for Brain and Cognition at the University of California, Vilayanur Ramachandran, with co-researcher William Hirstein, proposed that there are possibly eight ‘artistic universals’\textsuperscript{88} employed by artists – either consciously or unconsciously – to excite the visual areas of the brain. (Reference Appendix B iii Summary of Eight Artistic Universals) These eight ‘laws’, or artistic universals, are intended to provide a more rounded three-dimensional view (than merely aesthetic analysis or phenomenological explanation) of the complexities and drivers of ‘being’ an artist and the creation of art. To do this they have looked at the biological framework, to explain the internal logic of making art rather than just seeing it as the product of long-accepted creative, historic and aesthetic ‘rules of thumb’ and they contend that art and creativity can be analysed in terms of biological, anthropological and evolutionary factors. With these underpinnings, it may therefore explain why the ineffable qualities of art have been innately understood and constantly repeated by humans through all time and all cultures and why it is such a primary aesthetic experience, able to be ‘felt’, even though it may not necessarily be able to be fully explained or understood.

\textsuperscript{87} Harth, Eric \textit{The Emergence of Art and Language in the Human Brain} p 97\textsuperscript{87}\textsuperscript{87} Journal of Consciousness Studies, 6 No. 6 – 7, 1999 p 107

\textsuperscript{88} Ramachandran, V. and Hirstein, W. \textit{‘The Science of Art - A Neurological Theory of Aesthetic Experience’} pp 15-51 Journal of Consciousness Studies, 6, No 6-7 1999. Reference also Appendix Biii Summary of the Eight Universals p 180
The Pygmalion Proposition

J.Ure

Changeux\textsuperscript{89}, on the other hand, characterises creative output as a ‘virtual space’ or a ‘conscious milieu’, however he hastens to add that the space where mental images are formed is still not identified in the brain and that this enigmatic creative space is where current perceptions, stimulation, memory, self-representation, past experiences and emotion all combine. Here, he contends, they are also sifted through ‘reason’ and are overlaid with the contributing deliberations of social rules, culture and the innate biological forces that are beyond the artist’s perception. As all these processes are the artist’s own internal definition, they then become externalised representations of the artist’s internal circuit, being highly individual and made real by the drawings on paper or the sculpture in clay. Then, with the evolutionary predisposition of neural activity which guides finger movements and the complex ‘dialogue between brain and eye’\textsuperscript{90} and brain and body, as well as the apprenticeship and skill from practising their art, the artist then moves their hand and directs the drawing material precisely, as an extension and expression of their internal mental creation, adding the necessary corrections, adjustments and restarts that contribute to making an artwork. An extraordinary, elaborate and astonishing process.

Changeux\textsuperscript{91} also notes that there are many other contributing components to creativity within the arts, such as novelty, culture and the environment, that are significant drivers and influences in these processes. Previous discoveries, divergence to attain originality, coincidental or direct collegiate influence and interaction, direct and accidental observations, new techniques and direct learning etc, are also additional agents in this creative ‘cognitive crystallisation’. Finally it is the aesthetic ‘artistic rules’ imposed by the domain, which ensure creative and societal coherence and the acceptance and validation of the work in ‘the real world’. These rules are also important to the psychology of the persona ‘artist’ and for their creation to be deemed ‘art’. However, while the scientist requires more stringent objectivity and validation of their work to project meaning onto an object (being the rules of their domain), the artist can, to a greater extent, define the creative ‘rules’ in the form of their own ‘style’, although they too must still be within the bounds of art and their society. Then the spectator is also free to complete the creative process by their many different, individual, cognitive routes.

**How Perceptions and Creative Thinking Enable Artistry**

Events in the world affect the individual receiver/perceiver and are translated into concepts, ideas, activity, experience, responses and behaviour which are unique, complex, subjective,

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\textsuperscript{89} Changeux, J. As in P.; Damasio, A.R.; Singer, W. Christen, Y. *Neurobiology of Human Values* Springer Berlin, 2005 pp. 3-4
\textsuperscript{90} Ibid
\textsuperscript{91} Op Cit., Changeux, pp. 3-4
interactive and heavily varied due to biological processes (e.g. by genetics or the receipt and processing of multiple sensory experiences). While Pygmalion’s inner and outer life dictated his actions they also fed into the perpetual loop of the creative neuropsychological relays of his brain. As these relays have no single pattern, they elude definition, and when measured, they would show up as complex neural activity over broad areas of the brain, which could provide raw data about the world as Pygmalion saw it, but not light up as cognitive meaning. Therefore putting Pygmalion into an MRI scanner would not have shown one spot in the brain where he was ‘creating Galatea’. As Pygmalion was an emerging artist and creative thinker (although feminists might argue he took a narrow view with his subject matter), he too had the ability to apply his divergent thinking to generate many solutions to his creative (and social) problems, to produce a novel, successful solution e.g. by deciding to carve a perfect female figure from ivory, called Galatea, instead of knocking out the rough wooden likeness of a dog called Pythagorus. Granted, he had a little divine intervention in the final stages of perfection and anthropomorphism, but essentially he too had some basic internal drives or incentives. For example, he had a functioning brain with reasonable intelligence. He was lonely and frustrated, so highly motivated. He had the intelligence and abilities for creativity and was energetic and/or driven, so he could begin to work. He had inspiration and imagination and so he could also project (i.e. he could ‘see’ the outcome he wanted, anticipate how to reach that outcome and he could plan the steps necessary to reach it). Then, finally, he had acquired all the experience and skills necessary to design, carve, continually assess the work, make modifications and avoid errors. He also had the sustained time and energy to deal with the external elements required for daily living while working, and finally he was reconciled to accept the outcomes of his work. In short, he had all the prerequisites, according to Professor Charles Dorn92 and Mihaly Csikszentmihalyi93 to contribute the kind of intuitive and divergent thinking he would need to ‘be’ an ‘artist’ and create his personal perception of a ‘perfect’ artwork.

According to Dorn94, these pre-requisites to ‘be’ creative are:

- Expertise in the creative field
- Creative skill (including the ability to persist and use divergent thinking) and
- Motivation to pursue production for intrinsic reasons rather than external reward

93 Who first coined the term ‘flow’ in relation to absorbed creative activity as in Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996
94 Dorn, Op Cit pp. 44-5
Csikszentmihalyi\textsuperscript{95}, on the other hand, proposes that the common threads within the creative process, in all domains (professional fields or areas of interest), can be summarised as five stages of problem-solving, involving:

- The problems emerging as inspiration (often in combination)– from personal experiences, social pressures or from the domain
- The influence and application of past knowledge or the conjunction of ideas
- The social contributions and influences (including the domain, the experience, the encouragement, the social conditions, catastrophic events etc)
- The discovered problem (as opposed to the obvious or presented and which may be reformulated not just recycled)
- The incubation and allowance of time, thought to be the most ‘creative’ and mysterious part of the process and often below consciousness
- These are followed by the ‘ninety percent’ of perspiration\textsuperscript{96} required to get such insights out of the head into the real world, translating them from a thought, inspiration and imagination into tangible ‘creativity’. This, Csikszentmihalyi contends, not only involves a great deal of work, but also the need to pay attention to the constant evolution of the problems and solutions, keeping an open flexible mind, having goals and keeping on track and being in touch with current domain knowledge to be efficient and effective, and seek collegiate support and advice

\begin{quote}
‘How extraordinary. I have never thought about my brain before. But when you explain it like that, I will now have to listen more carefully to that voice inside my head and learn to quieten it down so I can do my art!’
\end{quote}

\textit{Echoes from a retired Public Servant}

\section*{Reflection}

\textit{Given the enormous complexities of the human brain in general, it is difficult to contemplate the added complexities of the creative brain in particular, but it is thought that throughout human history, the highly social activities of art and language were made possible by the evolution of the brain and sensory processes and the ‘private discourse between the}

\textsuperscript{95}Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996
\textsuperscript{96}Ibid p. 104
emerging self and its externalized expressions\textsuperscript{97}. Variousy described as chaotic and entangled, or computer-like and efficient, it is the uniqueness, dynamism, scale and complexity of the brain’s processes that makes being a thinking, functioning human being quite amazing. And being a thinking, functioning and creative human being, a profound and astonishing gift.

Therefore, given my teaching experience across all ages, and being mindful of my responsibility toward ‘training brains’, I can only agree with such researchers as Semir Zeki\textsuperscript{98}, Nancy Andreasen\textsuperscript{99}, V.S. Ramachandran and William Hirsten\textsuperscript{100} et al., who have drawn our facility and need for creative thinking back into the spotlight, heightening the urgency of the need for change in our educational processes, to train creative brains and to educate creatively. As Andreasen urges\textsuperscript{101}, we need to be deeply concerned over the lost or diminished capacities of our children, because the inadequate environmental exposure we currently provide is causing a failure to learn at critical periods. Pinker\textsuperscript{102} further purports that, with a child’s brain having ultimate plasticity in their early years, their brain particularly needs good nurturing and good education then, because, to a greater or lesser degree, how humans acquire skills, abilities and knowledge depends greatly on what they are exposed to, and if they are not exposed to good teaching and good environmental influences (especially early in their life), brain cells literally die off and capacity is lost. To that end, with such processes continuing all our lives, Andreasen\textsuperscript{103} also asserts that education shouldn’t end with school, because throughout life we could do much more to exercise our brains and become more creative.

It is therefore widely agreed that, with good educational practice, children will be helped to establish brain pathways that will give them greater creativity through new and transformative knowledge, skills, ideas and perceptions. Andreasen therefore urges such training should include: the early learning of foreign languages; reading; getting out into nature; and connecting all areas of learning, rather than having discrete subjects. She also vociferously argues against inappropriate exposure to technology and abhors excessive, inappropriate and passive television watching and ultimately argues for recognition of our universal and uniquely individual capacity for creativity and the urgent need to teach our children how to be more creative.

Therefore, when I teach my students (of all ages) art, I know I am teaching a subject that can open students to the world, because of its multiplicity of interrelated subject matter, skills, techniques, communication, imagination and emotion - in the form of pleasure and play - across all ages, abilities, cultures and dispositions. It – like other creative arts - is therefore a subject which is ancient, profound, extraordinary, powerful and unique, encompassing the whole of human history and all cultures. As a teacher who has been a direct contributor to ‘building brains’ (from early childhood to adult education) I now include such insights gained (into the workings of the brain as we currently understand them) for several reasons, including: that this can help the student understand how they ‘see’, think, respond, move and have learned what they know so far; they are often then

\textsuperscript{97} Csikszentmihalyi, Csikszentmihalyi, Mihaly \textit{Creativity – Flow and the Psychology of Discovery and Invention} Harper Perennial, N.Y. 1996p. 104

\textsuperscript{98} Zeki, Semir \textit{Artistic Creativity and the Brain Science} Vol 293 6th July, 2001


\textsuperscript{100} Ramachandran, V & Hirstein, W \textit{The Science of Art} p. 15 -51 Journal of Consciousness Studies, 6 No. 6 – 7, 1999

\textsuperscript{101} Ramachandran, V & Hirstein, W \textit{The Science of Art} p. 15 -51 Journal of Consciousness Studies, 6 No. 6 – 7, 1999

\textsuperscript{102} Pinker, S. as quoted in Ede, Sian \textit{art and science} I.B. Tauris, London 2005 p. 77-78

\textsuperscript{103} Andreasen, Nancy C. \textit{Op Cit} pp. 143-181
more relaxed, knowing that learning is, in the first instance, a biological process that may allow an instant acquisition of the information or skill (if the neurons are established, predisposed and firing), or that may take more explanation, different explanation, more nuanced teaching, time, repetition or any combination of such factors to ‘understand’ and retain; that the neurons are always developing, changing, growing, expanding and connecting, therefore the ‘Ah Ha!’ moment will come and that this is why repetition, patience and persistence is sometimes required, to lay down and reinforce the information, skill or understanding; that some of the skills and abilities they possess are innate and some are acquired and that they can be in different proportions and to different effect across many domains; that although some people are obviously more adept in some areas of knowledge and skill acquisition, they too had to begin somewhere - and then they had to repeat these skills until they were masterful; that we are the product of a Western education system; that the ‘chattering voice’ (often of ‘doubt’) inside our heads needs to be acknowledged, then quieted; that there are many ways of ‘knowing’, learning and being ‘intelligent’; that mastery takes time, persistence and practice; and that the fable of innate ability and ‘genius’ has lead to the false presumption that if you don’t ‘get it’ straight away, that you cannot do it.

I also need to frequently assure my students (young and old) that Michelangelo and Leonardo da Vinci also had to learn how to draw and that someone had to teach them. Then I frequently need to remind them that in any other area of human enterprise (from dancing the Samba to designing an aircraft) no-one seems to anticipate that a human being should be able to do it instantly, except, for some strange reason, art! That such myths are an absurdity that persist in our society beyond common sense, is often a revelation as their eyes widen and they often looked shocked and say:” I had never thought of it that way!”

Although we have yet to be able to totally define and localise intelligence and all the functions and areas of the brain (including the complexity of our human traits and the neuronal activity called ‘creativity’) it is thought that ‘genius’ is not a function of any ‘genius’ gene but a product of both inheritance and environmental factors (which will be further addressed in the socio-cultural chapter of this research). However it is also known that superior performance can be achieved with passion, practice, time and dedication. What isn’t fully understood (although our current education system and our children depend on it so determinately) is that tests (especially ‘intelligence’ tests) may only be teaching, then testing and measuring a narrow band of human intelligence. As there is more to every life and more to everyday living and intelligence than tests can measure, our system of ‘measuring’ and how and what we teach our children, continues to fail to account for such vital factors as: the working of our brains; our innate ability and potential; our motivation, opportunity and persistence; our social skills and social milieu (which includes adversity, support and opportunity); the quality of the educational input and the kind of teaching we receive.

Therefore it is vital that we, as teachers, understand all these complex factors and try to use our own brains to employ the best thinking, information and skills to teach creatively and ‘ignite the creative spark’ in others.
Images from the Exhibition Undertaken As Part of the Research

By visually articulating my research and enacting the very processes I have been researching I have not only been more 'conscious' of these processes but also awed by their power, complexity and creative outcomes

Figure 5: Thinking About The Brain

Pencil, ink, gold leaf

Reproductions of three human skulls showing the evolution of human beings from *Australopithecus afarensis* to *Homo Erectus* to *Homo Sapiens*. This evolution represents a three-fold increase in brain size which allowed humans to think abstractly, make tools and create language and art.

Published by Andreas Vesalius (1514-1564) in 1543 at the age of 28, *De humani corporis fabrica libri septem* (*On the fabric of the human body in seven books*) was a book of highly detailed illustrations of human dissections, often in allegorical poses. This is an adaptation of plate 164. Vesalius was the first to draw the brain accurately and assert that the brain was the centre of mind and emotion.

Slice through a human brain looking down on the top of the head, showing the grey and white matter.

A facsimile / replica/reproduction of a brain ‘wavelet’ obtained through the brain imaging

A facsimile of the brain activity of an amateur artist (left hand side) and master artist (right hand side) both doing a portrait as captured by a fMRI scan. Contrary to first impressions there is greater brain activity needed for the amateur artist because they need to make many more connections and solve more problems to form the work.

The homunculus – this is a representation of the order and relative amount of space used in the motor cortex of the brain, for each part of the body. It may be seen that the largest amount of the brain is needed for the fine muscles of the face, fingers hands and lips
Figure 6: **The Brain in a State of Constant Transformation**  J.Ure © 2010

Pen, ink, gold leaf – four panels

Facsimiles of Neuronal Connections as they increase in our first two years of life

a. At birth   b. At three months  c. Fifteen months and d. Two years.

Contrary to previous belief, it's not 'all downhill after 40' as the brain can change even into our old age (for better or worse) depending on our efforts, experiences and activities. Given good genes, brain exercise and good health we are able to continue to 'rewire' its circuitry. It is also well understood that the most vital time for learning is during early childhood, which is a vital consideration for our education system, how our children learn and how (and what) we should teach.
Pen, ink and pastel, gold leaf - two panels -

Left Hand Side - The neuron discharges a chemical through its dendritic tree, which produces a minute electrical charge. This charge pulses through the axon at lightning speed until it reaches a synaptic gap (the minute gap between neurons) and is transported across by chemical neurotransmitters. This then triggers an electrical exchange with the receiving cell (on the right hand side) which picks up this charge.

Right Hand Side - The receiving cell picks up this charge at the terminals called dendrites. While some connections are short loops, others may be longer spans across to other lobes in the brain. However all connections are made with great efficiency, instantly (estimated to be about 160 milliseconds from sight to action\textsuperscript{104}).

With these millions of connections being made it allows us to multi-task. However we cannot have two or more significant activities that interfere with the main task (a good reason why listening to music and working can be soothing, but driving and mobile phones don’t go well together, or why it’s difficult to watch and listen to the news while also trying to read the ‘crawler’ messages at the bottom of the screen).

\textsuperscript{104} Zimmer, C. \textit{Soul Made Flesh} Arrow Books UK 2004 p274
A slice through a nerve as seen through an optical microscope in 1718 Antonie van Leeuwenhoek using a single element lens) Nerve cells communicate electro-chemically.

**An Axon**

Most body cells look like spheres, plates or cubes but neurons have irregular shapes, with dendrites branching out like trees and axons protruding from their surfaces. Axons are like living ‘wires’ so that neurons are linked to each other by neuronal circuits. A nerve impulse travels until it reaches a synaptic gap, then neurotransmitters release chemicals which travel across the gap, locking onto the receptors of its neighbour. Repeated signals down this relay strengthen the connection between neurons, which is why, with repeated learning and repeated strengthening, we become increasingly competent with information, skills and memory.
This is a facsimile of nerves, as they were first seen through a multiple element lens and hand drawn in 1909 by Rámon y Cajal. Originally wanting to be a painter, his father determined he should be a doctor. Using a superior form of silver staining on the slide, he was the first person to establish the importance of a neuron and to understand their complexity and their relationship to each other.

A facsimile of neurons in the cerebral cortex as we age. Although brain performance can diminish as we age, the good news is that we also have the capacity for change as the brain remains ‘plastic’ throughout our lives. So if we make the effort and ‘exercise’ our brains all our lives we will be the best we can be.
Chapter Four – The Senses
Emphasising The Significance Of Sight And Touch

Figure 10: Eye of the Beholder by JA Ure - Acrylic, pen, ink, charcoal and pastel, gold leaf

A transverse section of the eye as light enters the pupil and facsimiles of Leonardo’s notebook drawings of the eye circa 1508.
As evidenced by the insights within the Pygmalion myth, although intuited millennia ago, it is now known that for the creative human being there are immensely diverse and complex elements and conditions that contribute to the creative process. The story of Pygmalion and Galatea is therefore a metaphor for the artist’s perceptions, vision, foresight, insights, touch, sensitivity, sensuality, feelings and the sensory experience of making art, as well as the personal connection, through the art object, from artist to audience. For an artist, vision and touch are therefore vital, as they translate ideas and skill into artistry, reinvent and represent knowledge, and imbue meaning and emotion.

Resonance

It becomes most obvious that our sensory acuity and memories are both powerful and important to us when, for example, a particular tune sends our mind back to an event, the smell of perfume or after-shave reminds us of the wearer, when a hug offers the greatest comfort and connection, when a taste bursts in our mouth, or a scene fills our eyes with colour and our brains with pleasure.

Apart from the many lessons I give to my students about the nature, use and application of art materials (requiring an intricate connection and coordination between eye, brain and hand), one of the most anticipated workshops I teach is about colour. Given its primacy in artmaking, it is the one topic that seems to cause both the most delight and the most worry to most students. The delight comes with their enjoying, observing, playing with and making colours, with the worry being that they may not be able to control, name or mix anything but ‘mud’ (being the most dreaded ‘art sin’ they can think of). Then, when I recount my first, thrilling memory of colour in art, at age seven, painting a yellow duck to illustrate a Chinese fable, it is usually followed by a deluge of stories from my students about their first sensory and emotional responses to artmaking (often at far earlier ages, with the memories still palpable and significant in their lives). Therefore for all of us the responses are strong, the memories are sharp and the stories can be told in such detail that the feelings evoked are obviously visceral. The brain seeks to ‘know’ and the body to experience in a living, sensory, creative loop that embeds ideas, experiences, memories, concepts, attitudes, emotions and perceptions as we hone our senses in the service of our art and in turn our artmaking thrills our senses, mind and heart.
Because we come to know the world through our senses, our artmaking responds to, relies on and evokes each one. Therefore, as most of us travel through each day barely aware of their sensory input and voluntary and involuntary responses, I frequently need to bring the notion of 'sensory awareness' to the attention of my students, both formally and informally within their art lessons. Most of the adults come in to the studio after work, following a day of sensory over-load, with technology, language, personal interactions, physical labour, often working in artificial environments, having operated machines, used tools, driven their car, been endlessly harried by the inner chattering voice in their head and dealt with every personal and professional call on their time and attention during the day. Then I also need to consider the growing minds and acutely over-loaded senses of the children we teach as they rush in after school, bodies and brains tired but also over-active, looking for both excitement and peace. I therefore not only need to be aware of all these over-stimulated, dulled and/or exhausted senses but also need to consider many sensory elements and conditions within my studio from the background music I try to carefully choose (but of which I am aware affects each person in different ways), to the subtle mix of ‘allowing’ chatter for emotional release and social connection, to the importance of peace for concentration; the acute awareness of changing light, to an awareness of a multitude of visual, emotional, physical and/or learning difficulties that may affect each person ... and on and on, in a creative sensorium between balance, stimulation and over-load of which I must be both master, then guide.

Until I had started teaching art I had rarely thought of all the elements and conditions within a human being, from the environment to the processes of artmaking, that need to be considered and catered for, as they can enhance or impede being creative and making art. Therefore, still working my way from the inside-out, this chapter will explore the senses as vital elements for creativity and artmaking. Although the primary focus here will be vision and touch, it is through all our senses that we receive and transmit information to the brain, which in turn enables us to interact with and learn about the world.

Of the many successes in the biological evolution of man, the most spectacular organic systems are those of the brain and senses, as both gather important information for a human to be able to function, respond and also excel in the world – or not. So two fundamental senses, those of vision and touch, will be discussed here, in relation to the brain and in the context of their vital contributions to creativity and the visual arts.

Reasoning

This chapter examines the elements and conditions of our senses, as they receive and process information about the world, that can then be translated into creativity to enable (or hinder) creativity and the production of art.

Sight

In responding to the sensory input from the environment, the brain records experiences of the world throughout a lifetime of seeing and sensing. It can then also begin to imagine what the world could be\(^ {105}\) and all these computations are made so that ‘reasonable actions might

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\(^{105}\) Harth, Erich The Emergence of Art and Language in the Human Brain p. 62 Journal of Consciousness Studies, 6 No. 6-7, 1999
be performed\textsuperscript{106} by the human being. Therefore all the senses, and particularly the eye, have evolved for much the same reasons as the brain, that is to enhance human adaptation, survival and reproduction\textsuperscript{107}. For example, the eye-brain interaction evolved to survive in a changing, dangerous world, so the brain could ‘see’ danger or discern the shapes, colours and forms that would distinguish what food was appropriate to eat (and how fast it was running at the time).

In terms of evolution, the brain was structured so that for the immense amount of sensory input, parallel processing was possible. This allowed the distribution of impulses over large areas in a parallel rather than in a stepped fashion, so that neurons could simultaneously pass on messages to numerous other neurons in ever-branching and complex networks. The cortical developments that allowed humans to detect and avoid predators in prehistoric times, have now also developed these skills to a point where they perform a similar function in the competitive contemporary corporate world. This detection of the world and its contemporary ‘predators’ is done through all the senses and particularly through vision, which is now a central sense in Western society and one of the most important senses to the production and appreciation of art.

\textit{The Mind’s Eye}

Either window on the world and/or window to the soul, the eye is crucial to humans and is especially so to visual artists.

Vision takes up large parts of the brain’s functioning and is one of the richest sources of sensory information\textsuperscript{108} and a prime medium for acquiring knowledge about the external world. The brain has an aptitude for constancy\textsuperscript{109}, so it is able to acquire knowledge to accommodate constant environmental changes, the physical characteristics of certain objects and their endless variations (such as changes of location, viewpoint, light, distance and so forth). Visual artists depend greatly on this element to both process and create ‘reality’, linking the brain, self and ideas to the world.

Therefore in terms of what is seen, how it is seen, how it is processed by the brain and then creatively perceived there are immense complexities of biology and sensory perception. So from the moment light enters the individual eye and travels to the brain (a process which is

\textsuperscript{106} Harth, Erich The Emergence of Art and Language in the Human Brain p. 62 Journal of Consciousness Studies, 6 No. 6-7, 1999 p. 69


\textsuperscript{108} Ibid p. 21

\textsuperscript{109} The brain is continually self-monitoring and correcting to maintain perceptual, schematic constancy
estimated to take about 60 milliseconds\textsuperscript{110}, the equipment that interprets the visual perception and the experience that creates symbolic structures in our brain ceases to be uniform. We each begin to process with a ‘different’ eye and ‘see’ with a different brain. We draw on a stock of patterns, schema and experience, our lifetime of training in a range of representational conventions, and then seek to find plausibility within the environment from which we are drawing the information\textsuperscript{111}. Such different visual experiences not only make us ‘see’ differently, they also result in a varied cognitive style, diverse reference to our cultural and personal experiences, all of which ordain our individual understanding, knowledge and responses.

Although vision is a complex process\textsuperscript{112}, it is only when visual information is sent to the brain to be interpreted, that ‘seeing’ actually occurs. In fact we taste, smell, hear, feel and see with the brain rather than the receptors of the tongue, nose, ear, skin and eye.

Images are also not conveyed directly to the brain from the eye, because after they pass through the lens to the retina they are transformed from an image into a pattern of nerve impulses, which are indistinguishable from all nerve impulses throughout the body. By decoding these impulses it is the brain that interprets them as being from the eye (…it’s an image!) or from the ear (…it’s a sound!)\textsuperscript{113}, and it is the plasticity of the brain that allows it to compensate in any sensory area, working with whatever information it can gather e.g. heightening touch, taste and smell when vision is impaired.

The eye is therefore a communication channel, bridging the outer and inner worlds of reality and experience\textsuperscript{114} and the brain is the decoding, interpretative organ that makes sense of the world. It sorts and sifts all the various pieces of information, paying attention to some and ignoring others, being purposive, not simply recording information but attending to the senses in various degrees, given each situation. This process becomes obvious when an artist is so absorbed in something (e.g. making an art work) that the image becomes the focus and the sounds and sights of the environment ‘disappear’. The brain has effectively ignored all surrounding distractions, allowing the artist to concentrate, only snapping them back to attention, for example, when their name is called, or another important (or urgent) issue arises, to which their brain (and other senses) must then pay attention.

\textsuperscript{110} Zimmer, C. \textit{Soul Made Flesh} Arrow Books UK 2004 p.274
\textsuperscript{111} Onians, John \textit{Neuroarthistory} Yale University Press New Haven 2007 p.179
\textsuperscript{112} Reference Appendix BV Touch p 188
\textsuperscript{113} Restak, R.(Dr.) \textit{The New Brain – Research From The Frontiers of Brain Science} Rodale Ltd London, 2004 p 169
\textsuperscript{114}Gregory, R. \textit{et al. The Artful Eye} Oxford University Press, Oxford, 1995
In his book on creativity, Csikszentmihalyi, explores this phenomena of total absorption described to him during the many interviews he conducted with highly creative people. In these interviews they reveal to him common elements of the conditions of their creative lives, such as: loving what they do; not being motivated by money; finding great motivation and enjoyment in what they did; and also the occurrence of an ‘optimal experience’ in their focus, capacity, work and discoveries, which he describes as ‘flow’. He found that, no matter what the creative experience, the age, the culture, the outcome or the domain, this experience of automatic, effortless, highly focussed consciousness was consistently described by his respondents. When this state was reached, with the senses and brain alert, skilled, masterful and focussed, the concentrated, absorbed, timeless, disembodied merging of awareness and action, the internalised success, the balance of challenge and skills and the pleasure of the creative process, all evoked a feeling of well-being and enjoyment which was then strongly linked to the individual’s feelings of happiness.

However, while the mind of the artist creates the object, it could also be said that the object and the activity of making it also ‘creates’ their mind.

An artist will respond and pay attention to an object, and the need to create (or recreate) it, firstly depending on their interest and their familiarity with the subject matter. The brain will ‘see’ the object and draw up a model of it. This ‘model’ will take into account the current circumstances (schema), which may include such factors as the distance of the object or the weight of art materials in the hand, the need to move the hand and push the brush or apply pressure on to the clay, and so on. All of this information then requires increased electrical and metabolic activity and the preparation of muscle movement milliseconds after the object has been seen and before the hand actually moves. By conducting these activities it will then further reinforce neural pathways by adding to individual’s schema, memories, emotions and ideas. Then both mind and object are also mediated by the environment and the culture in which they are ‘seen’ and also by the individual whose mind is ‘seeing’ them. So ‘seeing’ is more than just computing an image. How we exist and what we know is ultimately the lived experience of our senses (predominantly the eye – unless it is damaged) and we also cannot separate our biology and sociology from our senses. So when we say ‘I see what you are saying’ or that something looks and ‘smells a little fishy’ it actually does describe the brain’s propensity to substitute, attend to and emphasise sensations in a comingling which, when at its height, is known as synaesthesia.

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So that the mind can guide the hand and execute the higher processes of imagination, the basic ingredients of seeing are therefore a sensory-brain interaction of attending to the sensory information (which is firstly based on the evolutionary instinct for survival, need and adaptation) and gathering information from an interaction of the senses. Then begins the biological processes of vision, with the information being focussed on, and processed by, the brain. This information is applied to intellect, emotion and memory and filtered through the prism (and distortion) of one’s personal perception. The visual-cognitive information that has been received is then acted on or responded to by thinking about the work, guiding the hand to make the work and then the cyclical process begins again, because it may now also include new viewpoints, corrections or making other decisions and connections as changes to the work or actions are now required. Not forgetting, of course, that at the same time the brain and senses are also processing a myriad of other environmental conditions, sensory experiences, thoughts, ideas and so on.

Not only do different optical signals go to different areas of the brain for different attributes, they also take different periods of time (although the differences are milliseconds). Therefore colour, form and motion are actually consciously perceived at different intervals. Having studied the separation and focus of modern art movements e.g. Cubism, Fauvism and such artists as Mondrian and Hockney, the neurologist Zeki argues\textsuperscript{117} that such separation may also form a mini-consciousness. Given that many artists seem to be able to give aware and insightful reasoning for their ‘specialisation’ and the evidence that lies within their art, Zeki has proposed that with the inherent separation between the different types of processing, perhaps this is an attribute some artists may be alert to and respond to selectively, being intuitively aware of their brain processes and restricting and exploiting particular attributes to maximise the aesthetic stimulation, such as colour, form, and movement.

Therefore in ‘seeing’, the eye and brain must detect, pay attention, select, perceive the images and symbols, then process, think about, remember and act upon them. As discussed in the previous chapter on ‘The Brain’, from this bottom-up process of selection, neuron groups and networks are selectively reinforced, while others die, a process likened by Neidich\textsuperscript{118} to ‘sculpting or ‘pruning’. Onto these ‘bottom-up’ perceptions we then also impose ‘top-down’ concepts, which are influenced by individual motivations, cultures, contexts, beliefs, thinking, knowledge, values, beliefs and attitudes\textsuperscript{119}. Researchers therefore continue to ponder such human complexities and debate about what really happens after light enters the

\textsuperscript{117} Zeki, S. As quoted in Onians, John \textit{Neuroarthistory} Yale University Press New Haven 2007 p.197
\textsuperscript{118}Warren Neidich as quoted in Ede, Sian \textit{Art and Science} I.B. Tauris, London 2005 p.108
\textsuperscript{119}Ede, Sian \textit{art and science} I.B. Tauris, London 2005 p. 105
retina and transfers images to the brain, and how all these elements and conditions therefore influence our world picture.

It is generally accepted we must all see at least some commonalities about the same image when we all look at it (e.g. a stop sign), otherwise there would be unbridgeable differences between people’s perceptions (and lots of accidents) and there would also be no ability for social communication – or perhaps even sanity - within a community. But we must also be aware that we cannot assume we see objectively or even the same across cultures or even generations e.g. Kandinsky was said not to have recognised Monet’s Haystacks and was incensed that he had painted them so unrecognisably. From the biological predisposition to see and think, to the selective cultural and individual social impositions that mean we all ‘see’ things differently, one is left to wonder to what degree this influences our thinking, beliefs and actions and is influenced by our contemporary world and its technologies. Once again, the research and debate is on-going.

**Seeing Colour**

Colour vision has an important ecological evolution, enabling humans to perceive the different qualities of light in different environments, to link object to space and motion, to perceive the chemically-laden products needed to be eaten and the socially effective colours of courtship, threat and social markers. Colour is perceived universally, from infancy, and as a product of the brain. Colour originates in sunlight, which, although to the naked eye seems colourless, actually contains all the colours of the rainbow. It is the surface of the object that absorbs the sunlight and reflects its colour back to the eye and it is the processes of the eye which receive the colour and sends this message to the brain.

But for humans, colour is more than just wavelengths and brainwaves, it is a means for survival, an aesthetic pleasure, a useful tool, is expressive of and influential over our moods and a pervasive element of our history and culture(s). We pepper our language with colour (e.g. saying: in the pink; seeing red; green with envy; or feeling blue) and find associations and symbolism within culture, the arts, our environment, media, our own experience and our upbringing (e.g. white can mean purity, death, surrender or be the preferred ‘colour’ of sculpture etc). Therefore colour and light are not only the most fundamental tools of the artist’s trade, they also resonate with other human beings and are also deeply embedded in human development, history, consciousness, memory and culture.

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122 Taubes, Timothy *Art and Philosophy* Prometheus Books, Buffalo New York, 1993, pp. 94 - 96
‘I think this is my favourite. Look at what it can do! 
I just love getting my hands dirty with the charcoal!’

Echoes from a mother, grandmother and high school teacher (currently teaching her grandchild to draw)

‘Please don’t give me charcoal to work with. I cannot stand it. It’s too messy. I suppose it’s because I have spent 40 years keeping my hands scrupulously clean, but really, I simply cannot stand it on my fingers...’

Echoes from a retired doctor and acrylic painter (with no charcoal under-drawings)

**Touch**

Touch by the human hand is vital to human development and is the most primordial of the senses\(^{123}\). The most acute sense in newborns is the sense of touch.\(^{124}\) Touch includes the ability to sense the position and movement of one’s body and limbs and the sensation of an object as the sense of touch gauges its location, shape and material properties. Often referred to as active or haptic, and related to kinaesthesia, (which is the perception of motion, weight, body position) or proprioception (an internal awareness of motion and position from the sensory nerve endings of the muscles and tendons), touch refers to the ability to experience and understand the environment through active exploration, mostly using our hands.

Manual dexterity involves: the kinaesthetic sensory system (which perceives or senses the motion, weight and movement of the limbs, changes of position and muscle force); muscle receptors (which give feedback for perception of limb movement); skin and joint receptors (to match the position of the limb and the range of joint movement), the psycho-physical judgement of limb position, movement, velocity, sensation, weight and sense of force; vision, audition and sensitivity to environmental stimuli; specialised sensori-motor functions of the hand and manual dexterity to give highly skilled movement; and a fine degree of force or control in each of these areas. One can only wonder what additional skills, abilities and interactions, from brain to skin, are required for the making of art and master-crafts or surgery, athletics and bomb-disposal.

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\(^{123}\) Noë, Alva *Action in Perception* MIT Press Cambridge Massachusetts, 2004 p. 98  
\(^{124}\) Winston, R *The Human Mind - and how to make the most of it* Bantam Press London 2003 p. 77
Therefore touch is complex, comprehensive and central to our lives. Not only does the skin feel texture but also temperature, and the hand can be sensitive across palm and finger, and strong in its grasp, gentle in its caress or effective in its agency. Touch is vital to our survival as babies, to our development as children and our safety and social interactions as adults. It is a sense called into play when other senses are damaged (e.g. with blindness). It triggers psychological comforts, excitement, affection, alertness, persuasion and, although a ubiquitous and elusive dimension of sensation, it has such power within our reception and perception of the world, our concepts and our language. It therefore has one of the longest entries in the dictionary, needing multiple definitions to adequately describe its diversity and elusive qualities.

Touch is not really a separate sense but part of a bouquet of all the senses as they receive and transmit, in a perpetual loop, to the labyrinthine sensorium of the brain. We use senses together and together they add to our brain’s perception. We perceive the world through our senses, with visual information reaching the ventral and dorsal streams of visual projections in the cerebral cortex. With different requirements being detected, the visual-motor system delivers knowledge of the object and events in the world (ventral stream) and the moment-to-moment information about the location and disposition of objects (dorsal stream). Both then work in an integrated fashion to control behaviour and goal-directed action. The brain then connects, through the spinal cord, to a veritable highway of nerves called the nervous system, to communicate with the rest of the body in response to these visual and tactile perceptions. This is done in a split second so that the brain collects all necessary sensory information and the body can then send signals to the skeleton and muscles to: locate and pick up a mallet, chisel, brush or paint tube; grasp them, weigh them in the hand and hold them appropriately for their effective use; move them into the right location to begin work; feel the weight and adjust the balance of the tool or screw off the lid and squeeze out the paint; assess the right amount of force needed; locate the direction and speed of the blow to begin to sculpt, or the fine motor action to swirl the brush to mix the paint or apply it to the canvas in a specifically developed technique; the sensitivity to brush the surface with the fingers to feel the texture, or smear and wipe off paint. Then there is the prickle of sweat, feeling the heat of the studio, the goose-bump excitement of completing a thrilling work and all the sensory input and mundane requirements of cleaning-up.

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Touch is the sense that covers the whole body. It can be localised or generalised. Both touch and movement (with their sensory-motor dependence) are processed at the top of the brain. Art is also a ‘touching’ experience, both literally touched by the hand and because of its tactile and metaphoric qualities. We can reach out through space and actively touch the work, sensing the space, dimension, form, weight, location, texture, force and movement and is a form of haptic aesthetics (as aesthetics was originally conceived by Aristotle, as a sensory faculty) whereby we are affected by the qualities, texture, symbolism, meanings of, and connections to, the artwork through tactile sensation. Such hyper-sensuality – beyond the merely visual - has now also become the locus of contemporary artworks.

