

6

ARTISTIC COGNITION AND CREATIVITY

Graeme Sullivan

Introduction

For as long as I can remember I have ‘pictured’ the problems solved, the concepts understood, or the histories read, because for me ‘to see is to think.’ Information received, situations encountered, or systems experienced, are always being felt as much as framed because there is always another way to look at something. Reflecting on these curiosities and capacities raises important questions about what we do as individuals in the various roles we take on as researchers, academics, teachers, and artists. What guides these motives and actions are seamless connections that link these roles and responsibilities, perceptions and representations. What glues them together is an unwavering belief in the pervasive power of creative and critical insight. Yet there is a general misunderstanding about what it means to ‘see’ as a way of thinking, acting and making, and how artistic cognition can give rise to powerful forms of human understanding. After all, the thoughtful practice of making art and the thought-provoking process of encountering art makes an impact on individuals and communities through the insights offered and perspectives opened up. This intensive activity is imaginative, sometimes troubling, but it is hard to ignore because it adds to the store of human understanding in profound ways.

In this chapter I align a theory of artistic cognition within the context of creativity and suggest that research into these constructs remains limited within the existing conceptual boundaries of disciplines. The argument presented is that it is within a notion of art practice as research that the full potential of cognition and creativity as informing human capacities can be realized. Artistic cognition can be described as seeing and thinking that is partially shaped by the cultural contexts that inform ‘what’ it is we see, and partially governed by the biological processes that connect ‘how’ we see. Collectively, these dynamic interactions activate cognitive processes that are distributed throughout the various media, languages, and settings that shape the way images are made and what they might mean. Further, ‘doing art’ in a research setting requires the use of the imagination and intellect to respond to the incessant need to know,

and to do so in a way that meets the rigorous demands of inquiry undertaken within scholarly communities. Within this academic environment conventional research in general proceeds from the known to the unknown, yet it is important to acknowledge the benefit of inquiry that moves in the other direction – from the unknown to the known – for fresh perspectives as much as prior knowledge are determinants in creating and constructing new knowledge. This is the trajectory of inquiry that characterizes practice-based research (Sullivan 2005; Mäkelä and Routarinne 2006). Henk Slager described it this way:

Artistic research seems to continuously thwart academically defined disciplines. In fact, art knows the hermeneutic questions of the humanities; art is engaged in an empirically scientific method; and art is aware of the commitment and social involvement of the social sciences. It seems, therefore, that the most intrinsic characteristic of artistic research is based on the continuous transgression of boundaries in order to generate novel, reflexive zones.

(Slager 2009a: 51)

Purpose of the chapter

In exploring artistic cognition and creativity, two related themes are described in this chapter that provide the argument and rationale for proposing a theoretical alignment of the two. The initial section, *The Cognitive Turn to the Visual*, suggests that our understanding of cognition remains limited by the continued tendency to study how we think and act within existing paradigms of theory and practice. The second section, *Creativity in Context*, profiles how different conceptions of creativity have framed our knowledge of this critically important human and cultural construct. In drawing the cognitive and creativity arguments together, a theory of visual cognition is presented. I describe visual cognition this way:

Visual cognition is both a biological and cultural construct where mindful practices are structured, framed and embodied. These cognitive practices take place within, across, between, and around the artists, artwork, viewer and setting. Visual cognition creates ideas and insights that connect ‘within’ and ‘across’ individual dispositions and experiences, and produces cultural capital that questions existing knowledge systems and structures ‘between’ and ‘around’ discipline boundaries and cultural contexts.

The evidence to support this explanatory thesis is drawn from the way artist-researchers make use of private processes and public practices that exemplify what visual cognition and creativity might achieve when seen as integrated modalities within the practices of research.

The cognitive turn to the visual

The theme of cognition forms the core of this chapter, while the theme of creativity provides the context. The purpose of this section is to bring several perspectives into focus and to arrive at an explanation of artistic cognition that may be useful in considering how art practice yields new knowledge within the context of practice-led research. The cognitive arguments draw on several sources that describe the current theoretical issues being debated concerning cognition and the significance of visual processes in how we come to know things. Early arguments that saw a need to consider perception and conception as interrelated mindful processes are briefly surveyed, along with the initial enthusiasm for cognitive symbolization perspectives (Arnheim 1969; Gardner 1985). Theorists that identify the significance of the cultural basis of cognition bring to the debate important long-term assumptions about the interrelated evolution of cognition and culture (Donald 1991; Dissanayake 1992; Solso 2003), while recent trends towards linking artistic and scientific conceptions of the mind (Stafford 2007; Edwards 2008) are challenging many ideas about discipline-specific traditions of the function and meaning of visual images. Finally, an account is given of recent developments in our understanding of visualization and the role played by the embodied mind and the brain, and the rise of provocative discussions about universal modes of visualizing that engages feeling states, the unconscious, and in some instances, broader philosophical areas such as 'neuroaesthetics' (Zeki 1999; 2009).

Perceptual forms and cognitive structures

Rudolf Arnheim's (1969) transdisciplinary argument that thinking and seeing were inextricably linked as mindful processes was a radical jolt that challenged the dominant view at the time that *thoughts* were the essence of cognition, and 'feelings' were the province of affective, emotional states. Arnheim's attempt to figure out how we make meaning from what we saw was, of course, a longstanding quest that tracked back to Plato's claims about 'immaculate perception' and the shady reputation of perception as a source of truth. But Arnheim was part of a growing cognitive coalition who rejected the idea that perception was mindless sensation. Although it may be immediate and intense, it was argued that perception did not merely provide data picked up by the senses; it also played an active role in concept formation.

In taking cognition beyond the limits of binary thinking that had kept it tied to experimental needs for operationalizing concepts suitable for clinical intervention, deeper questions were asked of cognition. Consensus suggested that cognition involved thinking and acting whereby a range of mental processes were used to make sense of knowledge and how best to use it to make decisions about our interactions with the world around us. This meant that not only was the challenge to understand one's immediate world of experience, but also the necessity to be able to infer from past knowledge and to anticipate what to do next. In other words, the kind of thinking processes we use every day involved more than rationality and reasoning and invoked messy constructs such as memory, intuition and feeling, and these capacities were found in abundance in the arts.

