***Visualcy:* the Progenitor of Literacy and Numeracy (RJVL-2023-0014)**

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Visualcy: the Progenitor of Literacy and Numeracy

Abstract

This article aims to enhance the pedagogy of drawing by integrating relevant aspects of art history and aesthetics with perception and communication theories.

Visualcy is defined as an articulacy with visual languages, from which the more familiar '3Rs' (*R*eading, w*R*iting, and a*R*ithmetic), alluding to literacy and numeracy, evolved. It embraces not only the more familiar definition of 'visual literacy' in the sense of how people perceive, interpret and learn from existing visual imagery, but also the *semogenic* facility for producing the means to understanding through the articulation of visual elements (line, shape, tone, texture, colour) in the construction of new images. After reviewing the role of drawing in cultural evolution, the article discusses drawing in relation to aesthetics, before outlining a pedagogy of drawing designed to nurture visualcy, of central importance to human culture.

Keywords

visualcy; drawing; aesthetics; pedagogy.

Introduction

Visualcy, a neologism I first coined in 2001 (Riley, 2001, p.1) specifically to describe an articulacy with the language of drawing (Riley 2019), is the progenitor of literacy and numeracy familiarly known as the '3Rs'. It is inherently interdisciplinary, operating across the domains of visual perception and visual communication, and as such deserves a theory-

informed basis for its pedagogy.-The neologism was later used in 2005 by W.J.T. Mitchell (in Elkins, 2008, pp.11-21) for his talk *Visual Literacy or Literary Visualcy?* at University College Cork, but is not as widely recognised as 'visual literacy', generally believed to have emerged at the first conference of the International Visual Literacy Association (IVLA), Rochester, NY in 1969 (Michelson 2017), and defined by Roger Fransecky and John Debes (1972). However, James Elkins (2008, pp.1-2) notes the term "…*visual literacy* has been in uncommon but intermittent use for over a hundred and fifty years" and defines it as "…understanding how people perceive objects, interpret what they see, and what they learn from them." The emergence of such a phrase at that particular time of the Industrial Revolution in Britain, indicates its dislocation from the perceived priority bestowed upon literacy and numeracy, both deemed essential to equip a class of people – a 'middle' class, between manual workers and the owners of the means of production - with the abilities to read, write and count in the service of administering a burgeoning mass- industrialised economy. Even though the conventions of geometrical projection systems were developed as a specialism of industrial design production, the definition of 'visual literacy' lacks, in Michael Halliday and Christian Matthiessen's (1999, p.17) term, the *semogenic* component of visualcy, which not only embraces Elkins' sense of understanding, but also *the facility for producing the means to understanding through the articulation of visual elements (line, shape, tone, texture, colour) in the construction of images.* This more inclusive definition is in line with Gina Burkhardt's (et al. 2003, p15) acknowledgement of the demands of the expanding field of the digital age requiring "the ability to interpret, use, appreciate and create image and video using both conventional and 21st century media in ways that advance thinking, decision making, communication and learning."

It is worth remembering that drawing's earliest, prime function was to produce and preserve shareable knowledge conducive to our species' survival - such as how to recognise predators!

The popular notion of drawing as a means of self-expression is a relatively recent one deriving from a burgeoning consciousness of a new dialectical relationship between the masses and the individual as a consequence of mass-industrialisation. Faced with such overwhelming mass-social forces, the psychological need to retain and express individual identity became crucial to a European Modernist aesthetic. Reactions to the traditional Academy's attitude to drawing as analytical objectivity and the tight conventions of technical drawing for industrial production gave rise to more pragmatic functions of drawing and art production in general, based on the notion of the subjectivity of the individual eye. Reality, already challenged as a given absolute, was construed more as an individual subjective experience, to be visualised through non-objective, non-academic means: *Expressionism,* through which the distortion of drawn visual elements was deemed to express a disturbance of emotions; both figurative distortions and non-figurative, abstract compositions in which the work itself became subject-matter in its own right, as with Wassily Kandinsky from the first decade of the twentieth century, through the American abstract expressionists of the 1940s, to today's *penchant* for performative gestures by dancing-drawers making marks as indices of their movements.