Rodin, as recounted by Rainer Maria Rilke, described the erotic energy of a sculptor’s modelling of form and also attributed his compulsion to model many small hands, as having an animation and subjectivity that passed back and forth from the form of the hands and bodies to the hands of the maker. In Kenneth Gross’s book, *The Dream of the Moving Statue*, he also refers to the maker’s touch within the story of Pygmalion, where touch is used (with a little effort by the goddess Venus), to turn humans to stone, while conversely Pygmalion has to use every sense, every effort and his most delicate touch to carve to perfection the female form he hopes will animate. It is this allegory, that also reflects the nature of art in terms of the living and the artificial, the ambiguity of creative work, the complexity and ambivalence of a creative pursuit and the transformational touch of all artists. And it is this threshold of transformation from idea to object, from unformed to complete, from untouched to formed (and sometimes to overworked) that, with sensory practice, becomes the masterful touch of the artist and the source of most artists’ creative longing and anxiety. As expressed by Barbara Hepworth “Body experience...is the centre of creation. I rarely draw what I see. I draw what I feel in my body”.

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128 Ibid., p. 72
Reflection

Artists have always been reflective about, and fascinated by, the source of their creative 'powers', be they divine, innate, received or hard-won through sheer labour. In the story of Pygmalion, the repeated theme of eye and hand are allegories for the artist's touch, the sensory experience of making art, the connection of artist and audience to art object and the realisation that the creation is both made and sought out in order to give and receive emotional connection, human satisfaction, visual stimulation and metaphorical or literal 'touch' in return.

Within our objective capacity we receive sensory information, such as a reversed image on our retina which is then reordered and interpreted by the brain. Then this is subjectively filtered through identity, context, place, perspective, interest, emotion and so on. It is then stored as information and memory or used as the conduit to translate image, imagination, ideas, knowledge and skills into an external object (be it a painting or poem), imbued with meaning and emotion, called art. It is an astounding process and human creative ability. With our visible, oral, audible, tactile, olfactory acuity it is the artists (poets, musicians, dancers and writers) who are acutely able to holistically explore their brain, senses, emotions and abilities to make creative links and engender powerful emotional response, communication and creative connections within themselves and among others.

In just such a search, after dissecting about thirty corpses trying to find the source of such abilities, Leonardo da Vinci filled the cavities of these bodies with wax and plaster so he could better study the forms of the heart and brain, exclaiming in his notebooks the wonders of such a superb invention by a 'supreme master'. Now, some might argue, the 'supreme master' of our lives, which gives access to information, wonderment and the world (for better and/or worse), is not the internal workings of the body but the external workings of the world, with the revolution provided by technology and communication. With so much communication and so many images in the world, the brain is receiving, through all its senses (but especially the eye) the demands, dramas and mayhem of the world as never before in history. Until the camera and silent films were invented, information was conveyed by print or spoken word, however with a voracious media and constantly evolving technologies, the largely unmediated images that are now received have become human beings' most powerful form of information and communication and often more intense and powerful (or perhaps more worryingly - desensitising) than a verbal description, the still painting or the read word.

For contemporary human beings, therefore, there is now concern that media images (especially of violence and death) may not only be damaging our reception and processing of information but also our expression of emotion, as they are sited in the same areas of the brain that registers fear and real-life emotion. Therefore, from the earliest age, the deeper concern among teachers and scientists is that children are now endlessly exposed to

‘This is just the loveliest feeling. I love the way the paint slides across the canvas.
I find it so exciting when I actually mix the colours and they are so fantastic. They’re delicious.
It makes you want to push the paint around with your fingers or makes you feel like you want to eat it!
It’s such a powerful sensory experience’

Echoes from an erudite high school English teacher and oil painter
emotionally arousing images which the eye sees and to which the brain reacts. These incessant exposures are establishing and strengthening circuits in the brain that may increase psychological harm by creating over-sensitised or desensitised viewers and may also be ‘creating’ a generation of either frightened, fatigued, short-attention-span or indifferent citizens. This disturbing proposition, in the light of astonishing technological and pace-of-life changes, further emphasises the need to find creative outlets, quieter, less intense moments, as well as the need to train our children in sensory acuity, visual perception and visual literacy and creative expression through quality education.

I then step, as artist and teacher, into this milieu, bringing all my embodied knowing as a creative human being and artist as well as my wealth of experience as a parent, teacher, artist and community member, to teach art to individuals from 5 to 95 years of age, who enjoy, aspire or long to be creative. The over-arching philosophy of my studio is perhaps best summed up by the by-line I have used within the studio logo for the last six years: ‘...bringing art to life’ 130. With both obvious and inferred multiple meanings, it now embraces a philosophy that had always been intuited by me (but is now confirmed by this research), acknowledging an ancient and universal creative drive among human beings and the need to embed creativity in life. It also supports the theory that everyone has the potential to be creative (within the limits of their abilities, interests, motivation and persistence) which then requires the good teaching, support and encouragement for each individual to firstly be able to do so and then to be able to expand to reach their greatest potential.

Therefore as a teacher (either when learning myself, training my teachers or teaching my students) I am now more mindful of all the elements and conditions I have explored within this research and that I (and they) need to know about and consider. From the biological attributes of a human being, or the psychological dispositions each individual develops and carries with them into this studio, to the complex ways each person acts out in, and is being acted upon by the world and the art world, by better understanding these complex elements and conditions it has also ‘brought art to life’ for me as well, in ways that have been startling, gratifying, and most importantly – useful.

As my students span all age groups, socio-economic, cultural and educational backgrounds, we teach a multiplicity of medium and subject-matter to match individual interest, ambitions and abilities to try to meet these needs. I also know they bring with them a myriad of experiences, aspirations, abilities and many delicate psychological, social and creative complexities, therefore we also have a box of tissues in every room for the emotional tidal-wave that the creative experience can sometimes release. Therefore, when I am teaching students to think and ‘see’ differently, to find pleasure in the process, to touch and be ‘touched’ by art, to become skilled in production and to dare to experiment and take flights of imagination (which may be an uncommon, long-for, inhibited, fearful and/or joyful experience) I know I need to recognise these individual needs, interests, potentials, vulnerabilities and abilities. Therefore, through this multi-layered process and the understandings wrought by this research, I now know that ‘art’ and ‘being creative’ touches every aspect of our humanity. Therefore I am not only the conduit of information, but also a mentor, sometimes leading from the font, sometimes gently urging from behind and often needing to stand quietly by.

Because of such diversity I now know I need to be skilled at employing pedagogic multiplicity and also foster the potential of the individual (not just paying lip-service to that notion). Therefore by offering the insights into the creative drive and process that I have learned here, by applying practical directions with warmth, humour and encouragement, and by explaining and encouraging the benefits repetition, persistence and resilience, I now

130 The image of the studio logo with its by-line is included in the Conclusion, Chapter 8
know that I am literally helping strengthen and extend neurons, helping develop sensory acuity and building psychological courage and stamina, which in turn may enable the self-development and self-discovery that can become the foundation for creative exploration and personal potential. I knew I was doing something important, but now I know better how and why.

Therefore, beyond the pedagogic rhetoric learned in teacher training, intuited from my own philosophies, life and armaking, and drawn from my teaching experiences and finally from this research, I am now more consciously aware that I am literally helping each student, from 5 to 95, to train or retrain their brain and senses, which can then help them to undertake the next steps in the physical, psychological, emotional, social, creative and cultural journey they seek. However, because this can be a hard task for some, but is fundamental to the process, it requires my brain to think of as many ways of saying things, demonstrating, showing examples and finding the means to access their understanding, heightened their senses and compound their knowledge and skills as I possibly can. Therefore I am now more alert to the nuanced signs of such things as physical differences e.g. dominant eyes, difficulties with fine motor movement, or the need for repetition (that isn't boring) and/or a better/different explanation and so forth. I have experienced, and am also now more aware of, how the lack of a creative background, poor art experiences and/or the fear of failure in a success-and-economics-driven culture can often be so overwhelming (at any age). I have both felt and witnessed that it requires a great deal of reassurance, warmth and encouragement, a pleasant, relaxing and welcoming environment, as well as more detailed, incremental explanation, practice and affirmation of 'worth' (both creative and personal) to feel 'safe' to create. I am also more careful with incremental directions and instructions, repetition, elaboration and experimentation, rather than offering bulk lessons, single demonstrations, generalised instruction and/or vague exhortations to 'be creative'. I even better understand the subtle – and sometimes painful - need to encourage, direct and even offer 'permission' (from a perceived 'authority') for students to dare to fail, enjoy, experiment, imagine, emotionally respond, take time and have time-out, in order to find and foster the creative, life-enhancing spark within themselves. Then, when making my own art, I am also now more acutely aware of the complex 'work', the drive and the ineffable experience of making art and of my own (ancient, intuited) attempts to make sense, imbue meaning and carry messages and skills out into the world to try to reach my own art audience and do something meaningful. It is a most complex, fascinating, rewarding and worthy enterprise. And from my, my students and colleague's experiences (which have been confirmed by the readings within this research), it would appear that the trying, being, becoming and teaching to be creative is tragically, largely misunderstood, under-taught and undervalued in this time and place. It needs to be embedded in and brought back to life. If only we had the brains to do so...

Although intuited millennia ago ( .and even six years ago in my own head !) it is now known that, for the creative human being, there are immensely diverse and complex elements and conditions that contribute to the creative process. Some of these, as discussed so far, are: the person's genetic makeup and 'hard-wired' predispositions; the functions and dexterity of the body and the acuity of the senses; innate and learned intelligence; the multiplicity of knowledge, communication and forms of intelligence; as well as the subtle and overt complexities of upbringing and socio-cultural influences. In the following chapter, the elements and conditions of our psychology, which have been received, filtered and shaped by the brain and senses, as they respond to the external world, will be explored. As an individual's disposition, attributes, behaviours, attitudes, perceptions and abilities are in turn filtered and shaped by their upbringing, socialisation and culture, teachers need to understand the mechanisms of the brain and body and then be mindful of how the ever-encroaching, intrusive – and some might even say invasive – elements and conditions of the external world impinge and impose on our experiences, emotions and self-perception, which in turn affects our personality, our creativity and our ability to make – or continue to make- art.
Images from the Exhibition Undertaken As Part of the Research

As a sensate being, an artist and one who had the brief, but frightening, prospect of losing sight, sight and touch are both ‘seen’ and ‘felt’ to be vital to the many processes in art making. In these images I was not only aware of the image I was beginning to imagine in my mind’s eye and the in-sight needed to research, design and make them, but also of the curiosity and awe with which most artists – including Leonardo da Vinci – have had through the centuries for their sensory acuity, which, in a form of alchemy and metamorphism, enable them to evolve into creative abilities and tangible objects, which can then also be seen, understood and ‘felt’ by others.

Figure 11: Eye of the Beholder

Acrylic, pen, ink, charcoal and pastel, gold leaf

A transverse section of the eye as light enters the pupil with facsimiles of Leonardo’s notebook drawings of the eye circa 1508. After dissecting about thirty corpses, Leonardo filled the cavities with wax and plaster so he could better study the form of the heart and brain. His notebooks are full of exclamations of the wonders of such a superb invention by a ‘supreme master’. Now with so many images in the world, the brain is also receiving, through the eye, the chaos, dramas and mayhem of the world as never before in history. However with constantly evolving technologies, these visual medium are more intense and powerful than a verbal description or the read word and their largely unmediated images have become human beings’ most powerful form of information and communication. The concern is that, from the earliest age, children are now exposed endlessly to emotionally arousing images, which the eye sees and to which the brain reacts, establishing and strengthening neural circuits that may increase psychological harm by creating over-sensitised - or desensitised - activation.
A facsimile of the cells of the retina showing the rods and cones

A representation of a human beings' visual perception, showing that we have 180 degrees of peripheral vision, 60 degrees of near peripheral, 10 degrees of parafoveal and 2 degrees of foveal vision. Therefore the world we see becomes increasingly stretched and blurry the further away from the central foveal focus.

On either side are illustrations of our top-down processing of images, where we see what we presume or are prompted to see: for example words can facilitate, override or interfere with our perception. What do you see? A 'skyline' or the 'letter E'?

The mobility of our vision and thoughts can also change our perception. For example, which way are the triangles pointing? We constantly select and pay attention only to certain things that the brain finds relevant or interesting. Otherwise we would be overwhelmed with all the sensory information we receive (e.g. we cannot cope with the triangles going in several different directions at one time).
Acrylic, pen, ink, watercolour pencils and pastel, gold leaf

- Left hand side – (two images)

  Top - No two fingerprints (even in twins) are alike – fingerprints and thumb prints are formed prior to birth and are unique to each human. They are generally the same pattern, although they vary in size across each finger

  Bottom - Located all over the body, free nerve endings inform the brain about pain

- Right hand side (Two separate images)

  Top – These are the nerve cells that relay tactile information. We have two groups: those that receive the sensations of pushing, pulling and movement and those that sense temperature. The receptive fields of the fingers are so sensitive and highly specialised that stimuli can be felt even though only millimetres apart. These Meissner’s corpuscles are grouped on the skin of the fingertips, lips and orifices, indicating shape, feel and touch. They are only stimulated when touched and they constantly adjust to the environment e.g. the brain adjusts to ignore the constant feeling of clothing

  Bottom - Pacinian corpuscles detect pressure, telling the brain when a limb has moved
CHAPTER FIVE - PSYCHOLOGY

THE PSYCHOLOGICAL ELEMENTS AND CONDITIONS OF CREATIVITY AND ARTMAKING

Figure 1.2: *Know Thyself* by JA Ure – Colour pastels

Drawing my self-portrait is both an historic connection to (and a walk in the footsteps of) artists of all cultures throughout time and it is also the outward evidence of my sensory acuity, brain processes, artistic skill and self-perception.
The story of Pygmalion is not simply a gentle comedy about the fallibility of man, it is also about the metamorphosis of man to artist, the artwork coming ‘alive’ through his inspiration and skills, and it is also about an artist falling in love with his art\textsuperscript{131}. The story of Pygmalion therefore offers the perfect analogy to the life and work of an artist as they evoke both meaning and a search for fulfilment and answers to ‘the big questions’ through their art. As Carrol proposes, ‘Art’, on the continuum of ‘creativity’, is a means of engendering aesthetic response and human emotion, with a creative enterprise that affords, for the artist: a vehicle for self-expression and communication; a means of realising their audience’s expectations and aesthetic experience; and for the viewer, the vehicle for fulfilling the unique human and aesthetic experience they seek. Both can engage their senses, induce an absorbed, contemplative state or enjoy challenge, surprise, or pleasure. Art is a self-rewarding task, it proposes and solves problems, evokes meaning, emotion, memory and sensation.\textsuperscript{132}

\textbf{RESONANCE}

\textit{Human beings have always been fascinated by portraits. They are not only external evidence of the artist’s perception and skills but also of the sitter’s characteristics, possibly embedded also with clues to their life. Therefore portraits and self portraits have been the compelling subject matter of artists since the earliest artforms, from hand prints in caves, to Egyptian sculptures in tombs, the iconic patron portraits of Medieval art, to the increased popularity of vanity portraiture during the Renaissance and celebrity photography now.}

\textit{By the Renaissance there was an increased interest in the individual as subject-matter as well as recognition of an artist as being more than an artisan. So for art and artists, there was now also the introduction of self-promotion and narrative in art, the notion of the artist’s thought, observation and ‘hand’ being made visible, with a sense of connection,}

\textsuperscript{131} Gross, Kenneth \textit{The Dream of the Moving Statue} The Pennsylvania State University Press University Park Penn. 2006 p
communication and revelation made possible with the viewer. Therefore I have interleaved a self-portrait here, not only to invoke art history and the continuity of human interests in human beings and the psychology of artist and sitter, but also as an example of the many elements and conditions of being human, creative, an artist and teacher. In making an art work, particularly one that can be so revealing, like Pygmalion, it is palpable evidence of the many complexities of our human, creative psychology and how it effects, and is effected by, our art.

As I cannot actually ‘see’ myself the way other people see me – either literally, metaphorically or even practically (by looking into two facing mirrors) - I am certain that every attempt I make to ‘replicate’ my face is incorrect and skewed. Therefore, to my mind, a self-portrait (or in fact any artwork I do) certainly doesn’t represent what I ‘see’ (visualise) in my ‘minds-eye’ nor how I actually ‘see’ (perceive) myself. For example, the ‘staring’ or ‘cranky’ quality of many self-portraits (as is painfully evident here) stems from the fact that the sitter is staring intently, concentrating hard as the brain receives complex visual information and the mind sorts all the perceptual, emotional and social elements involved in representing the sitter or self to the outside world. Therefore it is not a reflection of how I actually feel - nor of my personality. Then the colours used may be applied or interpreted as an artistic device to evoke mood or emotion, or they may simply be an excursion into experimenting with non-local complementary colours. Then of course there may or may not be a story attached to the pose, the expressions, the context or symbolism. Human beings love psychological conundrum, insight and emotion.

Therefore as an artist I need to consider many elements within an artwork and I wanted to know about, and be aware of, this complex weaving and analysis of the brain’s processes both through this research and in ‘real life’ and ‘real time’ as I worked. Specifically, by doing a portrait for this chapter of the research, this enabled me to have both the conscious experience and the visual record of how my brain, senses and mind ‘see’ (and distort) myself and it would also enable me to finally ‘see’ how the visual and tactile information, as translated onto the paper via eye, brain and hand to page, can be ‘read’ and understood emotionally and psychologically by both artist and audience.

In this way, using this (highly vulnerable and subjective) subject matter, along with all the other artworks I did for this research, I have tried to both enact and understand the physical processes and then analyse them in relation to the psychological layers that such creating, making and responding to art invoke. Then, with such focus and deliberate action and analysis, I would also know how this relates to and was supported by what I was reading. It also alerted me as to what I can expect from, need to be aware of and therefore should also teach to my students.

For example, when an artwork is finished, I am more often than not left with an almost inevitably unsatisfactory image and feelings of disappointment as the visible marks rarely correlate with the ideas, intention or the visual images I had in my head (which are always more wonderful!). Then there is the relentless chattering voice inside my head saying: “You didn’t do that very well, did you?” Or, “That doesn’t really look like you”. And almost inevitably: “What will everyone think when they see it?” (…and on and on in torturous self-examination). Then, if doing an artwork, and especially a portrait for someone else, I also have the tricky problem of laying three ego’s bare, being: the patron or sitter’s, who wants a good artwork and likeness for posterity (but who also cannot truly see themselves as I see
them, nor translate exactly what they want in their artwork so I can ‘reproduce’ it in a way that matches the image they have in their head, my own ego, wanting them to like the work I have done (bringing personal and professional assurance and professional and self-affirmation); and finally, the viewers’, being that unknown audience of self-appointed critics who almost inevitably feel compelled to voice an opinion on the likeness. All of which, to other artists, is easily identified as a familiar round of artist’s experience, anxieties and angst.

Therefore, doing this portrait, as part of the research exhibition, exemplifies for me such artists’ (and students’) creative dilemmas and also brings to bear the psychology of being human, creative, an artist and teacher. By doing these artworks: I not only tried to make the cultural and historic connection to my creative forebears, they also became a research tool by both consciously and unconsciously enacting the very processes of creating and making that are discussed within the research. Therefore I was able to examine the many elements and conditions within my own biology and psychology and reflect on the literature and research of ‘other voices’. This process also sharply reminded me what the experience was like for my students and that I was also required, as an artist, to be mindful of and responsive to my audience. Therefore it also enabled me (from idea, to canvas, to research to exhibition) to further examine all the psychological elements and conditions that can enable or disable creativity and the ability to make art, from the interest and motivation to begin, to the courage to create and exhibit, to the tenacity to persist. By making these works I can now ‘look’ at them with greater insight and also see myself more truly ‘reflected’ as human being, artist and teacher.

From my artmaking and teaching experiences I know that when students begin, especially if they are new to art, they are often highly anxious about their ability, the outcomes, their teacher’s perception of them and their work, and ultimately, how the rest of society (especially friends, family and colleagues) will see their efforts and enterprise. Like this self-portrait, they feel exposed, only slightly revealed but showing anxiety mixed with deep concentration. I know, (especially among professionals with their high standards and self-perceptions) that most people undertaking art tend toward harsh self-criticism, unrealistic expectations and often absurd comparisons. There seems to be in our culture, the compulsion for perfection and the perception that they need to have the ‘genius’ of Leonardo or they’re doomed to fail.... which then requires a great deal of support, re-thinking, affirmation and encouragement. Then I am often confronted with the common perception among new students that, without formal training or being told what to think by books, authorities and institutions, that they cannot truly appreciate art, offer opinions, make judgements, participate in learning the skills or even be ‘game enough’ to purchase artworks, believing that there is no validity, authenticity and appropriateness to their spontaneous responses, aesthetic preferences, emotional connections, thoughts or opinions.

Therefore it would seem that art is perceived as fraught and ‘dangerous’ territory, being deemed to be elevated beyond ‘ordinary’ ability and requiring special skills and innate talent and that it is the province of the elite, generally beyond their remit and requiring a great deal of ‘natural’ ability, art authority, courage and drive to participate in. These students therefore seem to exemplify the ‘removal’ of art from life and the everyday that is also discussed in this chapter. That these attitudes and perceptions are so consistent among new students, artists and the community also confirms to me that such false beliefs in the myths of natural genius and the requirement for instant, replicable, unobtainable
perfection are some of the most pernicious disablers of creativity and artmaking and enjoyment of the arts, causing anxiety and often hindering any creative pursuit. So I have been compelled to find their source.

Then, in another psychological layer, I also frequently need to offer the ever-present tissue box, as being in an art studio (having finally ‘arrived’), making art, being totally relaxed and absorbed (or tense and anxious) ‘zoned out’ and meditative, excited or fragile, also seems to open people up to welling emotion and palpable memory. Luckily I have enough skill and experience, across a wide range of media, to meet the teaching/learning needs of most students, and for these abilities I owe a debt to my long experience making my own art, to the wonderful art teachers who taught me these skills and to my long teaching (and life’s) experience across every age group. Therefore I have now developed enough sensitivity to know that sometimes being creative and ‘doing art’ isn’t always even about the art, but that it may be the means and expression, from a deep well of human need and longing, to: prove or satisfy ‘self’; fulfil aspirations; regain hope; bolster self-esteem; calm anxieties; find pleasure; express joy; stimulate the mind; work through shock; stave off aging; climb out of depression; ‘spend’ time; externalise thoughts; relive experiences; feel good about self; express emotions; pursue aspirations; soul-search; solve problems; meet new people; experiment; feel pride; make an object; enjoy praise; improve skills; make a career; show off; create a gift; ...and on and on, across an infinite spectrum of human, social, educational, professional, psychological (and sometimes therapeutic) needs, from ego and elation to pleasure or grief. I certainly know now that ‘art’ is also more than its myths and the superficial, ego-driven, fraught, money-manipulated and competitive race-to-celebrity that can be often touted and fostered across the art institutions and markets of the current ‘big A’ art world. Because in the ‘little a’ art world it is generally a more deeply personal and significant trigger to a myriad of other things within each human being who is participating, as artist and / or audience, which can bring creativity and art slightly closer to ‘life’, community and the ‘real world’.

So, from all these complex psychological elements and conditions, I am acutely aware that art and making art taps into every area of ‘self’, from memory and ego, to ambitions and the veracities of life. Therefore, in its making, appreciating, acquiring and participating, art taps into life, being human, our human history and the fragility of our psychology embedded within it. It seems, for those who participate in it, to reach (in a multiplicity of ways) into the core of our being.

The psychology of human beings is known to be a complex interaction of genetic inheritance, temperament, perceptions, emotions, cognition, behaviours and relationships, which are garnered from the senses, processed by the brain and learned from, and reflected back into the world as attitudes, actions and abilities. Therefore these amazing metamorphic processes of creativity and the making of art, from brain to psychology, culture to creativity, will be discussed in this chapter, moving beyond the physical in an attempt to explore the elements, conditions and processes that affect our personality, memories, emotions, behaviours and experiences as we make, appreciate and express our creativity.
This chapter will therefore explore the psychology of art and artmaking as an evolutionary process, where our ‘mental world owes its complex organisation to the same process of natural selection that explains the physical organisation of things’\textsuperscript{133}. It will also argue that creativity, art and the arts are driven by ancient, innate and universal aesthetic and creative predispositions, which bring many benefits to the psychology of individuals, groups and societies, which is evidenced by the fact that creative human beings and the arts have persisted across all human time and cultures.

Then having examined these benefits it will propose that there is a need to enhance these psychological elements and conditions for creativity, art and the arts to enable and make them accessible to all. This is further argued as requiring change to the myths and false preconceptions of art, with the need to reinforce its benefits and consider that our new technologies and social conditions may actually be changing the structure of our brain, our human psychology and learning. Therefore it also argues that we need to widen the choices and opportunities within our education system, to enable our children to be psychologically receptive and self-assured and to be enabled to be creative in order to build creative societies and a dynamic future.

\textsuperscript{133} Bedaux, Jan Baptist and Cooke, Brett (Ed). \textit{Sociobiology and the Arts} Editions Rodopi Amsterdam 1999
REASONING

The story of Pygmalion is not simply a gentle comedy about the fallibility of man, it is also about the metamorphosis of man to artist. Through his inspiration, attributes, ambitions and skills the artwork comes ‘alive’, evoking such passion that he falls in love with his art\textsuperscript{134}. Therefore this chapter evolves from the physical elements and conditions of creativity to explore how our disposition, attitudes and personality become important considerations in our ability, motivation, tenacity and confidence to ‘be/become’ artists and create.

This chapter moves beyond the biological explanations of creativity and the ability to make art. It briefly explores our historic psychological inheritance and examines creativity, art and the arts’ contribution and place in our lives and the wider community. It then proposes that their human value does not ultimately lie in their ethereal, elite, rare or commercial qualities, nor as a matter of innate genius pre-ordained by genetic makeup, but rather, in terms of the evolutionary, intellectual, emotional, aesthetic and cultural contributions art makes, as well as the extraordinary enrichment, possibility and heightened human experience that creativity and art can endow to the individual and community. It finally argues the benefits of creativity and artmaking and how – and why - we should develop and promote creativity in individuals and our society.

\textsuperscript{134} Gross, Kenneth \textit{The Dream of the Moving Statue} The Pennsylvania State University Press University Park Penn. 2006 p. 72
The Evolution Of A Creative Society

Dissanayake, in her book ‘Homo Aestheticus - Where art comes from and why’, contends that, from ancient times, art has been integral, not peripheral to life. She argues that it has been vitally important to health, well-being, social cohesion and cultural identity. Specifically, she attributes art as having: contributed to our capacity for communication, play, enjoyment, display, exploration and experiment, amusement, pleasure, innovation, discovery, unity and order, resolution of tension, emotions, wonder, urge to explain, instinct for workmanship and ritual and it also augmented other behaviours such as hunting and practices such as religion, culture and societal rules. She argues that, until recently, it has neither been dysfunctional nor had the place or the intention of being trivial, disengaged, provocative or mocking, because it has had a core human purpose, high social status and value far beyond its current social reaction and market value. However, Dissanayake also expresses concern that, in contemporary Western culture, she perceives the evolution of oddly dichotomous and deeply ingrained beliefs that ‘art’ is either: intellectually undemanding, an entertainment or a diversion; and/or that creativity and art are demanding and largely the preserve of the esoteric genius, as exemplified by a narrow pantheon of legendary ‘art stars’ and therefore are perceived to be remote and unattainable by the many.

In a report commissioned by the Australia Council in 2003, which surveyed professional arts practitioners regarding their economic circumstances, some of the major findings for visual artists were that: they were generally highly educated; they tended to be more mature; they were hard working and ‘multi-skilled’; they had several sources of employment; and that most earned surprisingly low incomes (with visual artists having the lowest median ‘creative income’ of just $3,100). They also earned considerably less than other occupations requiring similar periods of training, with a mean average income of under $30,000 from all sources of employment (or less if from an arts-only income). In comments addressing this report, made in 2004 by Community Cultural Development NSW, they note that the data: ‘reflects the general perception that CCD work has a lower value. It seems a bizarre situation that..."
people put so much time, effort and money into their training and establishing a career, only to end up below the poverty line, but the data indicates this is the case in CCD’.

Therefore, given that this occupation appears not to be pursued for its rich financial rewards and appears to defy the economic imperatives (and even possibly the common sense) of our Western society, one would have to question what the psychological elements and conditions are, that metamorphose human beings into ‘artists’ and drive them to create.

‘Since coming here I have been amazed at what I have been able to do!’

Echoes of a business owner and beginner drawer

The Evolution Of A Creative Self

Noël Carrol\textsuperscript{140} proposes that ‘art’, on the continuum of human ‘creativity’, is a means of engendering aesthetic response and human emotion with a creative enterprise that affords, for the artist: a vehicle for self-expression and communication; a means of realising their audience’s expectations and aesthetic experience; and for the viewer, the vehicle for fulfilling the unique human and aesthetic experience they seek. Both artist and audience can engage their senses, induce an absorbed, contemplative state or enjoy challenge, surprise, or pleasure. Therefore art is a self-rewarding task as it proposes and solves problems, evokes meaning, memory and sensation. The story of Pygmalion therefore offers the perfect analogy to the life and work of an artist as they metamorphose from ‘human being’ into ‘artist’, just as their work also metamorphoses from ‘labour’ to ‘purpose’, ‘object’ into ‘art’ and from ‘meaning’ into ‘feeling’.

Creativity, once pondered by philosophers as a function of mind, body and aesthetics, has most recently been studied in the domain of psychology, in relation to intelligence and personality traits, with an emphasis on the individual and frequently without cultural and social context (which will be addressed in the following chapter). However, over the last ten years, it has been studied in science as a function of the brain, which has generated heated debate that such analysis is empirical, artificial, categorical and/or a reductionist scientific construct. However, such researchers as Arnold Berleant have countered, that great art is not

\textsuperscript{140} Carroll, N. \textit{Philosophy of Art: A contemporary introduction} Routledge, London 1999 p. 160
made greater by being inexplicable\(^{141}\), nor that a rational exploration of it makes it less exciting or spiritual.

Therefore, in their more intense examination of the complexities of the brain, researchers now recognise that the creative processes within the brain have the capacity for intricacies and reorganisation beyond what had been previously been thought.\(^{142}\) With an average brain having about one hundred billion neurons, with each neuron connected to between one and four thousand other neurons, in sixty four potentially different ways, the numbers of connections become almost literally astronomical (exceeding the currently known particles in the known universe). However, it is these astonishing interconnections that also create our mind, our moods, memories, thoughts, ideas, actions, reactions and abilities. From birth, the brain receives and develops information, building from a nascent infant brain, into a consolidated adult mind, loading abilities, personality and attitudes about who we are, what we are able to do and how the world is and should work\(^{143}\). Therefore the interaction between the individual, their experience, their attitudes and their cultural filters, is the schema against which we respond, giving us a powerful individual perspective on our top-down processing of the world. This shapes our ‘reality’ and self-perception. Therefore the life we lead, our perception of it and our self-perception are vital elements that may enhance or hinder our abilities and capacities, in particular for creativity and making art\(^{144}\). Therefore, as Western preconceptions and mythology about ‘art’ have curiously deemed it as both light-weight and extremely difficult, being either something of a hobby or the preserve of innate genius, this has not only clouded our judgment about human ability and potential in general, but the assessment of our own abilities in particular. It has also clouded our societal conceptions of what ‘creativity’ and art are and what they mean to our lives and our culture.

Creativity and art are species-specific. They are the evolutionary, innate and learned characteristics of our brain has allowed important human communication to become a visual record of consciousness, called an artwork\(^{145}\). By understanding the basic biological and evolutionary compulsions to create we can begin to understand the intrinsic importance of art to us as individual human beings, societies and cultures and we can further understand its value as a vocation, its social capital and its monetary value as a material asset (rather than its money value alone). We can also assess its presence or absence from our lives, its communal contribution or elitist segregation, and we can then understand and give

\(^{141}\) Berleant, A. The Aesthetic Field – A phenomenology of Aesthetic Experience Cybernetics Corporation Christchurch New Zealand 2000 p. 15
\(^{142}\) Levitin, Daniel This is Your Brain on Music – Understanding A Human Obsession Atlantic Books, London 2007 pp. 87–90
\(^{145}\) See also Appendix C i - A Short List of Art Through the Ages p 200
expression to our yearning for creative fulfilment and meaningful experience. As articulated by Dissanayake:

“Social systems that disdain or discount beauty, form, mystery, meaning, value, and quality – whether in art or life – are depriving their members of human requirements as fundamental as those for food, warmth, and shelter.”

The Psychological Origins of Creativity and Art

As we can never be sure how any century, culture or individual actually experienced their art, given the different times, beliefs, contexts and conditions, creativity and consciousness studies into the origins and evolution of creativity, art and the arts are often inconclusive in their findings but hold both fascination and scepticism as to their integration and origins. However, with research over the last ten years trying to provide a universal explanation of art’s creation and appreciation, there has also been a contemporary resistance to this scientific measurement and definition. Post-modern argument that it is reductionist, self-consciously artificial and transitory also rejects all notions of a natural empathy in the mind of one who contemplates art (termed by Trevarthen ‘einfühlung’). However, Trevarthen argues that this ignores art’s purely expressive, not just its informative and representational, aspects. At human beings’ most elemental level, it is generally agreed that progress could not have happened without natural selection and brain function, which produced intelligence, the ability to problem-solve, conjecture and imagine, which are all the preconditions necessary to reinterpret, make and re-present the world and human experience, for both science and art.

Therefore, given the power of all these evolutionary elements, which have been evident in art’s progression since humans’ existence nearly 60,000 years ago, contemporary archaeologists (and now some art historians) believe that creativity, the arts and visual art may be more than simply extraneous human activities, but rather, may be adaptive, important and deeply embedded in our human evolution.

Due to the universal compulsion for humans to survive and reproduce, human behaviours, products and artefacts also reflect and express such fundamental drives and are therefore part of the natural selection process, making art more primal than has previously been recognised. For example, there seems to be some general commonalities in genre (e.g. the figure) and aesthetic consistency across time and cultures (e.g. the traditional visual

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148 Ibid., Trevarthen
149 Ede, S. Art and Science I.B. Tauris London 2005 p 50. Recent discoveries of ritual burial and the use of decorative ochres may put this figure now at nearly 100,000 years ago.
150 For example Ede and Spivey
151 Levitin, Daniel This is Your Brain on Music – Understanding A Human Obsession Atlantic Books, London 2007 pp. 251-267
152 Ede, op, cit., p. 6
depictions of female beauty). These are thought to both reflect and culturally reinforce biological drives\textsuperscript{153}. For example, our biologically-driven preference for symmetry\textsuperscript{154} and even the comfort and consolation we may find in art, uniting us with feelings of sentimentality, profundity, shared sensibilities or ‘social equilibrium’\textsuperscript{155}, all of which are actually linked to the limbic system of the brain (the area that controls basic memories and emotionally driven behaviours). Therefore, as Sawyer\textsuperscript{156} also points out, through a range of archaeological speculation and debate (including the apparently sudden and rapid dissemination of painting), there is indicated a human need to create, that may have been due to either an evolutionary brain-change, a spreading cultural innovation, or perhaps a more gradual and progressive biological evolution. This evolution might be evidence of a slow development of genes, inherited predispositions, cognitive processes and organic development, which in themselves are all influenced by the environment.

Other evolutionary psychologists, however, have argued that as there is no spiritual force, no ‘intelligent design’, no apparent hard-wired evolutionary adaptive purpose or ‘natural selection’ for such activities and that they are more likely to be due to human ‘pleasure-seeking’, which is now also recognised as being sited within the brain. However, whether sited in Africa, the Middle-East or Europe, such prehistoric mark-making shows that the development of decorative, symbolic patterns, in diverse and locations, indicates art and the arts were universally important to humans, as they relayed information and they became a cultural activity which was learned. This suggests the elements of: symbolic thought; an attempt to apply unusual aesthetically pleasing qualities to artefacts; the development of individual ‘taste’; and the social importance now given to this activity.

As an archaeologist and professor at the University of Reading, Steven Mithen\textsuperscript{157}, has linked such ancient artmaking to four kinds of intelligence, involving: planning and executing creative marks to a preconceived mental model; referencing objects or events beyond their normal time and place; these demonstrating an imagination; and this activity therefore having the intention to communicate to others. That these earliest works are ‘art’ Mithen also attributes to the signs and symbols existing in many cultures. Being a medium of communication like language, they directly attribute meaning to a visual image, were intended to communicate multiple meanings at a significant level, were individual and/or culture-specific and were a link between the metaphysical and the natural world, being

\textsuperscript{153} Sawyer, K. R. \textit{Explaining Creativity} Oxford University Press, N.Y. 2006 p. 82
\textsuperscript{154} Ibid., p. 83
\textsuperscript{155} Sawyer Op Cit p. 86
\textsuperscript{156} Sawyer, K. R. \textit{Explaining Creativity} Oxford University Press, N.Y. 2006 pp. 89-90
\textsuperscript{157} Ibid., p. 50
outside the confines of these peoples’ time and space. Therefore this ‘art’ was momentous, and just as it is for artists now, was intended to evoke both a social and individual response and to communicate intense personal and community meaning.

As humans developed biologically, social groups became more widespread and diverse and art became more elaborate, it would appear from the evidence of ancient artworks that with humans and the natural world being seamlessly interconnected, and that the artist appears to be the shamanistic intermediary between the present and an ‘other’ world. Therefore these ancient artists could obviously envisage another world, being able to imagine outside their current time and place. They could not only communicate this with symbols and representations and imbue them with greater meaning, they could also anthropomorphise animals and show that humans could imaginatively project onto other entities, such as ancestors, animal gods and even supernatural beings (which in some quarters has also been construed as the possible beginnings of religious ideology and ritual). Then as groups grew into societies they became traders and farmers, evolved into towns, cultures and colonisers, and their wealth, mythologies and their art also became increasingly elaborate and embedded in their societies.