Explanations about how human cognition undertook this task of ‘coming to know’ varied at the time Arnheim and others were opening up the debate. One popular conception was that information processing was best explained by the distinctively human proclivity to understand that things could be represented by symbols. Arnheim’s Harvard colleagues, Nelson Goodman (1978) and Howard Gardner (1973), for instance, took the argument in a structuralist direction and described the cognitive processes used in coming to know things to be a condition of symbolic functioning. Other cognitivists used metaphors such as the computer and modularity to illustrate the workings of the mind (Sternberg 1990), but most agreed that the separation of human knowing into dichotomies of cognition and affect was unnecessarily reductive. Gardner found his metaphor and means in arts practices where thoughts and feelings were inextricably linked and given form in images and objects. Gardner’s cognitive model identified three systems – making, feeling and perceiving – and the process of symbolic functioning as the process that guides understanding through these thinking and doing processes. The symbolic processing approach gained popular support, especially among arts educators, because it presented a notion that ‘art knowing’ was a blend of intuitive and intellectual functioning that took place within a cognitive framework. At its most basic, the symbol systems approach proposed by Gardner placed the cognitive structures in the mind, which did its business in the head, and involved symbolic functioning whereby forms and media were encoded and decoded for meaning.

In his later critique of the symbolic processing model of cognition, Efland (2002) raised several concerns. First, he questioned the computer analogy, explaining that the reduction of information to modular bits and to operations carried out on symbols meant that the necessary mix between the ‘hardware’ of the mind and the ‘software’ of content was difficult to reconcile. A second concern for Efland was the apparent context free aspect of symbolic functioning. He argued that Gardner created an artificial barrier between the individual and the environment whereby actions in the real world were transformed into symbolic representations that disembodied them from the individual and cultural context. But it was less a consequence of conceptual tinkering within the discipline structures of arts and education that ultimately rendered Gardner’s theory of symbolic functioning moot. Rather it was partly a result of his search for a more comprehensive, systems approach to human intelligences that could account for the variability of biological and culturally valued mental dispositions – which he found in his theory of Multiple Intelligences (Gardner 1983).

The other threat to the idea that the mind mostly serves a symbol encoding and decoding function is more recent and comes from neurobiology where many of the capacities that early cognitive scientists felt unable to study scientifically, such as felt emotions, subjective experiences, and the like, are now understood to be very much involved in human knowing. But before looking at that area it is necessary to examine the other expanding canvas of cognition that has unfurled in recent decades that highlights the powerful cultural influences on artistic cognition.

Cultural cues and thinking in practice

Studying individual ways of thinking and culturally based forms of knowing has long been seen to be two quite different tasks with each based on different theories and

methodologies. On the one hand, the psychological study of individuals is undertaken within the methodological controls of clinical settings in search of universal explanations of cognitive thought processes. Field-based researchers, on the other hand, are interested in human cultures and social processes and investigate real-world contexts to understand how culture impacts on cognition. In recent decades these paradigmatic positions are becoming tentatively integrated under the broad rubric of cognition and culture (Schleifer *et al.* 1992; Cerulo 2002; Ross 2004).

Researchers interested in diverse modes of knowing that are evident within and across cultural divides not only consider how immediate situational factors might impact on thoughts and actions, but also the influence of broader social contexts. The argument is that cultural experience plays an important role in helping individuals make sense of themselves as thinking, feeling, beings who live in complex socio-cultural settings and this enculturation process allows for shared values and beliefs (Chapter 5). There are twin elements to this process. The first is the socially constructed nature of theories of practice that describe the relationships among individuals, others, and the communities in which they live. Second, there are the systems of knowledge upon which communities and cultures are built. These areas of focus are now seen to be in a more dynamic relationship whereby 'culture is an emerging phenomenon evolving out of shared cognitions that themselves arise out of individual interactions with both social and physical environments' (Ross 2004: 8). The pervasive impact of cultural processes and practices on the way we think and act individually and collectively has long been of interest to artists and part of the challenge is to consider how artist-researchers might participate in these inquiries in ways that open up new conceptions that go beyond the limits of discipline-based views and practices.

The content of culture is negotiated much in the way of theories of social practice (Bourdieu 1977; Giddens 1979) whereby a cognitive orientation acknowledges the interactive nature of human agency and the 'relational interdependency of agent and world, activity, meaning, cognition, learning, and knowing' (Lave and Wenger 1991: 50). As Lave and Wenger also note, 'learning, thinking, and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world' (1991: 51). The focus on cognitive processes that have individual and communal relevance has been of more interest to culture-based researchers who are critical of past perspectives than essentialized cultures. The need was to look more closely at similarities and differences among individuals and groups within cultural contexts. One intriguing development has been the need to fashion new forms of inquiry that are critically reflexive and more appropriate in studying cultural and cognitive practices as processes that exist when individuals make things.

The interest in the research setting as an interactive site was seen in the 'visual turn' evident in anthropology and some areas of sociology with a new methodological interest in visual research methods (Pink 2001; 2006; Stanczak 2007). Although visual forms of documentation in a range of media have long been part of the armoury of field researchers, it is only relatively recently that the assumed objectivity of these forms has been challenged. The quip that 'cameras don't take photographs, people do', has taken a long time to filter into the methodological consciousness of some disciplines. Furthermore, it is not so much a visual account of phenomena that is revealing, but the manner by which individuals and cultures make sense of their reality through the

production and understanding of visual forms of representation and communication. Hence, there is tentative acceptance emerging in these areas of social science research that visual data cannot only be collected but also ‘produced’ that has the capacity to yield important information (Rose 2007).

