The mind on art: cognitive functions and states associated with aesthetic engagement

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This memo explores one of nine distinctive characteristics of ethical engagement through the arts. It is part of the research informing the report entitled: Invite | Affirm | Evoke | Unleash: How artistic and cultural processes transform complex challenges." *This research was proposed by the Community Arts Network (affiliated with the Porticus Foundation) and carried out and written by IMPACT: Imagining Together Platform for Arts, Culture, and Conflict Transformation.*

"The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honours the servant and has forgotten the gift" - Albert Einstein

"The end point of rationality is to demonstrate the limits of rationality" - Blaise Pascal

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Abstract

Engaging with the arts spans the 'rational' and 'non-rational', involving a wide range of cognitive functions and states. The aim of this memo is to highlight different forms of cognition involved in arts engagement that complement and go beyond what is commonly understood by 'rational reasoning'. Scientific literature from cognitive sciences and philosophy is used to examine the following question: What are non-rational forms of cognition involved in arts engagement, and how do they contribute to knowledge?

Three key areas were identified. The first pertains to art as 'sensate' knowledge, and examines the embodied, emotional, and empathic processes involved in arts engagement. The second concerns 'creative thinking', and examines how the arts encourage non-linear processes of accessing information, ideas, and solutions, namely via intuition, divergent thinking, inspiration, and insight. The third involves different ways in which the arts help derive meaning in non-explicit and non-reductive ways, including holistic appreciation, implicit understanding, and storytelling.

Arts engagement transcends simplistic distinctions between thoughts/feelings, rational/irrational, and entails a holistic range of cognitive forms and ways of sense-making. We discuss the central role of attention and awareness to cognition, and how arts engagement involves different complementary ways of attending to the world. We consider how the arts may cultivate a wider array of tools to help understand and make sense of the world, and to a rebalancing of reductionist worldviews and narratives. Finally, we explore how the forms of cognition involved in the arts could contribute to addressing complex, systemic, divergent global problems, through relational, contextual, holistic understanding and insightful, creative approaches that can go beyond linear approximations.

Introduction

Engaging with the arts spans the 'rational' and 'non-rational', involving a wide range of cognitive functions and states. The aim of this memo is to highlight forms of cognition involved in arts engagement that differ from what is commonly understood by 'rational reasoning'. It also explores how these forms may have benefits that extend beyond artistic and creative disciplines. Basing itself on cognitive science and philosophy, this memo argues that engaging with art involves different cognitive states and stimulates a range of functions that extend and complement our abilities to make sense of the world and generate knowledge.

Art entails both rational and non-rational cognition

Statements like 'science is rational, and art is irrational', or 'reason consists of rational thoughts, not feelings' reflect popular simplifications of epistemology and aesthetics. In fact, the arts involve a combination of modes for generating meaning and acquiring knowledge. At one level, they require the use of rational, linear, analytical and logical processes, active and conscious activity, as well as explicit, propositional knowledge. At another, they involve different states of awareness and consciousness, sensate and embodied forms of perception, the appreciation of implicit meaning that transcends

language, dream-like thinking, holistic appreciation of overall form and context, intuition, insight, and inspiration.

Approach and limitations

This memo uses a combination of scientific studies from the broad area of cognitive sciences (including psychology and neuroscience), and philosophy (including aesthetics and philosophy of mind). While scientific studies were considered useful to bolster 'the case' being made in this report, it is important to recognize the limitations of the scientific approach to discuss the arts, creativity, and non-rational processes. Experimental methods cannot adequately approximate complex constructs like creativity or imagination (Dietrich & Kanso, 2010). Furthermore, the "laboratory context, in which most of the research in empirical aesthetics is carried out, attenuates and shortens the experience of art, probably due to the removal of contextual factors that are integral to the experience of art" (Leder & Nadal, 2014). While such methods can provide useful information on perception, they cannot address many aspects related to the perceiver. This is a realm where the humanities are more eloquent and accurate, and why this essay also turns to philosophy.

Aim and definitions

The aim of this memo is to identify and explore different forms of cognition involved in arts engagement that differ from what is commonly understood by 'rational reasoning'. It responds to the following question: *What are non-rational forms of cognition involved in arts engagement, and how do they contribute to knowledge?* In order to explore this question, we have divided this essay into three sections. First, we identify and discuss three key forms of non-rational cognition associated with art engagement. Secondly, we examine the wider literature on different forms of knowledge. Finally, we discuss the implications of non-rational forms of art-related cognition, their linkages to knowledge and their value and contribution to sectors beyond art and creativity.

For the sake of clarity, we will need to define a number of terms used in this paper:

- The words 'cognition' and 'cognitive processes' will be used instead of 'thought' and 'thinking'. 'Cognitive forms' or 'forms of cognition' relate to cognitive functions (i.e ways of thinking) as defined in the cognitive science literature. They broadly encapsulate different types of attention, processes, as well as states of awareness. To avoid a reductionist perspective on thoughts only being in the brain, we use 'mind' rather than 'brain' when referring to cognitive functioning.