Sian Ede\textsuperscript{158} therefore argues that for art, such factors as: its social value in easing social interactions; its social status indicating wealth and consumption; its outward display of sensitivity; its alertness to the world and exceptional perceptiveness; and even its defiance of current traditions which have existed from ancient times to now, might actually still signify an adaptive evolutionary purpose through to this time. As artists are generally non-conformists, being the makers of meaning within a culture and/or defiant toward the accepted status quo, Ede proposes that these qualities can also make them ahead of their time, able to express and adapt to new conditions and therefore be socially ‘supreme survivors and good company to be in’\textsuperscript{159}, qualities and abilities that still make the role and work of being an ‘artist’ socially elevated on the human continuum of ‘survival of the fittest’.

\begin{quote}
\textsuperscript{158} Ede, S. art and science I.B. Tauris London 2005 p 81
\textsuperscript{159} Ibid., p. 81
\end{quote}
‘These are great people to be around. I didn’t think I’d have much to talk about but I really like talking about these different things. It’s a great social outlet as well as a creative one.’
Echoes of a businessman and new painter

What a great way to spend an evening and time with my friends. It was lots of fun and a beautiful result. I’m thrilled!
Echoes of a startled participant enjoying an art workshop – their first nervous encounter with art since high school

The Social and Cultural Functions and Benefits of Art and Creativity

‘Art’ and its uses have been viewed differently in Western society at various times in history and are different in different cultures. For example, in Western culture it has variously been seen: by Plato as feeble mimicry; Kant as sufficient unto itself, in that it may contain inherent pleasure; the Romantics as a means of signifying the sublime; the Pre-Raphaelites as a vehicle to return to an untainted pre-industrial ideal; Freud as the outward expression of inner repressed desire; and by scientists today as an outward manifestation of biological determinism. Then in other cultures throughout the world, ‘art’ is not a commodity but is the vehicle and vessel of meaning, ceremony, the communal artefacts that are inseparable from life.

As art has ancient origins and universal application, it has obviously been both a source of pleasure and value to humans, to both make and look at. From prehistoric times, art objects have been a means whereby the environment could be divided into transportable units and it also provided a mechanism for observing and preserving a record of cultural history. Whether the elements and conditions of making art are, or have been: pleasing a god; providing information; adding meaning; telling a story; recording events; evoking a response; generating a feeling; titillating the senses; or giving insight into our humanity, the features of universality, historic continuity and intrinsic pleasure and value\textsuperscript{160} of art indicate its fundamental and eternal importance to humans. Song, dance, theatre, ritual and creative/functional arts in ‘primitive’ societies are still not separate\textsuperscript{161} from life and make no

\textsuperscript{160} Davies, Stephen \textit{The Philosophy of Art} Blackwell Publishing, , Malden M.A 2006 pp. 1-3

\textsuperscript{161} Ibid., pp. 1-3

\textsuperscript{162} Feldman, E. \textit{Becoming Human Through Art} Prentice Hall. New Jersey, 1970
distinction between fine, functional and applied arts, such as we now do with Western art forms.

Therefore the ability to make and appreciate ‘art’ does not come in the form of one evolved ‘art’ gene, or the inheritance of natural genius, but is the result of the many elements and conditions of human biology, evolution, existence and individual experience. The ‘behaviour’ of ‘art’ therefore reflects a biological and psychological drive and evolution because we have been so highly motivated to do it. It enhances humans socially and culturally because: it can enrich our lives as both individuals and communities; it can form groups of producers and consumers; it has the power to engender mutuality, with like-mind, shared interest and shared identity; it socially enhances objects and ritual; it socially enhances community and important events; it is a means of communication and symbolism (establishing and enhancing ritual, knowledge, lore, history, rites and values etc); and it has contributed to creating aesthetically pleasing objects and environments, where other communal factors (such as values, belonging, respect, generational cohesion, stability and control, sense of community etc) can flourish. It has therefore been a successful additive to the quality of human life\textsuperscript{162} throughout all time and in all cultures.

The skills of art (such as curiosity, imagination, adaptability and patience), the products of artworks (from paintings, to decorations, designs and ideas that affect all areas of life) and the intrinsic and extrinsic rewards of art (i.e. it’s not tied to short-term benefits and gains) have therefore allowed the survival of art in tandem with human survival. That it has also evolved our capacity to think and invent, elaborate our environment, explore and communicate our knowledge and ideas, produce objects of value (such that their veneration and collection is important) and provide a rich emotional and sensory life, has allowed its valuable skills and commodities to continue. Therefore, beyond biology, art has also evolved as a personal enhancement and cultural invention with unique, valuable products and processes.

However, in Western culture art making and appreciating is no longer embedded in life, having evolved dichotomous divides and creative hierarchies such as: art and craft; fine and decorative; painting versus sculpture; high and low; as well as the competitive art ‘markets’ which have created artificial rankings of artists, materials, skills, objects, aesthetics, ‘value’ and creative ‘rules’. From Periclean Athens and the French Enlightenment to contemporary art, there has gradually evolved a mythology that has become an accepted axiom: that artistic activity is the preserve of special people with special talent\textsuperscript{163} and that the uniqueness and/or

\textsuperscript{162} Feldman, E. \textit{Becoming Human Through Art} Prentice Hall. New Jersey, 1970 pp. 1-3

\textsuperscript{163} Sarason, S. \textit{The Challenge of Art to Psychology} Yale University Press, New Haven, 1988 p. 2
beauty of art works elevates them to totemic objects, being the visible representations of psychic sustenance\textsuperscript{164} and the preserve of the elite and / or the insightful.

Since the Renaissance, with the improved social status and nascent mythologising of artists\textsuperscript{165}, artistic rule-making and art also shifting from private to public view, the conception, definitions and marketing of ‘art’ have also evolved. With the catastrophic changes wrought by World Wars I and II, art also began to reflect the world’s shift to new concepts of freedom, democracy, human rights, equality, individual claims for opportunity, education, growth and expression. Now art was definitively deemed to be a separate commodity in our lives and in a global economy. It was no longer connected to guilds, crafts, religion or divine influence, or even subject to ancient and universal ideas and practices. It could now be connected to science and technology and cut free from previous iconic influences, heritage and cultural claims. It was now able to break all the traditions and ‘rules’ of the Western canon of art. It could now be perishable, ephemeral, provocative, shocking and involve new technologies, even asserting the prime role of the viewer, concepts and language.

Dissanayake\textsuperscript{166} argues however, that, just like language, aesthetic values are an innate predisposition in humans, which are then specifically, culturally learned and passed on. While the arts are manifest throughout history and all cultures, the West has now designated these specific practices as ‘The Arts’ whereas other (for example, indigenous) cultures have ‘the arts’ so embedded in their lives, universally participated in, appreciated and enjoyed, that their artists are honoured for their contributions with their work being among their societies most important undertakings.

With new economies, manufacturing, communication and technologies, as well as worldwide markets, we are capable of creating and making more objects than ever before -and also debasing objects with equally careless profusion. Particularly with Western consumer manufacturing, traditions and craftsmanship have been unravelled so that, for most, we now have a casual attitude toward buying and using objects daily, with little or no understanding of their provenance, their source, their craftsmanship, their making or their ‘worth’ (either intrinsic or extrinsic). Therefore ephemera, language over substance, non-aesthetic and anti-aesthetic philosophies, built-in obsolescence and ‘commodity’ has also allowed shifting ‘rules’, which in turn has diminished the endowment of meaning and value, as well as raised questions about the benefits of creativity and art in education and in our contemporary

\textsuperscript{164} Burnham, J. Beyond Modern Sculpture Pub. George Braziller, N.Y. 1973 p. 1


\textsuperscript{166} Dissanayake, E. Homo Aestheticus Where art comes from and why University of Washington Press, Seattle 1996
consumer world. Therefore, for some, art has now become either so alien, merchandised or commonplace, it has become irrelevant, meaningless and powerless, while for others, because of such factors, it conversely has a heightened its significance.

However, for those who pursue art, as maker or audience, they continue to channel their ancient ancestors, because it still offers emotional, nostalgic and aesthetic pleasures, an enhanced sense of community and a richer cultural connection to a unique human activity that is both universal and immensely old.

‘I’d have to say I didn’t have much faith that it would be much fun. I didn’t really like art much at school. I wasn’t very good at it. But it really surprised me. I certainly know that everyone else has enjoyed it too because they haven’t stopped gabbing on about it!’

Echoes of a masterful hair artist and now tentative (but still doubtful) beginner visual artist

The Psychology of Engaging With Art and Creativity

Supported by other researchers, Trevarthen has interpreted children’s art as being less concerned with representation (which is a good reason why adult standards should not be imposed on it) than it being a means of communication, conveying invention and emotion. Then for the adult artist, the lessons learned during infancy, about making contact with other minds, understanding and representing the world, conveying emotion and cultural meaning are enacted with adult skill, understanding and intention.

Semir Zeki asserts that, although many might argue aesthetics are an opaque subjective experience, like all human activities, because it is experienced by so many human beings, aesthetic experience must therefore obey rules of the brain. Solso describes our similar aesthetic experiences as being subject to different, individual interpretations, but that our perceptual-cognitive experiences are universal as we are ‘bound by an invisible web of humanity’. Zeki also claims that, even with the intrusion of such ‘cerebral variance’ among humans, rather than detracting from our aesthetic experience, by understanding the

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168 Zeki, S. as in Journal of Consciousness Studies, 6 No. 6 – 7, 1999 pp. 94 -95
170 Ibid., p. 172
workings of the brain, it could enhance our wonder at this form of creativity and of art’s beauty. We now know that this is an astounding ability of many brains and the infinite ‘noise’ of our sensory system, enabling us to derive such a variety of experiences and to communicate profoundly through art, without either speech or the written word. By stimulating the brain directly, art can help loosen our (often unconscious) cultural incongruities, our semantic shackles and penetrate our ‘lexical prison’. Therefore, although sometimes art and creative output needs to be translated and described, to evoke our cognitive and aesthetic awareness and emotional arousal in ourselves and others, sometimes artworks and the creative arts are so evocative they are (or should be) outside our abilities for description. In fact Solso and Trevarthen both contend that often ‘art is more than words can express’ and that there are times when there are not adequate words to express our aesthetic, intuitive, emotive art experience, when words and analysis can contaminate or degrade our perception and ‘truth’. It is then that their rich information and emotional impact can only be embedded in silence, experienced by us alone, being beyond explanation or logical analysis and we ‘cry out for a non-linguistic means of expression that tells of one’s inner feelings’. That the human behaviour of ‘art’, in its making and appreciating, is not only valid and valuable but wider and deeper than just its practice, promotion and marketing, is most fully experienced when we behold a work that transcends ‘idiomatic semantic expression’.

As all humans view art with similar visual-cerebral apparatus, we generally don’t need to express all phenomena or seek consensus (for example, in broad terms we can agree we are looking at a face). We can also view art with a superficial glance or engage with it meaningfully and at many levels, depending on such factors as: the veracity of our vision; our knowledge base; our accumulated experience; and our attitudes, emotions, thinking etc. Solso illustrates this with the following analogy:- in a crowd of fifty onlookers at the Louvre, the responses to the Mona Lisa will be initially consistent, in that everyone will see an artwork, of a woman, approximately 77 by 53 centimetres. However, there will then be variations, from those who see a Renaissance masterpiece of a woman with an enigmatic smile, to those who feel obliged to look at a boring, smirking woman with no eyebrows. Oddly enough, we may also ‘see’ works differently across time, different cultures or given different information. For example, not only did Van Gogh’s art not ‘resonate with the community at
large while he lived”\textsuperscript{178} (whereas now it is lauded) our perception and emotions change when we ‘see’ a masterwork which is treasured, become reviled, having been found to be counterfeit.

However humans must still absorb the artist’s images and ideas, symbols and codes, then decode, remember, perceive and interpret them in their own unique way to engender any response to the work. While studies have analysed all the elements of artworks and human response to them, why humans respond to art as they do is still inconclusive. However, on a continuum from ‘chaotic’ to ‘contrived’ responses, whether intentionally or unconsciously, artists have continued over millennium to use universal cues, techniques, materials and aesthetic devices for both the making of art and to evoke meaning and provoke responses in other human beings.

Therefore, in order for humans to respond to art there is an incredible biological, cognitive, emotional and psychological interchange. It is a form of communication between the world and the brain, with information flowing between one and the other to form a communication bridge between the outer and inner world of the artist (writer, musician, actor etc) and that of the viewer. Brain to brain, experience to experience, loaded communication to effective message, this interchange proceeds until a knowing, empathetic understanding can be had between artist and audience. Therefore artists, having gained their own personal and professional knowledge (and also having learned from and emulated their predecessors), then spend their artistic life continuing to learn about, intuit and improve the ‘art’ of relaying these messages across the space of a gallery (performance space, art book, lounge room etc). From mind to mind, via each other’s senses, so they can effect this form of communication known as ‘art’. From there the artist’s message may be remembered and assimilated into the viewer’s world (which may or may not resemble or refer to the world of the artist, the viewer or even to Fine Art) or, depending on both the artwork and the viewer, it may be dismissed, overlooked or forgotten.

That this endeavour is participated in, experienced, enjoyed and actively sought by others (across all time and cultures) is an extraordinary human activity and achievement and, as Trevarthen\textsuperscript{179} proposes, it is an activity that is appreciated everywhere because it ‘explores and confirms the motivational roots of cultural communication’ and allows human beings to share their life experiences. Therefore art both fascinates and provokes. We are motivated to attend to the world by our need to socialise and the emotions that attend that need, and it is emotion, aroused by every artistic device, that makes artworks ‘speak’ to us about the eternal

\textsuperscript{178} Ione, Amy \textit{Journal of Consciousness Studies}, 7, No 8-9, 2000, p. 25

\textsuperscript{179} Trevarthen,C. Chapter 8 as in Gregory, R et al \textit{The Artful Eye} Oxford University Press, Oxford, 1995 p. 170
truths of life and also makes us want to pursue it as a means of expressing ourselves. We treasure their existence, beyond what they portray, because making ‘Art’ is about being human and it can also be the means of finding understanding, meaning and wisdom. It can illuminate our hearts and minds, question our existence and give us a feeling of significance in a transient life. As Donna Wheelwell\textsuperscript{180} asserts, it is art’s greatest value that it ‘lifts us above our mundane concerns....’ as it ‘illuminates the human condition and uplifts the human spirit’\textsuperscript{181}

\begin{quote}
\textit{I don’t know why....every time I come here I just seem to cry...}
\textit{But I can’t stop coming.}
\textit{So I hope you can put up with me, because \textit{I JUST LOVE COMING}!}
\end{quote}

Echoes of an anxious beginner artist who also works in the welfare and social services sector

The Psychological Benefits For Human Beings

Evoking and Enhancing Thoughts, Feelings and Emotions

From a neurological point of view, the brain needs to be visually nourished from birth so that it will not be neurologically ‘blind’. While it is thought that representational art is generally more successful in meeting the brain’s need for constancy\textsuperscript{182}, all forms of art can have psychological power and present several truths within the same work. For example, artworks can have technical virtuosity, unique materials and a variety of ideas. They can be abstract or representational, conceptual puzzles or pure aesthetic pleasure. They can portray human relationships or be trivial and decorative. They can contain a narrative, be didactic, have emotional nuance or ambiguity. Then, in a remarkable exchange, little short of alchemy, the viewer responds to all or any of these by referencing their own store of schema, perception, memory and emotion to ‘finish’ the work by applying the filter of their experience. Through heart, eye and brain they relate it to their own lives, their knowledge, ideas, attitudes, mood and emotion.

\textsuperscript{180} Wheelwell, D. Journal of Consciousness Studies, 7, No. 8-9, 2000, pp. 37-42

\textsuperscript{181} Ibid

\textsuperscript{182} Zeki, S. as in Journal of Consciousness Studies, 6 No. 6 – 7, 1999 p. 86
Emotion has the evolutionary function of keeping us safe, by responding to our environment, keeping us social, by recognising, responding, empathising, loving and committing to other people and by experiencing feelings that can guide our actions, thoughts and enrich our internal life. That art has the capacity to evoke such emotion, mental processing and action makes it an extraordinary medium in our human history and our lives. Our reception and expression of emotion through art is also a major source of its value and strengthens our appreciation of its construction and psychological importance.

Trevarthen\textsuperscript{183} argues that shared symbology, learned in infancy, is inherited and communicated generation after generation, developing a coherence within each society by labelling and referencing the ‘creations and discoveries of a coherent culture’\textsuperscript{184}. Therefore humans world-over appreciate art as a means of communicating and sharing life experiences because art can transmit an idea from the artist to the object back to the viewer. Taub’s contemporary view is that art is also a form of language\textsuperscript{185}, a means of communication and a code for a universal ‘transcendental’ idea that the artist is trying to convey\textsuperscript{186}. He argues that the profundity of the artwork may not necessarily lie in either the genius of the knowledge or the accomplishment of the application, but in the inventiveness and contribution it makes. Therefore he proposes that artists are actually inventors, absorbing, abstracting and communicating daily experience, finding new ways of looking at the world, pondering the human mind and adding to human knowledge\textsuperscript{187}. He also proposes that people world-over have metaphysical needs (e.g. for such things as peace and an ethical society) and that art can fulfil the purpose of mixing ideas with messages and emotions to provide a spiritual communion in the face of contemporary rabid self-fulfilment and ethical and spiritual disenfranchisement. He further argues that contemporary artworks can therefore often miss the mark with their audience if they don’t have an all-embracing unifying message and that by being so highly personal or even trivial, he argues such works can be reduced to barren subjectivity or separation, rather than being a communion with their audience and the projection of ideas.

Artists frequently self-reflect and record personal insights (as indicated by the artists’ observations interleaved within this text), sometimes even giving clues within their work, as to their physical, psychological and emotional responses they are having e.g. the extreme sensitivity to and preoccupation with light that is observed within the work of Monet, or the

\textsuperscript{183} Trevarthen, C. Chpt. 8 as in Gregory, R et al *The Artful Eye* Oxford University Press, Oxford, 1995 p 170
\textsuperscript{184} Ibid. 1995 p 170
\textsuperscript{185} Taubs, T. *Art and Philosophy*, Prometheus Books, Buffalo, N.Y. 1993 pp. 77 - 80
\textsuperscript{186} Ibid., p. 58
\textsuperscript{187} Taubs Op Cit p. 58-9
rapids marks of Pollock or the vivid colours of Van Gogh. Andreasen188 posits that being creative is therefore a kind of trait which manifests itself in curiosity, adventurousness and sometimes even being iconoclastic. She also proposes that one of the hallmarks of creative people is the ability to ‘perceive things in a totally new and different way that other people are simply not able to see’ or that are not obvious to others’. However, for some creative people, she further asserts, although they may actually be quite humble, the intensity of their absorption may sometimes be seen as ‘trance-like’ or misconstrued as being withdrawn or arrogant, troublesome or weird, ‘know-it-all’ or obsessive, fulfilling the erroneous but clichéd stereotypes.

When the structures and processes of the brain are described, they may seem mechanistic. There are also variously argued as being: akin to a computer; merely chemical and electrical impulses; a functional, self-regulating process of mind and body interacting with the environment; a phenomenological construct from inhabiting the world through our senses and assembling and performing ‘self-made fictions’189; another evolutionary step away from our origins as a single-celled organism; or a reflection of the mind of God. However, it is important to understand that from this amazing structure also arises the extremely important, largely unobservable, and complex subjective states of the mind, emotion and personal consciousness, deemed to be our psychology. It is almost incomprehensible that from such a complex biological system comes a ‘mind’ that unconsciously self-regulates, updates and automatically operates the body’s functions. Then that this mind can also be fully conscious, self-and-other-aware, with a sense of the world and how one moves through it, with a heightened sense of self, which is autobiographical190 and unique and all of which are particularly called upon in the lives and works of artists. Such artistic devices such as ‘stream of consciousness’ writing in novels or installations in art, where the artist and/or viewer becomes part of, or instrumental to the work, attempt to explore and describe aspects of these phenomena.

Having evolved and learnt from our earliest infant responses to become social animals, we can remember, emote, imagine and transpose ourselves into a situation where we can respond both objectively and subjectively based on our own experiences. Therefore art’s power is that it provokes emotion and recognition in others, the creative choices of artists and the aesthetic feelings of the perceiver, which arise from the impulse to seek an authentic perceptual experience191. It is not only a powerful intellectual, psychological and

190 Damasio, D as quoted in Ede, S op. cit., p. 119
philosophical tool but a powerful transmitter of images and communication of the subjective and emotive.

**Addressing the Meaning of Life and Mortality**

At other times and in other places art has been integral to life, because, while humans once had a direct connection with the environment they were not in control of nature or their lives. Subject to tenuous forces, awed by their environment, ignorant of the universe and uncertain of their place in it (much like today) artists were able to create symbols, images and objects that locked within them humans’ knowledge, meanings, messages, hopes, wishes and prayers. Therefore, while technology has made consumer goods and high-stakes weapons, created communication links and globalised and homogenised cultures, it has also damaged the biosphere and the earth’s environment and we are still struggling with ‘the big questions’ about our existence and our spiritual barometer. Therefore, as Sian Ede contends, except for the ‘most superficial works of art’\(^\text{192}\), then as now, art has always been instrumental in ‘addressing the mystery of death’ and with life and death on a continuum of our concerns, from cave walls, to the video art of our times, societies have always vested artists with ‘some sort of route to eternal truths’\(^\text{193}\) as they seem to defy time by making a permanent record of life.

\[\text{"Thank you!...I love the way you manage to challenge me!"}\]

Echoes of a business manager and wonderful life drawer

**Creativity and The Pleasure Zones**

The pleasure of putting in and teasing out the perceptual, intellectual and emotional details of an artwork are known to tap into both the visual and limbic systems of the brain. Hidden meanings, distorted perspectives, emotional shock, confounded perceptions and conflicting information can both unsettle and tantalise (e.g. Goya’s ghoulish war scenes; Escher’s visual conundrums; Mueck’s uncanny life-like works in unusual scale). Therefore art can be both informational and vested with emotions which can be provoked by disorder, puzzle and shock, stimulating the limbic system and teasing the mind to evoke memory, provoke

\[^{192}\text{Ede, S. art and science I.B. Tauris London 2005 p. 53}\]
\[^{193}\text{Ibid p. 55}\]
curiosity and create individual, personal meaning. It is the further interpretation of these artefacts, from prehistoric savannah to contemporary New York, that then governs our perceptions.

According to Semir Zekia, for artists, the top-down imposition of memory, attitude, knowledge, belief and so forth, on bottom up seeing and perception, is thought to also help artists and audience with applying ‘neurological tricks’ to the art. He therefore also proposes that ‘perceptual conundrum’ can give the reward of pleasure from deciphering the image, which further links emotion and memories in the limbic system. It is this aesthetic appreciation that reflects the original meaning of aesthetic (from ancient Greek) which is to be sensitive or sentient. In contemporary art, artists have also used these understandings to create dissonance, incongruity, novelty, shock and cognitive conundrums within their works to prompt, goad, attract, repel or engage their viewers and to generate multi-dimensional responses in the ‘seeing’, responding, thinking audience.

Through their senses and brain processes, both artist and audience can also have heightened emotional and psychological experiences of art. Artists can cause creative tension, arouse emotion, provoke social commentary, reveal an inner and outer world, or touch the eye, mind and soul with deeper meaning and the quality of qualia, which is experienced by the viewer as feeling of vivid immediacy in the here-and-now. Although art is ‘unreal’ and not of the here-and-now, such captivating creativity has the capacity to evoke an immediate and vivid response of pleasure, marvel or spiritual uplift which can also lend a feeling of aliveness and immediacy. For the artist, in producing their work, these sensations may be felt on completion, however the intense, exhilarating, focussed and timeless experience, while thinking about and producing their work, has been described by Mihaly Csikszentmihalyi as ‘flow’.197

196 Ibid
197 Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996
Cognitive psychologists and scientists have also proposed that the pleasure centres of the brain are exceedingly receptive to an immediacy of sensory response, a pleasurable complexity of ideas, connections and incongruities, as well as the ability to create new experiences and stimuli which explore the richness of human experience\textsuperscript{198}. Davies\textsuperscript{199} however, views the benefits of the arts more widely, as contributing to our psychological, emotional and moral development and wellbeing and providing social and personal goods of the highest value. He deems that a measure of a society’s maturity, sensitivity and sophistication is the quality of its greatest artists and, more generally, the extent to which its government and public supports the arts.

\begin{quote}
Well, at least I’ve tried. It’s not very good though...
Perhaps I should just give up?
\end{quote}

Echoes of an elderly retiree and anxious beginner. Then a quitter. Then a beginner again. Now exhibiting.

\begin{quote}
‘My doctor told me that no one would teach me so perhaps I shouldn’t come to class.
It’s because I’m dyslexic and I may not be able to do it....
I think he only said it because didn’t want me to be disappointed.
But I would really like to do it’
\end{quote}

Echoes of a determined, persistent beginner artist who is also defying the obstacles of their learning difficulties

\section*{The Psychological Enabling and Disabling of the Myth of Creative ‘Genius’}

In terms of psychological impact that can enable or disable creativity and artmaking, the perception of ability and potential can be quite profound – both within the individual and the whole of society. Therefore it is important to examine how the concepts of creativity have changed over time\textsuperscript{200} and are being played out in this time and place.

Creativity has been variously attributed to super-human forces, inspiration from God and being blessed with a special ‘genius’. However, stereotype about the tortured, impoverished creative genius have only evolved into urban myth in the last two hundred years with the

\textsuperscript{198} Ede, S. art and science I.B. Tauris London 2005 pp. 103-104
\textsuperscript{199} Davies, S. The Philosophy of Art Blackwell Publishing Malden MA. U.S.A. 2006 Preface
\textsuperscript{200} Sawyer, K. R. Explaining Creativity Oxford University Press, N.Y. 2006 pp. 12 -18
establishment of art academies, collections and art institutions, the evolution of original signed works (mostly oil painting) and the artificial hierarchies and rules of the art world.

Whereas once craftsmen had collective, hierarchical systems of guilds, from apprentices to Masters, based on patronage, economic success, skills and social status, now the Western cult of creativity, with the mythic stand-alone genius and their iconic body of work, is upheld to conflate both the mystique and the commodity of art. For the general public it not only provides a good story of divine gift and sometimes madness, supporting the highly valued notion of innovation and great ideas as emanating from a singular great mind.

There is also a social and cultural context where creativity and the role of ‘artist’ is often seen by the psyche of the general public as an individual pursuit and largely ephemeral process, not being understood as a consequence of brain processes which are then expressed, enhanced or diminished by ability, attitudes and the social processes of both the ‘real’ and the ‘art’ world. Sometimes cultural systems have emerged from such conceptions e.g. the cultural explosion in Florence during the Renaissance or New York in the 1950s, that have actually fostered, promoted and even craved these abilities and contributions within the culture. However, it must be kept in mind that these times and places don’t represent a greater number of ‘genius’ children within the population, but the active fostering of a more creative environment, due to the cultural, historic, economic and political mix, which consequently offers education, patronage, wealth, training, materials, audience and opportunity.

Through her detailed study, researcher and biographer, Lisa Jardine CBE, Professor of Renaissance Studies at Queen Mary University of London, has debunked the many established ‘truths’ of genius, giftedness and the pure, pious artists of history. She found that not only were these stand-alone ‘geniuses’ in fact standing on the shoulders of other significant thinkers and do-ers, they were, as expressed by Francis Bacon 'deeply enmeshed in matter' and only slightly more prominent than others (in a long line of brilliance and ‘eureka’ moments, that either preceded or surrounded them) that have now largely faded into history.

Instead, she proposes a more rational alternate view: that these ‘geniuses’ of the sciences and arts were in fact making their discoveries and innovations in the milieu of social pressures (often military), at a time when there was also an explosion of wealth, social status, sponsorship and power. That by bestowing and flaunting such wealth, status, opportunity

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201 Sawyer, K. R. Explaining Creativity Oxford University Press, N.Y. 2006 pp. 12 -18
203 That is, scientific matter
and prominence onto the selected ‘genius’ and the public eye, their patrons also enhanced
their own prestige, their place in history and reinforced the power of such myths.

Lauded in conventional art history as inspired beings, consumed by piety, natural ability and
the facility to express eternal, transcendent truths and inspiration through their creative gifts,
Jardine also argues that although they may have had great creativity, it is important to
consider that such artists also had opportunity, and in this milieu they could ‘be’ creative.
They could compete, be dazzling, pious, clever, mad, dangerous and glorious as they had
fabulous sponsorship/patronage. They were also able to be well-trained and were, in truth,
more driven by material consumerism than ability, as it was money that made their art (and
lifestyle) possible and sponsorship that enhanced their opportunity, their reputation and
their consignment to legend.

Although still much debated, the notion of ‘giftedness’ or prodigy has also given recent
researchers some insight into how the brain works, indicating that the difference between the
‘gifted’ from the ‘normal’ brain might be\(^{204}\): an insatiable curiosity, memory and ability to
master subjects and learn more quickly; an ability to make discoveries independently and to
intuit answers without following linear steps; and an intense focus and powerful drive to
master their areas of interest. However, while such obsessive mastery and focus in our society
can lead to high achievement, it can also lead to social isolation and marginalisation, being
out of step with peers\(^ {205} \), sometimes leaving the more gifted, more isolated. Apart from social
isolation, boredom, social and emotional problems appear to be higher with exceptionally
gifted children and often, by middle childhood, such children will try to hide their abilities
and Winner contends that, rather than isolating pull-out programs for the gifted and
talented, that a higher standard of general education is needed as well as identification by
more means than simply ‘relying on plain-vanilla IQ tests’\(^ {206} \).

That art making has been thought to be a matter of ‘natural’ ability or innate genius defies
common experience, as art (in both its making and appreciating) makes significant cognitive
demands on humans and has also made significant contributions to our cultural, social,
political, scientific and technological progress. From such ingrained beliefs and spurious
arguments about natural ability and the lesser importance of the arts over other domains,
Efland and Robinson\(^ {207} \) contend that there has now also evolved an historic and erroneous


bias in education that favours ‘weightier’ subjects, such as science and maths. With such subjects now perceived to be more ‘important’, ‘academic’ and are therefore more valued in our contemporary society, such perceptions eschew both the arts’ powers of intellectual progress, their creative possibilities in education and this has also had the consequence of narrowing the cognitive potential of future citizens\textsuperscript{208} and the creative potential of society.

A great deal of recent research also suggests\textsuperscript{209} that, while extraordinary ability may be a matter of genetic predisposition in some cases (or to some degree in all cases), masters and superior performers may in fact be fundamentally ‘ordinary’ humans who are using their brains differently, through their individual, concerted effort and their extra-ordinary pursuit of their area of interest. For example, chess masters (who may otherwise be quite ordinary in other areas of their life) use long-term memory, with vast storage and a high degree of organisation and efficient retrieval, to recognise problems and retrieve solutions, whereas skilled amateurs analyse their moves on a case-by-case basis. Anders Ericsson\textsuperscript{210} also contends that, over and above inherited qualities (of which he feels there may be a small but important hereditary component), the key ingredient to expertise and ‘genius’ is actually the willingness to ‘stretch yourself to the limit and increase your control over your performance’.

Therefore ‘genius’ or superior performance is not just a matter of the constant repetition required for mastery, but also of the constant achievement of higher levels of control over every aspect of the performance, as well as the ability to avoid boredom by improving (without automation) and enhancing something new all the time. The ‘masterful’ can rapidly encode, store and manipulate information and acquire refined mental representations to be able to access the relevant information and apply flexible reasoning. Nothing is automated and no opportunity is left unexplored or unimproved. They explore new ideas, constantly monitor their performance and deliberately acquire and refine cognitive mechanisms to enhance, control and monitor their performance. They also develop deep focus and concentration, often to the exclusion of everything and everyone else (which can frequently be perceived as socially challenging, although in truth is more likely to be task-focussed than self-focussed). This ability to focus on the task, without self-consciousness, without self (or other) evaluation or faltering under pressure has been described as ‘flow’\textsuperscript{211} where the internal motivation and the personal achievement of performing is above self evaluation and self-consciousness.

\textsuperscript{208} Efland, Arthur, D. Art and Cognition 'The Teachers College Press, Columbia University, NY2002 p 2
\textsuperscript{209} Restak, R.(Dr.) The New Brain Research From The Frontiers of Brain Science Rodale Ltd London, 2004 pp. 24 -47
\textsuperscript{210} Anders Ericsson, specialist psychologist in genius and prodigy at Florida University, as quoted in Restak, R.(Dr.)The New Brain – Research From The Frontiers of Brain Science Rodale Ltd London, 2004 p. 27
To achieve such a performance, with a ‘smooth non-self-conscious transfer of learned actions from working memory’\textsuperscript{212} into action, involves thousands of hours of practice, which attests to the brain’s plasticity and human interest combined with tenacity. It is an effort, Ericsson\textsuperscript{213} believes, that is achieved after about 10 years of intense application, as this period will at least enable a superior performance. He also contends that the one percent of the highest performance may still reflect some small element of genetic predisposition, but also argues that this doesn’t diminish Thomas Edison’s exhortation that genius is: ‘ninety nine percent perspiration and one percent inspiration’ and in fact reinforces the view that we should select an endeavour that interests us and then work with sufficient intensity and dedication that we eventually reorganise our brain’s circuitry\textsuperscript{214}.

The Need To Build Better Brains and Construct Creative Cultures

‘My teacher said that I am getting to be the top of the class in art now. Because of what I have learnt here I don’t worry about what the other kids might think anymore. I know I can do it now, so I experiment a lot more.’

Echoes of a 15 year old enthusiastic, increasingly confident, aspiring artist

While creativity, art and the arts is known to foster creative expression and imagination, in our education system and cultural milieu this also seems to imply less academic rigour (and therefore less significant economic potential). Creativity, art and the arts are also seen as being ‘other’, difficult to assess and therefore of uncertain quantifiable ‘value’. Creativity and the arts are therefore relegated to the status of being largely ‘recreational’, therapeutic or ‘cultural’ activities for the sensitive, the retired, and (if foolishly pursued as a career) for the naturally talented or gifted.

Proposed by Arnheim\textsuperscript{215}, as early as the 1980s and confirmed by recent studies by Andreasen\textsuperscript{216}, as it is now known that the brain has plasticity and an ability to change throughout life, being the only organism capable of reforming its biological patterns in a

\textsuperscript{212} Restak, R.(Dr.) *The New Brain – Research From The Frontiers of Brain Science* Rodale Ltd London, 2004 p. 33
\textsuperscript{213} Anders Ericsson, specialist psychologist in genius and prodigy at Florida University, as quoted in Restak, R.(Dr.)*The New Brain – Research From The Frontiers of Brain Science* Rodale Ltd London, 2004 p. 38
\textsuperscript{214}Anders Ericsson, specialist psychologist in genius and prodigy at Florida University, as quoted in Restak, R.(Dr.)*The New Brain – Research From The Frontiers of Brain Science* Rodale Ltd London, 2004 p. 38
\textsuperscript{216} Andreasen , Nancy *The Creating Brain – The Neuroscience of genius* Dana Press, New York. 2005
matter of years. It is by developing a creative brain throughout life that creativity and art can afford stimulation, cognitive improvements, emotional benefits, social pleasures and cultural advantages that are frequently overlooked. Arnheim\textsuperscript{217} contends that while education has largely concerned itself with verbal activities, there is no reason (given that the hemispheres of the brain are almost physiologically identical) that intuitive and creative learning couldn’t be learned and applied equally as well within our education system. He further argues that by ignoring our capacity for creativity, we are actively creating brains that are less able to participate in these areas.

Restak\textsuperscript{218} Robinson\textsuperscript{219} and Andreason also put forward similar arguments for creative education but further propose compelling arguments for caution, given the rapid changes in our environment, culture, foods, education system and even our own biology, with technologies that not only engage the mind in singular, repetitive activity, they question whether we are effectively ‘sculpting’ the brain by changing its structure and therefore also changing the personas of our population. They further argue that, to avoid uncertain and unsettling outcomes, we need to shape our education and societies to cope with our personal and collective futures.

Therefore many scientists and educators, such as Andreason and Sir Ken Robinson, continue to argue\textsuperscript{220} that to have personal enhancement, a creative society and a positive, dynamic future we need to widen the choices and opportunities within our education systems, beyond the current narrow curriculum choices, and support our children to be creative, both within and outside formal education. It is at this intersection between science, technology, the arts and education that has the most urgent and enormous importance for human development now and into the future.

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\textsuperscript{218} Restak, R.(Dr.) \textit{The New Brain – Research From The Frontiers of Brain Science}. Rodale Ltd London, 2004 and Andreason, Nancy op, cit.
\textsuperscript{219} Robinson, K. \textit{Out of Our Minds – Learning to be creative}. Capstone, Chichester UK, 2001
\textsuperscript{220} Sir Ken Robinson Author of ‘Out of our minds’ and speaker on the TED website \textit{How School Kills Creativity} 
‘I’d really like to have a go at learning how to draw again for 2 reasons. One being that I enjoyed it the first time around and the second is that I’d like to be able to teach my son to draw. I’m finding that I can’t even draw a basic tree or a cat for him and I don’t really have any confidence and so I would like some help so we can both learn.’

Echoes of a dedicated doctor, parent, beginner drawer and now beginning drawing teacher

REFLECTION

Ken Robinsons cites creativity\textsuperscript{221} as a product of our brains, senses and psychology and as a powerful example of the dynamic nature of intelligence, which employs all these areas of our mind and our being. With our world becoming more complex and changing so rapidly, he further asserts, that where we once used to find spiritual, cultural and community comfort within our society and through the things we did, we now we seem to be increasingly disconnected, more narrowly educated and responsible for our own existence in an increasingly sterile way, within a maze of artificial systems and technologies.

Although creativity and the arts are paid lip-service as being important cultural capital, they have also generally suffered from perceptions in Western education of being either the province of the ‘gifted’ or of being a less serious pursuit. Therefore they have largely been perceived (and therefore have become) the lightweight elective options in education, or trivial, extraneous activities in society that might be good for personal entertainment and/or as a ‘cultural experience’ in our communities. Therefore, over time, art and the arts have not only been removed from their deep connection, accessibility, pleasure and meaning in our everyday lives, they have also been deemed as having little substantive application to the ‘important’ issues of the ‘real world’, to cognitive development\textsuperscript{222}, academic achievement, jobs and economic significance. Although patently not true (as evidenced by human development throughout all time and in all cultures) such perceptions and marginalisation eschew the possibilities, potential and the ‘dazzling cornucopia of human achievements and aspirations’\textsuperscript{223} that would otherwise be available to us if the arts were placed at the core of our education and our culture.

\begin{footnotesize}
\begin{itemize}
\item[221] Robinson, Ken \textit{The Element – How finding your passion changes everything} Allen Lane / Penguin Books Camberwell Victoria 2009 p.70/71
\item[222] Robinson, Ken \textit{Out of Our Minds – Learning to be creative} Capstone, Chichester UK, 2001 p.6 -7
\item[223] Ibid p 66
\end{itemize}
\end{footnotesize}
With art and the arts no longer embedded in life, nor expansively experienced, inherited, enjoyed or transmitted within the population, they are now largely ‘received’ by a narrow group of the population through the contemporary cultural filters of institutional authority, media, education and technologies. Then, with the intervention of mystique, rules, elitism, myths, elevation and in some cases, the alienation of art, this then further intervenes in the immediacy of a more personal experience.