When the concepts, mental structures, schema, and forms of representation that had at one time mostly been of interest as universal cognitive traits were re-positioned as constituents of cultural practice, new tensions arose around explanatory models of human cognitive variability. The most dominant metaphor, the computational model, has proved to be more robust in some modalities than others, such as Noam Chomsky’s hard-wired theory of language development. Less sustainable has been the model of the mind as merely a symbol encoding and decoding structure because there is no stable filing cabinet of pre-set codes we draw on and apply in new learning situations – the cognitive scripts and schemas that frame the way we see are ever-changing and help us interpret a situation, rather than read it, or decode it. Even the digital revolution and the networking features of internet space have been unable to support the common analogy that the mind is the software and the brain is the hardware.

The other competing image of cognitive processing is the connectionist view of parallel processing (Bechtel and Abrahamson 1991) that is gaining momentum. Here the argument is that the architecture of the mind consists of an enormous array of parallel neural networks that enable learning to take place as process of ‘connecting.’ In this model, information happens ‘in’ the process of making connections, rather than the neural network merely being a delivery system that loads up knowledge and shunts inputs and outputs back and forth as the individual interacts with the world. In this sense, the meaning is in the making and content connections can come from anywhere within the labyrinth of the mind. Based on an associationist model, the neural architecture is seen to be a system of interconnected hubs and units that can be activated simultaneously in many areas of the brain as information is accessed (Linden 2007). This is a parallel, rather than a serial process, for connectionism is not governed by any executive function or central processor. Rather cognition activates links strengthened by prior knowledge, but new learning is also open to intuitive and opportunistic connections (Hoffman 1998).

Arts practitioners will have little difficulty appreciating the explanatory power of the connectionist view. There is something attractive about the notion that knowledge creation and construction is partially a process of integrating prior experience with the possibilities of new connections within and around the ideas, media, and settings usually encountered in the studio, classroom, street or the Internet, or wherever art making takes place. One example is the argument that this distributed view of art knowing means that the binary-bound idea that art is a ‘process’ or ‘product’ needs to be abandoned. Conceiving art inquiry as a practice that is distributed throughout the various media, languages, situations, and cultural texts offers the possibility of a more convincing cognitive account.

The visual brain and embodied minds

The psychologically grounded description of cognition and the socio-cultural situated view have both been shaken up by the emerging neuropsychological insights into the

pervasive role visualization plays in our cognitive constructions. Although David Linden describes the design of the brain as ‘inefficient, inelegant, and unfathomable,’ he acknowledges that it ‘works’ (2007: 6). His point is that the evolution of the brain has given us an entity that is part ‘kludge’ (he describes this as a poorly assembled bunch of ill-fitting parts), and part strategic design. What is clear from recent research in neuroscience is that the assumed linear link between what is perceived and what is known is far too simplistic an equation. A common theme is that while our understanding of brain functioning initially emerged from a perceptual paradigm that was grounded in the psychology of stimulus and response, the way we actually make sense of the world we see is far more non-linear. However, the use of new methods in brain imaging using functional brain scanners are giving tantalizing accounts of what can be inferred about how the mind works by observing what the brain does. By tracking changes of blood flow throughout the neural network of the brain as an individual undergoes tasks under the watchful eye of brain scanning it is conceivable to be able to map patterns of thinking as impulses activate various areas of the brain (Frith 2007; Stafford 2007; Zeki 2009).

The active mind that is inferred from the kinetics of the brain ‘lighting up’ give some sense of the transformations that take place in response to sensory input. Perception is therefore far from passive – a lot happens after light patterns hit the retina and we proceed to make sense of it. Sensory perception begins by taking in incomplete information from our surroundings and these visual bits and pieces are tracked to an array of places in the brain that process it so that conjectures are able to be made about the possible meanings of what we see (Hoffman 1998; Solso 2003; Frith 2007). The French impressionists and post-impressionists more or less did the same thing and showed the pathways of visual thought and action by sculpting forms from patterns of light and movement and thereby leaving much of the detail to the imagination. What we see is not what flows in through the eyes, but rather how the brain makes sense of the electrical impulses activated by what is sampled from the environment. Ann Barry describes it this way:

What we ‘see,’ then, is a combination of the processing of external stimulus by the visual system, of the simultaneous firing of particular neurons in patterns, which make us conscious of what we see, of learning appropriate perceptual skills at the right time, and of prior learning, which is brought to bear on present perception. Perception is a process, which utilizes not only the retinal image, but also the whole of a person’s being as well.

(Barry 1997: 65)

The balance between what is hard-wired into our brains and what is adapted from our encounters with the environment has moved from broad debates about nature versus nurture, to more focused accounts of human capacities previously thought to be the province of the heart rather than the head. For instance, Semir Zeki’s (2009) text on the brain and art, is sub-titled *Love, Creativity and the Quest for Human Happiness*. Building on his decades of studies in neuroscience and the psychology of art, Zeki is adamant that the most profound of human abstract experiences are matters of the mind and can be investigated and understood using brain imaging technologies. He

asserts the main function of the brain, and for that matter, art is to acquire knowledge and it takes place through concept formation and some concepts are ‘inherited’ and some ‘acquired’. Zeki distinguishes these nature-nurture constructs this way:

The inherited concepts organize the signals coming into the brain so as to instil meaning into them and thus make sense of them. The acquired concepts are generated throughout life by the brain, and make it significantly independent of the continual change in the information reaching the brain; they make it easier for us to perceive and recognize and thus obtain knowledge of things and situations.

(Zeki 2009: 21)

For Zeki, creativity emanates from a sense of dissatisfaction and ambiguity that is resolved by making aesthetic responses and creative products, which open up multiple ways of satisfying this sense of disquiet. Furthermore, there is a neurobiological basis to how aesthetic concepts are perceived and processed in this knowledge-seeking and knowledge-creating task because it is not possible to separate seeing from understanding, perception from conception. Zeki defines his approach as ‘laying the foundations of a neurology of aesthetics, or *neuro-aesthetics*, and thus for an understanding of the biological basis of aesthetic experience’ (Zeki 1999: 2, emphasis in the original).