- We will not focus on specific art forms so much as creative and artistic activities in general. The findings presented here relate to the different forms of cognition that are involved in engaging with arts in terms of practice (making art) and in terms of perception (witnessing art). The two are addressed collectively as 'arts engagement' or 'aesthetic engagement'. Although it is recognized that both practice and perception of art can also be analysed through the lens of individual or shared practices (participatory arts practices, community arts and rituals, etc.), this facet of engagement is not addressed here.

- The definitions of the words ‘rationality’ or ‘reason’ are subject to debate, and the two are often conflated. This memo is based on the premise that ‘reasoning’ is a broad set of ways of making sense of the world. It can involve conscious and unconscious processes, explicit and implicit ways of sense-making, analysis and synthesis, and embodied cognition. ‘Rationality’ will be considered to be an analytical subset of reasoning. Rational thinking is defined as discursive, logic-driven, sequential, inferential reasoning based on an analysis that can be explained in prosaic language or mathematical symbols. Rational thinking implies an active, focused, bounded form of attention. It is philosophically associated with reductionism, the attempt to explain any phenomenon as the sum of its parts.

Finally, we acknowledge that what constitutes ‘thought’ and ‘knowledge’ is a complex topic that is subject to widely differing opinions. ‘Knowledge’ has been grappled with by different cultures and fields for millennia, and may be beyond the scope of a single, convergent definition. It invites questions related to consciousness, to theory of mind, to the deeper nature of knowledge and truth, and where ideas come from; however these are beyond the scope of this memo.

NB: Double quotation marks “ ” are employed for authors’ quotes, and single quotation marks ‘ ’ for all other uses.

What are non-rational forms of cognition involved in arts engagement and how do they contribute to knowledge?

This section summarizes findings from studies of cognitive processes associated with the arts that depart from our definition of rational forms of cognition. We identify three key areas. The first pertains to art as ‘sensate’ knowledge, and examines the embodied, emotional, and empathic processes involved in arts engagement. The second concerns ‘creative thinking’, and examines how the arts encourage non-linear processes of accessing information, ideas, and solutions, namely via intuition, divergent thinking, inspiration, and insight. The third involves different ways in which the arts help derive meaning in non-explicit and non-reductive ways, including holistic appreciation, implicit understanding, and storytelling.

Embodied perception

Art is not only processed as an idea in the mind, but ‘perceived’, an emotional, sensorial, embodied experience. It implies a form of relationship between the perceiver and the perceived, more like an encounter than a concept, and necessitates a form of empathy. This contrasts to an understanding of abstract, factual information which may be more cerebral and associated with rational thinking. It is not a detached analysis but a fuller, lived experience.

The common expression of ‘being moved’ by art is supported by empirical evidence. Perceiving an artwork causes a stimulation, which is followed by a simulation in the perceiver. Encountering an

artwork (through any of the senses) leads to a kind of 'action' in the body, which in turn elicits emotions and sensations. At the heart of this process is the mirror-neuron system, through which we simulate the experience of something that is observed or perceived. It is an 'embodied simulation' which elicits physical sensations and emotions. Damasio and colleagues note that "the brain – within 'simulation mode'– reproduces the somatic states seen in or implied by the painting or sculpture, 'as if ' the body were present" (Damasio et al, in Freedberg & Gallese, 2007). A number of researchers (Agius, 2018; Chatterjee & Vartanian, 2016; Freedberg & Gallese, 2007; Leder & Nadal, 2014) suggest that this simulation takes place at two levels: empathy for what the artwork represents, as well as "empathetic feelings in the observer…[for]…the artist's creative gestures, such as vigorous modeling in clay or paint, fast brushwork and signs of the movement of the hand" (Freedberg & Gallese, 2007).

Perception of art involves a relationship between the perceiver and that which is perceived; we participate in our own aesthetic experience. Making sense of the artwork requires meeting it halfway, and necessitates a form of empathy. "The two processes cause the viewer to bodily and emotionally move with and be moved by individual works of art, and consequently to recognize another psychological orientation than her own" (Brinck, 2018, in Agius, 2018). "[T]he empathic nature of the experience means that it has more in common with encountering a person than a concept or an idea that could be expressed in words…works of art, music, poems, paintings, great buildings – can be understood only if we appreciate that they are more like people than texts, concepts or things" (McGilchrist, 2019). The term empathy derives from Einfühlung or 'feeling into'. It was explored by 19th Century German philosophers like Theodor Lipps (Freedberg & Gallese, 2007). They reflected upon the physical feelings aroused by paintings, architecture, music, or sculpture, and how "we feel in our own muscles the sense of the object or action being perceived"(Cohen, 1997). This fuller, more embodied kind of perception also mediates intuition, which will be further discussed in the following section.

'Creative thinking'

Creativity and imagination are commonly cited features of 'artistic thinking'. They are cornerstones of any artistic discipline, and have features that do not fall within 'rational thinking' as we have defined it.