From creating to appreciating, by making it ‘other’, art and the arts then move beyond the means, enjoyment and understanding of many. Therefore our leaders, educators and businesses need to consider that the supreme value of creativity, the arts and culture does not ultimately lie in artefacts or commerce but in its potential to heighten ordinary human emotion and experience and to enhance our creativity and intellect (across all domains. By diversifying aesthetic and cultural experiences and augmenting our creativity and contributions to this world, this makes creativity and the arts both valuable to the market and invaluable to the human experience.

Given the limitations and curiosities of reality T.V., the gladiatorial thrills of spectator sport and the hunting instincts of shopping, people seem to be desperately seeking ‘something else’ in their lives. Therefore, the great diversity of people who now come into my studio to learn how to make art, often do so because they are tired of the routines of their job, the sterility of consuming and the shallowness of their life-style. They want to explore imagination, thoughts, emotions and their creative potential, after a lifetime of rigid conformity, linear outcomes, narrow driven thinking and the mirage of aspirations. When they reveal that they are ‘desperate’ for a ‘work-life balance’, when they talk of the urgent need to find ‘some me-time’ or get back to their ‘creative self’, they are voicing, as Ken Robinson proposes, the pursuit of their natural capacities and the ability to think differently about themselves and what they are doing in their lives. They want to become more fully engaged in the present and prepared for the future, finding a richer vision of their ability, creativity and individual talents and passions. By trying to connect what they really love to do with what they can become good at, they are therefore seeking fulfilment and discovery of who they really are.

Having read the history of artmaking and such research as Csikszentmihalyi’s ‘Flow and the Psychology of Discovery and Invention’, the three factors that he asserts are imperative

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224 Robinson, Ken The Element – How finding your passion changes everything Allen Lane / Penguin Books Camberwell Victoria 2009 Introduction
225 Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996
to the work of creative people, beyond just their ideas and the things they create, then also became a consideration in my own artist’s practice and my understanding of the nature of the creative processes in our culture, becoming an important message within my teaching, especially for those students who aspire to ‘become’ professional artists. His research alerted me to the proposition that creativity cannot be an isolated ‘spark’ in an imaginative head, because: it firstly has to get out into the real world, where it is then dependent on an interaction of culture and its rules; secondly, that it is dependent on the person who brings this novelty into the domain, given their biological makeup, attributes, tenacity, focus, dedication, motivation and so forth; and lastly, that it is dependent on the experts who will then support, recognise and validate the innovation, idea, discovery or product when it gets out into the domain and the ‘real’ world.

He then struck another chord (with an idea that I have proposed throughout all my teaching) by asserting that lauding such people as Einstein or Da Vinci as isolated geniuses (while not disregarding their extraordinary abilities) is both a simplification and continuation of an unhelpful mythology. By perpetuating the legends of creative genius, we overlook the reality that they (mostly males) had enormous support, total focus and a favourable cultural milieu in which they could develop, as well as the simple truths that these mythic ‘geniuses’ were also often idle and ordinary. Therefore, he further argues, to ‘be’ creative is not dependent on the personal trait of ‘creativity’ or of ‘genius’ but requires exposure, dedication and ‘attention’ that allows complete focus within the domain226 (which may well explain why females have always had added difficulties, often needing to choose between family and focus). He also asserts that creativity requires the development of specialised knowledge within the chosen domain and anticipated that this would be an ever-increasing phenomenon into the future, with our ever-increasing volume of information.

Therefore, the optimal elements and conditions required to be creative, within an individual’s psychology and the milieu in which they exist, include: the person’s interest in the domain; their intelligence and capacity; their single-mindedness; the luxury of unburdened time and total focus; and the social conditions that will enable and allow their creativity to be developed, supported, tried and tested. Therefore, when our attention is scattered, motivation is poor, when life is busy, commitments are pressing, family or other support is limited, opportunity is restricted, or if the domain’s ‘gatekeepers’ are inhibiting, one’s personal, cultural and financial conditions are unfavourable, or it is difficult to devote

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226 The term ‘domain’, as Csikszentmihalyi uses it, refers to a significant area of knowledge within a culture, such as mathematics, medicine, business, art etc rather than ‘wisdom’, housework etc. Within such domains is the ‘field’ which may include the disciplines, people and agencies etc. e.g. the Visual arts domain within which is the field of art teacher, galleries etc. For some, these domains are powerful callings, beyond financial reward.
time, energy and the ‘attention’ required, it is difficult to be ‘creative’ and making a living\textsuperscript{227}. And these are the very common elements and conditions that most of my students face as they give themselves permission to ‘be creative’ once a week, almost against all odds.

As a human being, teacher and artist I have both experienced and witnessed among my colleagues and students these same individual, familial, social and cultural impositions that have shaped our psychology and enabled (or disabled) our creativity, artmaking and even our careers. Therefore in now knowing about the psychology of creativity, including the historic impositions upon our perceptions and attitudes, as a teacher, I am now more aware of the areas of intransigence or fragility in myself and my students, which has then enabled me to find various means to counteract, rebuild or re-frame ideas, confidence, pleasure and expectations.

By understanding the historically inherited ‘myths’ of genius, knowing about our innate aestheticism and acknowledging the elements and conditions that enable mastery and pursuit of our art as it impacts on our human psychology, I have now become more sensitive to the intense anxieties I encounter among my students about ‘being good enough’ or ‘being clever enough’. Therefore I have also been better able to deal with their many doubts and expectations so they don’t overwhelm the impulse to try or the persistence needed to sustain, to explore and to care less about ‘failure’, focussing more on the persistence, experimentation and the pleasure of being creative, so they can simply enjoy the processes without being entirely focussed on the product.

The analogy of art as a ‘journey’ is the one I most often use in my studio and it is the subject of discussion and the object of this research in the next chapter, as the creative journey proceeds through to the socio-cultural elements and conditions that can enable or disable creativity and making art.

\textsuperscript{227} Referenced through the Australia Council's Publication ‘Don't Give Up Your Day Job’ An Economic Study of Professional Artists in Australia’ Throsby ad Hollister, 2003 as outlined within this document
Images from the Exhibition Undertaken As Part of the Research

From the weight of history, with its myths of ‘genius’ and the source of thought, creativity, personal attributes and the workings of the human mind, the following (replicated) images show how other artists throughout history have also tried to analyse the psychological forces of brain and personality (from numerology to phrenology), while the contemporary artist also tries to ‘see’ themselves through the eternal (convenient and introspective) subject-matter of their own self-portrait. The complexity of human psychology and creativity have always been both a puzzle and a favourite subject-matter of artists and researchers, it being such a dominant element in the enhancement or impediment of creativity and the making of art.

Figure 15: Ratio, Cognatio, Aestimatio And Memoria (Reason, Thought, Judgement And Memory)

- Left Hand Side - Half-panel
Historic accounts indicate human beings’ constant fascination with how the body and mind work. Originally the heart was thought to be the site of all thought, feeling and bodily functions, then from Medieval times to the 1500s more complex models of the mind began to be based on a division of the brain, orbits of the mind and the ultimate dominance of ‘Deus’ (the Judaeo-Christian God)

- Right Hand Side from Top to Bottom
Circa 1400 Facsimile of a Medieval figure with the head divided into three cells, the first receiving signals from the senses, with the heart being connected to the ears and brain
Circa 1200 Facsimile of a triple ventricular system within the head
Circa 1700 Facsimile of a Chinese concept of channels of vital energy relating to vital organs to maintain the balance of yin and yang
Circa 1500s Facsimile of a woodcut showing the merciless treatment of ‘trepanning’ for neurological diseases and psychiatric illness. An un-anaesthetised, a hole was drilled into the patient’s head to release unwanted vapours or spirits.

Figure 16: *Intricate Orbits And Scientific Measurements* J.Ure © 2010

Acrylic, pen, ink, gold leaf

Human beings have always been fascinated by the workings of the mind, the personality and human abilities and have tried to symbolise, measure, divine, predict and label these all over the human body, across all cultures and throughout human history. From mystic readings, to religious dogma and scientific discovery, the human brain, intelligence, senses, emotions, beliefs and functions have been a constant source of fascination, conjecture and ‘scientific’ theory.

Phrenology Heads - Phrenology pervaded books, side shows, medicine, criminal identification and ‘scientific’ discussion. ‘Phrenologists’ asserted that the brain’s function was as the organ of the mind and therefore the person’s attributes, abilities, behaviour and dispositions could be explained by the bumps on the surface of the skull.
Charcoal, pastel

Drawing myself is both a walk in the footsteps of artists throughout time and a complex weaving of analysing the brain’s processes as I work, making a record of how and what my brain and senses ‘see’ and also how the information is translated onto the page from eye to brain to mind to hand to page. As I cannot actually ‘see’ myself the way other people see me – either literally or metaphorically – I am certain that every attempt is incorrect and skewed, even to my eyes. They certainly don’t represent what I am trying to ‘see’ in my ‘minds-eye’ nor how I actually ‘see’ (perceive) myself.
The evidence for the human need to create is before our very eyes as my hands pull back the curtain of art history (with a nod to the work ‘Drawing Hands’ by C Escher), to reveal the tools of art as well as examples of paintings, sculptures and architecture across time and all cultures, from the Venus of Willendorf to Hirst’s shark: ‘The Physical Impossibility of Death in the Mind of Someone Living’ (1991).
I use to love art in high school, but I was told I was not very good at it, so I never continued. It was pretty awful and I hated it after that. I would like to try it again now but I’m a bit worried that I’m still not going to be good at it.’

Echoes of a part-time administrator and beginner drawer

Over the millennia of human history, creativity was deemed to be the gift of supreme beings with superhuman forces. Therefore creative members of ancient societies (such as poets, mathematicians and artists) were thought, like Pygmalion, to have had divine inspiration breathed into them, receiving their creative inspiration from the gods. Then the European Enlightenment shifted this emphasis to the ‘divine’ nature of humanity itself and deemed creativity to be its purest expression. Therefore, from the first artist of mythological history, when the gods made the earth and human beings, artists have always had a significant, almost ‘mythic’ place in society. However today, when we not only blithely disregard ‘the gods’, make human beings under a microscope and (unlike Pygmalion) can also see the whole of earth from space, artists often struggle for both ‘divine’ inspiration and societal support and intervention, at a time when now, more than ever, the world needs the gifts of creative human beings to ensure societies and cultures have a creative future.

Resonance

On Becoming An ‘Artist’

Over the last 5 years, from the ashes of a devastating studio fire to now running my own teaching studio, I have slowly built up my teaching practice, one pencil, one easel and one student at a time, honing both my art and my teaching skills, while also building a wide collegiate network and a professional reputation as both artist and teacher. However, it has been an immensely difficult task.

Therefore knowing about and living as ‘an artist’, both practically and effectively enacts and exemplifies the coalescence of the physical elements (brain and senses) and psychological elements (from artistic ability to the sheer courage to try) that have both enabled and driven me to create, make art, teach creativity and art-making out in the ‘real world’ and also aspire to being an ‘artist’ in the ‘art world’. As the exemplar of both Pygmalion and Galatea I have created both my art and myself as an artist and art teacher, and in so doing, I have both lived through (as an artist) and witnessed (as a teacher) the kinds of elements and conditions that buffet creative human beings within their societies and culture and that can either enable or disable their creativity.
As a relatively recent immigrant to this unique art world, I had no idea that I also typify the ‘standard’ artist in Australia, by being highly educated, lowly paid and having at least one other job to support my art. Having only ever aspired to being either ‘an artist’ or ‘an art teacher’, in order to pursue my art and also be able to pay my bills, it was therefore sobering to research the material contained within this chapter and realise that my experience was not unique - if somewhat bleak. As confirmed by the Australia Council research\(^\text{228}\), being a career artist and also being able to pay the bills do not necessarily go hand-in-hand in Australia.

Therefore, after yearning for half a lifetime to be able to participate in something I had always loved and aspired to, having worked so hard and long, forfeited so much, and then to feel the longing and frustrations of often unrecognised potential and frequently thwarted possibility, it has made this a difficult journey through a vivid, but somewhat arid career landscape. However, such difficult and sometimes disappointing experiences have also made it easier, as an eye-witness traveller, to see the great divide between the popular perception of being a ‘real’ artist (i.e. one who gains entrée into the lucrative – if sometimes short-lived - ‘big A’ Art World\(^\text{229}\) and art market) and the reality of being a ‘little a’ artist, which is the majority experience, where one needs to turn their hand to other things (including, sometimes, even abandoning their art) to survive in the ‘real world’.

**Learning To Teach Art And Being Taught Art By The Art Institutions**

By enacting the ‘norm’ of an artist’s existence in this time and place, I have had to find, make and then relentlessly carve out another job to support my art. Throughout this time of building up my teaching studio, in a desperate attempt to put my art and teaching skills 'to good use' (i.e. to help me survive in the ‘real world’ by getting a ‘real job’), I also enrolled in a one-year Visual Arts Diploma for Secondary teaching. Joining 18 to 30 year old students as a re-training dinosaur I found that, while pedagogy in Visual Arts at the university emphasised the need for creative teaching, individual analysis of learning styles and deep consideration of the whole learner, the information was actually delivered to students in the form of prior reading from an American text, followed by mass lectures in crowded auditoriums and on-line assessment tasks. I was astounded that they failed to see either the irony or inadequacy. While I had had a life-time’s experience of teaching across all ages, I also recognised the frequent misalignment between text-book theory for student teachers and classroom practice for teachers and I seriously wondered how these young art teachers would survive in a ‘real’ classroom on the teacher-training we were receiving.

I was soon to find out, surviving the ‘practicum from hell’ in a tough area, with students belligerently engaged in threatening argument, jumping out of windows (literally) and having no hesitation in telling their teachers to “fuck-off” at frequent intervals. It made me question my course, my decision to re-enter teaching, the value of ‘art’ and teaching in this school in particular and the whole education system more generally. It also made me wonder what place creativity and ‘art’ had in these

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\(^{228}\) Australia Council for the Arts ‘Don’t Give Up Your Day Job: An economic Study of Professional Artists in Australia’ Australia Council Government publication Throsby and Hollister 2003, also commented on by submissions from the Community Cultural Development NSW in 2004\(^{228}\).
children’s lives, with the serious doubt that it would have any place in their future, as it seemed to be considered (by the children, parents and staff alike) as an irrelevance and ‘soft-option’. However, the interesting conundrum was that I also observed, no matter how much their participation was exhausting, querulous and constantly obstructive, through all their protests and diversions, the children would reluctantly, finally and belligerently comply with instructions rather than have to leave a class they actually, antagonistically enjoyed. For all that they found the written coursework tedious, burdensome and irrelevant (e.g. of what relevance were ‘the f*#ing frames’ to their chaotic lives anyway?) ‘art’ appeared to be a relatively safe-haven and irritating pleasure among the many irrelevancies of school.

However, in a desperate bid for some sort of peace in my practicum and a modicum of learning between us, I finally gave up the semi-literate curriculum struggle I was compelled to teach and asked my supervising teacher if I could take some of the classes ‘back to basics’, with lessons such as colour-mixing (as their paintings didn’t reflect any understanding of what they were doing – or why). These, at last, were the most successful classes I did, with the children quiet and attentive, actually completing and visibly enjoying the tasks (so much so that the teacher took a photo as ‘evidence’ – which is included here). It was both a revelation and a blessed relief to be actually ‘teaching’, and made me wonder – for the millionth time - whether we had exchanged the elementary skills and spontaneous pleasures of art and creativity for, what appeared to me to be watered-down university course-work which was driven by academic ‘outcomes’, with language-dense contemporary art theories, which was, to them, largely irrelevant and obviously “f*#ing boring”.

From this difficult experience I began to re-think the purposes of ‘art’ and the means of engendering ‘creativity’, for teens in particular and my art students in general. It also gave me pause to think about the ‘uses’ of art, as, during this time, I had also volunteered to establish an arts/craft project with a large group of recently-arrived African refugees. This art-and-craft making now brought to the fore the impact of the arts as an emotional outlet, learning tool and even highly effective ‘bribe’ (such was its power in the service of personal pleasure). For these exhausted, anxious, disenfranchised people it was a weekly ‘safe haven’ that was greatly looked forward to because it offered relaxation, was the vehicle for self-expression, elicited emotion, prompted language, facilitated a sense of community, created a feeling of possibility and provided, where words and culture failed, a ‘universal language’ of shared experience, fun, goodwill, creative pleasure and connection to an alien culture.

I then joined the university to begin this Master’s Research degree, once again giving me an interesting insight into an ‘institutional’ approach to art and education, as I
The Pygmalion Proposition

J. Ure

seemed to ‘fall between the chairs’ with this uncommon topic (as it defied the more usual Fine Art subject-matter and methodology and also traversed the domains of art, education, sociology and medicine) even evoking, in some instances, some startling ‘too-hard-basket’ responses.

As I had also found in my Fine Arts training in Sydney, there are current theories, philosophies, academic controls, political dominance and professional manoeuvrings in tertiary institutions, that tertiary students need to be alert to, as they so greatly influence the charts and course through capricious institutional waters to the far-flung islands of ‘academic success’. It was my experience that often, ultimately, such institutional socio-cultural influences may have very little to do with either the process of being creative or the product of ‘art’, but be more the consequence of current theories, coded language, perception, funds and public profile etc, or the pragmatic product of preferred projects, departments, students, mediums, ideologies, age groups, current thinking, fashion and/or the clever, complex and often elusive means of achieving ends. Observing such fickle elements and conditions on this particular institutional art journey now showed me that ‘Art’ was sometimes more the vehicle than the road travelled.

However, reading about the social and cultural elements of art throughout the ages, as part of this research, has provided a timely reminder that the ‘more things change, the more they stay the same’. It seems that the ‘shaping’ of culture and the creation of artificial hierarchies and gate-keeping within the ‘art world’, that I had/was experiencing, was nothing new. It was also a salutary lesson that my imagining that by joining the dominant institution or participating in the cultural hurdle-race (particularly at this age and stage), might give me entrée into the inner circle of the big ‘A’ art of this region was a delusional proposition. The galleries, the tertiary training and this institutional ‘art world’ certainly also made it clear to me that my art, ideas, form of teaching, clients and the art circles I moved in were deemed to be ‘little a’ art and that the art I was dealing with among my students was also perceived to be quaint, verging on the (now pejorative terms) ‘traditional/representational’ or even (gasp) hobbyist and (even if sometimes interesting and obviously skilled) was ultimately of no interest and certainly no commercial interest (therefore being irrelevant) to the grander scheme of ‘big A’ Art and the contemporary art market. However during this time, and in complete contradiction to the power-and-perception looking-glass of art and the ‘art world’, in the ‘real world’ my ‘little a’ art classes were growing across all social groups, interest, abilities, genres and ages. I began to see that the ‘little a’ art world was vital, not only to ‘big A’ Art (if only in its demarcations and definitions, whereby one would not exist nor be defined without the other, and the spheres of public and private being appropriately catered for in each). But more importantly, I recognised that being creative and making art was an inheritance, capacity and ability that should be fostered in every individual because it could not only foster potential in the individual but also make a vital contribution to the wider society, seeping into every facet of creative human existence.

When I first started my art classes I had taught with zeal, applying the same (institutional) ideas with which I had been taught. However my thinking has now changed. I now consider all creative endeavours (from kittens to contemporary) are worthy and requiring good teaching. I now recognise that, for people to even have the ‘courage’ to try, the willingness to participate, the openness to find pleasure and personal growth (to whatever degree they are either capable of or choose) is enough. I
now know that it is the daring, the doing, the willingness and the self-fulfilment sought and found that actually makes this ‘irrational’ human pursuit both ‘worthy’ and a most important part of a human being’s persona and creative journey - of which I feel privileged to be a part.

Before lessons start for each new student I try to find out a little about them, their art experience and their aspirations. From these first discussions have come many startling revelations, a consistent thread across most adults’ stories, when I ask them why they want to do art. Almost to a person and unprompted, they recount their almost inexpressible need to be creative, to find another side to themselves in their otherwise busy lives and then to recall (often back to instances from early childhood) the parent and/or teacher or event that was inspirational and encouraged them to be creative, or (more usually) that destroyed their opportunities, efforts, hope and/or confidence in something they had always enjoyed and wanted to explore further. For most, the first art lesson is often the first, brave, tentative, almost always anxious step toward a longed-for endeavour and craved ability.

Therefore this chapter endeavours to coalesce the physical and psychological components of creativity and making art, with the elements of our social and cultural inheritance as they are played out within our contemporary society today. It also examines how our current Western society, contemporary arts, art and culture has become a complex cultural, social, educational and commercial cross-fertilisation, where learning to be creative and participate creatively in this society has become more difficult, with being ‘creative’ not as highly valued as being ‘academic’ and with ‘art’ having become a hierarchical commodity and more separate from everyday life.

From all of these issues, it also raises questions as to both the place and support of creativity, art and the arts in our Australian culture and our education system, and questions whether our current education is adequate to meet our human needs for the growing complexity, competition and the creative chasms that are looming within the world of work and within our human, personal, educational and societal need for creativity, art and the arts, now and into the future.
Reasoning

This chapter examines some of the socio-cultural elements and conditions that can enable (or hinder) some human beings to ‘be/become’ artists and create. Specifically exploring our culture and education it also proposes how we can – and why we should - develop and promote creativity and art-making in individuals and our society.

How Creativity and Western Art Have Evolved

The ground-breaking research of evolutionary psychologist Ellen Dissanayake\(^2\) argues that, from a biological, evolutionary and social perspective, for human beings, the arts are ‘normal, natural and necessary’.\(^3\) In doing so, she bridges the gap between the biological drive to create, the psychological needs such activities satisfy and the social and cultural enhancement creativity and the arts have brought to human evolution. She also proposes that, as humans have evolved to pursue what is in their best interests, the arts, art-making, participating and appreciating the arts have been essential for human beings. She asserts that this is not just for art’s sake, but for ‘life’s sake’\(^4\), as human beings are born with an innate and universal aesthetic, and also because, in evolutionary terms, the arts have made a fundamental contribution to human survival and evolution.

Dissanayake\(^5\) and Pinker\(^6\) propose that the arts have had profound cultural and societal impact as they have promoted cooperation, harmony and unity within groups. They have also reduced anxiety, dealt with important psychological and social needs and addressed human issues, such as life and death. The arts have built concord, engendered meaning, mutuality, collaboration, purpose, care and a sense of bonding and belonging for infants, the individual, and the group. They have been (and still are) a

\(^{3}\) Dissanayake, Dr Ellen Keynote address ’Art for Life’s Sake’ ArtsHealth Conference 2, Newcastle 2009
\(^{4}\) Ibid
\(^{6}\) Pinker, S. as quoted in Ede, Sian *art and science* I.B. Tauris, London 2005 p. 8
sign of social status and a display of consumption that indicates health, wealth and leisure time to create. Ramachandran\textsuperscript{235} also proposes that art has brought sexual emblems, notions of beauty and provided other ‘humanising’ effects such as: engendering community; enhancing ritual; and developing intimacy, cohesion and psychological welfare, all benefits that have ensured our humanist, cultural and aesthetic survival and evolution. Therefore Dissanayake and other evolutionary theorists contend that it is all of these elements and conditions that have enhanced our chances of reproductive success and group cohesion, survival, adaptation, invention and cultural leaps.

Dissanayake\textsuperscript{236} also emphasises that the arts were once embedded in, and essential to life, such as they still are in many indigenous cultures (for example the Wodaabe nomads of the northern Niger deserts or the Dogon of the Republic of Mali\textsuperscript{237}). However, in our Western culture and contemporary life (where we are still looking for the same kind of security, purpose, belonging and emotional satisfactions as our ancestors), creativity and the arts have now become extraneous to, and removed from, everyday life. She believes that the innate drive to make, participate or appreciate the arts is now perceived as the separate province of a select few, contained (and controlled) within narrow artificial parameters of participation, and like other, basic, ancient human needs, they are largely marginalised and ignored because of the pace of our busy lives.

\textsuperscript{235} Ramachandran as quoted in Ede, Sian art and science I.B. Tauris, London 2005 p. 81
\textsuperscript{236} Dissanayake, E. Homo Aestheticus Where art comes from and why University of Washington Press, Seattle 1996
\textsuperscript{237} Maybury Lewis, D. Millennium Tribal Wisdom and the Modern World Viking Penguin New York 1992
Art in Contemporary Culture

Overlaying our society’s traditional notions of art (such as conventional materials and production, intention, meaning and the nature of sensory experience) has been Postmodern debate, challenging long-held aesthetic concepts and questioning such ideas as individualism, gender, pluralism, globalisation and so on. With ‘art’ becoming lingual, cerebral, complex and sometimes, to the general public, quite shocking, it is no longer about self-expression in traditional materials, mimetic reflection or the traditional ideals of truth, beauty and goodness. It may also no longer be about a direct gaze and the sensory response, but about written and verbal language, concepts and what the viewer brings to the artworks. For many, this has caused bewilderment, distance and a sense of its irrelevance to their life.

While Duchamp declared ‘Anything can be art’ and Collings has argued that ‘Art fits with everything now’, Kuspit contends, to the contrary, that the confusion between art and mass culture may now have blunted or overtaken our perceptions and judgement and may, in fact, be a mark of the ‘death of art’, requiring another artistic evolution to return art to both creative quality and common apprehension. He further argues that while audiences escape the stress of their days, looking to art to find meaning and reflected life, they are now often bombarded with post-art ephemera, mass culture, meaningless, violence and a spiritual vacuum. He also asserts, that it is all the pop and pap of mass-culture that has blinding quantity but not quality, offering only ‘dead-end entertainment’ without the imaginative refinement and enduring, transcendent elements of art that have always offered spiritual comfort, subjective human resonance and aesthetic pleasure to our ancestors.

239 Collings, M. This is Modern Art Weidenfield & Nicolson, London, 1999 p. 12
241 Kuspit, D Ibid p. 177
Art’s legacy to humanity has been its part in human development and creative, aesthetic capacity. It was once the vehicle for the artist’s identity and message, and for the viewer, an opportunity for an insightful, comforting or uplifting experience. It has also: reflected us back to ourselves and our lives; pondered death; told stories; recorded and embellished our environment; been an instrument of power and wealth; and touched on the ‘unfathomable’ in our quest for the transcendent. However, in an age of globalisation, science and technology, with infinite imagery, bombarded visual acuity, miniscule arts education and even more infinitesimal audience time and attention-span, the siren-call of the ‘big A’ Art World has appeared to become about celebrity and spectacle, which has seemed enough to endow any object, technology or action with the status of ‘high art’. Therefore, as it can sometimes be difficult to distinguish, define and describe contemporary ‘Art’ (as most of the general population might understand ‘art’ to be) therefore Museums, galleries and the ‘Art Market’, now, as never before, impart their understanding, define context and endow meaning onto many of these art-forms. This can be an attempt to aid the audience with clarification, so they can feel they have understood and experienced a work that they might otherwise have passed by with little understanding or attention, or it may also generate a sense of intellectual authority and of the artworks being privileged, special objects beyond the remit of an ordinary, untrained and individual response.

As art is also now often communicated through language, audiences (and even artists) can sometimes be afraid to articulate their own truths and perceptions, having suspended their personal responses in the face of apparent expertise. So in a contrary proposition, while the ‘Art World’ both lauds the postmodern philosophy of individual perception and reaction, such intervention may also have the effect of denying the authenticity of an audience’s immediate, emotional and sensory responses, disregarding their commonplace aesthetic intuition as ignorance, or even worse, as ‘taste’. At a time when we enjoy more liberties, information, technology, comfort and commodities, human satisfaction, connection and ‘happiness’ seem more elusive than ever, so perhaps the ultimate creative challenge for human beings may now lie in the ordinary, ‘necessary’ and accessible ‘art’, offered by the ‘little a’ art world and also by ‘art’ becoming embedded once again, to be better understood and appreciated, in our lives and in our communities. Because just like our ancestors, the ‘big questions’ of life are still being asked and spiritual and metaphysical relevance, reassurance and human resonance are still being sought by artists and contemporary arts’ bewildered
audience, because human beings have always looked to their arts and their artists for meaning, insight and comfort.

‘...anyway, after a few galleries closed in the area I was beginning to run out of options. One, where I had had some really good sales in the past, had decided to increased the commission to 70% and I was flabbergasted. And when I talked with him he was very rude and he said he should charge his artists a 100% for the work he did for them. I mean, I would be better off just walking into the gallery and start smashing my pots! I really don’t know what to do next.

I’m not sure how to sell over the internet and I’m not sure that that’s the way to go...

How do you sell a three dimensional tactile object over the internet?’

Echoes of a beautiful ceramicist and beautiful, bewildered soul

The Life and Work of Artists

It is becoming increasingly understood that creativity is not just a product of the mind, of genetic inheritance, mythic unique genius nor eccentricities (i.e. our biology or the gods). There is now a more encompassing view\textsuperscript{246}, that creativity and the arts are, in reality, a product of many elements and conditions, including: the evolutionary progress of nature; genetic inheritance, individual biology and psychological disposition; the societal factors of time and place; cultural influences; the fluctuating factors of group input and dynamics; the influence and collaboration of colleagues; educational experiences; societal pressures; the importance of family and peer support; and many other overt and obscure individual and societal factors, all of which have emerged and fused throughout the progression of human evolution, tradition and history. Therefore, being creative, being an artist, making and appreciating art are all understood to be complex and multi-faceted which, given all the socio-cultural elements and conditions upon which these are dependent, may either contribute to an individual’s distillation or demise as a ‘creative’ human being.

While Solso\textsuperscript{247} defines art, at its most basic level, as ‘physical material that affects a physical eye and a conscious brain’, he argues that its viewing is largely ‘seen’ and then interpreted by the brain, due to the eons of evolution and socialisation. That the senses

\textsuperscript{246} Sawyer, K. R. \textit{Explaining Creativity} Oxford University Press, N.Y. 2006 pp. 30-32

compel intellectual activity and emotion, that the art object carries meaning and is the
catalyst to a subjective response which touches us in inexplicable, profound, enigmatic
ways through emotion, experience, understanding and appreciation, is an extraordinary
human attribute. And all of this happens through: the processes of sensory perception
of the art’s characteristics; then responding to its psychological aspects; then relating
these to its story and our own schema; then on our comprehension of it in a deeply
personal, emotional way.

Berleant\textsuperscript{248} also proposes that ‘art’ is more than just the process of producing an art
object. It is larger than the object itself because it may have one, some, or most of such
elements as: biology, intellect, aesthetics, taste, humour, sensation, hypothesis,
scholarship, emotion, experimentation, imagination, invention, play, morals, cognition
etc and then there may also be the many influences and conditions under which it is
undertaken, produced, presented, assessed and appreciated. These may include:
ideology, psychology, patronage, social and political conditions, educational and
cultural conditions, tribal, fashion, historical, metaphysical, religious, technological,
environmental, institutional and commercial etc. In other words, it touches every area
of life.

Therefore any creative being and art activity is both the sum of, and greater than, the
many diverse elements and conditions of creating, making and appreciating.
Consequently, many authors and researchers, such as Ken Robinson\textsuperscript{249} are now moving
outside the usual parameters of art criticism and art history to examine creativity and
art in such diverse domains as science, medicine and education. In Robinson’s case, he
now even proposes the apparently rash and revolutionary suggestion that, to a greater
or lesser degree and across a wide range of interests, everyone can be creative.\textsuperscript{250}

It is therefore at this intersection between myth and reality, the ‘hype’ of the art-market
and the realities of the everyday, that the elements and conditions of being creative,
making art and ‘being’ an artist within our contemporary society and culture begin to
elicit questions as to how we can be creative and make art and relate to the art of our
time and place. Which also provokes reflection as to what value we (really) place on
creativity and art-making, and then, how we can best use and express our amazing
abilities and better educate our children to ‘become’ creative individuals. In so doing, it

\textsuperscript{248} Berleant, A. \textit{The Aesthetic Field – A phenomenology of Aesthetic Experience} Cybernetics Corporation Christchurch New Zealand 2000 p. 14
\textsuperscript{249} Robinson, Ken \textit{Out of Our Minds – Learning to be creative} Capstone, Chichester UK, 2001; and \textit{The Element – How finding your passion
changes everything} Allen Lane / Penguin Books Camberwell Victoria 2009
\textsuperscript{250} Which brings to mind a legendary tale related by Nigel Spivey in the opening chapter of \textit{How Art Made The World}, BBC Books,
London, 2005 P7: ‘Once there was an artist who was also a teacher of art. He held classes at an art school, and many students signed up
to follow them. So many students applied to take this artist’s lessons that the directors of the art school became alarmed. There was not
enough space, they said, to accommodate such a crowd of apprentices. They summoned the artist and ordered him to cut down the
number of people taking his lessons. ‘You mean I must reject some people who apply?’ he asked. ‘Of course!’ they asked. ‘Because everyone is an artist,’ declared the artist. He refused to alter that faith; in the
classroom he would chalk up the message, EVERYONE IS AN ARTIST. Eventually the directors of the art school had him dismissed.’

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might suggest how we can, through the mechanisms of our society and culture, develop creative citizens and evolve a creative future.

The Difficulties of ‘Being’ Creative and ‘Becoming’ an Artist

Researchers such as Csikszentmihalyi, and Simonton propose that, although the uniqueness of the product, social recognition and appropriateness may be the hallmarks of creativity, they can only be defined by any society at that particular time and place.

Using the Renaissance and post-war New York art scenes as examples, Sawyer proposes that our Western society has now been caught up in creativity myths of genius, perpetuated since the Middle Ages, which have developed complex concepts of ‘creativity’ and its attributes and achievements. Consequently, these have often erroneously shaped our concept of ‘art’, the art-world and the achievability of creativity and the role of the artist, consequently influencing the importance and ‘value’ we place on creativity, art and the arts. From these myths have also sprung many misleading expectations of art, an artist’s work and their behaviour. These myths may not only be an erroneous legacy but may also exclude many who are creative.

In reality, Csikszentmihalyi and Sawyer therefore propose, the achievement of creativity and artistic output is more usually a very real, pedestrian and utilitarian activity, often dependent on recognition, support and the diffusion of new ideas at a

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251 Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996
252 Simonton, Keith as in Sawyer, K. R. Explaining Creativity Oxford University Press, N.Y. 2006 p. 28
253 Sawyer, K. R. Explaining Creativity Oxford University Press, N.Y. 2006 p. 32
254 Sawyer op. cit; and Csikszentmihalyi, M op. cit. pp. 32 -36
given time and place, rather than the amount of ‘creativity’ (genius, eccentricity or madness) vested in one individual. It also involves the complex combinations of the individual’s biology, psychology, their skills and work, as well as their social circumstances and the time and place they live in.

Some of the many examples of these socio-cultural factors that have supported and encouraged ‘creativity’ come from history, including: the economic and political strength and apprenticeship system (in Renaissance Florence); technological change such as occurred in post-war New York or Postmodern Biennales; a break with religion, as in Renaissance Florence and contemporary society; and/or a change of conventions, such as the art movements of post-war New York, the Postmodern treatises of the 1960s or the global Art Market surge since the 1980s. Sawyer255 also asserts that, for creativity and art-making, there has always been the all-important system of patronage that has supported and promoted certain individuals, allowing them (mostly ‘he’) to not only be sought-after and perceived as the ‘creative genius’ of their time, but which also forms the prototype for our contemporary Art World ‘art-stars’. Effectively, he argues, to be creative and an artist, the elements and conditions are both a ‘quirk of nature’ and a ‘whole-of-society force’ that actually ‘creates’ the creativity.

After thirty years of research, Csikszentmihalyi256 concludes in his book, ‘Flow and the Psychology of Discovery and Invention’, that three factors are imperative to the work of creative people, beyond just their ideas and the things they create. Creativity cannot be an isolated ‘spark’ in an imaginative head, because it firstly has to get out into the real world, where it is then dependent on an interaction of culture and its rules. Secondly, it is dependent on the person who brings this novelty into the domain, with their biological makeup, attributes, tenacity, focus, dedication, motivation and so forth. And lastly, it is dependent on the experts who will support, recognise and validate the innovation, idea, discovery or product when it gets out into the domain and the ‘real’ world. He further asserts that lauding such people as Einstein or Da Vinci as isolated geniuses of original invention and accomplishment, is both a simplification and continuation of unhelpful mythology.

All creators, he asserts, begin from prior knowledge, need stimulation to their thinking, have intellectual and social networking and also have the social mechanisms that recognise and promote their innovation. So the precedents, current circumstances and critical evaluations of the artist and their work actually become as important (some argue, for contemporary art, more important) as the individual’s creation, because, as

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255 Sawyer op cit; and Csikszentmihalyi, M op cit. pp. 32 -36
256 Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996
the changes they make to their field or domain equates to an evolutionary process, for such creativity to survive and become part of the culture (or history), it also needs to be a significant link in the cultural, creative chain, and one that is strong and worthy of being passed on.

In terms of the socio-cultural elements required to ‘be’ creative, the personal trait of ‘creativity’ Csikszentmihalyi\(^{257}\) deems not to be enough, as such creativity requires exposure and ‘attention’ to the domain in which the creative person works and also requires dedication to all areas of their creative life, that will allow complete focus within this domain\(^{258}\) (which may well explain why females have added difficulties, often needing to choose between family and focus). He also asserts that creativity requires the development of specialised knowledge within the domain and anticipated that this would be an ever-increasing phenomenon into the future, with our ever-increasing volume of information.

Other elements and conditions of a capacity to be creative include: the person’s interest in the domain; their intelligence and capacity; their single-mindedness; the luxury of unburdened time; and the social conditions that will enable and allow their creativity to develop, be tried and tested. Csikszentmihalyi further contends that, when our attention is scattered it is difficult to be creative. For example, when interest, skill or motivation is poor, when life is busy, commitments are pressing, family or other support is limited, opportunity is restricted, or if the domain’s ‘gatekeepers’ are inhibiting, one’s personal, cultural and financial conditions are unfavourable, or it is difficult to devote time, energy and the ‘attention’ required to be truly focussed, it is difficult to be ‘creative’. It is also the tenuous and lived experience of most artists (and particularly ‘little a’ artist) struggling with making art and making a living\(^{259}\).