Drawing and Cultural Evolution

Colin Renfrew's (2008) 'sapient paradox' questions why we large-brained *homo sapiens,* having been around for c300,000 years, did not draw the animals which shared our environment until c40,000 BP (Before the Present)? The drawings may be attributed to emergent social needs of that time: the increase of population densities in environmentally supportive regions would have afforded the convergence of hunter-gatherer groups for ritual or spiritual purposes, but also led to the need for the preserving and sharing of knowledge (how to recognise predators as well as prey!) particularly across social communities exceeding 150 members, a number proposed by Robin Dunbar (2003) as the maximum group

size an individual can manage before the breakdown of oral communication, resulting in social fragmentation and conflict unless some means of externalising knowledge conducive to survival could emerge. As Fiona Coward (2016, p. 86) explains:

> The increasing incorporation of material culture into hominin and human social networks is fundamental to the scaling-up of those networks in time and space which has propelled us from just one group of African savannah-dwelling primate species to the globally dominant and globally distributed species we are today.

Larissa Mendoza Straffon (2019, p. 408) reviews two main approaches to an explanation of what she terms human "species-wide presence of visual art"; one as a side-effect of perceptual experiences, simply a source of pleasure; the other arguing for natural selection, since visual imagery contributed to the survival – and reproduction – of those individuals who produced it. She focuses on the second approach, identifying three hypotheses for the origins of visual imagery (Figure 1):

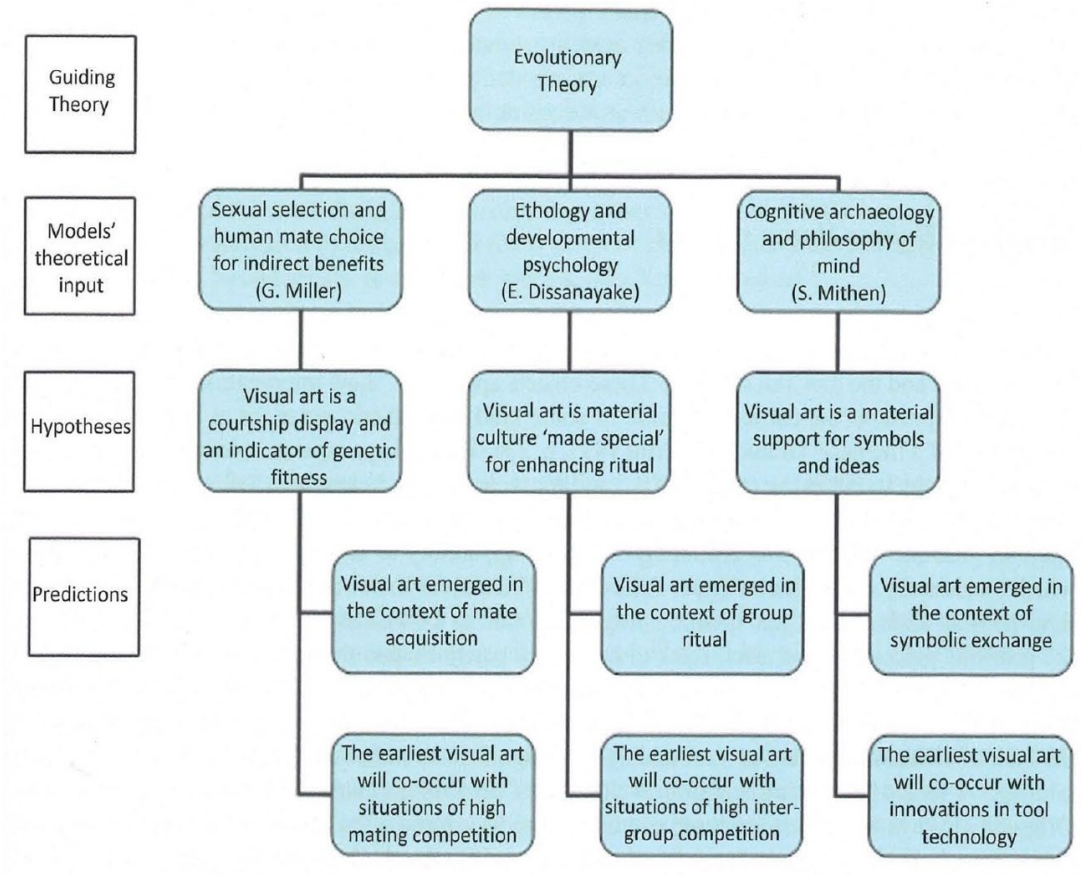

Figure 1 Three hypotheses for the origins of art (Straffon 2019: 409)