For Ann Barry it is not so much the neural networks that hold the conceptual clues for melding of artistic and scientific interests, but the way research suggests a radical change in our understanding of the role of emotions in visual processing. It seems that the non-linear relationship between sensory experience of the world and the neural networks puts in place a sequence where emotional responses precede more rational reasoning. In other words, ‘we begin to respond emotionally to situations *before* we think them through’ (Barry 1997: 18, emphasis in the original). For those in the arts, this crucial observation confirms what many have intuitively known and gives new emphasis to the significance of feeling states in cognition. The pre-emptive role of emotions in cognitive functioning challenges the common belief that we think logically in response to external situations as a basis upon which to act, and ‘then’ we think about how we feel about it. Stephen Rose explains it this way:

Brains are not primarily cognitive devices designed to solve chess problems, but evolved organs adapted to enhance the survival chances of the organisms they inhabit. Their primary role is to respond to the challenges the environment presents by providing the cellular apparatus enabling the brain’s owner to assess current situations, compare them with past experience, and generate the appropriate *emotions and hence actions*.

(Rose 2008: 8, emphasis added)

There are two critically important notions that emerge from these explanations of the visualization process. The first is the re-assessment of the role that emotions and feelings play in coming to know our world, not as some lower level form of precognitive processing, but as leading elements in the cycle of understanding. With the continual interplay of sensory perception, individual consciousness, prior experience, and rational

reasoning, what we come to know will be greatly influenced by memory and emotions. This is a far cry from the image of the mind as first and foremost the source and site of rationality. A second important outcome of neurobiological studies is the ultimate rejection of the mind-body duality, as the embodied nature of feeling, acting and thinking becomes better understood. If the means of processing information is through feeling states, mental imagery, and diverse forms of representation, then this implies a new significance for the imagination and metaphor as agencies of visual cognition (Lakoff and Johnson 1980; Damasio 1999).

These two conditions give new importance to the construct of embodied cognition. Katherine Hales explains that although embodied experiences 'are culturally constructed, they are not entirely so, for they emerge from the complex interactions between conscious mind and the physiological structures that have emerged from millennia of biological evolution' (2004: 229). She adds, 'the flexibility of the human neural system enables new synaptic connections to form in response to embodied interactions' (2004: 231). Examples of changes in the extent of embodied experiences is very much part of her argument about how we became 'post human' (Hales 1999) and can be seen, for instance, in digital environments that are inhabited as embodied spaces on our behalf by avatars and cyborgs. The premise is that we live in a dynamic, interconnected, relational world whereby the element of 'self' that was more or less denied by the cognitive scientists, takes centre stage.

Summary: beyond the disciplinary limits of cognition

Previous attempts to isolate artistic cognition, as a discrete, observable human capacity did not yield the insights expected. Visual knowing proved resistant to efforts to explain it within the causal regimes of clinical study and experimental design where language and behaviour were the units of analysis. Although recent efforts at tracking the biological basis of visualization within neuroscience are yielding more probable explanations of the inextricable relationships between the mental and physical processes of how we make meaning with images, what we are coming to know remains dwarfed by what we don't. The identification of neurobiological determinants of visual cognition may, in the future, explain more of the variance in how we process what we see. However, as argued in this chapter, there is little doubt that as a human condition, visual knowing is also influenced by broader, informing contexts as we creatively negotiate our way in the world.

Creativity in context

Creativity is not only a habit of mind but also a form of socio-cultural practice that helps us understand issues of our time. Two themes are explored in this section that chart conceptions of creativity. The dominant direction has been the psychological study of creativity, which has, in part, been revived by investigations in neuroscience and constructs such as intuition and emotional states. Once the socially constructed nature of creativity was accepted, more systemic models evolved that loosened the disciplinary ownership that had variously been claimed by the arts and the sciences. Parallel to these socially mediated approaches are culturally specific insights that emerge from

the shifting social diaspora that led to new ways of theorizing culture (Brazier and Manner 2003). These themes are taken up as creativity is positioned as the contextual factor that mediates between the creative insights that emerge from visual cognitive processing, and the critical processes that occur when these insights are interpreted within discipline frameworks and other socio-cultural parameters.

Creativity as a bio-psychological construct

A common approach in coming to understanding the conceptual basis of creativity research was to construct binary or categorical concepts that characterize its distinguishing features, methods and uses. This in itself was a telling strategy for it reflected the predominance of a scientific mindset in analysing and synthesizing creativity as an individual and social construct. For instance, in his review of creativity research, Richard Mayer frames his analysis around several questions and asks whether creativity is a 'property of people, products, or processes? ... is creativity a personal or social phenomenon? ... common or rare? ... domain-general or domain-specific? ... quantitative or qualitative?' (1999: 450–1). In answering these questions Mayer identified the dominant psychological perspective and the tendency to see creative behaviour as a valued human capacity that existed in varying degrees. Even for those interested in broader analyses of creativity that moved beyond the focus on individual capacities to broader social and cultural contexts, the convenience of dualism remained. For instance, Todd Lubart's review of the study of creativity across cultures cut neatly down a Western and Eastern divide.

The analysis of creativity in diverse cultures shows that creativity is context dependent. Culture is involved in defining the nature of creativity and the creative process. The Western definition of creativity as a product-oriented, originality-based phenomenon can be compared with the Eastern view of creativity as a phenomenon expressing an inner truth in a new way or of self-growth.

(Lubart 1999: 347)

A curious feature of the psychological and psychometric approach to creativity research was the way that reductive or convergent methods were used to investigate a capacity prized for its divergence (Edwards 2008). The tendency to reduce complex artistic practices to a performance that was assessed to be creative because of the fluidity, frequency, and flexibility of ideas and how rare or original they might be (Lubart 1999), offered a limited perspective at best. Similarly, the assumption that creativity was a problem-finding and problem-solving human drive that was brought into sharp relief by a reflective practitioner (Schön 1991) and can be rendered in equally sharp profile by a cognitive psychologist, underestimated the cogency of creativity.