Unfortunately we still live with the legends of creative genius. However, in reality, it is only myths and the conventions of history that would suggest that Leonardo da Vinci, Beethoven, Michelangelo or Picasso were the only unique, isolated ‘geniuses’. Not disregarding their extraordinary abilities, it is important to keep in mind that they did not pour forth totally original work without support or a favourable cultural milieu in which it could develop. They did have financial and social support. They also had a cultural precedent and the many art elements and social conditions of their time and place that helped enhance their success. They had excellent training, collegiate networks

\(^{257}\) Csikszentmihalyi, Mihaly Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996

\(^{258}\) The term ‘domain’, as Csikszentmihalyi uses it, refers to a significant area of knowledge within a culture, such as mathematics, medicine, business, art etc rather than ‘wisdom’, housework etc. Within such domains is the ‘field’ which may include the disciplines, people and agencies etc. e.g. the Visual arts domain within which is the field of art teacher, galleries etc. For some, these domains are powerful callings, beyond financial reward.

\(^{259}\) Referenced through the Australia Council’s Publication ‘Don’t Give Up Your Day Job’ An Economic Study of Professional Artists in Australia’ Throsby ad Hollister, 2003 as outlined within this document
and creative support. They also had patronage and powerful interventions. They were not tied to manual labour to feed themselves, nor did they have to look after small children. They also did not lead incessantly brilliant, vivacious lives with every minute filled with constant success, creative insight and social accomplishment. Often they would have been idle and ordinary. While Van Gogh might well be the ‘exception that proves the rule’, in his time and place, he was largely thought of as mad, unskilled and sometimes even a nuisance, and was therefore largely disregarded. For him, the vagaries of time and place were significant elements and conditions of his art-making and whether he was deemed a real ‘artist’. However, this lack of recognition in the nineteenth century only turned to adulation in the twentieth century, with the art aesthetic and art critique having changed so as he was able to be ‘rediscovered’.260

For artists now, it still takes time, effort, art experts and marketing to ‘be’ a professional artist. However the art institutions, galleries and contemporary art market now promote marketing and media as some of the most potent elements and conditions that can escalate the chosen few to the big ‘A’ art world, in compressed time, to achieve ‘fame’, art promotion and ‘celebrity’. This, for little ‘a’ artists, is important to know, as it presents a significantly different picture from the myths of history and becomes more realistically embedded in the everyday opportunities, pedestrian activities, vital efforts, choices and vagaries of ‘real life’.

‘I thought: This is it! ...and then, having carefully looked through the portfolio for ages she said: I’m sorry. I just love the work, I really do! It’s so different and is obviously very talented. So I hate to say this, but we really aren’t looking at any new artists right now.

We are just keeping with the ones we have because they are well known ‘names’ and we know they’ll sell.’

Echoes of a highly skilled, highly educated, talented and ‘unknown’ artist

Being Creative And An Artist In Australia

Such experience of the difficulties of being an artist in this time and place have been confirmed by the 2003261 Australia Council’s survey (noted earlier) and commented on by submissions from the Community Cultural Development NSW in 2004262.

This research revealed that, in spite of a great deal of lip-service paid to the arts, in reality there was superficial support for the arts in Australian society, with little ‘a’ art being in a particularly parlous state. The report revealed: artist’s narrow opportunities for ‘Big A’ Art World participation; the general unwillingness of the population and arts audiences to pay for the arts; and the overall poverty of our ‘little a’ artists, who, despite their increasing numbers, indicated that income from their arts practice (and in particular visual arts practice) was particularly low (and had continually decreased since the late 1980s), and that most artists had to work up to three other jobs to support and cross-subsidise their arts practice (which also compromises their art).

Therefore ‘being an artist’ in this time and place is both a ‘unique’ experience and the professional aberration of a highly educated, specialised sector of our society. Such stark reports certainly dispel the mystique and ‘high regard’ in which our culture supposedly holds the arts and artists. However there are further imposts that are negative elements for artists, such as: the inequities and omissions within our tax laws; the consistent infringements of copyright; the difficulties encountered with galleries, sales, commissions and fluctuating markets; the inequities of profit between artists and

The Pygmalion Proposition  J.Ure

Art markets; material and exhibition costs; the lack of recognition of ‘artist’ as a profession, for the purposes of social security; the extraordinarily expensive insurance/s; the scattered, narrow arts and art-employment opportunities; the difficult, time-limited applications for, and dependence on sponsorship, grants and subsidies which may ‘buy’ some time and materials to create, but then also create uncertainty and a precarious existence; and the need and expectations (from Governments to Galleries) for artists to not only create, but also be ‘personalities’, good communicators, marketers and micro-businesses, with few support mechanisms available for any of these (either financial, professional, commercial or collegiate).

‘...he loves art. Not interested in soccer, not interested in surfing or anything like that. Just art, art art. And he was doing so well at it! Quite frankly, if he had the chance he would do art every day. So of course he selected it as his elective – and then suddenly the school cut it down to one term only! And even that is at the end of the year. So now he doesn’t know what to do because he wants to keep learning about art.......and I think it’s ridiculous. I mean, if he can’t study art at school what will he do after school? It’s what he wants to do!'

Echoes of a concerned mum of a frustrated and disappointed son

‘Without this help and encouragement I would not have had the courage to consider entering TAFE...and I love it!'

Echoes of an elder retiree and new art student

‘I’m beginning to despair. They are cutting down the creative arts, moving dance into P.E. and reducing the budget for what’s left. It’s all about computers and science and maths now...

But, surprise, surprise! We are still the window-dressing for the school. So we’re the first ones trotted out if they want a performance or an exhibition to look good for the parents. Really, we work harder than any other department in the school and yet we have to fight for every dollar, while the other departments just click their fingers!

I worry about the future. I just don’t know what we’re creating here......’

Art In Education And Education Shaping Life

Within all these socio-cultural elements and conditions, it is ultimately how we educate our children to meet the challenges of our contemporary world, that develop them personally, then professionally, to ultimately become contributors to our society and
culture. As Robinson contends\textsuperscript{263}, we neither live nor create in a vacuum, therefore we not only create our art, ourselves and the world in which we live, we also have the capacity to recreate it, with imaginative ideas, creative insights and revolutionary change. Or not.

However, in a rapidly changing world, where we need to unlock individual and social potential and harness creativity and innovation, Robinson proposes\textsuperscript{264} that our current education in this contemporary socio-cultural milieu, with over-emphasis on ‘academic’ subjects and scant attention to the need for creativity and the arts, may not be preparing us for the future, as it clings to old ‘certainties’, which are not at all certain.

Csikszentmihalyi,\textsuperscript{265} states that creativity is not an unnecessary luxury, but an accomplishment that has advanced our humanity and civilisations. He further argues that the arts enrich our lives and our daily existence. This is because creativity and the arts: solve problems; provide positive goals; provide an exciting model for living; enhance our lives to become rich and fulfilling; motivate behaviour; and enhance exploration, curiosity, imagination and motivation. However, he too contends that, while we pay a lot of lip service to art and creativity, in reality, we really focus on our immediate concerns and demand their short-term practical applications and solutions.

Such attitudes were confirmed in the Australian Senate report on Arts Education in 1995,\textsuperscript{266} with the Chairman’s opening remarks expressing alarm at the dominance of economic rationalism, with the arts in society and education largely being seen as performative and a consumer product. Therefore art now seems to be deemed as ultimately subservient in our lives, having been corrupted and made a commodity. He also lamented the arts’ wider application and appreciation in the community and education as being limited to ‘product’ and also diminished to ‘training for employment’ or ‘audience appreciation’ in the service of industrial and economic needs. With creativity, art and the arts no longer seen nor experienced as an embedded, intrinsic, inseparable and/or vital part of life, now being largely separate, extraneous, dispensable and a luxury that must prove its ‘worth’ and worthiness for a mass market, Csikszentmihalyi,\textsuperscript{267} further proposes, that this is moving us toward becoming an age of bookkeepers, not innovators.

Therefore if ‘life’ –and even art - is driven by market forces, being now about expansion, production and consumption, and our lives are in service of these goals, of what ‘use’ is

\textsuperscript{263} Robinson, Ken Out of Our Minds – Learning to be creative Capstone, Chichester UK, 2001 p. 11
\textsuperscript{264} Ibid
\textsuperscript{265} Csikszentmihalyi, M Creativity – Flow and the Psychology of Discovery and Invention Harper Perennial, N.Y. 1996 p. 10
\textsuperscript{266} Parliament of the Commonwealth of Australia Report of the Senate Environment, Recreation, Communications and the Arts References Committee October 1995 Chairman’s Foreword p.v
\textsuperscript{267} Csikszentmihalyi, M. Op. cit., p. 10
creativity, art and the arts to us, our nation, our culture and our future? Then how can we all become more clever and creative as individuals, artists and as a creative, artistic nation?

Professor Arthur Efland, of Ohio University arts education asserts\textsuperscript{268} that there are at least three major problems that affect the arts in general and education in particular. The first is that the arts are generally thought of as extraneous, in society and in education, as modes of entertainment, frivolous occupations and elective options. That is, they may be ‘nice’ cultural experiences to have if time and resources permit, but they are not regarded as major contributors to personality formation, the cultivation of the mind, or as serious contributors to work or to the future. Therefore the illusory appearance of the arts as prized cultural capital is in reality, superficial, as they are not accorded real importance in either education or society. Instead, he asserts that weight, support and regard is given to those subjects that might lead to ‘economically productive lives’ in the world of occupations\textsuperscript{269}. Efland further proposes\textsuperscript{270} that, sometimes, even among those who teach or foster the arts, there is a serious lack of awareness of (or argument for) the power of imagination, thinking and knowledge acquisition, as well as an understanding of the substantive roles that the arts can play in overall cognitive development.

The third problem, according to Efland, is that this situation is made more difficult by these biases and then compounded by the uncertainty of educators as how best to directly apply the arts in education, to develop cognitive abilities in children and then assess such attainments. Such assertions could be said to be affirmed and exemplified by the proportion of time dedicated to creativity and ‘the arts’ in teacher training and perhaps even to one of the major educational psychology texts, currently used by a regional teacher-training university to train its teachers,\textsuperscript{271} where, among its 600 pages, there are endless examples of educational theories and theorists, but only four and a half pages dedicated to ‘Creativity’. Not only do these pages have brief definitions of ‘creativity’ and thin guidelines for its assessment and ‘encouragement’ (referring to tests developed in the 1980s), in a starting line embedded in the text, it then undermines both the guidelines and assessment criteria it presents by stating: ‘Teachers are not always the best judges of creativity’.\textsuperscript{272} At the very least one might suggest it’s time to review the texts, the coursework and the training that refers to them.

\textsuperscript{268} Efland, Arthur D. *Art and Cognition* Teachers College Press, New York, 2002 p. 6
\textsuperscript{269} Efland, Arthur D. *Art and Cognition* Teachers College Press, New York, 2002 p. 6
\textsuperscript{270} Ibid. p. 7
\textsuperscript{271} Woolfolk, Anita *Educational Psychology* Ninth Edition Pearson, Allyn and Bacon Publishers, Poston, 2004
\textsuperscript{272} Ibid., p. 484
Like other Western education systems around the world, education in Australia has been through many movements and applied educational theories, based on the research or postulations of psychologists, educators and philosophers. While creative theories, and theories on creativity and the arts have faded, (from Pestallozi, Montessori, Froebel, Dewey, Maslow to Gardener et al) other rationalist, outcomes-based, commerce-driven theories have taken their place. From Piaget and behavioural views of learning, to cognitive learning, metacognition, social cognitive theories and our current outcomes-based curriculum, we have continued to give precedence to a narrow range of ‘academic’ subjects and assessment criteria which are seen to meet the needs of the workplace, and in doing so, to satisfy our human and societal, if not our cultural needs (with the unwritten implication that consumerism and a strong market economy are currently deemed to be the most important elements of an adult life).

Both Edwards273 and Robinson274 therefore argue that while our culture and world have changed dramatically, and will continue to do so with ever-greater rapidity in the future, our educational institutions have resisted such change, being still chained to the economic/industrial and intellectual/academic models of human ability and training that began with industrialism, in the nineteenth century, and have been perpetuated by political, cultural and educational institutions and consumer and commercial interests ever since. In which case, one might suggest, that perhaps it’s time to see the enormity of what creativity, art and the arts have to offer education and consequently, our society. By instigating a courageous and critical move, which put creativity and the arts at the centre of our education system, our society and our lives, we would be undertaking an inspirational and revolutionary act, on the scale and enormity of the Renaissance in Italy, with the anticipation of an equally revolutionary cultural, intellectual and scientific flowering. Such a radical shift however, would require a re-conceptualisation of ‘creativity’, ‘art’ and society, with a focus of arts instruction in education and creativity and the arts central to our culture. It would then be intriguing to wonder what personal, educational, social, cultural, economic and future social ‘riches’ that might bring.

Although science is now confirming that human intelligence is complex, diverse and multi-facetted, beginning with our brains, being most critical during early childhood and puberty, but vital throughout our lives, this is not reflected within our education systems, with our current education, teacher training and academic models continuing to tap into antiquated models of learning, aspirations for ‘academic’ subjects and tapping into a narrow range of abilities and assessment among students (and their

274 Robinson, K *The Element* Allen Lane / Penguin Books Camberwell Victoria 2009
teachers). This ensures narrow fields of learning and even narrower parameters within which to teach, with support, recognition and resources given to those ‘academic’ subjects (and consequently those teachers and departments) that might lead to economically productive lives in the world of occupations. Subject matter is separated, specialised and taught to high-stakes exams. With both emphasis and rewards flowing to ‘academic’ subjects, while simultaneously diminishing the choices, diversity, complexity, experience and possibilities within the humanities and arts such policy also depletes (and sometimes extinguishes) the ingredients and well-spring of creativity and wider participation in the arts.

Edwards\textsuperscript{275} and Robinson\textsuperscript{276} further argue that, as ‘creativity’ is not separate from the brain, it is possible to ‘be creative’ across all activities that engage human intelligence. Furthermore, as humans have different creative strengths and potential, according to the pattern of their intelligence(s), their personalities, their interests and their time and place in the world, it is proposed that real creativity can come from finding inspiration across a wide range of subject matter and areas of interest. Therefore, rather than causing our students to ‘fail’ when they show no ability in narrow ‘academic’ subjects and are corralled into high-stakes exams, Robinson proposes that instead, our education system should be expanding how we think about subject matter, relevance, creativity, intelligence, ability, humanity, creativity, thinking and ideas. Although he supports the need for academic subjects, he eschews the fundamental misconception that confuses ‘intelligence’ with ‘academic ability’ and he therefore calls for a higher standard and different form of education, particularly one where creativity is explored and encouraged in every domain and art and the arts are at the centre not at the periphery of the curriculum. Ultimately, he abhors the fact that, although we are born with creative capacity, the more time we spend in the world and at school, the more we diminish this capacity through our ‘education’, which favours academic measurement over creativity\textsuperscript{277}.

To accord importance to the arts and their proper ‘academic’ authority in education, Efland proposes\textsuperscript{278} that educational authorities, teachers and students should understand that creativity and the arts are significant in our lives. He also proposes that teachers should be made aware that science now proves that the arts are major contributors to creativity, the cultivation of the mind and also to our personality formation, from evolution, to neurology, psychology and the social sciences.

\textsuperscript{275} Edwards, D. \textit{Artscience: Creativity in the Post-Google Generation} Harvard University Press, Cambridge Mass, 2008 pp. 6-13
\textsuperscript{276}Robinson, K. \textit{The Element} Allen Lane / Penguin Books Camberwell Victoria 2009
\textsuperscript{277} Ibid
\textsuperscript{278} Efland, Arthur D. \textit{Art and Cognition} Teachers College Press, New York, 2002 p. 6
Andreasen\textsuperscript{279} further asserts that, knowing that the prime periods for learning among children occurs in early childhood and then puberty, in an endeavour to ‘build better brains’ we need to attend to these extraordinary, brief, but highly significant periods of development. Being deeply concerned over lost or diminished capacities, she further asserts that it is good (formal and informal) educational practice that will help establish brain pathways and give students greater creativity through new and transformative knowledge, skills, ideas and perceptions. Although it might be argued that many abilities (such as language) are innate (with the superficial argument being that they will learn anyway), Andreasen\textsuperscript{280} emphasises that, to a greater or lesser degree, humans acquire skills, abilities and knowledge depending greatly on what they are exposed to, and if children are not exposed to good teaching and good environmental influences (especially early in their life and again at puberty), brain cells literally die off and capacity is lost.

Therefore children need nurturing, language-rich, creative, aesthetic environments to learn, to understand symbols and cultural signs and to make associations to understand the world and its complexity and diversity. However, as both Pinker and Dissanayake propose\textsuperscript{281}, given human beings’ natural, evolutionary and necessary predisposition to aesthetics, children also need explicit quality education, appreciation and experience with creativity (across all fields) and the arts. Because education is now taking place in an age of science, media, economy and technology, where optical power has been amplified by technology\textsuperscript{282} and a visual culture\textsuperscript{283}, and where (as a spectator and consumer of images) each ‘look’ is significant, it is also posited that perhaps we should now also be providing significant visual literacy\textsuperscript{284} as well, because by integrating this into all subject matter, especially creativity and art, it would provide the capacity to function well in this visual, technology world. Therefore, rather than passive reception, such an education would allow a child to function in a rapidly changing environment, to ‘read’ it, survive it, embellish it, manipulate it and enhance all their opportunities, skills and abilities to be able to make things with their hands and minds, and use technology cleverly, rather than passively, as an extension and tool for their creativity.

\textsuperscript{280} Pinker, S. as quoted in Ede, Sian art and science I.B. Tauris, London 2005 p. 77-78
\textsuperscript{283} Ibid, pp. 1 -6 Where artefacts, images, media, environment, performances etc serve as aesthetic, symbolic, ideological, political, practical, subversive functions for those who make and those who receive them. They therefore need to be ‘seen’, perceived, judged, remembered, known-about and understood as part of a person’s daily existence, experience, as producers and consumers, for use, pleasure, information, meaning, function, power, need, contemporary ‘survival’, emotion, and consequence.
\textsuperscript{284} Walker et al. Op Cit. pp. 97 - 109
Such understanding of how our brains operate and our minds develop, as part of teacher training, (including the kind of bottom-up, diverse and layered view of human ability and learning, as is tentatively attempted here) might therefore help teachers, the institutions and the public, truly appreciate the vital role and importance of creativity and the arts. As literally ‘shapers’ and ‘influencers’ of brains and minds (which then shape personalities, lives, and ultimately societies), teachers’ roles and importance to our society have been largely undervalued, marginalised and often undermined. Then, rather than the narrow focus of our current ‘academic’ education, by putting creativity and the arts at the centre of all areas of curriculum, it would help provide more diverse, interesting, creative and relevant ways of ‘encountering and reinterpreting the world’ \(^{285}\), which in turn could enhance teachers’ own perception of their role and significance for every child and importance to the whole of society. Rather than someone who writes (in some cases very lightly) on a ‘blank slate’ teachers could be recognised as those who have the power, potential and significance to provide for, nurture and mentor the nascent creative adults, workers, professionals, parents and citizens of the future.

Elaborating \(^{286}\) further on specific ways to help build a creative brain from early years to old age, Andreasen further suggests: the need for mental exercises; introduction to new and unfamiliar areas of knowledge that can be explored in depth; the practice of meditation; the practice and facility for observing and describing, memorising and imagining; the importance of turning off the television and reading; that we emphasise and encourage diversity in all things; that we address gender inequities; that we become interested in music; and that we ask interesting questions. She also asserts that ‘education’ should neither start nor end with school, because throughout life we could do much more to exercise our brains and become more creative.

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\(^{285}\) Ede, Sian *Art and science* I.B. Tauris, London 2005 p. 77-78

Reflection

This chapter has endeavoured to coalesce the physical and psychological components of creating and making art, with our social and cultural inheritance and contemporary society.

Having viewed these issues through multiple lenses, from within my own teacher training, the systems of education in which I have taught (from preschool to TAFE) and the tertiary institutions in which I have learned about teaching and the ‘art world’, it was cold comfort to discover such authors as Efland, Robinson, Davies and Andreasen, having all expressed the same concerns with our recent thrall and preoccupation with a narrow range of ‘academic’ ability and the continual push to ‘raise standards’ in education. They contend that this form of teaching and its narrow range of subject matter will not ultimately educate satisfactorily, nor creatively solve the problems we face in the world now and for the future. However, they observe that governments seem enamoured with such contracted fields of learning and measurement of achievement, with narrow focus on ‘academic’ (or sporting) ‘excellence’ and artificially constructed ‘outcomes’, where teaching to tests and pushing our children through anxiety-provoking hoops, seems to be the dominant view of how and what human beings should ‘know’ and how we should learn and teach.

Echoes of adults art experiences, past and present

‘I have not studied art since grade 12 in Queensland. I am now interested to find out if I still have it in me. Unfortunately I don’t draw much anymore.’

‘I used to love art at school. I had this really fantastic teacher……’

‘I used to hate art at school. I had this awful teacher. I did this terrific painting (…well, I thought it was terrific) but by the time the teacher finished with it I didn’t ever want to do art again!’

‘...I felt so stupid and you know what they did? They painted straight over the top of my work! Without even asking! I couldn’t believe it! If any teacher did that to me now…’

Robinson, K. *The Element*  Allen Lane / Penguin Books Camberwell Victoria 2009p. 7-9
Such archaic (some might argue politically expedient and commercially driven) attitudes seem to almost wilfully disregard a great deal of research, and even teachers’ everyday understandings, that there are a full array of human abilities, dispositions and varieties of teaching and learning that need to be addressed. As Robinson argues288, these attitudes have now also created an artificial dichotomy between the notion of ‘academic’ subjects and ‘the arts’ that have caused a tragic narrowing of concepts of intelligence, capacity, knowing, creativity and achievement and that cause a ‘profound waste of creative capacity’. He further argues that we now need to re-think ‘intelligence’ to effectively educate everyone, beyond mere ‘academic’ prowess. We also need to value and participate in the arts (not just as the province of the ‘gifted’ few, for the elite, or as a frivolous recreation), putting them back into the centre of education, in recognition that they are also physically and cognitively demanding subject matter, relevant to the world of work and vital contributors to a positive, creative future.

Although many schools offer arts education, it appears to be increasingly moving to the perimeter of the core curriculum, a reflection of the wider community, where ‘art’ is generally experienced and perceived in Australian culture and society as: a nice attribute or interesting cultural asset; as being achievable only by the talented and/or as the innate province of the few who are ‘gifted’; that it is apart from the concerns of the ‘real world’; that it is not ‘useful’ nor will lead to a ‘real job’; that it is to be participated in as a personal recreation or a secondary professional occupation; and that it is largely pursued by the elite, in search of the arcane.

When children participate in art at a young age (seeking the natural, archaic drives of sensory pleasure and feelings of mastery), art is accepted as largely undemanding and a fun thing to do. However by high school, students (their parents and their teachers) often ‘cannot see the point’ of taking art (and the arts) and demand that its ‘academic rigour’, its cultural purposes and commercial outcomes, especially in relation to jobs, are proven. With little support and poor status it can therefore be perceived as a relatively trivial subject-matter that takes away from significant scores and time spent on more important academic subjects (with such evidence being its poor and erratic application in primary schools, its ‘downgrading’ from a three to two-unit HSC subject and its anticipated marginalisation in the National Curriculum, recently underlining this view). However, those who actually participate in the Visual Arts in schools (both students and teachers), will attest to the contrary view that it is

highly demanding, academically rigorous and more personally challenging than the ‘correct answers’/linear thinking required in many other subject areas.

With such elevated emphasis and emphatic perception of the need and pursuit of ‘academic’ subjects in education (in a competitive social and educational triathlon which now begins from preschool through to tertiary education, only to start again in the world of work), in order to achieve a glorious commercial and consumer future, it becomes increasingly difficult to see the importance of creativity and the arts or to see their cultural meaning and relevance to everyday life or to the practicalities of work. Therefore with schools and universities having to budget resources between subjects, with this poor perception of art’s cognitive value, personal ‘worth’ or interconnectedness with other subjects and the ‘real world’, it then makes it an easy choice to marginalise or diminish it economically, academically, socially and culturally.

Warning that there is a crisis, caused by rapid change and de-skilling at a time when creativity is most needed, Robinson proposes therefore, that there now needs to be: balance across the curriculum; acknowledgment of different modes of intelligence; relationship and interconnection between the arts and other subjects; recognition of the need for creativity and the arts in all areas of life; and interconnection between education, creativity, the arts and the world beyond. Finally, he contends, that as we have been tied to the interests of an industrial economy and academic achievement, we have also subjected ourselves to a ‘partial form of education’, which will not serve us well, either in human satisfaction, personal or social achievement nor economic needs for the future. To keep pace with such change, he concludes, ‘we will need all our wits about us – literally. We must learn to be creative.’ Such failure to recognise and nurture individuals, so that they can reach their fullest capacity and various abilities which will enable them to explore their creative potential (which may include ‘creativity’ equally in science, cooking, mechanics or on a canvas) is, in Robinson’s opinion, a reprehensible waste of individual and collective ability and potential.

At a time when we need good education and good educators to develop our capacity to be creative, when we desperately need to enhance our lives, reach our fullest potential, preserve our world, invent new products, create a positive future, evolve new ways of thinking and interacting, as well as find creative ways to utilise our time and our

289 Robinson, K. The Element Allen Lane / Penguin Books Camberwell Victoria 2009, p. 201
290 Ibid p. 203
291 Robinson, Op cit, p. 203
human and material resources, I have endeavoured\textsuperscript{292} to find a more holistic, comprehensive insight into creativity and art-making that might also help us teach and foster creativity better. A tiny start, within a larger aspiration, I deem it a worthy pursuit on behalf of my students, the arts and education research.

As Robinson mostly aptly describes such creative pursuits\textsuperscript{293}, they are a ‘hymn to the breathtaking diversity of human talent and passion and to our extraordinary potential for growth and development’.

\textsuperscript{292} As outlined at the end of the chapter on the Senses
\textsuperscript{293} Robinson, Ken \textit{The Element} – How finding your passion changes everything Allen Lane / Penguin Books Camberwell Victoria 2009 Introduction
**Images from the Exhibition Undertaken As Part of the Research**

With innate drive and an inexplicable urge to create from an early age, I was blessed with some encouraging, supporting and creative teachers, who have enabled me to enjoy and participate in a life-long intellectual pursuit and creative process, with which I am now able to make a contribution back into the world through my own art works, research, teaching and by encouraging creativity, art and the arts within the community and igniting the individual creative spark in others. It is a Pygmalion-esque metamorphosis, from human being to ‘creative human being’ ..for which I am eternally grateful.

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**Figure 20:**  
**Creativity - Sample Works**  

A small sample of artworks from my ‘body of work’

Charcoal, graphite, pastel, acrylic, oils, sculpture

My own art work goes on, through the processes of the brain, senses, psychology and within the socio-cultural conditions of the world and the ‘art-world’. By the thinking, sensing, imagining and making required to both write this thesis and make these artworks, I have therefore enacted these creative processes and produced external evidence of the internal phenomena and processes of the brain. I have also personified all the elements and conditions that ‘creativity’ and ‘being an artist’ (and teacher) entail and impose, including, in the examination of both thesis and exhibition, the eternal search for personal answers, educational insights and professional approbation.
CHAPTER SEVEN - DISCUSSION

‘...what excellent teacher training! It was wonderful to see my staff so engaged in something so enjoyable and worthwhile. Although they were nervous to start, they got lots of ideas as well as had some fun. Some even said they would like to get back to some art, so it has obviously stirred up some latent artists I think!’

‘I have a pretty stressful job (and life). I haven’t drawn or painted since I was a young teenager and now I’m looking at the class as more of a hobby and a way to relax.’

‘I’m a frustrated adult doodler but I’d really like to know how it’s done properly.’

‘I want to do something for me since I work and study most of the time.’

‘I’m quite serious about my art, so I want to explore new techniques, materials and the possibility of exhibiting’

‘... Just letting you know I have no artistic skills whatsoever. I can draw a pretty good stick figure but I have mostly joined these lessons for some sort of relaxation/hobby.’

Echoes of adults’ creative aspirations

Resonance

Motivated By Myths and Metaphors

This research was first prompted by an inadvertent glance at the image of Jean-Léon Gérôme’s painting of the myth, ‘Pygmalion et Galatea’294. Just as, through the ages, myths have had the power to portray the human condition, warn of the verities of life and reveal eternal truths, within this image and its improbable story, was revealed the evolution of a human being who became the first mythic artist of history, while his artwork also metamorphosed from stone to become the living embodiment of his imagination.

These were metamorphoses that: sparked neuronal activity to become a driven, ineffable creative experience and urge to ‘make art’; prompted a human being to become an artist; enabled imagination to become an artwork; shaped stone to become ‘Galatea’; made an idea ‘come to life’; and ultimately flooded a human being (himself as cold as stone and withdrawn from self and society) with passion, creativity, human

294 Opening page of the Introduction - Pygmalion and Galatea. ca. 1890. Oil on canvas, 35 x 27 in. (88.9 x 68.6 cm). Image copyright C. Permission to use this image has been granted by The Metropolitan Museum of Art. Image source: Art Resource, NY. Gift of Louis C. Ragen, 1927 (27.200). Artist: Gerome, Jean Leon (1824-1904)
Location: The Metropolitan Museum of Art, New York, NY, U.S.A.
emotion, hope, meaning and reconnection. And it was this vision, of desperation and longing, as Pygmalion reaches out to bring his creation ‘to life’, that epitomised to me, the singular, focused and driven passion of a working artist, undertaking a uniquely human pursuit, almost against all odds.

This was also a myth-as-metaphor for the driving force of creativity, the need to make real the objects of imagination, the ineffable experience of creativity and its pursuit as a powerful vehicle for human aspiration, affirmation, hope and meaning. And here too, was the analogy of the artist’s practice, with its hope, struggles, frustrations, uncertainties, personal needs and ambitions, that deeply resonated with the depth and breadth of my personal, embodied knowing and my professional and public experience as human being, artist and teacher.

Therefore as both witness to countless numbers of students’ Pygmalion-like metamorphosis from ‘ordinary human being’ to ‘creative human being’, and as a personal reflection of my own art journey from human being to teacher, then artist to art teacher, I too knew the pursuit of creativity and making art to be a uniquely human endeavour, driven almost beyond need and logic. So I was prompted to ask the first question, that formed the basis of the ‘Pygmalion Proposition’:

So, why do we do this?

From my own arduous experience and embodied knowing, as well as my students’ recounts and colleagues’ discussions, I knew that being creative and endeavouring to become an artist was not a simple, superficial whim, because in this culture, in this time and place, being creative and becoming an artist is a difficult task and tenuous profession. Which then lead me to ask another question, evoking a larger proposition: As this ineffable need and drive to create appears to have been evident among human beings throughout all time and in all cultures, what are the elements and conditions, that combine together, that can enable (or disable) our ability to be creative and make the objects of our imagination?

Which in turn lead me to the final question: Then how can (and by implication, why should) we promote and develop creativity and art in individuals and our contemporary society?

These questions not only needed to be asked with the personal, professional and public goals of creativity, art and artmaking in mind, but in multiple and interleaved layers, looking at creativity as a whole (the most obvious offspring of which are art and the arts), making this exploration more than a superficial examination of obvious and external production of ideas and art objects. This required a personal and professional search for the elements and conditions of creativity and artmaking, across time and place, from the core of our being into the outside world and the ‘art world’.

**Personal Echoes and Professional Reverberations**

As a complex, multi-layered and creative human being, I came to this research with a depth of embedded, embodied knowing of which I was only initially vaguely aware. I also brought a vast store of personal and professional experience, as a dedicated and passionate teacher, who has been directly responsible for ‘developing brains’ from early childhood to adult education. Therefore in pursuing the ‘Pygmalion Proposition’ I have sought many personal and professional answers to the fundamental question: Why do we do what we do?

Therefore within these multiple metamorphoses, my values, philosophies and experiences have also been embedded, prompted and reflected by this research in many unexpected ways and might best be summed up by the philosophical by-line I wrote for my studio logo over ten years ago (and that I still use today): ‘The Arts Emporium...bringing art to life’. With the conclusion of this research, it is now glaringly
obvious to me that I have done everything in my power (including this thesis) to fulfil this aspiration, for myself and others, since I began this odyssey.

I have always been intuitively aware that there were many ways of knowing, learning and being ‘intelligent’, however through my teaching experience, this research, and now teaching in my own studio, it has heightened the awareness that teaching, learning, ability and creativity can be as varied, powerful, enabling, debilitating and as fragile as the personalities, attitudes, egos and capacity of each person in whom they are vested. Therefore by teaching creativity through art, I have now experienced a human capacity and subject matter that truly spans the panoply of human experience, ability and the gamut of human thought and emotion. Then, through reading the works of Ken Robinson (in tandem with other authors that I have discovered during this research), as he articulated the arguments about our inadequate education systems and our need to find our true creative ‘element’ in life, the arguments that had resonated most profoundly for me were affirmed and distilled, facilitating the final connections that I had been seeking.

The Scaffolding

Having found the topics of ‘creativity’, ‘art’ and the human drive to achieve and teach both being vested in discrete domains within the current research and literature (e.g. in education, medicine, art, psychology and so on), I chose to gather this diverse and scattered information together for my own personal insight, my professional development and to hopefully give an anticipated audience, of artists, students and teachers a more three-dimensional overview of these elements and conditions, which I have not only read about but also experienced and taught, as being significant to creativity and artmaking.

Therefore, in attempting to answer these questions, I recognised that this research would not only traverse time, place and many domains, but would also require an accumulation and interlacing of ideas to understand the many connections and complexities of what it takes to ‘create’ and be/become a creative human being in this time and place. Then it would need a methodology allowing the flexibility of viewpoint, means of reportage, multiple voice and writing style, to be able to translate such objective and subjective complexities. Therefore, by choosing to undertake this multi-faceted journey as qualitative analytic autoethnographic research, I was also able to write for an intended audience of ‘like-kind’ – being the students, artists and other teachers, who both ponder and exemplify these creative conundrums.

Reasoning

Autoethnographic Analyses and the Reflective Loop

This search both began and now concludes with an exploration of creativity, art and the arts, consistently emphasising the importance of the brain and the need to develop creative brains for the benefit of individuals and the whole of society. Therefore the pattern of a reflective loop, which is repeated through every chapter, has again been used here for the purposes of analysis and discussion, with resonance (drawing from

my own experiences and the voices of other), followed by reasoning (supported by the literature and research) and closing the reflective loop with a personal reflection on the outcomes of the research as I have been able to apply them to my artist’s practice and my teaching.

As the ‘analytical’ component of this ‘analytic autoethnography’, the focus of the discussions within this chapter will now largely draw on the literature rather than the more subjective elements of the autoethnographic data that have been layered within the research and it will now also devolve backward, from the socio-cultural to the psychological, then back to the original and fundamental investigation of the importance of the brain and senses.

Therefore, in summation, the main points discussed here, are:

Because creativity has been an ancient and innate human trait, human beings are not only capable of but need creativity in their lives.\textsuperscript{297}  

That creativity, art and the arts are no longer embedded in life

That there are long-held and erroneous myths and stereotypes about ‘creativity’\textsuperscript{298} and ‘art ability’ being only the preserve of those with innate ‘talent’ and natural ‘genius’ and that creativity and the arts are less academic subject matter within education. These are argued to be inhibitors to creativity and the creative arts in this time and in this place, for both individuals and the whole of society.

There are many elements and conditions that come into play in the creative process, from: the need to build creative brains and heightened senses; to the need to develop a resilient personality with a strong sense of ‘self’ and to recognise the personal benefits of creativity and the arts; and finally, the need to develop strong social systems that value and support creativity and the arts, which are largely vested in our education.

To that end, this research argues that we need to build creative brains, starting with an education system that is flexible, supportive and that values diverse human creativity and enterprise beyond the primacy of high-stakes exams, technology and market forces.

It asserts that creativity and the arts are not lesser academic subjects, that they need to be at the centre of education, applicable to all subject matter and that they require a good curriculum and quality teaching.

\textsuperscript{297} Dissanayake, E. Homo Aestheticus: Where art comes from and why University of Washington Press, Seattle 1996

\textsuperscript{298} Jonathan \textit{Art History – The Key Concepts} Routledge, London, 2006 Various described as products, ideas or qualities of the mind, being complex innovative, inspirational, visionary, meaningful Harris,
It emphasises that this need for creativity, art and the arts is uniquely human and vital to develop fulfilled human beings and build a positive, creative future. It further underlines that this is a resource that is currently being marginalised, undervalued and wasted.

To that end, at the core and locus of all these abilities and propensities, elements and conditions, is the Pygmalion Proposition: that being creative is a natural, necessary and a compelling pursuit, that has been our human legacy for all time and in all cultures and which should continue to be embedded in our lives. However to do this we need to value creativity, art and the arts, provide excellence in our social support and education and ultimately, we need to develop a creative brain in each individual.

**Shapers and Influencers: The Personal and Professional Search for the Elements and Conditions That Create Creative Minds, Personalities, Lives and (Ultimately) Societies**

Although intuited for millennia, over the last twenty years in particular there has been a renewed interest in exploring the possibilities, complexities, diversity and drivers of the creative human being. Such research has generally been in response to the recognition that now, particularly within large market economies, there is an urgent need for creative thinking and products to drive these economies further. Conversely, in doing so, there is also a recognition of the urgent need for sustainability and a better way of living, to save the planet from insatiable and destructive rapaciousness. And finally, somewhere in the vague recesses of leadership rhetoric and reflected throughout the media and literature, there appears to be the faint intuition that there may also be an existential void looming, where citizens need more in their lives than just working and consuming.

As a nascent area of scientific interest, by exploring the many elements and conditions that may drive, enhance, inhibit or contribute to human creative abilities, it became obvious that the current literature and research was often inconclusive and was also generally explored, discussed and contained within discrete domains. However, there also appeared to be a general recognition and commonly repeated (dichotomous) theme, that our capacity for creativity is unique, limitless, precious and also largely...
undervalued, and that this was an area that needed further research and urgent attention, as the key to a creative society and a sustainable future\textsuperscript{300}.