How is creativity described in cognitive literature? It is a widely spanning, complex construct that cannot be easily measured, and most empirical studies focus on specific subcomponents that are easier to assess. Cognitive studies highlight several aspects to creative cognition including: dual activity (focussed/dream-like states and convergent/divergent processes); and non-linear ways of approaching problems using insight, intuition, and inspiration. Two commonly cited features of creative ideas is that they be *novel* and *useful/appropriate* (Abraham, 2019; Ritter & Dijksterhuis, 2014). Creative solutions are "approached by generating varied, original, or even unusual ideas, by creating unexpected associations between concepts, and finally by formulating fresh views and novel strategies for approaching and fixing the problem" (Beccone, 2020).

Dual processes and divergent thinking

One of the defining characteristics of creative and artistic cognition is the simultaneous interplay of different mental states, processes and types of attention.

Arts engagement has been found to involve two very different processes, one eliciting dream-like, partly unconscious, and internal processes; the other engaging active, controlled thinking (Abraham, 2019; Agius, 2018; Chatterjee & Vartanian, 2016; Kaufman, 2013; Leder & Nadal, 2014). The Default Mode Network (DMN) is predominantly introspective, most involved when the individual is experiencing their "inner world", including unconscious forms of processing, "mind-wandering" or dream-like thinking (Ritter & Dijksterhuis, 2014). Though it is not typically involved in processes that required conscious, active attention, it is fully operational when we engage in creative activities, alongside the centres that control focused task-based attention, speech and linguistic processing. Thus creativity involves "both controlled and spontaneous cognitive processes", as well as communication between areas with "seemingly opposing functional roles" (Beaty et al., 2014). It involves the practical, "goal-oriented" use of "unconscious", "spontaneous", "stimulus-independent" and "task-unrelated" thoughts (Ritter & Dijksterhuis, 2014).

Creative thinking is also described as involving the combination of 'convergent' and 'divergent thinking'. Convergent thinking refers to the analytical, reductive, critically focused thinking (Beccone, 2020). Divergent thinking includes unconstrained, free-flowing, analogous, open-ended idea generation including conscious and unconscious processes. Such processes generate many possible solutions in a short period of time (Beaty et al., 2014; Beccone, 2020).

Insight, intuition, inspiration

Arts engagement also involves a number of non-linear ways of accessing information and addressing questions. This includes processes like insight, inspiration, and intuition.

Insight

Insight refers to discontinuous 'flashes' of understanding that come in an "Aha! moment", (Pétervári et al., 2016). "Insight, in problem-solving, occurs when the problem solver fails to see how to fix a problem. Then, he or she has a sudden, almost epiphanic realization of how to solve it, as he/she at first clearly envisages the solution, often surprisingly and unexpectedly, then finally puts it into action"(Beccone, 2020).

It is associated with creative practices and problem solving. It can help find unconventional solutions to problems, particularly in addressing complex problems for which different solutions could satisfy the same question. Solving such problems can require a restructuring of thought, where the solver has to "disconfirm" prior conceptual frameworks. This is known as "breaking frame" (DeYoung et al., 2008).

Intuition

Intuition is a "distinguishing characteristic of art" (Biggs et al., 2010) that studies have found to be closely associated with higher creativity (Boden, 1996; Policastro, 1999; Weber, 1992). It can be defined as a process that is "rapid or instantaneous; spontaneous (does not require extensive effort and cannot be voluntarily controlled); and alogical (does not necessarily follow the logical rules)"(Pétervári et al., 2016).

Intuitions contrast with explicit, rational arguments, and are closer to opaque, felt inclinations. “It is the contrast to developing a solution in a linear logical manner that makes idea generation characteristically intuitive… the idea itself …is opaque and inaccessible to the problem solver” (Pétervári et al., 2016). It is also commonly perceived as a ‘gut-feeling’, which, as discussed in the previous section, is supported by cognitive studies of neurological activity in the gut and heart brain.

As a problem-solving process, intuitive thinking is particularly well suited to “complex, multidimensional…unstructured and ill-defined” questions, where the solution cannot be approximated via “pre-established, clearly defined rules” (Pétervári et al., 2016).

Inspiration

Another important way of accessing ideas in a non-linear manner is inspiration, which is also of critical importance to the arts. Thrash and colleagues find that inspiration is *evoked* as opposed to voluntarily initiated. They describe it as a state, which happens in discrete “episodes” that they divide into three parts: evocation, transcendence, and approach motivation (Thrash & Elliot, 2003). After a given stimulation, the individual “gains awareness of new possibilities that transcend ordinary or mundane concerns. The new awareness is vivid and concrete, and surpasses the ordinary constraints of wilfully generated ideas. Once inspired, the individual experiences a compelling *approach motivation* to transmit, actualize, or express the new vision” (Oleynick et al., 2014).