Perhaps it is in investigations that are less constrained by discipline conventions where a more profound understanding of the human attributes and capacities surrounding the psychology of creativity might be found. Not only are assumed definitions rendered moot, but also the methodologies necessary to match the complexity of the construct need to be re-invented. Some of these conditions are being explored in emerging fields

such as neuroscience and visualization. For instance, although we know that the brain is limited in the periods when growth and development is sparked by experiences, such as the capacity for enhanced visual and aural knowledge in the early years of life, we also know that the brain is amazingly adaptable. Even if certain potentials are lost if they are not exercised, we know from brain research that some functional capacities move from one hemispherical region to another if an area is impaired. Furthermore, this can occur at all ages. It may be that the divergence and connectedness so typical of creativity is a human capacity that is not temporally limited but exceedingly resilient if actively utilized in non-habitual ways.

For Ann Barry it is 'in the visual artist we see the perceptual logic of interconnectedness and gestalt formation kept open and alive to new influence' (1997: 64). Artists combine specialist knowledge in a medium or field with a broad repertoire of approaches to thinking and doing that is characterized by cognitive flexibility and neural plasticity. A study of aging artists wonderfully titled, *Above Ground*,¹ shows clearly that artists never give up creating – they never really 'retire.' Rather, as Robert Butler explains in the preface of the report, this 'sheds new light by the unique solutions artists embrace in living – for retirement (they don't), for social networking, for communication ... and as productive members of society, working in their studios on a daily basis' (Jeffri 2007: n.p.).

Although the creative practice of artists of all ages continues to reveal the cognitive richness of sustained critical engagement, it is the study of images themselves as they are created and perceived visually, figuratively, and mentally, that is moving debate along after being bogged down by discipline intransigence for several decades. It may be that other less constrained views about creative processes, practices, and products, can be revealed in looking with a new perspective. One intriguing example identified by Ann Barry (1997) is the application of aspects of non-linear systems to the study of perceptual processes at the heart of creativity. A key feature of complex dynamical systems is that they reveal how constraints can trigger changes and self-organizing behaviours that create connectionist networks that appear to exist at the cellular level and all the way up to observable human activity. Conceiving of consciousness in this way is, according to Barry, understandably controversial. Especially enticing, however, is the idea that experience may provoke cellular change that creates turbulent neural activity and opens up new possibilities for awareness before settling into a stable, self-organizing pattern that is given form in a creative product. Furthermore, this description captures new ways of considering the thinking practices associated with creativity, such as intuition, imagination, memory and subjectivity.

Creativity as a socio-cultural construct

The realization that creativity was more than a series of discreet human capacities, a greater range of methods of inquiry was used to look more closely at the socio-cultural contexts that influenced creativity. For some, this involved examining the outcomes of creative behaviour by investigating what creative people did. The argument was that there was merit in looking at the profiles of people seen to be creative, to get a better sense of how they work within particular settings, contexts and times. Constructing case studies of artists, writers, composers and scientists has a long history and continues

with more comprehensive use being made of qualitative methods such as biographical accounts (Smith and Watson 2002; Knowles and Coles 2008), auto/ethnography (Reed-Danahay 1997; Rolling 2004) and A/r/tography (Springgay *et al.* 2008).

Others looked at the environmental impact on creativity and identified a range of social cultural, political and personal factors that influenced creativity (Lubart 1999). Mihaly Csikszentmihalyi (1996) was convinced that creativity was not something that was contained within the head and heart of an individual, but was an outcome that was given meaning by what others had to say about it. Although psychological investigations offered valuable insight into human creative proclivities, whether something was considered to be creative or not was ultimately determined by the impact it made across the public domain (Feldman *et al.* 1994). In some cases judgment was arbitrated through constituencies such as the art world and associated peer processes. At other times, taking art 'to the streets' is a conscious community act where the political purpose overrode most other concerns.

The understanding that creativity is a highly valued human capacity that has a personal and public face shapes the socio-cultural research tradition surrounding creativity. An example of how creativity is framed as a set of relationships that encircle individual, situational and global forms is seen in the conceptual strategies used by Robert Storr in his selection of artworks for the 2007 Venice Biennale.² In his essay he said that the characteristics of contemporary art:

adumbrate a set of coordinates that may be extended far beyond the confines of this exhibition but will reliably gauge such qualities wherever they are found. Instead of naming tendencies or establishing stylistic lineages and hierarchies, this exhibition proposes such a matrix as a useful but provisional measure of contemporary art. And, instead of reaching backward to align its content with historical precedent, it suggests that the art conjugated to the present plural is sufficient for getting and maintaining our bearings.

(Storr 2007: n.p.)

Storr asserted that past practices that categorized art and artists according to historical styles, groups, hierarchies, or ideologies was no longer viable. The tendency to divide art into binary genres of old-new, objects-ideas, forms-contexts, or insider-outsider, had limited utility as a way to capture what artists do and how we might benefit. In effect, Storr theorized how creativity in contemporary art could be explained as an individual, cultural and community practice.

The 'set of coordinates' Storr used to select work for the 2007 Biennale dealt with form and content that displayed a variety of visual qualities, expressed different ways of making meaning, represented complex thinking capacities, reflected personal and public interests, and displayed the need to communicate with others. He suggested that these characteristics of contemporary art were categories or scales that could be organized within matrices or conceptual frameworks. For instance, he described the art of the Cuban-American artist Felix Gonzalez-Torres, in terms of 'contextual aptness' and 'economy of means,' which could be seen as two different ways artists communicate meaning through their art. The former required an understanding of surrounding contexts to appreciate the full impact of what was being presented, whereas the latter



Figure 6.1 Frank Shifreen. Mask: Portrait of Chief Pontiac (2008). Steel and aluminium. Exhibited in Souped-up Pontiac exhibition, Pontiac, Michigan, May 10–June 7, 2008.

adopted the position that the meaning of an artwork was contained fully within the form itself. Storr's reference to the necessary balance between the private realities of the artist and public participation helped address the educational consequences of art because creative and critical acts involved audiences as opportunities for learning were opened up. Here, his description of the visual qualities of Gonzalez-Torres' art reflecting 'intellectual courage' and 'toughness wrapped in gentleness' allude to the cognitive dissonance offered by artists who encourage us to see things differently.