Although endlessly referred to in the literature, research, government documents and education treatises, with wistful descriptions, motherhood statements and vague generalisations about its ‘value’ and our need to ‘become’ creative, it would appear that ‘creativity’ (in the guise of its most obvious off-spring - art and the arts), is still largely unrecognised, undervalued, untapped and unsupported in our homes, schools and social institutions. As Sawyer \textsuperscript{301} asserts, the elements and conditions required to be creative and an artist are both a ‘quirk of nature’ and a ‘whole-of-society force’, as it is all of these that actually ‘creates’ the creativity. However, the repetition of several themes across this research have both informed and confirmed my ‘hunch’ that, ultimately, to be creative in this time and place, we need to \textit{deliberately} enhance each individual’s ‘quirk of nature’, physically, mentally and emotionally and then actively \textit{enable} creativity by supporting it culturally and socially, especially through our education and social institutions.

To that end, as the brain is the core and locus of our humanity and abilities, to create a creative brain for a creative society, we need to attend to our contemporary forms of education, both formal and informal, from early childhood to our old age, to make them inspiring, enhancing, progressive, and especially, more creative.

With the world changing faster than at any time in our human history, when we feel overwhelmed with its problems, the demands of our communities and the complexities of our own lives, when human values and personal meaning are fluid, but are exercised (or stifled) in social systems that are constrained and commodified, we need a new paradigm for living and for developing our lives to their fullest potential. It is therefore essential that we better understand the importance of a human being’s \textit{need} for meaning and self-expression as well as their phenomenal capacity and potential to be creative.

As do many authors within this research, I contend that creativity is a resource that we currently stifle and often waste but it is also one that is urgently needed, to nurture diverse, dynamic and creative citizens, to invent inspired and sustaining environments and to develop a positive and creative future\textsuperscript{302}. However this research further argues that, at its core and locus, this requires the recognition that creativity needs the

\begin{footnotesize}
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\item \textsuperscript{300} The themes within both of Ken Robinson’s books: \textit{Out of Our Minds – Learning to be creative} Capstone, Chichester UK, 2001 and \textit{The Element} – How finding your passion changes everything Allen Lane / Penguin Books Camberwell Victoria 2009
\item \textsuperscript{301} Sawyer, K. R. \textit{Explaining Creativity} Oxford University Press, N.Y. 2006
\item \textsuperscript{302} Robinson, K. \textit{The Element} Allen Lane / Penguin Books Camberwell Victoria 2009
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fundamental development and fostering of a creative brain. To do this, we need to recognise and cater for the diversity of ideas, experience, talents, interest, knowledge, capacity, learning styles and intelligence that come in as many different forms as there are individuals. In turn this would require innovative, diverse and creative education, teaching and training, with creative teachers as guides and mentors and the societal and institutional supports that would enable each person to participate, flourish and reach their fullest potential. Such radical education and social/institutional support would then place creativity and the arts at the centre of a life-long education and embed creativity, art and the arts in life.

**Creativity, Art Objects And Art Making: Embedded In Life Or Products For The Marketplace?**

To be creative, make art, or participate in the arts, in this time and place, has become a complex cultural, social, personal, educational and commercial cross-fertilisation. Not only does it coalesce the physical and psychological elements of being a creative human being but it then tests, inhibits or enhances these capacities within the complex conditions of both the ‘real world’ and the ‘art world’. However, navigating these many elements and conditions of creativity and artmaking often resemble a cultural hurdle-race, making aspiration, achievement and participation difficult and sometimes even unrewarding.

Whereas art was once embedded in life, Dissanayake\(^{303}\) believes that, while the innate drive to make, participate or appreciate the arts, has always been (and still is) ‘normal and necessary’, it is now perceived in contemporary society as the separate province of a select few, contained and controlled within narrow artificial parameters of participation and largely marginalised, commercialised and/or ignored because of the pace and economic pressures of our busy lives. The effect of this removal of creativity and the arts from being natural and normal in daily life has been to cause creativity and the arts to be perceived as either difficult, elitist and/or the province of natural genius, or conversely, as an extraneous, recreational and less important activity and subject matter.

Therefore, ‘art’ has now largely become the province of markets, mystique and the institutions of art, inflating its prestige and ‘authority’ and/or conversely creating an artificial demarcation between the ‘big’ and ‘little A’ art and art worlds \(^{304}\). Such cultural ‘authority’ and public perceptions have consequently caused a subtle divide between educational subject matter that is now deemed to be ‘academic’ (and perceived by the

\(^{303}\) Dissanayake, E. *Homo Aestheticus Where art comes from and why* University of Washington Press, Seattle 1996
general public as ‘important’) and that which is ‘creative’ (perceived as largely recreational, effete, expensive, emotional, elusive and/or exclusive) pertaining mostly to the ‘talented’ and the province of the few.

However, if ‘life’ – and even creativity and art - is now driven by market forces, and our lives are in service of expansion, production and consumption, I was compelled to search for their source and then further, to find out what ‘use’ creativity, art and the arts are to us, our nation, our culture and our future. Which prompted the final question of this research, to find out how can we all become more creative as individuals and artists to help develop a clever, creative nation. It was an often a disheartening task and one born-out by my creative colleagues, students and my own experience as a teacher and an artist.

During the time of this research the Australian government has declared their intention to develop a national curriculum toward an ‘education revolution’\textsuperscript{305}. Within this transformation, the vital importance of creativity as a resource, to be ‘nurtured’ and ‘harvested’ to reap the rewards of innovation (therefore requiring more research, support and resources to encourage and engender ‘creativity’ in our society\textsuperscript{306} was also proclaimed. However, still to be released at the time of writing, the drafts of this document have drawn much criticism, fearing it has actually coalesced art into an amorphous ‘arts’ program while also reducing the time and resources allocated across a child’s schooling, in order to strengthen the prioritised ‘core’ curriculum.

In the initial research for these curriculum changes it was revealed that the majority of the parental population: wanted a stronger and better education in the arts; agreed that “the arts should be an important part of the education of every Australian kid”; and that they would feel more positive about the arts if there were “better education and opportunities for kids in the arts”\textsuperscript{307}. However, in spite of such views, there is now uncertainty that any of these parents’ aspirations will actually, effectively, be fulfilled, with hotly contested debate deeming this ‘revolution’ to be a great leap backward for creativity and the arts.


\textsuperscript{307} Ibid
In current Australian government documents, such as the ‘First we see’ and the ‘Imagine Australia’ reports, there is also frequent reference to international research and other governments’ acknowledgement that creativity is:

- A vital economic driver for international competitiveness
- A fundamental and required skill set for the emerging workforce
- At the core of the arts in the curriculum and therefore needing to be more central than tangential in education programs

However, while there is acknowledgment of Australia’s creative aspirations artistically, symbolically, culturally and economically, outlining their necessity in an increasingly globalised world, their ‘significant role’ is then largely deemed to be authenticated in the global desire for entertainment, spectacle, imagery, design and market commodities. That is, they have their uses.

In being able to harness, commercialise and make social use of creative ideas, it would appear, for our government and many governments around the world (caught up in the thrall of competitive education and the globalisation race), that the true purpose and highest use of ‘creativity’ and the arts are to enhance the economy, build wealth, create and extend work, solve social problems, meet consumer demands for functional and aesthetic design and make efficient use of material resources and human capital. As best expressed in the words of Jack Welsh, former CEO of General Electric: ‘Creativity and imagination applied in a business context is innovation’

With such constant emphasis placed on the ‘academic’ in education and economic in society as the key ingredients for success, work and the benefits of building an economic powerhouse, the need for commercialisation, production and competition is therefore a recurring theme in both the rhetoric and the contemporary cultural reality. Therefore governments around the world - including our own - are setting goals and implementing strategies in education to link innovation and creativity to commodity, service, competition, market forces, ‘success’ and trade. It therefore became glaringly obvious within the literature and the constantly evolving and current debate about education and the arts in Australia, that creativity, art and the arts are now deemed

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309 ‘Imagine Australia ‘The Role Of Creativity In The Innovation Economy’ Prime Minister’s Science, Engineering and Innovation Council 2nd December 2003 http://www.dest.gov.au

310 Ibid - acknowledging within this document that the converse is more often true

311 A recurring theme in both of Ken Robinson’s books: Out of Our Minds – Learning to be creative Capstone, Chichester UK, 2001 and The Element – How finding your passion changes everything Allen Lane / Penguin Books Camberwell Victoria 2009

312 Imagine Australia Op Cit p. 7
intellectual capital and an untapped human resource which is largely in the service of science, technology and the marketplace. Creativity, art and the arts were not seen as important to, nor embedded in life, to enhance life and provide a fulfilled, productive and meaning-full life for every individual. For both government and the general population, creativity and the arts now appear to be deemed either elitist luxuries, cultural commodities, irrelevant, trivial, home-spun recreations, or untapped goods and services ripe for commercialisation.

**Creativity, Art Objects And Art Making: Enriching Our Lives And Ensuring Our Future?**

However, as Csikszentmihalyi asserts, creativity and the arts are not an unnecessary luxury but an accomplishment that has advanced our humanity and civilisations as they enrich our lives and our daily existence. It is this capacity for creativity that has enabled human beings to solve problems, provide an exciting model for living, made our lives fulfilling, motivated behaviour and enhanced exploration, curiosity, imagination and motivation. However, he too contends that, while we pay a lot of lip service to art and creativity in our society, in reality, we really focus on our immediate concerns and demand their short-term practical applications and solutions.

Therefore, creativity, art and the arts now appear to be sited at a dichotomous intersection, between the mythologies about the ineffable nature of art and the perception that it is a product of natural genius, and the esteem we say we place on creativity and its practitioners which defies the reality of the actual value, education, social and economic support we give. It then becomes a sharp reminder that creativity, art making and participation in the arts have now become an undervalued national resource across the whole population and an everyday struggle in the ‘real life’ of those artists and arts organisations (outside the ‘big A’ Art world) who are driven, Pygmalion-like, to prevail and persist.

As experienced by myself, my students and colleagues and confirmed by the Australia Council, in it’s appropriately entitled ‘Don’t Give Up Your Day Job’ survey, this revealed that, in spite of lip-service paid to the arts and their practitioners, in reality, there was superficial support in Australian society, with community (little ‘a’) art being

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313 An argument supported by many researchers, such as Csikszentmihalyi, Andreasen Efland, Robinson, Pinker and Dissanyake
316 Ed O’Hara, S - A Commentary on ‘Don’t Give Up Your Day Job’ - Throsby and Hollister, Prepared for the Community Cultural Development NSW and the National Community Cultural Development Network, June 2004
in a particularly parlous state, with narrow opportunities for artist’s to participate in the art world of money, markets, celebrity and institutions, the general unwillingness of the population and arts audiences to support and pay for the arts. Such attitudes and experiences were also echoed as far back as 1995 in the Australian Senate report on Arts Education when its Chairman’s opening remarks expressed alarm at the dominance of economic rationalism, with the arts in society and education largely being seen as performative and a consumer product, with the arts ultimately becoming subservient in our lives, having been diminished, devalued and commodified. This lament (which is once again being revived in the many robust debates prompted by the current National Curriculum) saw creativity, art and the arts in the community and education as being limited to ‘product’ and as a matter of applying ‘training for employment’ and ‘audience appreciation’ in the service of industrial and economic needs. As best expressed by Csikszentmihalyi, such attitudes are moving us toward becoming an age of bookkeepers, not innovators.

**Developing Creative Brains : The Need For a Creative Education**

In a report commissioned by the Australian Arts Council in 2007, Kate Oakley examined arts and education for a creative workforce, citing that an estimated 60 to 80 percent of economic growth comes from innovation in industrialised and developing countries. ‘Innovation’ and ‘creativity’ are therefore the new and often interchangeable buzz-words and contemporary focus of policymakers around the world, with an increasing interest in the commercial realisation of innovation and the increasing need for broader skills (such as creativity, presentation, emotional intelligence etc.) as are often found in the arts. While acknowledging these are the factors driving policy on education for creativity, Oakley also recognised that this requires changes to formal knowledge bases, traditional classroom teaching and teacher training, which is currently at odds with the actual time and priority given to creativity and the arts in our curriculum and contemporary culture. Also, she cites, there is now a recognition of two perceptual camps in relation to creativity: firstly, there is the romantic notion that artistic ability is a matter of personal talent or genius; and secondly, that there is the emerging ‘democratic’ notion that creativity is the pro-social, communicative product of strong social systems, having the philosophy that everyone can learn it through cooperative and collective activity. The first therefore evokes perceptions of rare and

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317 Parliament of the Commonwealth of Australia *Report of the Senate Environment, Recreation, Communications and the Arts References Committee* October 1995 Chairman’s Foreword p.v


special powers, with consequent elitism, individualism and the creation of barriers to personal development, evoking attitudes of ‘you’ve either got it or you haven’t’. The second encourages empathy, communication, community and access, and now, having evolved my own artist’s practice and teaching methodology, as well as having done this research, I recognise that I fall into this philosophical and pedagogical camp.

With economic needs, the challenges of our society and the bid to raise standards in education, there is now a greater emphasis on outcomes, measurement, targets, competitiveness and skills, with testing, scores and the focus on high-stakes exams ultimately defying the rhetoric of self-development, creative enrichment, individual learning and self-expression (which have been found to diminish as the years of formal education and need for conformity increase). As Jon Hawke argues in his paper on Creative Engagement\(^\text{320}\), although our imaginations are an infinite resource which cannot be measured, measurement and being in the thrall of science and economic rationalism has now skewed our social priorities and perception of what constitutes education and a good life. He asserts that with such rationalism and economic focus, we have now traded such immeasurable goals as personal meaning, creativity and fulfilment for material prosperity and social disengagement.

In this rapidly changing world, where there is a verbally acknowledged need to unlock individual and social potential and harness creativity and innovation (while in actuality giving scant attention to the need for creativity and the arts), Robinson also proposes\(^\text{321}\) that our current education now has an over-emphasis on ‘academic’ subjects to feed market forces. As he contends,\(^\text{322}\) such an education clings to old ‘certainties’ which may ill-prepare us for the future, because, as we neither live nor create in a vacuum, we not only create our art and ourselves but we also create the world in which we live. Therefore we have – and need - the capacity to re-create it, with imaginative ideas and creative insights which will ultimately require a revolutionary change in our system of education.

Again reflecting and elaborating on such concerns, Professor Arthur Efland proposed\(^\text{323}\) that there are at least three major problems that affect the arts in general and education in particular. The first being that the arts are generally thought of as frivolous, elective and extraneous in both society and education, giving them the illusory appearance of being either prized social capital or simply nice recreations. The consequent result of this, he contends, is that greater weight, support and regard are now being given to

\(^{320}\) Hawke, Jon ‘Creative Engagement’ Artwork Magazine Issue 54 December 2002 Pp 10 -15
\(^{321}\) Robinson, Ken Out of Our Minds – Learning to be creative Capstone, Chichester UK, 2001 p. 11
\(^{322}\) Ibid
\(^{323}\) Efland, Arthur D. Art and Cognition Teachers College Press, New York, 2002 p. 6
those subjects that might lead to ‘economically productive lives’ in the world of occupations’\textsuperscript{324}.

The second problem, as Efland\textsuperscript{325} notes, is that even among those who teach or foster the arts, there is a serious lack of awareness of the power of imagination and the processes of thinking and knowledge acquisition, as well as an understanding of the substantive roles that the arts can play in overall cognitive development. The third problem Efland proposes, compounded by these biases, is the uncertainty of educators as how best to develop cognitive abilities in children by directly applying the arts in education and then, given our imperative for measurement, how to assess such attainments. Which ultimately brings all such elements and conditions back to our means of educating, across a lifetime, in order to embed creativity and the arts in life, and fundamentally, how to create creative brains.

As Edwards,\textsuperscript{326} Andreasen\textsuperscript{327} and Robinson\textsuperscript{328} (among many other researchers) assert, ‘creativity’ is not separate from the brain, nor is the brain separate from our personalities and ultimately, our life. Therefore it is possible to ‘be creative’ to each capacity and interest, across all domains that engage human intelligence and activity, whereby real creativity can come not just from the arts but from finding inspiration across many domains, subject matter and areas of interest. So, rather than causing our students to ‘fail’ when they show no ability in the narrow ‘academic’ subjects available, as they are corralled into high-stakes exams, it is proposed that they should be offered innovative subject matter to meet their broad range of interests, abilities and the human intelligence that exists within every potentially creative individual. Not denying the importance of core ‘academic’ subjects, all these researchers maintain that the current form of education confuses intelligence with academic ability and leaves little room for creativity in an outmoded rationalist system. As best expressed by Robinson, he abhors the fact that, although we are born with creative capacity, the more time we spend in the world, the more we diminish that capacity through our ‘education’, which favours academic measurement over creativity\textsuperscript{329}.

To counter these problems, Efland, Robinson, Pinker and Dissanyake variously propose:

- That creativity art and the arts should be accorded proper ‘academic’ authority and that teachers, parents and educational authorities should fully understand that

\textsuperscript{324} Efland, Arthur D. \textit{Art and Cognition} Teachers College Press, New York, 2002 p. 6
\textsuperscript{325} Ibid
\textsuperscript{326} Edwards, D. \textit{Artsience: Creativity in the Post-Google Generation} Harvard University Press, Cambridge Mass, 2008 pp. 6-13
\textsuperscript{327} Andreasen, Nancy \textit{The Creating Brain – The Neuroscience of genius} Dana Press, New York. 2005
\textsuperscript{328} Robinson, K.\textit{The Element} Allen Lane / Penguin Books Camberwell Victoria 2009
\textsuperscript{329} Robinson, K.\textit{The Element} Allen Lane / Penguin Books Camberwell Victoria 2009
creativity and the arts are significant in our lives – beyond the thrall of economic rationalism.

- That teachers and their political masters should be made aware that science has now proved the importance of creativity and the arts and the importance of a quality education and excellence in teaching these.

- That we need to attend to prime periods of learning, being especially important in early childhood education, but also in puberty and again in old age. To that end, we need to see formal and informal learning as a life-time occupation, not only to build better brains by creating and expanding neural pathways, but also to help preserve them across a life-time.

- This then leads to the need for explicit, quality education, appreciation and experience of creativity and the arts for all children through to their old age. Such an education, would not have a division between the arts and sciences, rather blending fact, ‘truth’ and calculation with feelings, imagination and self-expression. This would allow each child to function in their rapidly changing environment, to ‘read’ it, survive it, embellish it, manipulate it and enhance all the opportunities, skills and abilities they ‘naturally’ have into their adult life. It is further argued that such a diversity of human capacity, knowledge and learning should also be seen as an enhancement, rather than as detracting from education’s broader economic functions and one which would improve the social, personal and community contributions education can make, by creating active, engaged, fulfilled human beings, rather than just workers, spectators and consumers.

As proposed by Ken Robinson330 throughout his book ‘The Element’, and almost unanimously agreed upon among diverse authors, we also need to both recognise and stop the waste of our human capacity and potential by re-thinking ‘intelligence’, learning and teaching. He proposes that we need to effectively educate everyone beyond mere ‘academic’ prowess. Such a revision would involve: understanding the function and workings of the brain; valuing the capacity to create, both through the arts and across all subject matter; recognising that the arts are not oppositional to ‘academic’ subjects and also that they are physically and cognitively demanding subjects; and recognising that we need to make participation in the arts integrated, collective and communal, not just the province of the ‘gifted’ or elite few. We need to put them back into the centre of education, culture, community and lives, as serious, important, significant and supported, rather than regarding them as optional, frivolous, irrelevant or extraneous extras.

330 Robinson, K. The Element Allen Lane / Penguin Books Camberwell Victoria 2009
To achieve such a quality education, there would need to be a thorough understanding of how our brains operate and how our minds develop, as part of teacher training and curriculum delivery. Then, as literally the ‘shapers’ and ‘influencers’ of minds and personalities (which then directs lives and ultimately forms societies) teachers’ roles and importance in our society (which has often been diminished and undervalued) would require appropriate institutional and public support, investment and true acknowledgement of their importance to the creation of individuals, citizens and society’s future.

Eschewing the narrow focus on ‘academic’ education, it is therefore suggested by Robinson that creativity and the arts should be at the centre of all areas of curriculum rather than at the periphery. With the arts having been the evolutionary catalyst for human development throughout all time and in all cultures, they are known to have been both central and powerful in the creation of creative, fulfilled human beings and the evolution of culture and society. Now needed more than ever, by placing creativity and the arts at the centre of education we would not only ‘grow’ creative brains and creative citizens, it would also be a powerful recognition that they are (and always have been) relevant to human development, interests, personal fulfilment, history and culture. It would also be a recognition that they should be embedded in life because of their importance to the world of work and economics and as the means to personal fulfilment and a vibrant, engaged culture and creative, social future.

Such proposals for educational reform, both formal and informal, embedded back in life and receiving social, cultural and institutional support, were recently reinforced by Tim Joss, guest speaker for The Australian Arts Council in 2009. In his speech he outlined the need for the arts to have greater engagement with technology, ethical and social issues and he also pointed out the need for greater public engagement, accessibility and community participation in the arts by taking them out of museums, the realm of the elite and by them having less definition by state and institutions and more by community. To this, Jon Hawke might also add that we need greater accessibility and more active involvement of communities in the arts, through training, support and the practical means (right down to the tools and artist’s practices) that would enable them to express what really matters within those communities. Such a form of informal art education would not only be training brains but also bringing art back to and embedded in life.
The Mythology of Mastery: Minds and Motivation

This research has explored the psychology of art and artmaking as an evolutionary process, where our mental world owes its complex organisation to both the process of human development through natural selection and the innate predispositions and learned characteristics of our individual personalities as they both act in and are acted on by the world. In so doing it argues that creativity, art and the arts are still driven by ancient, innate and universal aesthetic, creative predispositions and familial genes, which are then overlaid by individual personality. It then argues that such abilities and potential brings many benefits to the psychology of individuals, groups and societies (as is evidenced by the existence of creative human beings and the arts having contributed so significantly to human development across time and in all cultures) which should be made available to all, not just those perceived to be ‘naturally talented’, in our contemporary time and culture.

However, in Western culture, creating, making, participating and appreciating in the arts is no longer embedded in life and accessible to all, as there has evolved dichotomous divides and creative hierarchies, with competitive markets, creative myths, artificial values and social ‘rules’, largely in the service of the economy.

Although such myths and perpetuated mysteries of genius, natural ability and giftedness being the prerequisites of creativity and artmaking have now been debunked (being more a product of garnering power, reputation, celebrity and enhancing opportunity) they still appear to persist within our society. However, this has also lead to research into the brain and senses to find out if there is a difference between the ‘gifted’ and the ‘normal’ brain. While it is acknowledged that some people have an advantageous ‘quirk of nature’ that enables them a prodigious memory, or an insatiable curiosity, or an ability to learn more quickly and so forth, it is now thought that superior performance (often touted as talent or ‘genius’) is more fundamentally the province of ‘ordinary’ humans who are using their brains, their time and their efforts differently. Therefore such perceived ‘genius’ can be, according to Anders Ericsson, more a matter of focussed attention, extraordinary effort and relentless pursuit of their area of interest, with the key ingredient to being masterful as the willingness to ‘stretch yourself to the limit and increase your control over your performance’.

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333 Bedaux, Jan Baptist and Cooke, Brett (Ed) Sociobiology and the Arts Editions Rodopi Amsterdam 1999
336 Anders Ericsson, specialist psychologist in genius and prodigy at Florida University, as quoted in Restak, R. (Dr.) The New Brain – Research From The Frontiers of Brain Science Rodale Ltd London, 2004 p. 27
Unfortunately, from such ingrained beliefs and perpetuated mystique of ‘genius’ there has evolved the consequent perception among the general population that art is largely unattainable, difficult and/or the reserve of innate ability. Efland and Robinson\textsuperscript{337} contend that such historic and erroneous bias has then continued in education, now favouring ‘weightier’ subjects, such as science and maths, rather than investing in subjects where you either ‘have it’ or not. This has therefore caused a division into subjects being perceived as ‘academic’ and valued, or ‘creative’ and therefore having little substantive application to the ‘important’ issues of the ‘real world’ of jobs and economic significance.

This research however, argues that human beings are not only capable of, but need creativity in their lives, from their earliest years to their old age. It proposes that, if a person is intelligent they are capable of being creative to the degree of their abilities, motivation, application, their good teaching and their support. It further proposes that to be masterful, achieving or having ‘talent’ and/or being perceived as a ‘genius’ ultimately requires the time and tenacity that has been oft-quoted and ascribed to Thomas Edison when he attributed his inspiration and success to: “...boiling down to one percent inspiration and ninety-nine percent perspiration”\textsuperscript{338}. And finally it contends that there are enormous psychological, personal and social benefits endowed through participation in and appreciation of creativity, art and the arts, that can permeate our lives, offer rich meaning, fulfilment, valuable occupation and worth.

**Play, Performance And Pleasure Zones: Some of the Many Benefits Of Creativity, Art and The Arts**

Through endless texts and interviews, a panoply of the benefits and enhancements of creativity and the arts, for both individuals and whole societies, are described and lauded. Throughout our ‘modern’ human history\textsuperscript{339} the evolutionary benefits have been proven, with this irresistible pursuit having withstood the test of time and making significant contributions to human development in all cultures. Therefore, creativity and the arts have obviously conferred many advantages to human existence, from the biological and evolutionary benefits of developing a front-heavy brain to the adaptive advantages of engendering and developing social cohesion and identity. By being uniquely creative, humans have therefore been able to: address their mortality and the meaning of life; use the arts as a means of communication, self-actualisation and self-expression; illuminate hearts and minds; engender a feeling of an enriched internal life...


\textsuperscript{339} Estimated by Onions as being about 40,000 years - Onians, John Neuroarthistory Yale University Press New Haven 2007 Preface.
and garnered significance in transience. As Donna Wheelwell\textsuperscript{340} proposes, through being creative we have been lifted ‘above our mundane concerns...’.

Noël Carrol proposed\textsuperscript{341} that being creative has been a self-rewarding task and that this is an activity that is universally appreciated because it ‘explores and confirms the motivational roots of cultural communication’\textsuperscript{342}, allowing human beings to share their life experiences by expressing emotion, communicating ideas, evoking meaning and provoking responses in other human beings. Therefore to be creative bestows many biological, psychological, social and cultural benefits that make it a unique and powerful activity.

Then, at a more individual and deeply personal level, the benefits of deeper commitment and creative mastery, defined by Mihaly Csikszentmihalyi as ‘flow’\textsuperscript{343}, are evidenced by the evocation of pleasure, totally focussed absorption, feelings of immediacy and aliveness, a sense of timelessness, exhilaration and intense fulfilment. Therefore, by developing a creative brain and undertaking focussed, dedicated creative activities, Arnheim, Andreasen\textsuperscript{344} and many other researchers propose, creativity, art and the arts can afford stimulation, cognitive improvements, emotional benefits, social pleasures and cultural advantages that are all frequently overlooked. Conversely, by ignoring our capacity for creativity, they also assert that we then actively create brains that remain under-developed, becoming less able to participate in these areas and driving our potential into a neuronal cul-de-sac.

By pondering a life of received information and an increasing addiction to technology, Restak\textsuperscript{345} Robinson\textsuperscript{346} and Andreasen\textsuperscript{347} (among others) have also questioned whether, by the rapid changes in our environment, culture, foods, education system and even our own biology (with technologies that engage the mind in singular, repetitive activity) we are now effectively ‘sculpting’ significantly different brains, by changing their structure and therefore also changing the persona of our population. If so, they argue, to avoid such uncertain and unsettling outcomes, we need to actively shape our brains through education and societal support that widens choices and opportunities within education and then supports creativity both within and outside formal education and across all ages, to enable us to cope with our personal and collective futures.
As Ken Robinson’s reflects, creativity employs all areas of our mind and our being, therefore, with our world becoming more complex and changing so rapidly, whereas we once used to find spiritual, cultural and community comfort within our society and through the things we did, now we seem to be increasingly disconnected, more narrowly educated and responsible for our own existence in an increasingly sterile way, within a maze of artificial systems and technologies. Therefore we need more than lip-service being paid to this important cultural capital in our society. We need to develop the potential, benefit from the possibilities and continue to build on this ‘dazzling cornucopia of human achievements and aspirations’ that would otherwise be available to us if they were placed at the core of our education and our culture.

Given the enormous complexities of the human brain in general, it is difficult to contemplate the added complexities of the creative brain in particular (of which so much is still known). However, it is the uniqueness, dynamism, scale and complexity of the brain’s processes that makes being a thinking, functioning human being quite amazing, and being a thinking, functioning and a creative human being in particular, a profound and astonishing gift.

REFLECTION

To do the enormous amount of work required for this research, to have struggled this hard to participate in the world of art and to try to conduct a professional artist’s practice, supporting it with teaching and now writing about it in this research, there must be some point (...beyond just a Pygmalion-esque madness and obsession). Therefore, although this endeavour has been the cause of great pain, insight, creativity, frustration and often mind-numbing reflection and correction, I believe that in undertaking this research I am now better able to understand the complexities of my – and my students’ - ability to be creative and make art, as well as my drive to be/become an artist and teach others to do likewise.

What I had not anticipated was such a long, arduous journey, nor the punishing and circuitous route it has taken. From needing to study ‘neurology 101’, to having to dig deeply into my own personal, professional and art ‘journey’, this research has revealed many topics that have both engendered near-bewilderment and offered moments of utter clarity and revelation. However, with each fact, question, correction,  

348 Robinson, Ken The Element – How finding your passion changes everything Allen Lane / Penguin Books Camberwell Victoria 2009 p.70/71
349 Robinson, Ken The Element – How finding your passion changes everything Allen Lane/Penguin Books Camberwell Victoria 2009 p 66
confusion and “Ah Ha!” moment has come the ultimate recognition that I too have been discovering the profundity of the human brain, the possibilities of creativity and the need for creativity in our lives as well as the necessity for good education and teaching to make this happen.

Therefore, through this research I have now developed a better personal and professional understanding of what drives and enables me to use my skills, imagination, problem-solving and pleasure-zones to make art.

This process has also enabled me to find out the many things I need to know to tell my students and colleagues, so that they too can create an artwork, fulfil their potential and sometimes even choose to ‘become’ an artist, teacher or better teacher.

And finally I have created a better teaching practice from all of these understandings, knowing a little more about what goes on, from brain to eye, hand and heart, as people struggle to learn new skills, to find a sense of self-fulfilment, create a work-life balance, search for personal meaning and also find the means and motivation for their creative expression and artistic journey.

That I have become a guide, who now knows better how to both to lead and follow, from this process and through this research, I have found to be a rewarding and creative experience.

**Insights, Reactions, Actions and Consequences**

I think it would be fair to say that, until I taught art to adults, I had received my most valuable teaching and learning experiences working as an Early Childhood teacher. By working with small children and also from my own children, I was not only able to see a human being’s nascent evolution, I was also acutely aware of my role and need to be a good teacher, overseeing this important stage of their development. This was a potent experience and an understanding that I was able to bring to this research. It is also one that I wish all teachers (from Early Childhood to University) could undertake to better understand the needs of learners and the responsibilities of teachers.

Now, as a teacher of adults as well as children, who come to my teaching studio with almost child-like (not childish) awe with the subject they are about to undertake, and anxiety with their own capacity and abilities (often with the echoes of past admonitions from teachers ringing in their heads), I realise that I need to bring many teaching skills and sensitivities to the task. To that end, I believe I am now more compassionate, tolerant, versatile, knowledgeable and aware and feel more confident.
that I make a better teacher and can really help develop creative brains and offer authentic guidance for an individual’s creative journey.

To that end, these are some (of the many) insights I have gained and am now better able to bring to my own teaching and my student’s creativity:

I know that when I explain concepts, give instructions, pose problems, relay information and ‘spark’ other creative brains that I’m actively igniting the electrical pulses that build neurons, connections, concepts and ideas that can enable creativity and the making of ideas and art. Then through reading such researchers as Andreasen and Solso et al, I have learned of some of the ways we can effectively ‘build’ better brains – and of the urgent need to do so.

Through such research as that of Dissanayake, Ede and Pinker, I am now also aware that the formation of the brain and the ability to create are a phenomenal contribution to human evolution and that they are still innate, normal and necessary. This has also revealed to me that, if a person is intelligent they are capable of being creative and that creativity is not merely the province of the arts but can also be applied across the many domains of human activity and achievement. However I am now also more aware that this ability is dependent on the degree of an individual’s own innate abilities, predisposition and personality, then their interest, motivation and application and that all of these are the product of their psychology and the way they interact with and are imposed upon by the world. Then, as a vital element to this process, it is also reliant on my brain, my knowledge, attitudes and abilities as a teacher, as well as my good teaching, mentoring and support to develop and foster this ability and potential in others.

This research has better informed me about the way the brain and senses work and that there are many ways of knowing, teaching and learning (from the teaching of my individual students to the way I have chosen to explore and write this research). With such insights as offered by Zeki, Pinker, Andreasen and particularly Csiksztimihalyi, it has also made me more alert to the consideration that needs to be given to the personal experiences, social pressures, attitudes, application of past knowledge and the conjunction of ideas that I and my students each bring to this enterprise. I also now know that time, persistence, repetition and ‘mistakes’ are needed to translate thoughts, inspiration and imagination into a tangible creation. However, it is these elements that are also sometimes difficult to sustain and endure. Now, having done this research, I am better able to describe how and why this happens and encourage my students to persist, have goals, solve problems and ultimately find resilience,
fascination and pleasure (with joy in participation and process over product), within the many complex tasks they are undertaking.

Then, as an artist trying to carve out a living at this time, having been both intuited and experienced by myself and colleagues, (but rarely able to be pin-pointed and adequately expressed), resonance has now been supported by reasoning as both my experience and this research have informed me about the social and cultural elements and conditions that come into play as I/we/ they struggle to fulfil personal and professional aspirations in a society that largely pays lip-service to creativity and the arts. This has therefore enabled me to better identify and understand the mythologies of artist-as-genius, as well as gain some insight into the cultural, institutional and social controls as well as the political, educational and market forces that exist in the world and are brought to bear on the experience of ‘being’ an artist and trying to make a living from art.

I now have a greater understanding, to support my personal experience, that when: our attention is scattered; motivation is poor; when life is busy; when commitments are pressing; family or other support is limited; opportunity is restricted; the institutions and ‘gatekeepers’ are inhibiting; or one’s personal, cultural and financial conditions are unfavourable or discriminated against; it is difficult to be ‘creative’ and even more difficult to make a living as a creative individual\textsuperscript{350}. However, such external disablers then allow me to point to the many benefits and life enhancements that being creative and making art brings – beyond external affirmation, reward and the dollar.

Then, by understanding the historically inherited, pervasive and corrosive ‘myths’ of genius, the erroneous theories of left/right brain activity, by knowing about our innate aestheticism\textsuperscript{351} and the elements and conditions that enable mastery and finally, by recognising both the need and the ability to develop creative brains and heightened senses from birth to old age, I have been able to deal more sensitively with the intense anxieties about being ‘good enough’ and the need for creativity predicated on ‘natural talent’ among my students. I now better understand why so many people say “Oh, I couldn’t do that – I don’t have any talent’ and I can now also respond when they also say “Oh I couldn’t do that – I’m too old/I wouldn’t be good enough and/or my teacher told me I was hopeless”. I am not only better able to encourage the attitudes, resilience and persistence needed to sustain, to explore and to care less about ‘failure’, I can now

\textsuperscript{350} Referenced through the Australia Council’s Publication ‘Don’t Give Up Your Day Job’ An Economic Study of Professional Artists in Australia’ Throsby ad Hollister, 2003 as outlined within this document
\textsuperscript{351} Dissanayake, Ellen Homo Aestheticus Where art comes from and why University of Washington Press, Seattle 1996
use the analogy of art as a ‘journey’ – and really mean it - making my students aware of the importance of their being ‘in the moment’ as well as the joys and pleasures of internal affirmation by placing greater emphasis on their own self-fulfilment, creative expression, self-discovery and work-life balance.

Therefore, when I teach my students art, I now know that I am teaching a subject that can open my students to both known and imagined worlds. In the form of pleasure and play, being creative and making art is extraordinarily ‘academic’, intellectual, challenging and fulfilling. Not only is it complex and fascinating, it reaches across all ages, abilities, cultures and dispositions and is ancient, profound, powerful and unique, encompassing the whole of human history and enterprise. Therefore in building creative brains and bringing creativity, art and the arts into the centre of our education and embedding them in society and life, we might be able to ‘ignite the creative spark’ in others and help build a creative future.

A Creative Curriculum to Cultivate Creative Citizens? Where To Now

This thesis has now offered the ‘Pygmalion Proposition’ as an overview of an ancient human drive and capacity called ‘creativity’, particularly as it is expressed in artmaking and the arts. By exploring its evolution from our biological inheritance, to our psychological predispositions, as well as the multifaceted complexities of being creative in this time and place, this research has also evoked further questions for future research.

Given the evidence, legacies and benefits of our 40,000 year ‘modern’ history of human existence and creativity,352 which traverses all eras and cultures throughout the world, this research suggests that we now need to ask what our contemporary society can and should do to perpetuate and promote creativity, art and the arts, so that we can foster creative citizens to ensure a positive and creative future.

It is therefore suggested that such research might ask:

- If creativity, art and the arts are deemed to be increasingly marginalised in our education system and our society, what might both look like if creativity and the arts were largely extinguished, and what would then be the consequences of such an ‘artless’ and uncreative society?

352 Onians, John Neuroarthistory Yale University Press New Haven 2007 Preface
• What does ‘being creative’, doing visual art and participating in the arts bring to our human experience that other areas of our contemporary life cannot (e.g. in terms of quality of life, cognition, commerce, invention and innovation, culture etc)?

• To what extent does our current culture, social structures and education system (formal and informal, public and private) provide adequate tools, opportunities, promotion and support for the development of creativity within the individual, the community and the society at large? Is it adequate or could more be done?

• What are the optimal learning conditions, environments, experiences and support that might actively generate creativity, art and the arts in individuals, communities and the whole of society?

• What are the most important elements and conditions that could foster the creative process and the metamorphosis from ‘human beings’ into ‘creative human being’ and how can we engender them? Conversely, what are the most important elements and conditions that can thwart the creative process and the metamorphosis from ‘human beings’ into ‘creative human being’ and how can we avoid them?

• What are the ingredients that might provide individual, meaningful and lifelong creative learning for our citizens in the pursuit of personal fulfilment, potential and social excellence to meet the needs of the future?

• What needs to be done to improve our education, teaching, teacher training and the connections between education, educational institutions and society/societal needs so that we can enhance these metamorphic, creative processes in individuals and ultimately in the whole of society.