States of mind

Non-linear cognitive processes may be mediated by different states of mind. Practicing art can also involve getting into “states of flow”, moments of ‘peak performance’ and deep concentration that are different to regular states of consciousness, often characterized by their being seemingly “effortless”(Csikszentmihalyi & Nakamura, 2010). These altered states can also lead to moments of transcendence, which are also the focus of meditative practices. “[T]ranscending the limitations of one’s self-centred Ego… freed from the bondage of Time and Space…is characteristic of insight experiences” (Beccone, 2020). It is a mental state that involves “self-abandonment”, and “self-oblivion…what some mystics call peak experience” (Beccone, 2020).

Thus intuition, insight and inspiration represent key cognitive processes that do not follow a linear, sequential course. They are also associated to different states than alert, effortful attention. *Where* the ideas that one encounters *come from* is still unresolved, and opens the door to questions about the mind and consciousness. As noted by Oleynick and colleagues in their study on inspiration, their findings “explain… the transmission, not the origin of creativity” (ibid).

Non-explicit, non-reductive ways of sense-making

Engaging with the arts also stimulates different ways of *making sense* of the world, deriving meaning, or understanding. While this includes rational, linear arguments and sense-making, it also entails ways of understanding that cannot be captured by explicit, propositional, or discursive terms such as holistic appreciation, implicit understanding, and storytelling.

Holistic appreciation

We appreciate art in a holistic manner, attending to the overall form. Whether watching a dance, listening to an orchestra, or observing a painting, we respond to the artwork as a whole, not a series of so many notes, brushstrokes, or movements. Art appreciation involves a sense of *'Gestalt'*, whereby the whole is greater than the parts. It can also be said to be a form of understanding that is more closely related to synthesis than analysis, as the form includes all the relationships and interrelationships between the parts.

The philosopher Susanne Langer speaks of this holistic appreciation both in terms of how we understand art, and in terms of how we create it. Regarding appreciating an artwork she notes: "[a]esthetic intuition seizes the greatest form, and therefore the main import, at once; there is no need of working through lesser ideas and serried implications first without a vision of the whole…In art, it is the impact of the whole, the immediate revelation of vital import, that acts as the psychological lure to long contemplation" (Langer, 1953). She contrasts this with "discursive reasoning, where the total intuition of relatedness comes as the conclusion, like a prize". Regarding the process of creating art, she uses the example of a musician working on a composition: "This form is the "composition" which he feels called upon to develop... the general Gestalt serves as a measure of right and wrong…One might call that original conception the commanding form of the work"(Langer, 1953).

Implicit understanding

Thanks to the non-explicit ways in which it conveys meaning, art can be eloquent where language fails. Where is the 'meaning' in art? Take a favourite musical composition. Is it in the notes? Is it in the spaces? It can defy analysis, yet once it is played, comes alive, and can seem to hold all the meaning in the world.

Implicit understanding is an essential part of how we make sense of art, just as it is key to understanding the meaning in encounters with other people. It is partly embodied, depending on a relationship with the perceiver. Though poetry and stories use language, there too, the sense of meaning cannot be captured simply through its explicit, factual symbols. We encounter stories and poems, they come alive as we meet them halfway with our own emotions and imagination. In this encounter, we derive multiple meanings that go beyond what is contained in its explicit content.

Symbols of implicit import

Langer explores differences between implicit and explicit ways of making meaning, and the role of art in this process. She considers how we require symbols to make sense of experience, and distinguishing between two types of symbols: the "discursive" (like prosaic language) which have stable and context-invariant meanings that can be built up sequentially; the "presentational" which can have different meanings in different contexts, like the moon in paintings, or a C sharp in musical compositions (Langer, 1953). She uses the word 'import' to refer to the non-explicit meaning conveyed in art. She defines art as "the creation of form symbolic of human feeling" (Langer, 1953). Art thus creates perceptible forms ('symbols'") that embody a kind of meaning that cannot be fully expressed in words.

Metaphor

Metaphor is a type of implicit symbol that is frequently used in the arts. While some disciplines, such as poetry, use metaphor directly, it can be argued that all art forms make use of metaphors in one way or

another. Whether in painting, dance, theater, or poetry, a thing in its entirety is often brought in relation to another one, in a symbolic, implicit, and embodied manner (Bonde, 2007; Farnell, 1996; Hatten, 1995). Through involving metaphor, art is also stimulating a way of deriving meaning that may also have significance to our cognition in more general terms.

There is a growing body of thought that emphasizes the central role of metaphor in terms of our understanding of language, and our wider ways of making sense of the world; all knowledge may essentially be relational, comparative, and involves a combination of explicit and implicit understanding (Lakoff & Johnson, 2008; Lindgaard & Wesselius, 2017; Ricoeur, 1978). Metaphors take us out of the web of literal language, with its self-consistent propositional symbols, and into our "embodied experience", placing thought "in a living context" through which the "parts of the world which language appears to identify retain their connectedness one to another" (McGilchrist, 2019). It elicits a relationship with our subjective experience, generating different associations which can provide new and deeper meanings.