Another example not connected to the Venice Biennale but dealing with similar conceptual and contextual issues may be found in the art of Frank Shifreen. Frank has been an artist in New York for a long time, working along the fringes of the art world in those 'in-between' community spaces where artists' collectives thrive, and where the art is passionate, prolific and public. Frank is also a doctoral student. His research



Figure 6.2 Frank Shifreen and Barnaby Ruhe. *Souped-Up Pontiac* Pontiac, Michigan, May 10–June 7, 2008. Painting event, May 10. Photograph by Gila Paris.

interests involve theorizing notions of non-institutional art through practice. He is continually looking to involve artists in projects that have community interest and invest in social and cultural capital. Often personal, and always political, the art he creates and curates is of the moment. Many projects are often site-based community events and Frank has been initiating these projects since the early 1970s.

For Frank, the intense personal focus of his art is best understood by his commitment to public interests. The art he created for the *Souped-Up Pontiac* project is a critique that takes place between the ‘coordinates’ that are of significance: between notions of ‘us and them,’ and beyond the centre and the periphery. The ‘economy of means’ depicted in the bruised metal mask of Chief Pontiac is part mythical distortion and part fender-bender. The distinctions that Storr identifies and Shifreen creates are important because what art ‘means’ and how it is expressed and communicated influences our understanding of the roles art plays in human development, community belonging, and cultural identity.

Frank Shifreen: The show – which seems ever more prescient with the economic crisis, was about lasting values in a world where a name on a car or city indicates a genesis or patrimony. Yet nothing could be further than the truth – if so we have lost our way. I was looking for the soul beyond the material as if Chief Pontiac could come through the steel. Pontiac is an empty (really empty) city. I knew nothing of Chief Pontiac when I started. The face is a monster as when humans live through technology and become cyborgs.

(Shifreen 2009)

The 'contextual aptness,' 'intellectual courage' and 'toughness wrapped in gentleness' Storr identifies as conceptual cues is evident in the performance painting event involving Frank and his colleague, Barnaby Ruhe, and takes its references from the situated meanings invoked by the local indigenous community surrounding Pontiac, Michigan. As participants with a history of experience and awareness from previous collaborations with indigenous communities, both Shifreen and Ruhe embody their creative spirit and the power of conversation as a ritual encounter that strikes against uncomfortable realities. This aligns with Storr's conceptual structures for they serve not only a means for making decisions in selecting and presenting artwork, but also an approach for organizing and educating the public about contemporary art and culture that is thoughtful, provocative, and inclusive. What remains open is space between these conceptual frames to encourage other interpretive practices to take shape. The central premise to emerge is that creativity is both a personal process and a public practice that is a primary source for creating and critiquing knowledge structures and values that has the capacity to influence and change individuals and communities.

I invited Barnaby Ruhe to participate in the Pontiac show. He is very serious as a shaman practitioner and as an artist. He was one of the founders of an artist organized exhibition called the Whitney Counterweight, which included artists who felt the Whitney Biennial survey was narrow and not representative of current art practice. We have worked together over the years. He paints portraits that are quick studies in serial sittings he calls portrait marathons. Barnaby and I have painted publicly over the years and both felt comfortable doing that. We chose a 900 sq ft room on the floor. We put up sheets of plywood, painted them the traditional sacred colours red, white and black. We each had an 8 × 8-foot panel and shared the panel in the middle and we each had two panels on one of the other walls. On the opening day we initiated a shamanic ceremony with the assistance of Native American Indians from local communities. Barnaby painted with an unconscious expressionism. I was looking for some connection with the material. My pieces turned out to be a young man who I thought of as young Pontiac and the other was a transubstantiation of the city of Pontiac. We started to paint.

(Shifreen 2009)

An integrated theory of artistic cognition and creativity

The two important content areas of visual cognition and creativity discussed here are central to conceptions of artistry, and crucial in mounting arguments about the impact of art within academic settings and community and cultural contexts. Each has its own history as a contestable construct and bears the mark of particular methods of investigation believed to best reveal information about the roles served in human and socio-cultural transactions. However, to fully grasp the individual and cultural significance of these twin constructs it is proposed that they are best amplified and

explained within the orbit of research in general, and within arguments that present art practice as research in particular.

When art practice is situated within the discourse of the research community the distinctive theories and practices of the relevant arts need to be defended. Therefore a goal is to reconcile what we know about cognition and creativity and to identify a conceptual structure that explains the elements of visual cognition and features of creativity, as they are currently understood within the literature. Also, a condition is that this approach is presented as a means to conceptualize visual cognition within the context of practice-based research, i.e. artist-researchers working within the constraints and potentials offered within degree-granting institutional settings of higher education. Here, theories of discourse and practices of research are some of the framing conditions of the academic art world that impact on how artists' cognitive dispositions and creative capacities are interpreted. The expectation of the artist-researcher is that he/she is creatively using practice-based research to produce new knowledge by creating artworks of critical acclaim that serve multiple ends related to theory and discovery.

Towards a theory of visual cognition

Elsewhere I have presented the argument that the construct of 'transcognition' can adequately explain the cognitive processes related to artistic practice (Sullivan 2002; 2005). The description of transcognition identifies three kinds of artistic practices that are involved that I describe as 'thinking in a medium,' 'thinking in a language,' and 'thinking in a context' (2005: 125–8). Thinking in a medium describes artistic cognition as primarily being the consequence of thought and action that is given form in a creative product. Thinking in a language acknowledges that cognition is a socially mediated process and visual artists and viewers make use of a range of languages of expression and communication to construct narratives and discourse through art and about art. The importance of context as an informing agency in learning and understanding is central to arguments about mediated cognition and this distributed structure captures the multiplicity of practices that characterize how artists work. The key role of visualization in these thinking processes is being taken up with renewed fervour in the burgeoning field of neuroscience and related interdisciplinary fields and this is giving new meaning to the significance of experience as a cognitive capacity.