Sexual selection hypothesis

Geoffrey Miller (2001) hypothesises that the earliest use of visual art was as bodily adornment, intended as an indicator of an individual's suitability as a sexual mate. Straffon (2014, p.100) refutes this, pointing out that although adornment may be interpreted as such, the archaeological record shows too high a level of standardisation in body ornaments, thus contradicting the notion of individualised attributes.

Social cohesion hypothesis

Ellen Dissanayake (2009) invented the term 'artification' to describe the act of transforming something ordinary - activity or object - into the extraordinary. This, she argues, is an innate human proclivity, a ritualised behaviour effecting social cohesion. Straffon (2014, p. 122) points out that the 'ritualised behaviour' actually refers to art's role as a communication signal, and that the archaeological record does not satisfactorily confirm Dissanayake's hypothesis.

Cognitive adaptation hypothesis

Steven Mithen (1996, p. 163) argues for visual art as "a product of cognitive fluidity", an abrupt redesign of the human mind which merged three separate intelligences, identified as natural history, social intelligence and technical intelligence. The implication being that humans were able to extend their minds by the use of external material culture - visual imagery - attributing meanings to objects, symbols, which are shareable amongst groups. Straffon (2014, p.135) disputes Mithen's hypothesis that the merging of intelligences caused the emergence of visual art, arguing that "…it is more likely that general intelligence has been the standard mode of cognition throughout the whole of hominin evolution."

Visual imagery as semiotic system

Having considered the three hypotheses, Straffon (2014, p. 145) argues that material culture, which includes drawings, is "…the product of a mixture of factors like social organisation, environment, economy, demography, and history," and so "…we should be able to suggest explanations that do not need to invoke any sudden neural changes to account for the development of modern human culture."

The common element in all these hypotheses about the function of visual art (See Straffon, 2022 for a wider review) is the notion that visual imagery is able to communicate: to store, to share information.

> …the evidence indicates that during the late Pleistocene, modern humans started cooperating at scales that required the development of cultural strategies to identify and remember individuals beyond the familiar group. This likely created a new niche for artefacts as social markers, resulting in the emergence of personal ornaments first, and of regional traditions of style and representational art, later. This is consistent with the idea that visual art can be understood as a human signalling system that exploits species-specific perceptual biases alongside our propensity to produce material culture to support communication.
> (Straffon, 2022, p. 1619)

A physiological system evolved to receive information in the arrays of light arriving at the eyes, prompted by the patterns of vertices on cave walls evoking similar patterns as those experienced in the wider environment, would stimulate a potent means to share, within and across the larger social groups, important knowledge conducive to survival that could also be assimilated and expanded by future generations: hence images of predators (and prey) in the form of permanent drawings can be understood as an integral part of the evolutionary process; drawing as a social function, a material means of consolidating social cohesion.

Much later, only c5000 years ago, systems of non-iconic marks were developed, symbols derived from those perceptual primitives which were the basis for drawn representations. Patterns of edges, (T, Y, λ, for example), became the beginnings of alphabets from which selections could be combined to communicate meanings agreed within the social group; the advent of writing. Drawing preceded, and facilitated writing.