Critically, the metaphors we use also have a bearing how we see the world and make sense of it. Metaphors create a paradigm through which we view and construct experience. The world 'as a machine' or the mind 'as a computer' are two examples of pervasive metaphors that have shaped the modern world. As noted by Lindgaard and Wesselius: "metaphors structure our experience and our understanding. Essentially, we use certain aspects of our experience to organize our understanding of phenomena that are less clear to us. In so doing, we organize our actual experience of those phenomena. Metaphors serve to highlight or conceal aspects of phenomena in ways that make both our understanding and our experience deeply interpretive"(Lindgaard & Wesselius, 2017).

Narrative

Stories are integral to art. Disciplines like writing, poetry, or songs all explicitly employ narrative, but it is arguably involved, at some level, in all artistic disciplines; be it through dance, music, or images, a story is often being conveyed. It can be used to convey explicit and implicit knowledge. Like metaphor, narratives influence how we see the world. They can also help organize and frame experience and information, providing a sense of coherence and direction.

Narrative is a "major organizing device"(Langer, 1953) that may be central to sense making, structuring the meaning we make of the world. "The primary human mechanism for attaching meaning to particular experiences is to tell stories about them" (Brody, 2002). Stories can convey both explicit and implicit meaning, and can be based on information obtained through rational and non-rational means.

In his book *Storytelling and the sciences of mind* David Herman proposes that narrative is central to cognition. He discusses narrative at two levels: firstly, how narratives, whether through words, images, or other means help stimulate our mental faculties; stories lead to embodied perception in the same way as other artistic forms, leading to a lived, emotional, experience in the perceiver, who can derive explicit and implicit meaning from it. Secondly he argues that we understand the world through the lens of the stories we employ (Herman, 2013).

Myth is a form of narrative, which, like metaphor, is non-rational, yet imparts understanding that differs from prosaic, propositional language. It addresses implicit, experiential, holistic "frameworks of value

and meaning", and is expressed through "arts, literature, values, aspirations and rituals"(Richards, 2011). As with metaphor, the myths we use address our inner worlds and influence what and how we perceive the outer world. They are also critical ways of sharing narratives with others, and form the basis of what brings together many groups, as seen in political parties and religion for example.

Narratives can be central ways of providing a sense of coherence and direction, individually and collectively. Many fields of study examine narratives and myths to help with sense-making, coherence of goals, and direction, including organization science, marketing, and design (Abolafia, 2010; Beckman & Barry, 2010; Broms & Gahmberg, 1987; Colville et al., 2012).

Perspectives on different kinds of knowledge

In the previous section we explored forms of cognition involved in the arts that provided ways of thinking and sense-making beyond 'rational reasoning'. This section explores rational and non-rational ways of knowledge more generally, as discussed in Western philosophy and science. Bringing these two sections together in the Discussion will give us a better notion of how the arts contribute to knowledge and understanding.

The epistemological distinctions popularly held in the modern world are arguably overly simplistic and categorical. Mainstream divisions relating to the mind/body, or thoughts/feelings can be traced to the Enlightenment period, followed by the Scientific Revolution (Graves, 2002). Though many of the philosophers and scientists that have influenced the modern era had a more nuanced view of knowledge, the assumption still prevails that analytical and objective methods are the primary ways of approximating what is true. This has led to a number of popular simplifications and divisions, setting the reason-based, conceptual, logical and linguistic on one side, and the emotional, perceptual, bodily, and imaginative on the other. "The most significant consequence of this split is that all [forms of] meaning…are aligned with the mental or rational dimension, while perception, imagination and feeling are aligned with the bodily dimension. As a result both nonpropositional and figuratively elaborated structures of experience are regarded as having no place in meaning and the drawing of rational inferences" (Johnson, 2013). "These polarities have reified themselves into structures of consciousness. If thinking is cognitive, then its contrary, (feeling), is noncognitive. If cognition involves the use of verbal and mathematical symbols to construct rational or formal propositions, then perceptual imagery is taken to be nonpropositional and hence noncognitive"(Efland, 2003).

Propositional and non-propositional knowledge

Though there are long standing debates in Western philosophy about types of knowledge, a few key categories can be identified. One common distinction is between propositional and non-propositional knowledge, or "knowledge-by-description" and "knowledge-by-acquaintance"(Hasan & Fumerton, 2020). Propositional knowledge can be described in a declarative sentence. It consists of explicit facts which do not require firsthand knowledge or a subjective experience. Knowledge-by-acquaintance on the other hand requires experience, and implies open awareness and a relationship between the perceiver and what they are relating to. This category also relates to *qualia*, the subjective, conscious experience of something (what makes water 'salty', as opposed to knowledge about the sodium

chloride content) (Hasan & Fumerton, 2020). Gilbert Ryle follows a similar approach, identifying three categories: “knowledge how”, “knowledge of”, and “knowledge that” (Fantl, 2017). ‘Knowledge that’ has parallels to propositional ‘knowledge by description’, while “knowledge of” is similar to non-propositional ‘knowledge by acquaintance’. “Knowledge how” addresses how to do something. It is subject to debate, but the mainstream opinion is that it does not necessarily require a full grasp of the facts, whether explicit or implicit. (Fantl, 2017).