Figure 6.3 describes cognitive practices observed in visual arts research activity and explains the relationships among visualization and creative and critical outcomes as they are conceptualized within institutional constraints and broader socio-cultural conditions. The cognitive and creative connections are forged over two phases that move from micro settings that surround individual creative behaviours and macro contexts that are socially situated.

Phase 1: cognitive dispositions and experiences

When transcognition is adapted to the information emerging from the literature of cognition reviewed earlier in this chapter, key biological processes are identified. These show cognition to be an individual disposition that operates 'within' and 'across' the neural architecture and explains how emotions, thoughts, ideas and actions are enacted

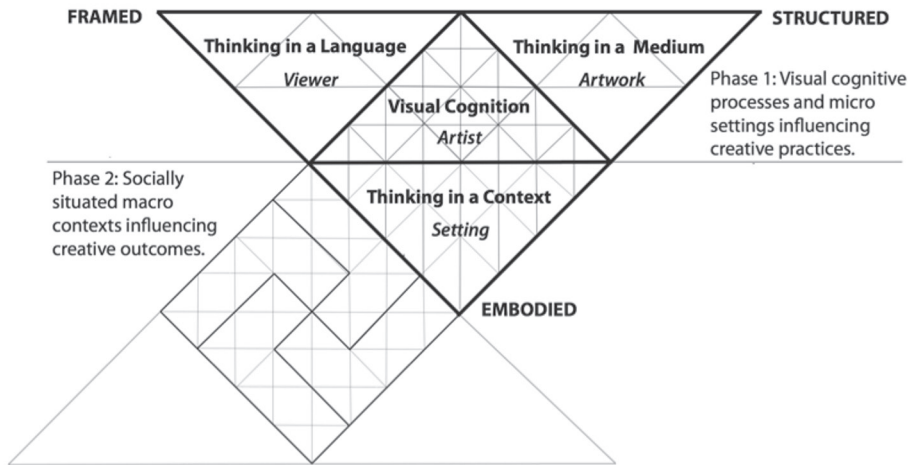


Figure 6.3 Theoretical structure of visual cognition and creativity. Visual cognition is both a biological and cultural construct where mindful practices are structured, framed and embodied. These cognitive practices take place within, across, between, and around the artists, artwork, viewer and setting. Visual cognition creates ideas and insights that connect ‘within’ and ‘across’ individual dispositions and experiences, and produces cultural capital that questions existing knowledge systems and structures ‘between’ and ‘around’ discipline boundaries and cultural contexts.

and embodied. This begins with the conceptual and perceptual processes that involve the mind, matter and medium that privilege visualization processes.

Phase 2: creativity in post-discipline settings

Creativity lies within the reach of what we actually know, yet outside accepted understanding. Consequently it finds its place within the borders of possibility that bridge what we know and what we don’t know. In many cases creative insight will emerge from within a relatively isolated pocket of unknown knowledge space that will spark a new way of ‘looking back’ at existing knowledge.

As the imaginative production of artworks proceeds a second phase of creative and critical processes is embraced. Here external conditions are brought into play in relation to other confounding factors. This is an interactive and mediating process that moves ‘between’ and ‘around’ the institutional and discipline demands that help determine areas of impact that might be expected. As knowledge or original insight that results from the cognitive process of visual knowing is assessed, the extent of the original contribution, or the related level of inventiveness achieved, becomes part of the discussion. Although the interpretive frameworks of existing knowledge are by no means finite, there will be appropriate terms of reference to consider in assessing outcomes. Just as likely, however, the interpretive lens may be open-ended and indicate directions for new questions and possibilities. As George Kubler noted back in 1962, ‘the technique of invention thus has two distinct phases: the discovery of new positions followed by their amalgamation with the existing body of knowledge’ (2008 [1962]:

58). Kubler further distinguishes between ‘useful’ inventions and ‘artistic’ inventions and his distinction is pertinent within the current discussion of visual cognition and research outcomes. He explains:

Artistic inventions alter the sensibility of mankind. They all emerge from and return to human perception, unlike useful inventions, which are keyed to the physical and biological environment. Useful inventions alter mankind only indirectly by altering his environment; aesthetic inventions enlarge human awareness directly with new ways of experiencing the universe, rather than with new objective interpretations.

(Kubler 2008 [1962]: 59)

It is the artistic inventions that Kubler describes that are relevant here and these are described in Figure 6.3.

The research environment needed to capitalize on cognitive and creative practices being explored within institutional research settings tends to cut across discipline boundaries. New post-discipline alliances are clearly seen in connections being forged among artists, sociologists, scientists, and technologists. For instance, Stephen Wilson’s text, *Information Arts* (2002), is a comprehensive account of artists, designers, technologists and scientists collaborating on topics of wide interest where methodologies are not constrained by discipline boundaries. The caricatures of the eccentric scientist, the reclusive artist, or the computer nerd have little basis in the reality of the post-disciplinary environment of today. Although critical theorists and visual culture commentators raise pertinent questions about problematic relationships among art, culture, science, and technology, there is a need to move beyond an analysis that still sees domains of knowledge cloaked in paradigmatic terms.

An emphasis on moving over and beyond the geography of conceptual and discipline boundaries is taken up by Irit Rogoff (2000) in her analysis of contemporary art practices and notions of space, movement, location and difference. In the many situations where artists and scientists are collaborating, there is little talk that sees science as merely a rationalistic endeavour or art as only an expressive activity. Questions, issues, and abstractions guide those imaginative investigators working outside the edges of disciplines where new knowledge is seen as a function of creating and critiquing human experience. By necessity, this complex practice has to bridge disciplines and in doing so not only opens up new possibilities but also renders mute old arguments that bind inquiry to prescribed methods.