• How can we open discussion, broaden our views and actively pursue the capacity for creativity, diversity and human potential beyond narrow and archaic definitions of human capacity, intellect, knowledge and learning and what is ‘academic’ and economically ‘useful’ (but which also doesn’t invoke such spectres as competitive ‘hot-housing’ of our children or eugenics in our society).

Perhaps from such research might come the recognition and support for creativity and the arts within our society, that could help bring them back into centre of our lives. It might also offer further ‘proof’ of what human beings have always ‘known’, in all cultures and through time: that we have had (for about the last 40,000 years) these extraordinary abilities because we need them in our lives. Because, just like our ancient ancestors, they not only make us feel good and enhance our personal and societal existence and coexistence, they are vital to ensure our positive future.
CHAPTER EIGHT - CONCLUSION

Figure 21 i & ii: From the Studio – Four pieces of evidence of ‘being’ an artist

353 At my easel in my studio
354 An artwork from my most recent exhibition: ‘The Muse’ Oil and ochres on grained timber panel 90 x 120 (J.Ure, Earthly Delights Exhibition, 2010)
355 Most recent Exhibition invitation (J.Ure, Earthly Delights Exhibition, 2010)
4. My Studio Logo (overleaf)

355 An artwork from my most recent exhibition: ‘The Muse’ Oil and ochres on grained timber panel 90 x 120 (J.Ure, Earthly Delights Exhibition, 2010)
355 Most recent Exhibition invitation (J.Ure, Earthly Delights Exhibition, 2010)
356 My Studio Logo (overleaf)
CHAPTER EIGHT - CONCLUSION

Striving for a Creative Conclusion

As is fitting, when closing a reflective loop, the end should reflect its beginning. Therefore this chapter starts and this research finishes, with the image of this artist and a summative quote - as the by-line of their artist’s practice - on the nature of creativity.

Echoes From The First Mythology

This autoethnographic enquiry opened with the tale of Pygmalion, the first artist of mythology, as both a metaphor for creativity and analogy for being an artist. The ‘proposition’, prompted by the myth of Pygmalion, was that the drive to create and make art, which reaches beyond our basic human needs, would appear to be both compelling and necessary to human beings, as evidenced by it having been undertaken throughout all human history and in all cultures. This
The Pygmalion Proposition  J.Ure

proposition therefore prompted my enquiry into what the elements and conditions were, that propelled (or inhibited) human beings’ creative thinking, as they endeavoured to meet their creative, cognitive, social and emotional needs and as they tried to shape the objects of their imagination.

With creativity and the ability to make art becoming an area of recently renewed scientific and academic interest, this research has been sited at the intersection between the fields of science, anthropology, the arts, medicine, sociology, psychology, history and education, all of which have previously tended to deal with ‘creativity’ and art-making as discreet and disparate subjects within each domain. However, as both a working artist, sculptor and dedicated teacher, I have sought to present this research as a more holistic, ‘three-dimensional’ overview of creativity and art-making, to better understand what the innate, inherited and imposed elements and conditions are, that can enable - and sometimes even drive - or disable this (almost irrational) human pursuit.

Because this research has traversed such a broad field of enquiry, I have chosen, as De Bono\textsuperscript{357} exhorts, research where “...instead of going deeper and deeper you relate the subject to many other subjects, and wisdom is that. The relating of things to each other and looking at things differently so it depends both on experience and your habits of looking at experience...” which necessarily became a more ‘shallow’, but also more a connected and encompassing view of creativity and the making of art. This approach has therefore enabled me to move progressively outward from the core of our human abilities by: firstly examining the biological inheritance and predispositions of our brain and senses as we currently understand them; then investigating our psychological propensities, as we interact with, and are influenced by, our environment; and finally by examining both the historic evolution of the creative human and exploring some of the social and cultural forces of the contemporary world and art world, that can so emphatically enable -or disable- the ability to be creative and make art, in this time and place.

This ‘proposition’ was further prompted and corroborated by ‘real life’ experience, as evidenced by: my personal drive and individual capacity for creativity; my long and hard-won journey to ‘become’ an artist; my diverse teaching experiences; the external ‘proof’ of my art work; from the many discussions I have had with creative colleagues; and (providing the greatest insight and motivation for this

research) from my work with, and observations of, my students. From such observation, embodied knowing and lived experience there appeared to be compelling ‘evidence’, which both reflected and confirmed the literature, that there was an innate and compelling urge to create among human beings.

Through such creative thought and activities these individuals appear to be able to connect with their sense of ‘self’, use their innate and learned abilities, foster their imagination, express emotion, develop their individual potential, communicate ideas and seek personal meaning and fulfilment. Therefore, by using analytic autoethnography and multiple writing forms as my research methodology, I have also been able to include ‘snapshots’ of some compelling ‘real life’ data into this research, as a multi-layered means to support the literature.

Therefore, just as other myths of creation and metamorphosis have the ability to reflect, reveal and communicate powerful, eternal human messages, this myth became the spark that ignited an exploration of some of the enablers and disablers of human creativity, and in turn, both reflected and revealed personal experience.

**The Structure of This Research**

As research about creativity, which has been unusual in its scope, ambition, composition and outcomes, this research has also required a creative approach in its writing. Written as analytic autoethnographic research, every aspect of this search is closely linked to my experience, values, philosophies and the depth and development of my professional practice in both teaching and in art. This has therefore been my attempt to understand, encapsulate and inform myself, other artists and teachers about the complex determinants and interconnections of human creativity and art-making. In doing so, it also echoes the voices and experiences of ‘others’, from artists, researchers and philosophers of the past to the observations of contemporary students, whose reflections on the nature of art, creativity, the art world and education are revealed and resonate within each of the chapters.

By the thinking, sensing, imagining and making required to think creatively, to evolve into ‘an artist’, to write this thesis and to make the supporting artworks, I have both experienced and enacted human creative development and produced the external evidence of these internal phenomena and processes of the brain and senses of which I write. I have also personified all the elements and conditions that ‘creativity’ and ‘becoming/being an artist’ (and teacher) have required psychologically, and then entailed and imposed socially and culturally (including
for example, the examination of both this thesis and its exhibition, in the eternal search for personal answers and external, professional approbation).

As an artist and teacher I have explored the origins of, and complex interplay between, the elements and conditions of creativity and art, always mindful that these findings are obviously at the cusp of a domain that still has greater complexity and potential than this search has allowed. However this undertaking has not only enriched my own artist's practice, it has now also added greater insight and depth to my teaching and my art-making – and hopefully, ultimately, to the expertise offered, and creative experience received, by my students. It has also revealed this to be a recent, relevant and evolving topic of growing interest across many domains, confirming that creativity and art is, as artists have always known, a domain that is central to nearly every aspect of human development and potential.

At a time when such ancient questions as: “Who am I?” and “What am I here for?” are still being asked by us (but might now be paraphrased as: “Isn’t there more to life than work and shopping?”), this research has also raised important questions as to the benefits and significance of creativity, art and the arts, for both individuals and the whole of our society. Beyond the functional values of production and consumption, such answers are sought in a bid to develop more fulfilled human beings and toward achieving a more positive, dynamic, aesthetic and creative future.

**The Use of Autoethnographic Methodology**

The autoethnographic methodology used in this research has enabled me to include images, layered text and to write in multiple 'styles', from the 'academic' to the anecdotal, to give both accessibility and insight through a variety of lenses. I have been able to look underneath the formal research to reveal the 'personal truths' of embodied knowing and lived experience and then support these with the objective analysis of the research and literature, with the introduced voice of others (students and colleagues) interposing a subjective and more personal response. This has also enabled me to make the important connections between research and human complexity and to link personal and professional meaning with 'real life' experience and wider social and cultural implications. This autoethnographic methodology has therefore facilitated: multiple genres in its presentation; the use of ‘self’ as a source of data, to help construct meaning from my experiences; the exploration of a multi-dimensional view within several domains; the exploration of information that will have a direct and practical
application to both my artist’s and my teaching practice; and has enabled the generation of further questions toward future social action.

Human Beings Need Creativity

As a representational analysis of current literature, debate and research and both embodying and enacting the very processes it discusses, this ‘Pygmalion Proposition’ concludes that:

- Because creativity has been an ancient and innate human trait, indicated by its existence throughout all time and in all cultures, human beings are not only capable of, but need creativity in their lives.
- Therefore it questions such long-held myths and stereotypes, which have now metamorphosed into community beliefs, such as: ‘creativity’ and ‘art ability’ being only the preserve of those with innate ‘talent’ and natural ‘genius’; and the simultaneously dissonant and dichotomous beliefs that creativity is elitist, difficult and beyond the scope of most people or less academic, largely recreational and less important than other areas of education and/or occupation.
- It also asserts that, if a person is intelligent they are capable of being creative (which applies across the many domains of human activity and achievement, not just art), to the degree of their motivation, application, their good teaching and mentoring or support.
- It outlines the many elements and conditions that come into play in the creative process, from: the need to build creative brains and heightened senses across every age; the need to develop a strong sense of ‘self’, which includes exploring our creativity and finding our true purpose, potential and fulfilment in life; the need to understand the true drivers of human creativity, moving beyond the mystery of creativity and the myths of ‘genius’; the need to find good teachers and mentors to meet our individual needs; the importance of both resilience and resources to sustain creative pursuits; the urgent need for a creative education system with a strong emphasis on creativity and the arts; and finally, the need to develop strong social systems (which would evolve from such an education) that are flexible, supportive and value creative human enterprise beyond just the primacy of technology and market forces in our contemporary society.

358 Jonathan Art History – The Key Concepts Routledge, London, 2006 Variously described as products, ideas or qualities of the mind, being complex innovative, inspirational, visionary, meaningful Harris,
• It therefore concludes that there is a need for creativity, art and the arts which is not only ancient and primal for human beings, but which is also becoming rapidly marginalised and diminished within our education system, culture and society.

• In doing so it underlines this need for creativity, art and the arts as lying within both the individual and the whole of society and as a need which must be enhanced by excellence in education and supported by aware, informed and creative social structures in order for human beings in this time and place to build a positive and creative future.
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APPENDIX A

Appendix Ai - The Story of Pygmalion and the Statue

“Pygmalion loathing their lascivious life,
Abhor’d all womankind, but most a wife:
So single chose to live, and shunn’d to wed,
Well pleas’d to want a consort of his bed.
Yet fearing idleness, the nurse of ill,
In sculpture exercis’d his happy skill;
And carv’d in iv’ry such a maid, so fair,
As Nature could not with his art compare,
Were she to work; but in her own defence
Must take her pattern here, and copy hence.
Pleas’d with his idol, he commends, admires,
Adores; and last, the thing ador’d, desires.
A very virgin in her face was seen,
And had she mov’d, a living maid had been:
One wou’d have thought she cou’d have stirr’d, but strove
With modesty, and was asham’d to move.
Art hid with art, so well perform’d the cheat,
It caught the carver with his own deceit:
He knows ’tis madness, yet he must adore,
And still the more he knows it, loves the more:
The flesh, or what so seems, he touches oft,
Which feels so smooth, that he believes it soft.
Fir’d with this thought, at once he strain’d the breast,
And on the lips a burning kiss impress’d.
’Tis true, the harden’d breast resists the gripe,
And the cold lips return a kiss unripe:
But when, retiring back, he look’d again,
To think it iv’ry, was a thought too mean:
So wou’d believe she kiss’d, and courting more,
Again embrac’d her naked body o’er;
And straining hard the statue, was afraid
His hands had made a dint, and hurt his maid:
Explor’d her limb by limb, and fear’d to find

359 As reproduced at The Internet Classics Archive http://classics.mit.edu/ The Story of Pygmalion and the Statue
So rude a gripe had left a livid mark behind:
With flatt'ry now he seeks her mind to move,
And now with gifts (the pow'rful bribes of love),
He furnishes her closet first; and fills
The crowded shelves with rarities of shells;
Adds orient pearls, which from the conchs he drew,
And all the sparkling stones of various hue:
And parrots, imitating human tongue,
And singing-birds in silver cages hung:
And ev'ry fragrant flow'r, and od'rous green,
Were sorted well, with lumps of amber laid between:
Rich fashionable robes her person deck,
Pendants her ears, and pearls adorn her neck:
Her taper'd fingers too with rings are grac'd,
And an embroider'd zone surrounds her slender waste.
Thus like a queen array'd, so richly dress'd,
Beauteous she shew'd, but naked shew'd the best.
Then, from the floor, he rais'd a royal bed,
With cov'ring's of Sydonian purple spread:
The solemn rites perform'd, he calls her bride,
With blandishments invites her to his side;
And as she were with vital sense possess'd,
Her head did on a plumy pillow rest.

The feast of Venus came, a solemn day,
To which the Cypriots due devotion pay;
With gilded horns the milk-white heifers led,
Slaughter'd before the sacred altars, bled.

Pygmalion off'ring, first approach'd the shrine,
And then with pray'rs implor'd the Pow'rs divine:
Almighty Gods, if all we mortals want,
If all we can require, be yours to grant;
Make this fair statue mine, he wou'd have said,
But chang'd his words for shame; and only pray'd,
Give me the likeness of my iv'ry maid.
The golden Goddess, present at the pray'r,
Well knew he meant th' inanimated fair,
And gave the sign of granting his desire;
For thrice in cheerful flames ascends the fire.
The youth, returning to his mistress, hies,
And impudent in hope, with ardent eyes,
And beating breast, by the dear statue lies.
He kisses her white lips, renews the bliss,
And looks, and thinks they redden at the kiss;
He thought them warm before: nor longer stays,
But next his hand on her hard bosom lays:
Hard as it was, beginning to relent,
It seem'd, the breast beneath his fingers bent;
He felt again, his fingers made a print;
'Twas flesh, but flesh so firm, it rose against the dint:
The pleasing task he fails not to renew;
Soft, and more soft at ev'ry touch it grew;
Like pliant wax, when chasing hands reduce
The former mass to form, and frame for use.
He would believe, but yet is still in pain,
And tries his argument of sense again,
Presses the pulse, and feels the leaping vein.
Convinc'd, o'erjoy'd, his studied thanks, and praise,
To her, who made the miracle, he pays:
Then lips to lips he join'd; now freed from fear,
He found the savour of the kiss sincere:
At this the waken'd image op'd her eyes,
And view'd at once the light, and lover with surprize.
The Goddess, present at the match she made,
So bless'd the bed, such fruitfulness convey'd,
That ere ten months had sharpen'd either horn,
To crown their bliss, a lovely boy was born;
Paphos his name, who grown to manhood, wall'd
The city Paphos, from the founder call'd.
APPENDIX BI. THE PRIMARY BRAIN STRUCTURES

Frontal Gyri
Temporal Gyri
Parietal Gyri
Occipital Gyri
Sulci/ Fissures
Basal Ganglia
White Matter
Ventricular System
Basal Cisterns
Limbic
Diencephalon
Midbrain
Brainstem
Cerebellum
Vascular structures
Dural Structures
Paranasal Sinuses
Bony structures
Cranial Nerves

3rd Harvard Medical Institute Whole Brain Atlas - Top 100 Brain Structure
http://www.med.harvard.edu/AANLIB/case/caseM/case.html
Appendix B ii - The Anatomy Of The Brain 101 (For Artists)

Fundamentally, anatomically, the brain has two major components:

- The cerebrum which is the largest part of the brain. It has two sides, called a right and left hemisphere.

- The cerebellum, meaning 'little brain', which sits at the back of the head directly behind the medulla oblongata and below and behind the cerebrum.

The Cerebrum

The cerebrum is the largest part of the brain. It has deep ripples (gyri) and chasms (sulci) which increase the surface area so more information can be processed across this surface. The cerebrum has a right and left hemisphere with a deep fissure dividing these two halves and each hemisphere communicates with the other through the corpus callosum, which is a thick tract of nerves, sitting at the base of this dividing fissure. Messages from one side of the body to the other are largely handled by the opposite side of the brain e.g. right side for left-handedness. However recent research also indicates that it is more a complementary than a discrete operation of the two hemispheres of the brain e.g. 95 percent of right-handed people produce speech from the left hemisphere – and so do over 60 percent of left-handed people.

The cerebrum is divided into four lobes which appear to perform specialised functions:

The frontal lobes – which sit right at the front of the brain (behind the forehead) and are used for ‘executive functions’ such as abstract thinking, organising, problem-solving, some forms of short-term memory, movement and planning. The prefrontal cortex is the anterior part of the frontal lobes of the brain and it lies in front of the motor and premotor areas. This area contributes to executive functions, mental synthesis, organising thoughts into intentions, building mental representations related to social interaction and attributing mental states to other people. It is thought therefore to contribute to such things as the aesthetic appreciation of artwork, moral judgment and empathy.

The temporal lobes – which process auditory perception and information from your senses such as smell, taste and sound. They also play a role in memory storage. Connections linking the temporal lobes to the frontal areas are also thought to play a

role in the synthesis of an object, to discover or harmonise its uniqueness and coherence, which are attributes artists and scientists frequently search for.\textsuperscript{363}

\textit{The parietal lobes} - which are for spatial perception, higher orders of language and sensory information, such as taste, temperature and touch.

\textit{The occipital lobes} – which are used to process information from the eyes and link the images to memory, to the temporal lobes and to language

All these lobes also contain regions where several more specific functions can be linked together, or ‘associated’\textsuperscript{364} at the same time, and science is continually discovering new areas, functions and connections within all parts of the brain.

\textit{The Cerebellum}

This part of the brain looks like a wrinkled ball sitting at the back of the cerebrum between the back of the medulla oblongata and at the back and underside of the cerebral hemispheres. It also has two hemispheres connected by a thin central region. It serves to control and coordinate complex voluntary muscle activity, posture and balance and it also combines sensory information from the eyes, ears and muscles to help coordinate movement.

\textit{The brain stem} links the brain to the spinal cord. It consists of a midbrain, pons and medulla. It also controls many functions vital to life, such as heart rate, blood pressure, breathing and sleep\textsuperscript{365}.

\textit{The Limbic System}

These are structures deep within the brain. They come in pairs, are duplicated in the opposite half of the brain, act together to form a functional unit and among other things, they control basic memories and emotionally driven behaviours e.g. fear, aggression and anxiety. The limbic system is essential for assessing danger and pleasure. It also helps shape a person’s physical and emotional landscape. It is intricately connected to the frontal cortex, marking emotional reference points to guide how we act in the world. The areas of the Limbic System are:

- \textit{The thalamus} - relays messages between the cerebral hemispheres and the spinal cord. Much like a telephone exchange or relay station it relays all sensory input to the thalamus and the hemispheres of the brain

\textsuperscript{363} Changeux, J. As in P.; Damasio, A.R.; Singer, W. Christen, Y. \textit{Neurobiology of Human Values} Springer Berlin, 2005 p. 6


The hypothalamus - controls emotions, regulates body temperature and controls such vital urges as eating or sleeping.

The pituitary gland - has two lobes, masters the endocrine glands, but in turn is linked to the hypothalamus by the pituitary stalk. Hormones from this gland control such things as growth, blood pressure, thyroid and sex organ functions and some areas of pregnancy and birth e.g. by releasing oxytocin during labour.

The hippocampus – is responsible for basic memory, sending memories to appropriate areas to be stored and then re-calling them when needed.

The cingulate gyrus – is involved in respiratory control, emotion formation and processing, learning, and memory.

The amygdalae - are almond-shaped collections of nuclei located deep in the medial temporal lobes of the brain. These are involved in memory consolidation where the information is slowly assimilated into long-term (which can be life-long) storage. This is called memory consolidation as the assimilation becomes a relatively permanent state.

Neurons

The basic communication unit of the brain is a nerve cell called a neuron. Neurons lie in six layers, on the outer rippled surface of the brain, communicating every millisecond of our life. The surface of all the lobes across the cerebrum is made up of six layers of these nerve cells. This six layered, wrinkled, folded surface, which looks like a dark outer stratum in a brain slice, is also sometimes referred to as cortical columns, modules or laminar units (with the laminations running horizontally and the modular units vertically) but it is more generally referred to as the cerebral cortex or ‘grey matter’ (just as it is referred to in everyday language and geriatric humour among ‘Baby Boomers’!)

With the neurons constantly monitoring, modulating, exciting and inhibiting one another, these interactions between multiple neurons are called neural circuits. The communication between neurons may occur with near neuron neighbours, across a few centimetres to another ridge on the brain, or to far locations. While some connections are short loops, others may be longer spans across to other lobes in the brain. However all connections are made with great efficiency, instantly (estimated to be about 160 milliseconds from sight to action366) and economically, sending messages in perhaps as few as five or six synapses367.

Neurons, have two main types of branches coming off the body of the cell: dendrites, which receive incoming messages from other neurons; and axons which carry outgoing signals to other cells, such as muscle cells, or nearby or distant neurons. Like the growth of a tree trunk branching out to the ends of its leaves, each neuron has a large cell body and from there it can enlarge its capacity for receiving information by extending branches, called dendrites, out from its surface. The dendrites can then also expand their information capacity by extending out to further small nodes, called spines, at the end of which synapses (gaps) are located. Dendrites are the receivers of communication.

Axons are also extensions from the neural cell body. They are long fine white fibres which end in multiple terminals of multiple synapses. They can reach to near neighbours or to more distant cells and they are also covered in myelin, a coating that acts like insulation wiring for the axon, between the cells and which forms the ‘white matter’ of the brain. Axons are the transmitters of communication to other cells.

Given that there are estimated to be approximately 100 billion neurons in the cerebral cortex, with more than a trillion in the cerebellum (...and that’s only two areas of the brain!), with each nerve cell branching out until it has approximately 1,000 to 10,000 synapses, then the numbers of neurons in the brain and the number of connections between them, become limitless astronomical figures, to the power of ten, followed by millions of zeros. This circuitry may be staggeringly complex, but it is also highly efficient. The connections are neither random nor regular, but they are organised. The connections in the neural network may have convergence, with many axons on one neuron, or divergent, with the same axon on several neurons, which can bring about ‘local specialisation and global integration within the cerebral network’.

It is as the brain develops and grows that these connections are made, with some connections genetically determined and ‘hard-wired’ while others are constantly being shaped by our experiences. Connections grow strong with reinforcement or weak or disappear without use (consistent with the old adage: ‘Use it or lose it’) and it is for this reason that it is so important how we learn throughout our lives and particularly what and how we learn while we are young.

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369 Ibid. p. 57
370 Changeux, J. P.; Damasio, A.R.; Singer, W. Christen, Y. *Neurobiology of Human Values* Springer Berlin, 2005 p. 2
371 Ibid, p. 2
372 Changeux, et. al *Op cit* p. 59
Synapses

It is the synapses that are the vital points at which the neurons connect, send and receive information between one another. Neurons do this electrical transfer of a message by sending and receiving chemical neurotransmitters. These chemicals communicate the message, then, when the neurotransmitter has been received and the nerve cell is stimulated, it in turn passes this electrical impulse on to other neurons. Such chemicals can vary according to location and function and may include: acetylcholine, dopamine, serotonin, noradrenalin, glycine etc, which is why brain medication is also complex, variable and individual.

Synapses are the gap between the end of the axon (which transmits) and the dendrites and spines (which receive). These chemical neurotransmitters are stored in the synaptic bulbs at the end of the axon. As the electric impulse moves from within the neuron to the tip of the axon it causes the release of these neurotransmitters across the miniscule synaptic gap, sending a message which is then received by the receptors at the ends of the dendrites, making the next neuron become active – a bit like a neurotransmitter relay. The process is then repeated from neuron to neuron until the impulse reaches its destination.

This extensive neural processing occurs in delicate cognitive steps, from image or sensory input to perception. The neural impulses are then processed, with some elements enhanced and others repressed. Learning and memory are based on these synaptic-dendritic connections between neurons, a branching network of parallel processing (rather than a stepped process like wiring which would take minutes passing along a sequence) that is virtually instantaneous (estimated in the order of 160 milliseconds by Zimmer373 and 600 to 800 milliseconds, from recognition to response, by Solso374). These processes are efficient but become increasingly complex over time and involve many millions of parallel processing units across the brain, all occurring at the same time, with astonishing computational power (that computers have yet to replicate)375.

A functional MRI can capture the image of a ‘thought’. It not only records an image of what is happening to the blood flow in an individual brain as the brain activity induces a flow of blood, it has also been able to show that brain activity is frequently in multiple areas of the brain. As a neuron receives a signal from its neighbour oxygen molecules surge toward the active neuron, giving a radio-wave pulse. The fMRI will then pick up

374 Solso, Robert The Psychology of Art and the Evolution of the Conscious Brain The MIT Press, Cambridge, Massachusetts, 2003 p. 120
375 Ibid, p. 121
the microscopic tidal rush of blood that occurs as it rushes to replace the oxygen\(^{376}\). Such images have indicated that modules in the brain are dedicated to different kinds of thought, although they don’t work alone e.g. some modules are more active when listening to different kinds of jokes or speaking in a second language etc, when puns or semantics are more difficult\(^ {377}\). The networks that are used for any task are complex, changeable and may also change over ‘seconds, minutes or decades’\(^ {378}\). Brain activity also uses great amounts of energy, however it cannot expend so much energy all at once, so is unable to take in all the information that is available. It needs to limit, sift and sort information. So as a self-organising organism it continually refocuses attention (mostly without our awareness) on to what is important and predictive e.g. boosting signals to the fields of vision when driving so we are more alert to details needed for our safety. Because the brain processes information in parallel, at the same time, it can handle many thousands of pieces of information about the world without hunting for a memory in logical, linear fashion. It can also spark a train of thought that might become remote from the original idea but be a creative connection. That artists have such attributes, where they can process complex information, facilitate the connection of disparate elements, tease these elements into unthought-of relationships, then use their expertise to externalise these ideas into an art work, is both an amazing facility and a wonderful aptitude.

So ‘brain work’ is also ‘mind-boggling’. It is the product of all these neural points, connections and their electrical and chemical transfers, which form a phenomenal number of inter-connections and a web of communications across the brain, allowing humans to think, feel, move, communicate and create. This reflection of the huge complexity of the brain - from its fundamental biology to the infinite amount of information it receives, processes, transmits and acts upon – illustrates the extraordinary complications and convolutions of the brain and why so much about it and its processes are still a mystery.


\(^{377}\) Ibid

\(^{378}\) Solso Op cit p. 276
Appendix B iii - Summary of Vilayanur Ramachandran and William Hirstein's proposed eight ‘artistic universals’\textsuperscript{379} as employed by artists

Ramachandran\textsuperscript{380} and Hirstein have theorised\textsuperscript{381} that, as art exists throughout the world and across time, in spite of its apparent biological and evolutionary uselessness and even though cultural factors, upbringing and taste influence our preference and enjoyment of art, the following eight ‘laws’ may actually be ‘universal rules’ or deep structures within the brain that makes human beings create and enjoy art and the artistic experience:

1. The ‘Peak-Shift Principle’ asserts that accentuation or exaggeration (e.g. the female form, depth, colour) may excite, by supernormal stimuli, areas of the brain more than normal stimuli. Described by Hindu artists as ‘rasa’ (essence) and physiologist Zeki\textsuperscript{382} as the ‘essential features’ of an image, which is an artists’ conscious or unconscious intention, it is the ability to distil and amplify this essence that contributes to making art. Discarding information that is redundant is anthropologically what our vision has evolved to do. Arguing in terms of difference being more amplified, this first ‘law’ proposes that the neurons in the brain that represent form (e.g. the rounded, sensuous hips of a female figure as opposed to the angularity of male form) may, across time, cultures and art forms have caused these features to be amplified e.g. from the Venus of Willendorf, to Indian architectural sculptures, to Renoir figures and captures the ‘essence’ of the form, producing a ‘correspondingly high limbic activation’\textsuperscript{383} (i.e. in the memory / emotion areas of the brain). By exaggerating, they propose, the artist (consciously or unconsciously) tells a story which may also evoke anthropological responses and stimulate neural mechanisms in the brain e.g. the cherubs painted by Boucher in form-space, colour-space or motion-space evoke a significant neural response from their baby-like features (which tap into primitive facial feature and neonate domains), exaggerated skin tones (with a vivid ‘healthy’ flush), their posture and movement. Other artists might exaggerate tone, texture, lighting etc and in contemporary art, such elements as sexual subject matter, music, smell, sound and shock may evoke other perceptual

\textsuperscript{380} Currently the Director of the Center for Brain and Cognition, Professor in the Psychology Department and Neurosciences Program at the University of California, San Diego, and Adjunct Professor of Biology at the Salk Institute for Biological Studies.
\textsuperscript{381} Ramachandran, op. cit., pp. 15-51
\textsuperscript{382} Zeki, Semir A Vision of the Brain Blackwell Scientific Publications Oxford 1993 pp. 71-104
\textsuperscript{383} Ramachandran op. cit., p. 18
principles or more primitive emotional responses that are ‘hard-wired’ into the brain. The exaggerations or triggers may not be immediately obvious but the excitation of the visual neurons occurs none-the-less, from the aesthetic perception and autobiographical memory of the artist to the audience’s ‘more general cognitive stock’ that they bring to the work when they look at it.\textsuperscript{384} They further propose that it may be possible that the movements of art history could even be understood by this principle of exaggeration and peak-shift, where every new art ‘movement’ contains homage to earlier artists and art forms but then amplifies the essence of the previous art forms, even across time and culture (e.g Picasso and African art).

2. Isolating a single cue in an artwork may help allocate attention and heightens peak-shift. According to Ramachandran, with over 24 or more visual areas concerned with different visual attributes (such as form, depth, colour, motion etc), the visual areas of the brain have the function of discovering and delineating objects in the visual field. For humans there is an incentive to discovering objects when they are more difficult to see (e.g. when they are random, indistinct or jumbled - such as with camouflage). This incentive is linked to the pleasure of discovering the patterns or objects within a visually noisy background and it is a mechanism of grouping, chunking or binding pertinent visual information until the image becomes obvious (e.g. picking out a camouflaged animal) or matches (e.g. putting colours together to be aesthetically pleasing in an outfit or a composition). The chunking, binding or grouping is also due to the limited attentional resources in the brain and competing representations in the neural space. It is proposed that to process visual information there is a build-up of segments of information e.g. delineating figure from ground, eliminating ambiguity, recognising the image among visual noise etc and that every stage receives a reinforcement signal from the limbic system, which causes the salient information to be held, attended to and added on, until there is a hierarchy of visual information, which makes us feel good when the final perception falls into place.

3. It is further proposed that artists exploit this grouping principle, so that when they refer to composition or grouping within a composition they are actually tapping into these principles, as one source of aesthetic experience, where one organisation of images causes a stronger activation of the limbic system than another.

4. Perceptual grouping by figure-ground delineation, grouping by similarity and closure extracts features in an image and is reinforcing (e.g. the pleasure of a line drawing or photograph) but it also requires discarding irrelevant information. It is attention to the elements that are more interesting and may also translate into ‘pleasing’ (e.g. where things are changing and not homogenous, such as the edges in a drawing, or its texture, motion, ornateness, unusual detail, colour contrast etc).

5. Contrast also draws our attention and like-grouping is an important survival principle in nature (e.g. in camouflage). As areas of contrast are information-rich they attract attention and visual reinforcement, with the discovery of objects. As this is the primary goal of vision it is also rewarding to the viewer.

6. Symmetry is thought to be extracted early in the visual process as it is important with biological objects (e.g. in choosing mates and evaluating prey). It grabs attention, facilitates processing, is interesting (i.e. it has the evolutionary purpose of not choosing an unhealthy asymmetrical mate) and is therefore aesthetically pleasing.

7. The ‘generic viewpoint’\textsuperscript{385} argues that there is an infinite number of viewpoints to produce retinal images but the visual system rejects those that are unique, have suspicious coincidence or are improbable. The brain favours generic viewpoints and generally rejects unique vantage points, therefore some images are attractive and others not. Although artists generally adhere to these visual ideals they also create pleasing effects by breaking these rules as well (e.g. Picasso’s cubist portraits). Perceptual problem-solving is also reinforcing, sometimes even more-so than obvious representations. For example, nakedness about to be revealed or seen through a diaphanous garment can be more titillating than a body totally exposed, or the introducing challenging connections between visual metaphors, symbols and objects in art can link vision to language, or visual incongruities to visual and intellectual play to amplifying the aesthetic experience.

8. Visual metaphors have always been used in art, linking concepts that may contain a jest, an analogy, an allegory or a visual echo (e.g. fruit echoing breasts). It is actively perceiving, or intuitively sensing the metaphor which is another artistic device that has its rewards. In emotional and evolutionary terms, such devices are an economic

code, they evoke powerful connections, allow for classification and enable the viewer to see links, disparities and similarities, to form concepts or representations – in other words, all the discoveries that might lead to a reward by activation of the limbic system.
## Appendix B iv - A Brief History of Brain Science

*Adapted from History of the Brain -Brain Science PBS Public Broadcasting Service U.S.*

<table>
<thead>
<tr>
<th>Age</th>
<th>Location</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,000 BC</td>
<td>Sumeria</td>
<td>Record of mind-altering effects of poppy plant extract</td>
</tr>
<tr>
<td>2,500 BC</td>
<td>Egypt</td>
<td>The heart is believed to be the site of life for the human body containing essences of good and evil. The Egyptian funerary guide - The Book of the Dead - instructs that a dead man's heart must be weighed against feathers to determine the balance of good to evil it contains. The brain is considered a minor organ of little importance. It is discarded during mummification. The Edwin Smith Surgical Papyrus contains the first record of the brain's anatomy documenting over 20 cases of brain injury and their treatment.</td>
</tr>
<tr>
<td>2,000 BC</td>
<td>Pre Inca South America</td>
<td>Evidence of a large volume of surgical procedures of Trepanization performed (i.e. boring a hole in the skull) using surgical tools made of bronze and sharp-edged volcanic rock. Suggested that it was used for spiritual and magical purposes and headaches, epilepsy and mental illness.</td>
</tr>
<tr>
<td>450 BC</td>
<td>Greece</td>
<td>Early Greek physician Alcmaeon uses animal anatomy and suggests that the brain is the centre of sensation and thought (against the accepted idea that the heart is the true seat of life and learning) He also suggests that the eye is a container of light carrying light to the brain – a theory that is believed until the middle of the 18th century.</td>
</tr>
<tr>
<td>335 BC</td>
<td>Greece</td>
<td>Aristotle claims the heart is the centre of sensation and thought and the brain merely cools it. He also contends that the basis for thought is sited in the rational soul, which cannot be found in the body</td>
</tr>
<tr>
<td>300 BC</td>
<td>Alexandria</td>
<td>Herophilus and Erasistratus are the first to dissect a human and compare it to other animals, writing about the structure of heart and brain. They posit that the ventricles of the brain hold intelligence. They also distinguish motor and sensory nerve in the nervous system.</td>
</tr>
<tr>
<td>170 BC</td>
<td>Rome</td>
<td>Belief in the balance of the 4 humors directing temperament and that mental faculties are situated in the ventricles. The 'humors' theory influences medicine for the next 1200 years</td>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Region</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100 to 1500 AD</td>
<td>Europe</td>
<td>The church bans anatomic studies as desecration of the body. Primitive brain surgery continues by barbers who remove the fictional &quot;stone of madness&quot; from the skulls of the mentally ill. The only surgeons are clerics who practice medicine, but not anatomy so they don't run foul of the church.</td>
</tr>
<tr>
<td>1543</td>
<td>Italy</td>
<td>Vesalius draws anatomical studies for one of the first anatomy textbooks. He shows sections on the workings of the nerves and the brain and disputes the notion that the higher functions of the brain are situated in the ventricles because they exist in animals as well and contends they have no soul.</td>
</tr>
<tr>
<td>1649</td>
<td>France</td>
<td>Rene Descartes, philosopher and mathematician claims nerves are filled with &quot;animal spirits&quot; that carry motor and sensory information to the ventricles of the brain but that doesn't account for some of the higher mental faculties such as intellect and emotion. He proposes a dual system (Res Extensa and Res Cogitans) where the organ of the brain is distinguished from the &quot;mind.&quot; (which contains the soul, thoughts and desires) He concludes it is the pineal gland which is the valve that controls the flow of information to body and mind.</td>
</tr>
<tr>
<td>1664</td>
<td>England</td>
<td>Thomas Willis writes the first monograph on philosophy and brain anatomy. He is an influential forerunner of neuroscience. He states that the cerebral hemispheres determine thought and action with a separate part of the brain that controls basic motor functions like walking and he locates specific mental functions within the corpus callosum, corpus striatum and the cerebellum, introducing the words, 'neurology,' 'hemisphere,' 'lobe,' 'pyramid,' 'corpus striatum,' and 'penduncle' into the modern vocabulary.</td>
</tr>
<tr>
<td>1791</td>
<td>Italy</td>
<td>Luigi Galvani experiments with frog muscle twitches. Touching them with wires he proves that electricity flows from the muscles to the nerve. This is later disproved as it produced by a chemical reaction caused by acids present on the frog's skin – however this forms a first step toward the modern understanding of the 'electrical' basis of neural activity.</td>
</tr>
<tr>
<td>1808</td>
<td>Germany</td>
<td>Franz Joseph Gall proposes that the brain is composed of thirty-one personality organs with a specific mental function and site. Called phrenology it became widely accepted as an objective analysis of character.</td>
</tr>
<tr>
<td>Year</td>
<td>Location</td>
<td>Event</td>
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</tr>
<tr>
<td>1811</td>
<td>Scotland</td>
<td>By showing nerves for senses come from specific areas of brain to organs, Charles Bell makes distinctions between the cranial nerves for chewing and expression and demonstrates that motor and sensory functions are anatomically separated.</td>
</tr>
<tr>
<td>1862</td>
<td>France</td>
<td>By studying a stroke patient with a lesion on the left frontal lobe of the brain Broca saw that a patient could understand language, although he had lost his speech. Working with brain-damaged patients he locates the site of the speech now known as Broca’s area.</td>
</tr>
<tr>
<td>1869</td>
<td>England</td>
<td>Francis Galton makes the first scientific attempt to measure intelligence. In 1888, he sets up an &quot;anthropometric laboratory&quot; in which he uses the rather dubious measures of visual acuity, auditory accuracy, and breathing capacity to assess levels of intelligence.</td>
</tr>
<tr>
<td>1875</td>
<td>Germany</td>
<td>In the 1870s, Wilhelm Wundt moves the study of human knowledge into the realm of human behaviour and experimental psychology.</td>
</tr>
<tr>
<td>1875</td>
<td>Germany</td>
<td>Freud publishes groundbreaking work on dreams as the road to unconscious and repressed desires.</td>
</tr>
<tr>
<td>1875</td>
<td>Spain</td>
<td>Cajal and Golgi research changes that neurons undergo in nervous system, connection of nerve cells and nervous system and isolate the nerve cells near the surface of the brain.</td>
</tr>
<tr>
<td>1875</td>
<td>Ireland</td>
<td>Henry Head and Sir Gordon Holmes research speech and sensory perception in the cerebral cortex.</td>
</tr>
<tr>
<td>1875</td>
<td>American</td>
<td>John B. Watson introduces a behaviourist viewpoint - that observable behaviour should be studied with the goal of predicting and controlling behaviour.</td>
</tr>
<tr>
<td>1875</td>
<td>Germany</td>
<td>Berger's invention of EEG or brainwave test provides a diagnostic test in neurology and psychiatry for brain research.</td>
</tr>
<tr>
<td>1875</td>
<td>England</td>
<td>Edgar Adrian and Charles Sherrington research how nerves transmit messages.</td>
</tr>
<tr>
<td>1875</td>
<td>America</td>
<td>Scientists propose theories of the mind based on complex representations and computational procedures. George A. Miller’ proposes a concept of mental representations as chunks of information that are encoded and decoded within the mind.</td>
</tr>
</tbody>
</table>
the field of artificial intelligence

Noam Chomsky further removes the study of the mind from the
behaviourism of Watson, B.F. Skinner, and others who had been
psychology's primary focus to date.