Limits of logic and rational analysis

Though the above distinctions are subject to debate, they all point to the fact that there are types of knowledge that significantly differ from ‘rational’ thought or analysis and cannot be fully grasped by it. Indeed, many eminent philosophers and mathematicians including Hegel, Wittgenstein, and Gödel have identified the limits of rationality, particularly with regards to propositional language and mathematical logic, arguing that it provides an incomplete approximation of knowledge. While ‘reason’ is often equated with logical understanding or rationality, it is arguably a wider set of sense-making approaches, of which rationality is a subcomponent (Kompridis, 2000).

Embodied cognition

Embodied cognition is the growing view that the mind is more than the brain, that knowledge is distributed across the body. It holds that most cognitive processes, including language and reasoning are predicated on a lived experience – something felt as opposed to something detached (Giladi, 2016; Lakoff & Johnson, 2008; R. A. Wilson et al., 2019). The mind was traditionally viewed “as an abstract information processor, whose connections to the outside world were of little theoretical importance…[however, it must rather] be understood in the context of its relationship to a physical body that interacts with the world”(M. Wilson, 2002).

The role of the body in cognition is supported by research on other neural centres, such as those of the gut and the heart, which also house neural hubs. Together they are referred to the as the “three brains. A number of studies now support the importance of the gut and heart in different type of cognition, notably of an intuitive and insightful kind (Beccone, 2020; DeYoung et al., 2008; Kounios & Beeman, 2014; Muth & Carbon, 2013; Soosalu et al., 2019).

Hemispheric asymmetry and two different ways of attending to the world

Finally, a recent thesis by psychiatrist and philosopher Iain McGilchrist critically examines the perceived divisions in Western epistemology, underlining how attention is key; a gateway to our different ways of understanding. His book *The Master and His Emissary* addresses asymmetries in the right- and left brain hemispheres, and shows how they impart two distinct ways of attending to the world that provide us with different forms of knowledge and understanding (McGilchrist, 2019). It is grounded in neuroscience, but set within a broader context that includes aesthetics, philosophy of mind, sociology, psychology and history.

Contrary to popularly conceived differences between the two hemispheres ('we engage with arts through the right, and science through the left') both hemispheres operate together for most processes. They are independent and function differently, yet are both necessary and complementary. McGilchrist argues that this difference allows us to be aware of our lived experience in reality, where things are in motion and interrelated, while also functioning effectively within this system, which requires stepping back from the immediacy of experience. While the left hemisphere is an essential tool for analysis, the right, though 'silent', is the key to synthesis; it is where we derive the fullest, most holistic appreciation of understanding and meaning.

The attention of the left hemisphere is essentially fragmented, focused, and strategic. It is essential for prosaic language, the logical components of mathematics, and other conscious, active reasoning processes. The attention of the right hemisphere is essentially holistic, contextual, and relational. It is necessary for understanding overall form and implicit meaning. It controls our embodied sense of self, and prioritizes the living as oppose to the mechanical. It is more involved in recognizing expression and emotion. Prosaic language is only processed in the left hemisphere, without which we lose the power of speech. The right hemisphere is thus 'silent', though it is also responsible for the *understanding* of narrative, as well as to the connection between different phenomena. The left hemisphere sees them as discrete components, which can often be out of sequence.

The two hemispheres are in a dynamic relationship. The left hemisphere offers a "valuable but intermediate process, one of "unpacking" what there is and handing it back to the right hemisphere, where it can once again be integrated into the experiential whole" (McGilchrist, 2018). However, they can also vie for dominance, based on which 'voice' we heed and which forms of attention we give priority to. He sees the effects of this struggle playing out at both the individual and societal level. He suggests that different civilizations have gone through cycles of relative balance or imbalance over time, and that it the left hemisphere viewpoint, with its strategic, powerful, logical, and language-based voice, that can often dominate the silent voice of the right hemisphere.

McGilchrist shows how arts engagement involves both hemispheres, yet its most salient features are moderated through the right. While technical and theoretical components related to learning and practicing the arts involve left-hemisphere dominant functions, the overall 'point' is appreciated by the right. Poetry is understood and generated by the right, along with essential features of music such as harmony, melody, timbre, and tone. It is critical to visualizations, divergent thinking, and appreciating the overall context and implicit meaning in art (McGilchrist, 2019). The importance of the right hemisphere in aesthetic and creative activities is supported by a number of cognitive studies (DeYoung et al., 2008; Gazzaniga et al., 2008; Kounios & Beeman, 2014; Runco & Jaeger, 2012; Runco & Yoruk, 2014), and people with regular artistic and creative practices have less pronounced differences in hemispheric dominance (Demarin & Bedekovi, 2016).