Conclusion: outside the limits of cognition and creativity

Social scientists may argue that progress leads to change because it builds upon accumulated knowledge; however, artists would argue that change leads to progress as imaginative leaps are made into what we don’t know, and this challenges what we do know. Consequently, discovery may reside within the cracks and erasures of the structures in place, but it can also be found outside these normative systems. Artists create within these unlikely liminal spaces and offer new ways to connect to existing and possible perspectives. In the past artists have relied on others to translate these

insights into cultural capital. However, new notions of cognitions and new sites of creative inquiry being opened up in institutional settings is giving rise to a new discourse of artistic research and artists are very active participants (Macleod *et al.* 2006; Barrett *et al.* 2007). Mika Hannula provides sound guidelines in asserting that artists are well placed to take more public responsibility in communicating the theoretical richness that informs art practice. In thinking about the flexibility needed, he believes that it is a commitment to a principle that methods of inquiry remain flexible rather than fixed, for artistic research is partly a 'methodological map of reflection' (2004: 71–2). What he means is that when studio inquiry is undertaken, the artist-researcher has a 'desire to say something about something to someone' (2004: 71) and therefore the research can be read by others as a landscape of purposes, premises, and practices. A key point Hannula makes is that artistic research continually remains open to the critical possibilities of what visual arts can achieve:

The basic idea here is to see artistic research as a practice. An engaged practice, which in each context is imbued with the necessary qualities and substance to make it what it is, and also to apply its own internal logic to deciding between what makes sense and what is invalid. A practice with a defined direction, but with an open-ended, undetermined procedural trajectory. A practice that is particular, content-driven, self-critical, self-reflective and contextualized.

(Hannula 2008: 112)

Theorizing artistic cognition and creativity as a distinctive form of human knowing involves examining the way creative and critical insights are explored and enacted, as mind and matter converge in the many individual and cultural contexts within which art practice takes place. Theorizing is an approach to understanding that occurs at all levels of human inquiry and involves conceptual reasoning, creative action and critical reflection. Artists, curators, and researchers all engage in theorizing in order to make sense of the complexities revealed in the inquiries and investigations undertaken. For many artists, theorizing is a reflexive process that can occur during the 'think-time' that happens when making art, or may be the consequence of reflective processes that take place afterwards. For instance, David Hockney explains that although he has an interest in theory he asks 'such questions and make(s) the theories only afterwards, not before – only after I have done something' (1993: 130–1). For curators such as Robert Storr theorizing is a crucial element in searching out interpretive systems that help us to understand what it is that artists do.

Researchers, on the other hand, have been debating the relationship between theory and practice for some time and the emergence of practice-based research in the arts has extended the boundaries considerably in conceptualizing how artists might contribute to this arena of human inquiry. Within the context of this chapter, a guiding assumption is that through their extensive training, sustained art practice, and immersion in complex cultural contexts, artist-researchers are important sources of information, expertise and insight. In addition, their artworks and the contexts in which they are created and displayed, and the discussion and debates that arise, are sites of knowledge creation.

There are several conclusions that can be drawn from the arguments made in this chapter that cluster around conceptions of cognition and creativity. Let me deal with the implications related to artistic cognition.

- First, it is acknowledged that the thinking artist is a practitioner-researcher who uses many visual cognitive strategies that dislodge discipline boundaries, override media conventions, and disrupt political interests as they take on roles as creators, critics and theorists.
- Second, seeing, experiencing and thinking in artistic contexts activates cognitive processes that are both mental and physical. Whether artists are 'thinking' in media, languages or contexts, the modes of creative and critical actions are distributed and connected throughout the neural architecture of the visual brain, and the various situations and settings that shape the way images are made and what they might mean. As such, artistic cognition is a form of human knowing that is embodied within artistic practice and incorporates creative and critical processes as mind and matter converge in the many contexts within which art practice takes place.
- Third, the image instinct that gives rise to a creative impulse is a continuously changing, dynamic process that makes use of the connective capacity of concepts, forms, and contexts, and stimulates a mindful search that takes place within and beyond the parameters of existing knowledge systems and structures. In this sense, artistic research is a 'post-discipline' practice.

The information presented in this chapter also draws on sources that offer 'micro' and 'macro' perspectives that advance theories and practices about creativity as a significant human and cultural impulse that warrants a central role in contemporary research. The purpose was to position creativity as a cultural practice whereby the creative and critical processes, interpretive structures and contextual factors that extend artistic cognition can be broadly situated within practice-led research. Creativity, it is argued, is more than a distinctive individual capacity that is best understood if seen through a psychological lens or as a bio-behavioural construct. Rather, the position taken sees creativity as being mediated by various socio-cultural factors, and although tentative, there is little doubt that neurobiological constraints are involved as well. Still, there are several conclusions that can be claimed.

- First, creativity can be described as the capacity to see things in new ways as a result of creative and critical inquiry that constructs knowledge that has implications others can identify with and value. Creativity, however is not merely a distinctive habit of mind, rather it becomes manifest through individual agency and creative social action.
- Second, creativity is the conceptual vehicle that translates visual cognition into forms, frames and actions that transcend the self and positions imaginative outcomes within broader socio-cultural contexts.
- Third, creativity can be described as a distributed cultural practice that involves creative and critical processes that are enacted, embodied and transacted across institutional, communal and cultural domains.

When considered in relation to the theory of visual cognition described earlier, the issues raised in this chapter define a theoretical structure for conceptualizing how visual cognition is enacted and embodied within the distinctive nature of practice-led research.

Notes

- 1 When asked the question, 'How are you doing today?' a 97-year-old artist responded, 'Well, I'm above ground.' Retrieved from http://arts.tc.columbia.edu/rcac/Aging_artists (accessed on 20 March 2009).
- 2 The Venice Biennale is an international art exposition first held in 1897 and features a survey of contemporary art as well as national exhibitions shown in the various pavilions at the Giardini and Arsenale locations, and throughout Venice. Under Robert Storr's curatorship the survey show included 98 artists from five continents (Storr 2007).