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>Australia</td>
<td>Discoveries re primary physiological and chemical processes of the eye</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eccles, Hodgkin and Fielding research the mechanisms of how neural cell membranes communicate or repress chemical impulses</td>
</tr>
<tr>
<td>1970s</td>
<td></td>
<td>The mid-1970s sees the emergence of cognitive science</td>
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<tr>
<td></td>
<td></td>
<td>Discovery of storage release and inactivation of neurotransmitters and the development of a PET scanner</td>
</tr>
<tr>
<td>1980s</td>
<td></td>
<td>Research on how visual information is transmitted from retina to brain</td>
</tr>
<tr>
<td>1990s</td>
<td></td>
<td>Discovery of how cells communicate</td>
</tr>
<tr>
<td>2000s</td>
<td></td>
<td>Carlsson, Greengard, and Kandel's understanding of neurotransmitters and synapses, the normal function of the brain as well as how disturbances in the signal transduction can give rise to neurologic and psychiatric diseases.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Art takes an interest in science as subject-matter and science in the processes of art</td>
</tr>
</tbody>
</table>
Appendix Bv - The Functions of the Senses – The Eye

The Biological Processes of The Eye – (101 For Artists)

As light reflects off objects it enters the eye through the first layer of moisture smeared across the eye, then floods into the cornea, which focuses the light into the eye. The tough white sac which forms the white of the eyes on either side of the cornea, is called the sclera and it surrounds and protects all the delicate features of the eye. From the cornea the light passes through the aqueous humor, moisture which circulates through the front part of the eye, keeping a constant pressure within the eye,387 then through to the coloured part of the eye called the iris, which contracts or dilates to adjust the amount of light going deeper into the eye. From there lights flows into the black spot in the middle of the iris, called the pupil, passing back to the lens, which can change shape to focus the light reflection from near and far objects (like a camera lens). This centred, focussed light is now sent through a bath of moist jelly called the vitreous until it touches the back of the eye where the retina sits. The retina is a flat, smooth surface that receives the image, a little like a screen of three layers of cells, however it has many working parts, such as:

- the absolute centre of the retina, called the macula;
- blood vessels that nutrify the retina, called choroids;
- the retinal pigment epithelium, a dark tissue that sits behind the photoreceptors which has cells to absorb excess light so the photoreceptors can have a clearer signal.
- two types of photoreceptor cells, which form an uneven mosaic within the retina, are called rods and cones -
  - rods (for low or night vision) They are blind to colour and are the ultimate in light sensitivity, responding to minute amounts of light (e.g. so you can see in the dark or by moonlight). Dim light doesn’t trigger the cones into action, so vision is improved in dim light by looking to the side of an object so the image focuses on the more sensitive rods instead of the cones. Rods generally outnumber cones 10 to 1 388 except in the centre of the retina, called the fovea. The fovea is a small pit at the centre of the retina that only has cones, so it provides the most accurate bright light

387 Howard Hughes Medical Institute. Seeing Hearing and Smelling the world Retrieved from the World Wide Web 21/04/09
http://www.hhmi.org/senses
388 Ibid.
vision (but is useless in dim light). The eyes constantly move to try to keep the image concentrated on the fovea.

- cones (for daylight or bright light) are responsible for high acuity and colour. There are three different types of cones, each with different pigments which combine to allow us to see colours. Under normal daytime light the eye is most sensitive to light in yellow-green hues but in low light the eye is most sensitive to blue hues and is almost blind to red. So in bright light a red and blue object look equally bright but in dim light the blue object will look brighter. 389

Light is electromagnetic energy. It excites the retina, so the light-sensitive rods and cones will provide day or night vision as each responds differently to the electromagnetic spectrum. Both of these convert the light images into electro-chemical neural signals, then transfer them via the optic nerve to the brain for processing.

The ability to see also depends on -

- **brightness** - this is dependent on the perceived luminance (which is a photometric measure of the light reflecting off the object into our eyes) and the contrast of surroundings or background. It can also be affected by colour or texture e.g. a glossy surface (bounces off more light), dark colours (low reflection)
- **time** – it takes time for the eye to view and assimilate details of an object (e.g. in low light with poor contrast it’s harder to read)
- **contrast** - without the contrast of surface to item it's difficult to see e.g. white pencil marks on white paper
- **size** – the larger or closer the object or text, the easier to see it

The brain comprehends physical objects based on how the brain and eyes ‘see’ and process. The brain interprets two dimensional and three dimensional images and objects by use of contextual clues and knowledge of the world gained through experience. We have a predisposition to see the world as three dimensional, so as humans we are constantly decoding flat stimuli to create depth and as artists, creating illusionary devices so that flat stimuli has depth.

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389 Howard Hughes Medical Institute *Seeing Hearing and Smelling the world* Retrieved from the World Wide Web 21/04/09
‘Normal’ sight perceives a flood of important and trivial visual images as light hits the retina of the eyes. We initially identify objects based on contours or shape and search for depth cues (detecting size, tone, orientation, texture, elevation, kinetic cues, aerial perspective, occlusion etc) until we can match the image to a preconceived prototype. These visual stimuli flood the brain through light striking the back of the eye, then the retina converts the chemical signals to electrical signals which travel down the optic nerve to the visual cortex, which is the area of the brain dedicated to visual information. The brain attends to some visual cues, ignoring others, choosing what we need to learn and remember and through using the brain across all areas, building up a databank. However greater complexities of sight are revealed in the book ‘Planet of the Blind’ as the writer Stephen Kuusisto describes the phenomenon of ‘blindsight’ where, although most areas of the visual cortex were damaged he still retained the capacity to ‘see’ things when he was in motion. It has been proposed that this ability, begun at a young age through aggregated sensory perception, stems from the creation of an internal map of the external world through movement, so all his senses could ‘see’.

The primary visual cortex (V1), a region at the back of the brain is about the size of a credit card, was thought to be solely responsible for vision. However it is now speculated that although it has a highly organised system of neurons for analysing an object’s outlines, there may be many areas of the brain involved with ‘seeing’. In its simplest - and still sometimes debated - transmission, the first visual processing (to determine outlines) is done in the areas designated as V1 to V6 in the occipital lobe of the brain. V1 is the visual cortex and receives nearly all visual information which it then transmits to two primary pathways. ‘What’ the object is (that is, its form and representation) is interpreted mostly by the ventral stream which moves from V1, through the visual area V2, to V4 and then to the inferior temporal cortex. The ‘where / how’ (that is the depth perception) transmission is done by the dorsal stream in the brain, which traverses from V1, through V2, then to V3, V5, V6 and the posterior parietal cortex.

The area of the brain responsible for the processing of vision and the perception of colour, identified as V4, is constantly being researched and has played an important role in interpreting the organisation of the cerebral cortex to provide insights into brain function allowing us to ‘see’ how the brain works. This research has shown that the complexities continue. For example, although V4 may be responsible for colour and colour constancy, as the brain shows great activity when exposed to different colours.

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and cells within this area, recent analysis of other parts of the brain show V1 and V2 may also respond to colour while V5 is thought to be responsible for the perception of motion. Within the area of V1 there have been found to be single cells that respond to lines and edges and at higher levels of cortical processing, other single cells that are sensitive to colour, motion or patterns. Then the brain interprets the colour and motion, what the object is doing (from kinetic cues) with even a specific area of the visual cortex to recognise the most important visual information of the face.

The signals gathered by the eye that can be verified by objective measurement (e.g. instruments), to provide information for the sensory-cognitive systems to understand, are known as ‘verdical perception’. These signals are caused by retinal stimulation, which is filtered and often corrupted by the senses, then interpreted and translated by the brain and finally individuated by personal experience. So although people may effectively ‘see’ the same objects through the same sensory vehicle of the eye, they will not ‘see’ the same, whole, undistorted view and may perceive the actuality of the real world quite differently from each other. This distortion is known as ‘illusionary perception’. For example, in terms of creativity, viewers may be drawn together with a general acceptance of the elements and principles of an artwork (i.e. they can all see, with verdical perception, the lines, shapes and perspective of the work) but then each may also ‘see’ a different artwork in terms of their viewpoint, its meaning, their general understanding of the work, their academic grounding and their personal engagement with the work. This is illusionary perception. From these objective transmissions and subjective interpretations we may then ascribe even greater meaning to the work by adding a linguistic description, so we can ‘transcribe sensory impression into words’. Finally, the brain ‘decides’ how to respond to all this visual information and what the person must do in relation to the object and amazingly, all these elements are brought together in infinitesimal time and detail, to ensure the whole image arrives ‘consistently in space and time’.

Therefore seeing the world is not just an exercise of the eyes and the occipital lobe. These processes also build up a catalogue of images, connections, memories and emotions as we sift and store the information across the whole brain, quickly sorting cues and committing sensations to memory.

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392 Ibid, p. 171
393 Ibid, p. 175
394 Ede, Sian art and science I.B. Tauris, London 2005 p. 68
395 Ibid, pp. 104-5
The eye is not only the most prominent but also the most active sensory organ of the body, constantly pivoting its orb or the whole head trying to capture the best focus.\(^{396}\) This mechanism, called saccadic vision\(^ {397}\) (the rapid focus and movement of the eye), is motivated by our innate visual curiosity and is used when looking at an art work. As the eye cannot process all information equally it scans it idiosyncratically, rapidly and accurately, driven by our interest, intention, motivation and context etc and in reference to acquired schemata. For example, when looking at art, not only do artists tend to have balance in the overall composition, punctuated with areas of visual interest, the viewer will then also search for the patterns, representations and narrative elements within the composition. This scanning saccadic vision moves rapidly across an image, with the eyes briefly fixating on the details of the image to enable it to capture and connect the information to the largest area of the visual cortex. This is done through the magnification of the fovea, which is more effective than any other area of the retina. As the actual, clear and full-colour detail of what is being seen is limited to a few degrees across the fovea, this is a form of visual sampling, giving us the impression that we are seeing clearly in every direction and when this movement is plotted, it can even indicate the main areas of a person’s interest within the work. The most frequently explored part of an artwork will generally be the centre, although different styles of artwork tend to produce different kinds of eye movements. For example, a complex picture with dense detail will produce shorter fixations, as it demands attention over a large number of compositional elements, whereas a figurative work may have fewer details but demand deeper study and consideration.\(^ {398}\)

Artists use of all these visual cues and also depth perception to create two and three dimensional art. Binocular vision includes the phenomenon of convergence and binocular disparity. For example, hand-eye coordination is dependent on both disparity and focus. The disparity between the different images on each retina is read as depth (although people with one eye can also have good perception of depth, though greater difficulty doing fine work) and focus, which is caused by convergence and is controlled by the ocular muscles, move the eyes to focus. Monocular vision then gives kinetic cues and pictorial cues, including\(^ {399}\), for example, relative size, shadows, orientation, occlusion, textures, elevations, atmospheric and linear perspective and colour. Because we learn at a young age how to judge the relationship and location of objects, artists can then also use the monocular depth cues to present the illusion of an image as being 3-dimensional on a two-dimensional surface and is why they will often close one eye to

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\(^{399}\) Ibid, p. 202
begin to draw. Kinetic cues then also provide further information about movement, as living in a three-dimensional world, humans need kinetic cues, and need to constantly follow them with their head and eyes, to locate themselves and other objects.

As humans excel in ‘seeing’ they can even recognise incomplete or noisy images and readily distinguish between an image and the real thing – including virtual reality.400 So one is left to wonder, why is there so much processing between eye and brain, if all the information is really contained within the original sensory image?

Images in themselves cannot convey anything. They lack coherence (i.e. to our physical eye, they are just millions of pieces of information that are unconnected), they are not embedded in our memory and previous associations and they are transient401. The information received through the eye can take many routes, determined by the nature of the message, for example: some find ready-made reinforced routes, because there has been similar information forged on these pathways before; other information is novel and transient or new important and becomes embedded in memory; or other information may be new but irrelevant and therefore discarded.

In terms of the brains processing, when a human ‘sees’ they record a visual image, then send it back to the visual cortex in the occipital lobe402, where the general features of the object are perceived, then are passed on to another area of the brain called the visual association cortex in the fusiform gyrus403, to have specific features perceived. Then to identify what we are seeing, the parietal cortex can recognise where the object is and then it is passed on to be interpreted in the temporal lobes. What happens from there is dependent on what is to be done with all the visual information. We draw on prior knowledge and images from our memory, which may confirm that we recognise something familiar, or unfamiliar, therefore confirming or modifying our perception. Even with cluttered or missing information our brains will compensate to fill in the gaps and make sense of the scene. In visual processing we are hunting for both regularities and surprises, for details to fill out the information we are receiving and they may come with strong, emotionally charged responses as to what is being seen. We are constantly checking this information against our memories and both for an artist and viewer, this information chase has been useful when scenes are frozen in time, for example, in a Turner painting offering an insubstantial, emotionally-charged glimpse of a dramatic event, or with the colour and motion of a Van Gogh.

400 Zeki, S. As in Howard Hughes Medical Institute op, cit., p. 99
401 Harth, Erich ‘The Emergence of Art and Language in the Human Brain’ Journal of Consciousness Studies, 6 No. 6 – 7, 1999 p. 99
403 Ibid, p. 57
“Can You See What I Mean?” - The Dominance Of The Eye And The Intervention Of Language

The senses have astonishing powers to reveal the world to us and also to engage us in the world. They are also the only means human beings have of gathering information about the world. Our visual system is the closest approximation we can get to knowing the ‘real’ world, ‘given our biological and sensory-cognitive limitations and the infinite interconnections and interactions between the sensory areas of the brain’\[404\]. Perceptions are formed from the ‘signals gathered by our senses’\[405\], to acquire information about the world, which are then further translated by our linguistic and cognitive coding. Because of our genetic and personal differences, the elements of sensory reception, the perceptions they form, and their ‘translation’ in cognition and language, varying across different brains, different individuals and in different cultures. So our sensory acuity is both various and vital.

However, in a vivid, living, chaotic and largely visual world, it has also been recently argued there is now a need to literally come ‘back to our senses’\[406\]. As globalisation and consumerism have increased the intervention of language (including a text and symbol-congested environment), and decreased our sensualisation (as opposed to sensuality), written and spoken ‘discourse’, rather than the senses, have now become the prime medium through which we tend to experience our (Western) world. This is because we have now shifted from the sensory world of Pygmalion, where he received and attended to the acute information he gathered across all his senses, to our contemporary world, where the eye dominates and language supersedes, leaving all other senses muted, as we cope with the distortions and demands of a symbol-congested, language-based culture, with its speed, short-bite information and all its technologies. We therefore appear, in a Poststructuralist culture\[407\], to have become ensnared in an intensely cognitive world, dominated by the eye and by language as our primary means of culturally-shaped perception. The eye and language now dominate our relationships, our responses to the world and our individual experiences of it.

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Language is a useful tool for understanding and communicating our perceptions. It has socially agreed-upon meaning, often specialised words within subject areas and it is also used to translate our sensory input, emotions, needs and ideas into Western lineal thinking. It forms semantic and social connections between humans, so they can express common thoughts and discuss complex concepts (such as art and creativity). However just as our technical control of nature has now almost insulated us from it and eclipsed our care about it, language may now also be restricting and stultifying individual perception, especially as it relates to our sensory experience. As the senses are largely information-gatherers and language is now the primary means of our perception, expression and communication, there may also be an increasing feeling in our contemporary world, of alienation from lived experience and a dulling-down of sensory awareness, because it has become atrophied by intellectual intervention, technology and linguistic dominance.

Used as an intellectual tool, words can either enhance, clutter, stultify, or even fail to adequately express what is sensually experienced or ‘seen’ in the eye of the beholder. While we need language to generally enhance semantic interpretation and cognitive development, it is further argued that we also need to reconnect with our senses and to break out from the ‘lexical prison’ that restrains our mind and distorts what the eye sees and what the senses perceive.

In experiencing the arts, the brain is directly stimulated via the senses. Therefore in making and seeing an artwork only in the context of its attributed semantics and imposed authoritative validation (most often demanded of artists and bestowed by arts authorities, according to their social or aesthetic ideologies), it may have become an experience that is now distorted or contaminated by words and cognitive objectivity, rather than evoking a direct, wordless, sensory, emotional or spiritual connection between maker, viewer and artwork. Particularly now, with modern museology, it has been proposed there is a danger of intervention, imposing language on sensory perception, individual experience and cognitive interpretation. This mediation can become a filter, which may either fail to express the experience adequately or may construct a narrow definition on a subject which may, for that viewer, exceed description.

In a world where the senses are overloaded and muted, without losing our ‘mind’ in our perception and appreciation of art, there is now a critical challenge, after a quarter of a

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408 Dissanayake, E. Homo Aestheticus Where art comes from and why University of Washington Press, Seattle 1996 xi
410 Where modern museology and curatorial authority tends to assume it knows what the visitor/audience needs, as discussed, for example, in such writings as ‘The New Museology’ by Peter Vergo (Ed.) and Tony Bennett in ‘The Birth of the Museum’
The Pygmalion Proposition  J.Ure

century of post-modern linguistic and symbolic primacy\textsuperscript{411}, to redress the enduring Cartesian mind-body division\textsuperscript{412}, the phenomenological / structural dichotomy and the Derridean elliptical word-play, to try to reconnect with our own ideas and emotions and fully experience our senses and perceptions, in both the making and appreciating of art.

\textit{Perception of colour}

Objects appear a particular colour because they reflect certain wavelengths more than others e.g. a strawberry reflects wavelengths from the red end of the spectrum and absorbs blue waves from the blue end, whereas it’s the opposite for a blueberry. An object’s colour is not only determined by the wavelength composition of the light reflected from it, it is also determined by comparison with the surrounding surfaces. The nervous system assigns the colour (e.g. red) on the basis of it being seen in long, medium or short wave light. Then the brain assigns to it (or effectively ‘sees’) ‘the colour red’. The object’s colour is therefore the consequence of several comparisons, surfaces and wavebands. The brain therefore gains knowledge from the reflectance of its physical properties and invests the object with meaning from that interpretation (however, a colour-blind person lacks certain types of pigment in the cones of the eye to be able to see this reflected colour).

As the retina doesn’t have different receptors for every wavelength (spanning the entire spectrum from red to violet) we perceive the immense variations of colour by combinations within the cones of the eye. Artists, printers and those who do graphics on a computer know that colours of the spectrum can, in theory, be mixed from three primary colours, however, artists also know that paint is not the same as pure light and that the process is actually more complex as it involves mixing from the many colour variations that occur in pigment. However, in terms of light, colour vision depends on the interaction of three types of cones in the eye which are especially sensitive to red, green and blue light. Receptor proteins in the cones are tuned to absorb different ranges of wavelengths, then, from the eye-to-brain pathway, it is the brain that compares the input from the different cone cells and constructs a stable visual representation of reality, judging wavelengths reflected from the object and its surroundings (e.g. a flower seen at midday as opposed to that flower seen at dawn) then comparing and cancelling out until colour constancy and a stable representation of ‘reality’ is achieved.\textsuperscript{413}

\textsuperscript{411} Onions, John, quoting Bryson in \textit{Neuroarthistory} Yale University Press New Haven 2007 p.2
\textsuperscript{412} A derivative adjective from Descartes name to denote his philosophy of the mind, which propose dualism between body and mind
\textsuperscript{413} Zeki, S. op, cit., as quoted in Howard Hughes Medical Institute \textit{Seeing Hearing and Smelling the world} Retrieved from the World Wide Web 21/04/09 http://www.hhmi.org/senses
Summary of the stages of visual processing when looking at an art work

Processing from image, to perception, to response, there are many cognitive steps:

- The eye receives reflected light. This retinal information is converted into neural energy and sent via the optic nerve to the visual cortex which processes the information for feature discrimination (e.g. to determine lines, edges, contrasts, shapes etc in the Van Gogh)

- Large numbers of parallel neural impulses are then sent to other areas of the cortex. The brain then perceives and analyses these high-order features by combining larger units e.g. various components of the artwork. This directs attention and activates more eye movements. The eye then moves to another area, repeating the above process, until the object is ‘recognised’ by the brain.

- Information is further processed by other areas of the visual cortex and in the wide distribution and parallel processing, information from the work is related to knowledge of the world and translated into higher order processing such as semantics and associations with existing knowledge, thought, memory, etc. The work is now being interpreted in reference to previously stored information. Motor processes now change the eye movement or locomotion e.g. the eye might now focus on certain parts of the work, with other areas of the brain now engaged e.g. the artist’s intention, searching for relationships, technique, the narrative etc. Then semantics may come into play as well as a preferences for one work over another and the work might be discussed (e.g. the preference for Van Gogh’s sunflowers over peasants).

- All of this visual recognition is processed by an eye and brain that have evolved over millions of years to move from mere survival (where they evolved to identify: What is it? Where is it? What is it doing? To now, an appreciation of an aesthetic object, and it is thought to take approximately 300 milliseconds from recognition to appreciation, a speed as yet unable to be replicated in either speed or complexity by the most sophisticated computers

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**Touch - a whole body sense**

Whereas pain is received at its site, sending signals via the spinal chord to the thalamus, which identifies the pain and where it is, while the cingulated cortex (in the frontal lobes) perceives the pain (which may explain why the ‘kiss and rubbing better’ for a wounded child, by actually sending an additional signal to the brain, so it must now pay attention to the two streams of signals, helps reduce the effects of the pain).

Touch acquires content and sense of depth or distance through action or movement.\(^{415}\) It can be definitive, elusive, fleeting, prolonged, delightful or uncomfortable. It can be a cognitive, psychological, sexual, social, symbolic, kinaesthetic or existential experience. Touch protects the body from danger, enables experiences and conveys physical pleasure, so it can be practical and efficient, comforting and pleasurable, dangerous or repellent. Touch also opens intellectual, physical and emotional possibilities (e.g. a kiss). There is great diversity with touch, as it locates a tangible object and receives sensory perception from it. Touch enables the body to perceive this form, its temperature, size, textures and fragility and then handle it with reverence, practicality, irritation or to move it, change its shape, make it do work, hold it down or keep it still, balanced or warm.

Touch can also be powerful in its duality (e.g. that this is a sense that can touch and be touched at the same time; that the tongues tastes and also feels the textural sensation of the food) and its absence (e.g. needing a hug or wanting to touch a sculpture); its delicacy (e.g. threading a needle; feeling a pulse, brushing a cheek). Touch can be vital in its perception of danger (e.g. gauging heat and feeling the cold, prickles up the back of the neck), its warnings and threats (e.g. receiving an ‘uncomfortable’ hug, stepping on a slippery slope, or feeling numbness) and its varieties and subtleties (e.g. feeling the different textures of food in the mouth, fabrics on the skin, the differences between slime and grit). Touch is enjoyed because of its sensuality and eroticism (e.g. delighting in a lover’s touch, sensing the heat from a close body) and its technologies (e.g. the prevalence of touch screens, the practicalities of Braille). Touch also has metaphor and variety of meanings (e.g. to be ‘touched in the head’, to be emotionally affected; describing a football game) and common usage (e.g. touched-up, touch-down, touch-stone, the unbearable lightness of touch). Touch can detect the different tactile qualities of the world\(^{416}\) and begs the question, are bodily feelings an aspect of sensation and touch (e.g. itchiness, tickling, pain)? By handling, touching and feeling we can sense

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\(^{415}\) Noë, Alva. *Action in Perception* MIT Press Cambridge Massachusetts, 2004 p. 97

\(^{416}\) Gross, K. *The Dream of the Moving Statue* The Pennsylvania State University Press University Park Penn. 2006 pp. 68-91
difference and surface (e.g. touching a marble, rubber or living hand), manipulate materials (e.g. carving rather than moulding or modelling) and modify the environment to meet our human needs (e.g. sometimes in dichotomous ways such as touching a wound or creating an injury).

Touching art is a form of haptic aesthetics (as aesthetics was originally conceived by Aristotle, as a sensory faculty) whereby touching we are affected by the qualities, texture, symbolism, meanings of, and connections to, the artwork through tactile sensation. Such hyper-sensuality – beyond the merely visual - has now also become the locus of contemporary artworks. However artworks within institutions are now often so quarantined from touch (and sometimes other sensory response) that viewers are increasingly anxious about their untouchability and the associated elevated status of art that they are also increasingly removed from the most immediate, personal and intimate sensory experience of it, relying instead on the cognitive, linguistic veneer, often provided by the art institutions, as the experience of ‘art’.
Appendix C i - A Short List of Significant Western Art through the Ages

As evidence of the emergence of the consciously aware brain from 77,000 years ago to today\textsuperscript{417,418}

Please Note: For the sake of brevity and as the main arguments within this research are focused on the Western canon of art, there is acknowledged, but omitted here, a long list of incremental developments in early Western art from the ancient through to the Renaissance as well as a vast and rich inheritance of Asian and indigenous arts and traditions, from the ancient to contemporary. This chart is included merely to further emphasise the longevity of this creative human activity and the relatively ‘brief’ period of (Western) artmaking, from Egyptian to contemporary art.

<table>
<thead>
<tr>
<th>Years ago</th>
<th>Artefact</th>
<th>Artistic evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>77,000</td>
<td>Blombos Cave South Africa</td>
<td>Modern human imagery and representational art thought to have emerged around this period with engravings found on pieces of red ochre (however some have argued that the sketches are little more than doodles) <a href="http://www.svf.uib.no/sfu/blombos/Artefact_Review1.html">http://www.svf.uib.no/sfu/blombos/Artefact_Review1.html</a></td>
</tr>
<tr>
<td>28,000 to 22,000</td>
<td>Caves at La Ferrasi and Arcy-sur-Cure</td>
<td>Symbolic art – schematic signs and images of animals and vulvas during early Gravettian period. At this time people were now ‘modern’ humans, not Neanderthals. Tools and eapons were also decorated by adding blacked blades and bevel-based bone points <a href="http://anthropology.si.edu/humanorigins/ha/laferr.html">http://anthropology.si.edu/humanorigins/ha/laferr.html</a> <a href="http://www.grottes-arcy.net/index_E.html">http://www.grottes-arcy.net/index_E.html</a></td>
</tr>
<tr>
<td>28,000 to 17,000</td>
<td>Venus figures found over a vast area from western Europe to Siberia</td>
<td>A form of portable art, these were carved figurines, the most famous being the venuses found at Willendorf <a href="http://vm.kemsu.ru/en/palaeolith/plastic/willendorf.html">http://vm.kemsu.ru/en/palaeolith/plastic/willendorf.html</a></td>
</tr>
</tbody>
</table>


\textsuperscript{418} All Web references and sites listed herein were retrieved from the World Wide Web on 27/04/2009 and are included here to assist in referring the reader to both images and information
<table>
<thead>
<tr>
<th>Date</th>
<th>Artistic Period</th>
<th>Location/Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,000</td>
<td>First polychrome cave paintings</td>
<td>Early images include the 'sorcerer' from Les Trois Frères. This cave is named for</td>
<td>This cave is named for the three sons of comte Bégouen who discovered</td>
</tr>
<tr>
<td>To 13,000</td>
<td>Les Trois Frères Lascaux</td>
<td>the cave and contains the earliest depictions of animals in Lascaux located in</td>
<td>it in 1910, with the earliest depictions of animals in Lascaux</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montesquieu-Avantès, in the Ariège départment. The cave also has two finely</td>
<td>located in Montesquieu-Avantès, in the Ariège départment. The cave</td>
</tr>
<tr>
<td></td>
<td></td>
<td>modelled bison.</td>
<td>also has two finely modelled bison.</td>
</tr>
<tr>
<td>15,000</td>
<td>Cave art</td>
<td>Paintings found in Le Portel and some in Lascaux – considered to be a more</td>
<td>Paintings found in Le Portel and some in Lascaux – considered to be</td>
</tr>
<tr>
<td></td>
<td>Le Portel</td>
<td>mature form of cave art.</td>
<td>a more mature form of cave art.</td>
</tr>
<tr>
<td>12,000</td>
<td>Cave art</td>
<td>Throughout southern France Altamira &amp; Font-de-Gaume cave art was at it’s greatest</td>
<td>Throughout southern France Altamira &amp; Font-de-Gaume cave art was at</td>
</tr>
<tr>
<td></td>
<td>Altamira &amp; Font-de-Gaume</td>
<td>abundance. Both coloured and black and white images decorate the walls and ceilings</td>
<td>it’s greatest abundance. Both coloured and black and white images</td>
</tr>
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<td></td>
<td></td>
<td><a href="http://thedordogne.info/dordogne/font-de-gaume/">http://thedordogne.info/dordogne/font-de-gaume/</a></td>
<td>decorate the walls and ceilings</td>
</tr>
<tr>
<td>9,000</td>
<td>Cave art</td>
<td>The largest Neolithic settlement excavated reveals paintings, reliefs of hunting</td>
<td>The largest Neolithic settlement excavated reveals paintings, reliefs</td>
</tr>
<tr>
<td>To 7,500</td>
<td>Çatal Hüyük Central Turkey</td>
<td>scenes, animals and geometric designs. Otherwise there appears to be a dearth of</td>
<td>of hunting scenes, animals and geometric designs. Otherwise there</td>
</tr>
<tr>
<td></td>
<td></td>
<td>art in this period, possibly due to nomadic behaviour due to climate warming</td>
<td>appears to be a dearth of art in this period, possibly due to</td>
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<td></td>
<td></td>
<td><a href="http://www.freerepublic.com/focus/f-news/1663312/posts">http://www.freerepublic.com/focus/f-news/1663312/posts</a></td>
<td>nomadic behaviour due to climate warming</td>
</tr>
<tr>
<td>9,000</td>
<td>Cave art</td>
<td>The largest Neolithic settlement excavated. Paintings, reliefs of hunting scenes,</td>
<td>The largest Neolithic settlement excavated. Paintings, reliefs of</td>
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<td>To 7,500</td>
<td>Çatal Hüyük Central Turkey</td>
<td>animals and geometric designs, with otherwise a general dearth of art in this</td>
<td>hunting scenes, animals and geometric designs, with otherwise a</td>
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<td></td>
<td></td>
<td>period, again, possibly due to nomadic behaviour as a result of climate warming</td>
<td>general dearth of art in this period, again, possibly due to</td>
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<td><a href="http://www.freerepublic.com/focus/f-news/1663312/posts">http://www.freerepublic.com/focus/f-news/1663312/posts</a></td>
<td>nomadic behaviour as a result of climate warming</td>
</tr>
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<td>5,000</td>
<td>Egyptian art</td>
<td>Egyptian art endures for more than 3,000 years stylistically unchanged and dealing</td>
<td>Egyptian art endures for more than 3,000 years stylistically</td>
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<tr>
<td></td>
<td></td>
<td>with religion, funeral matters and scenes of everyday life.</td>
<td>unchanged and dealing with religion, funeral matters and scenes of</td>
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<tr>
<td>15th –</td>
<td>Renaissance</td>
<td>An intellectual, spiritual and artistic revival sweeps over Europe. Artists used</td>
<td>An intellectual, spiritual and artistic revival sweeps over Europe.</td>
</tr>
<tr>
<td>century</td>
<td></td>
<td>perspective and realism in skilful paintings</td>
<td>Artists used perspective and realism in skilful paintings</td>
</tr>
<tr>
<td>18th century to now</td>
<td>Modern art</td>
<td>The whole of Western and Eastern art may be squeezed into the last 400 years and</td>
<td>The whole of Western and Eastern art may be squeezed into the last</td>
</tr>
<tr>
<td></td>
<td></td>
<td>artistic expression has changed markedly due to technological developments</td>
<td>400 years and artistic expression has changed markedly due to</td>
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<td></td>
<td></td>
<td></td>
<td>technological developments</td>
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Appendix C ii - Measuring Creativity and Artistic Ability

Until the mid nineteenth century, those who examined the limits of human potential were philosophers not psychologists. However, with increased scientific knowledge questions of human intelligence and creativity became the province of measurement, investigation and argument, with such developments as the Binet Intelligence Test leading to classroom interventions and changed teacher – pupil transactions. Everything became subject to measurement (as indicated by our current education system) and ‘genius’ was seen as the province of the remarkable and few. Only the end-product was (and still is) attended to as ‘evidence’ of ability, rather than perceiving the accumulation of elements and conditions towards ability, potential and creativity or attending to the quality, stimulation and supportive environment to engage and promote the individual.

Since the nineteen twenties psychology has been dominated by Freudian psychoanalysis, where personality was examined in terms of the unconscious e.g. surrealism, dreams, regression. In 1943 Maslow’s ‘Theory of Human Motivation’ proposed a hierarchy of needs, of which ‘self-actualisation’ (into which creativity was placed) was the pinnacle to be reached, after all lower needs were satisfied. Then during the fifties behaviourists psychology dominated, led by Skinner, who recognised creativity as being ‘mentally balanced’ but thought it to be a by-product of high intelligence. In the 1960s Dr Benjamin Spock gave parenting advice to develop well-rounded creative children with flexible rather than authoritarian parenting. Then Guilford then began an interest in creativity with the post-war economic boom, with the aim of developing more creative workplaces and to try to understand such challenged concepts as ‘freedom’ and ‘social development’ as well as trying to find creative thinkers and promising future scientists. However the researchers again found it difficult to explain creativity in behaviourist terms, so they tried to measure it with the Stanford-Binet intelligence tests, where marks are given for convergent thinking, whereas creativity is divergent thinking. Such paper-and-pencil tests (which we still use for exams and measures of intelligence today) were found to have too many variables and room for error, making them difficult to assess and unreliable to report, were unable to measure either the creativity of making or the subjectivity of assessing art.

Studies into creativity from the 1970s to 80s then compiled diverse creative profiles (e.g. Berckley University, Mackinnon’s research, 1978; Handbook of Creativity, 2006).
Cambridge University New York, 1987\textsuperscript{422}), while Carl Rodgers took a humanistic-
phenomenological approach to psychology, asserting that we all exist in changing world
of experience, to which they react, as it is experienced or perceived. It was during this
time, (although psychiatrists recognised that creative people were no more likely to
have mental illness than the general population, and that creativity was more advanced
than primitive thought) that this socio-cultural scientific approach still tended to
promote stereotypes of creative genius, such as: ‘genius’ artists were those with a high
IQ, Bohemian appearance, eccentric behaviour and neurotic outlook etc., which in a
‘Hippy’ era with lots of drugs and promotion of individuality, difference and
movements for change, were traits that were often actively pursued, although more
often as marketing ploys, as exemplified by Warhol from the 1960’s to the 1980’s.

In the 1980s Guilford and Torrance has replaced behaviourism with the study of traits
and personalities and developed more tests from these World War Two prototypes, to
identify creative potential. However scores didn’t reflect real life outcomes. For
example, they were surprised to find that the stereotype of the innate ‘genius’ was over-
rated and that even high intelligence was no guarantee of creativity. They also found
that divergent thinking was not the same as creativity, as it seemed to require a more
complex mix of convergent and divergent thinking, which switched at different points
in the creative process. They also found that creativity could emerge, given inspiration
and a lot of hard work, from ordinary, everyday mental processes. Ultimately it was
found that the ability to recognise good problems and the ability to ask the right
questions seemed to be among the most compelling characteristics of a ‘creative’ mind.

By the 1990s, when everything was being measured, ‘experts’ were rating everything,
including paintings, computers and poetry, to assess them objectively\textsuperscript{423}. There also
emerged the notion of stages of creativity\textsuperscript{424}, which included: preparation, incubation,
insight, verification (including evaluation and elaboration) but it was found that these
stages were actually too linear rather than being cyclical. Then from the 1990s to 2000,
with an economic boom period, research attention went elsewhere, except for the
ground-breaking work of Csikszentmihalyi, who not only introduced the notion of ‘flow’
but also reinforced the proposition that, although there were possible genetic influences
in some cases of creativity, that ‘genius’ was actually the result of hard work and
personality traits that caused the intrinsic motivation to choose a ‘creative’ lifestyle and
the be able to sustain the dedication and commitment required to do the work and
achieve effortless mastery. Until the Millennium, and particularly since 9/11, the Gulf

\begin{flushright}
\textsuperscript{422} Glover, J. (Ed.) Handbook of Creativity Plenum Press 1989
\textsuperscript{423} Sawyer, K. R. Explaining Creativity Oxford University Press, N.Y. 2006 pp. 3-5
\textsuperscript{424} Croce-Collingwood Theory as in Sawyer “Journal of Aesthetics and Art Criticism”, 58(2), pp. 149-161, 2000
\end{flushright}
War and Climate change, there was a dearth of research material which now appears to have suddenly and dramatically changed, with a renewed focus on the ‘building blocks’ of creativity and a call for our urgent attention and need to develop creativity in our population. Given the pace of change, an uncertain environmental future and overwhelming technological dependence, some anxiously contend that our static, outdated education systems and rapidly developing technologies are actually changing our brains, our biological and cultural evolution and our future
## Appendix C iii – Plate Numbers

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<td>14 Know Thyself</td>
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<td></td>
<td>15 Ratio, Cognatio, Aestimatio And Memoria (Reason, Thought, Judgement And Memory)</td>
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<td>16 Intricate Orbits And Scientific Measurements</td>
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<td>19 Demonstrating colour mixing and face painting at NAALA Refuge Program Newcastle</td>
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**Pygmalion Image**

Artist: *Gerome, Jean Leon* (1824-1904)


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