Discussion

This memo has explored various types of cognition associated with artistic practice and engagement that depart from 'rational-thinking'. It has also examined perspectives from philosophy and cognitive sciences on forms of knowledge and ways of understanding that go beyond rational reasoning. This section discusses some of the implications of these findings.

Art as holistic cognition

We have seen that the artistically engaged mind – far from being one-sided and purely entrenched in feelings – is in fact involved in widely-encompassing, holistic ways of cognition and understanding. Engaging with and in the arts spans rational and non-rational cognition, and different ways of deriving meaning and understanding.

Arts engagement elicits a more experiential, 'lived', and embodied form of perception that requires extending our subjective experiences outwards and meeting the artwork halfway. We come to art as an encounter, which is to say that we involve 'knowledge-by-acquaintance', as discussed in philosophy. Its technical and conceptual dimensions also involve 'knowledge-how' (e.g practical skills) and 'knowledge-of' (theoretical understanding).

Art can be articulate where language fails. Along with its use of explicit, discursive symbols, it relies heavily on implicit meaning, using presentational symbols that involve cognition in a contextual, lived, and experiential manner.

The non-rational cognitive processes that we have highlighted in this memo are also those that are right brain hemisphere dominant functions : seeing the world through a living, embodied lens ; understanding implicit meaning, metaphor, and narratives ; a Gestalt awareness of holistic forms ; a synthesis-based appreciation of context and interrelationships.

While art involves rational, logical processes and understanding, it is arguably these non-rational processes that have primacy and without which the arts lose their very essence. In the same way, while left hemisphere functions are essential and valuable tools for understanding, the right hemispheres broader, embodied, living perspective is necessary for a holistic, fuller appreciation and understanding.

Different kinds of awareness

The various forms of cognition and ways of understanding that we have discussed in this essay are all connected to attention. The kind of attention we bring to bear on the world plays a primordial role in what we see and how we make sense of it.

Arts engagement involves many forms of attention which mediate the different cognitive processes we have examined (Beaty et al., 2014; Kounios & Beeman, 2014; Posner, 2009). This includes attention that encourages sense perception, elicits personal emotions and feelings, heeds intuition, leads to dream-like 'mind-wandering' states, states of flow and altered atetntion that involve conscious and unconscious modes related to inspiration and insight. It also involves more external, active, focused

forms of awareness. Beaty and colleagues suggest that these two types of attention work together, and that we use "controlled attention" to sift through, direct and make sense of the broader kind of internal attention that allows divergent thinking, insight and intuition (Beaty et al., 2014). With respect to McGilchrist's hemispheric theory, we can say that artistic engagement thus encourages both left and right hemisphere ways of attending to the world, with the emphasis being on those related to the right.

Embodied awareness and empathy

Aesthetic engagement elicits a deeper, more experiential, 'lived', and embodied form of cognition that promotes self-discovery while also developing empathy, both of which can have positive impacts on individual and social wellbeing and mental health. Empathy and a deeper sense of understanding via embodied cognition may be important factors in addressing complex social challenges related to individual and collective emotional health and wellbeing, as well as social cohesion. A recent health-based systematic review of arts-based interventions found significant social impacts, including lower levels of aggression and violence, lower perceived social isolation, improvements in interpersonal bonding, and greater social cohesion. The authors also identified important mental health impacts. This includes effects on the general population, such as reducing anxiety, depression, and promoting wellbeing, as well as better management of acute conditions, neurodegenerative diseases, and non-communicable diseases(Fancourt et al., 2019).

Balancing the reductionist world view

We have seen how the arts may cultivate a wider array of tools to help understand and make sense of the world. Nurturing and stimulating more embodied, empathic, and holistic perception that includes sensitivity to explicit and implicit meaning may help us have a better gauge with which to navigate through our lives, address problem-spaces, and question different narratives, values, and paradigms.

The modern era is arguably suffering from a perspectival imbalance, overemphasizing what can be understood through rational, prosaic, language-focused reasoning. The world seen through the left hemisphere, while internally consistent, is based on *things* as opposed to *processes*, material reality as opposed to experience. Being cut off from contextual and implicit appreciation, it's sense-making is removed from our lived, embodied experience of reality, missing out on those elements to our meaning-making that go beyond what can be rationally, consciously focused on in a linear manner.

The faculties we have examined could provide an important counterpoint to this imbalance in attention. The right-hemispheric attention involved in arts engagement may well have primacy and lead to more holistic sense-making. To contribute to constructive change, it should also be noted that these qualities need to operate within a broader, ethical framework and intent that will help guide their direction in addressing complex challenges. Giladi notes the importance a wider "aesthetic framework which sees art as a form of enquiry, one whose aim is to not merely excite the imagination but to principally focus attention on social and cultural norms" (Giladi, 2016).

Finally, it bears mentioning that though perspectival rebalancing may be critical, it is impossible to predict where it may lead. This is a challenge for policy makers and planners to grapple with, because it is not amenable to predicting impact. To nurture more holistic cognitive abilities is to develop the very crucible of human potential; one cannot make linear extrapolations regarding the outcomes of

such a process, which could include both incremental and radical changes. We are ultimately speaking about cultivating the conditions for *poiesis*, a state of potential that will unfold and unveil something new.

Holism and creative thinking to address complex issues

Many of the modern world's most challenging problems are complex, systemic, and divergent, requiring approaches that go beyond linear, reductive, and disembodied thinking.

The OECD recently published a report on systems thinking for addressing complex global challenges, arguing that to address "planetary emergencies linked to the environment, the economy and socio-political systems, we have to understand their systemic properties, such as tipping points, interconnectedness and resilience" (Hynes et al., 2020). Complex systems are distinguished by having large webs of interconnectivity, leading to new properties arising from these relationships. They apply to all ecosystems, from physical and environmental systems, to social, economical and political ones. They require a different approach than those that are traditionally applied, they cannot be addressed using reductive approaches, requiring an understanding of nonlinearity, emergence and interdependence (Bar-Yam, 2002).

A notion related to complex systems is that of "wicked problems"(Zellner & Campbell, 2015). The term was defined by Ritter and Webber, criticising the scientific approach to solving problems related to social problems; however they have been applied to several other issues, including sustainability, climate change and spatial planning (Brønn & Brønn, 2018; Sun & Yang, 2016; Zellner & Campbell, 2015). Wicked problems are hard to define (by definition!); they are also novel, do not have simple right or wrong answers, and involve complex interdependencies. They require an appreciation of the whole, of interrelations, of context, and of relationships (Brønn & Brønn, 2018). Wicked problems also make use of E.F.Schumacher's approach to the typology of problems, focusing on their relationship to living systems. He defined two types of problems: "convergent" and "divergent" (Schumacher, 1995). In the former, efforts gradually converge towards a single answer. They are most often associated with non-living problems. Divergent problems on the other hand do not have a single solution, and are typically concerned with living, dynamic systems. They may also imply different philosophical positions related to the question. This has been used to address a wide range of topics, including sustainability, education, and energy policy(Hensley, 2020; King, 1993; Orr, 2002).

We can see how the forms of cognition and understanding that were examined in this memo could contribute to complex, systemic, wicked, divergent problems. These kinds of challenges describe require relational, contextual, holistic understanding; and insightful, creative approaches that can go beyond linear approximations. A focus on the overall form, or 'Gestalt' of a problem may be essential to grappling with complexity, where emergent properties have a central role, and systems behave more like organisms, with complex feedback loops, than simple machines. This is the principle that informs 'design-thinking' which seeks to apply a wider framework, a combination of rational and non-rational ways of reasoning, insight, emotions and empathy to complex problems. It is a growing field with applications in education, business management, organization science, urban, and industrial design (Brown, 2008). Complex challenges and divergent problems are also ideal spaces for the application of insight and inspiration. Embodied perception, which stimulates empathy and intuition, as well as an

approach that sets us firmly within the lived world (and not in a detached manner), may also be a useful way to approach complex bringing, helping bring new perspectives to light.

Concluding note

Art has its own unique function and place in society that cannot be reproduced by anything else; it does not need any other further impact to justify its value.

That said, engaging with the arts also develops faculties that may be able to contribute to individuals and society in a manner that extends to non-artistic endeavours. Many of complex challenges today require more holistic modes of thinking, harmonizing opposing principles. As stated by the philosopher Friedrich Schlegel: “where philosophy stops, poetry has to begin…[w]hatever can be done while poetry and philosophy are separated has been done and accomplished. So the time has come to unite the two”(Gentry & Pollok, 2019).

The precise impact of such a rebalancing, and the forms it might take, remains unclear. What is clear however is that ‘we cannot solve our problems with the same thinking we used when we created them’.

Author Biography

Ameer Shaheed is a researcher, project manager, and cultural actor. He combines a background in public health and international development with a lifelong passion for the arts. He is deeply intrigued by the role played by the arts and culture in the wider world, including how they can help address developmental, philosophical, and social concerns. His educational background is rooted in science, with a BSc in Biochemistry, an MSc in Environmental Engineering, and a PhD in Public Health (water, sanitation and hygiene). He grew up in the multicultural hub of Geneva, Switzerland, and has worked in 14 countries across Europe, Asia and Africa, primarily focusing on public health research and communications projects. He has maintained a keen interest in the arts, primarily as an event manager and musician. His events work spans different disciplines, including photography (e.g the African Photography Biennial in 2019) and music (e.g Bamako Jazz Festival 2019, Mali Afrobeat Festival 2018). He is now bridging his interests: working with the Geneva Water Hub on creative reflections around water and peace in the Sahel; writing articles for UNESCO's Art-Lab on cultural responses to humanitarian challenges; and collaborating with IMPACT on various research topics.

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