Such a provenance ought to be considered strong enough to withstand any attempt to usurp the centrality of drawing in today's educational curriculum. However, the infusion of neoliberal values in the artworld, and their subsequent infiltration of the art school curriculum by politicians and managers unaware of such provenance, indicates that more persuasive argument is required, in order to fulfil its pedagogical potential. Deanna Petherbridge, Professor of Drawing at the Royal College of Art 1995-2001, has argued:

> Learning to draw, while no longer a privileged activity in either school or specialist art teaching, remains an activity of enormous importance and potency for education as a whole. Learning to observe, to investigate, to analyse, to compare, to critique, to select, to imagine, to play and to invent constitutes the veritable paradigm of functioning effectively in the world. (Petherbridge, 2010, p. 233)

Drawing, Aesthetics, and Perception

In his Master's thesis of 1735, Alexander Baumgarten (2007) adapted the Greek word *aisthesthai* which means 'perceive', and invented the term 'aesthetic', to mean 'the science of what is sensed and imagined'. Since then, the discussion of aesthetics has taken place historically within various combinations of parameters, including 'formalist', a study of the material properties of the work in question; the 'socio-political context' which recognises the relationship between the artefact and its social environment; and inquiry into the psychology of the work's maker. In the 21st century, aesthetics has been construed as the philosophy of perception (Nanay 2016). All of which have implications for a pedagogy of drawing, as we shall see.

Nicolas Bourriaud (2002) is regarded as the main theoretician of 'relational aesthetics', a term used to describe artworld activities during a recent period in which emphasis shifted away from any concern with material objects, their formal properties or contextual situations, and instead focussed upon the relationships between visitors to artworld facilities and the

disparate activities they encounter or in which they might participate, contrived by individuals with access to those facilities. Jacques Rancière (2009, p. 56) explained:

> Relational art…aims no longer to create objects, but situations and encounters. In so doing, however, it relies on a simplistic opposition between objects and situations, effecting a short-circuit where the point is to carry out a transformation of those problematic spaces that once contrasted conceptual art with art objects/commodities.

Typical examples include Rirkrit Tiravanija's *Pad Thai* event of 1990 involving the making and sharing of soup in a gallery space, and Thomas Hirschhorn's *Bataille Monument*, a temporary structure at the 2002 Documenta 11 intended as a meeting place for group discussion.

However, we are now in a period of post-relational aesthetics, exemplified by the 2022 Turner Prize nominees (but pioneered by the environmental interventions of Christo and Jeanne-Claude), a period of activities which require a general ability to negotiate the endorsements of financial sponsors and permissions of gate-keepers to stage multi-media mash-ups in public or gallery spaces, what I shall call a *negotiational* aesthetic.

Astute readers will have noticed that the activity of drawing is not central to these latter scenarios, but notwithstanding such artworld diversions, the inherent human faculty so fundamentally semogenic as drawing should be of central importance to the art school curriculum. It is of concern that the prehistorical pedigree outlined in the previous Section, and the theoretical bases of drawing – theories of visual perception and visual communication – have not featured in the drawing curriculum; such essential fundamental bases for the nurturing of a pedagogy of drawing have been displaced by the distractions of artworld trends, and more recently by the ill-informed assumption that digital technology can fulfil all the social functions of drawing. The equating of digital means of visual representation with drawing is actually a *category mistake*. Gilbert Ryle (1949, p.16) first proposed this term, useful to explain the confusion resulting from the error of conflating the social, semogenic and pedagogical functions of drawing with the technical facilities for digital imagery

production. Actually, drawing is the prime means of nurturing an intelligence of seeing (Riley, 2008); whereas digital imagery technology is simply one application of such intelligence. Both deserve pedagogical attention. An intelligence of seeing is understood here as a versatility of vision, to construe the world afresh, to make the familiar strange, to make visible that which is yet to exist, appliable to all human endeavour through all technologies including digital. Drawing is a semogenic process, it is capable of generating new meanings by restructuring perceptual experiences, not merely mimetic, a representational process of recording appearances. As such, drawing relates directly to Bence Nanay's (2016) argument for *Aesthetics as Philosophy of Perception,* which effectively combines the two theoretical bases identified as crucial to the pedagogy of drawing, visual perception and visual communication.

Early opportunities to consolidate the provenance of these theoretical bases of drawing in the curriculum were missed in the first and second Coldstream Reports (1960; 1970), commissioned by the UK Government and chaired by the painter William Coldstream with the remit to make recommendations on the re-structuring of UK art education, The second report (Coldstream 1970, p. 50) had recommended "Not less than 15 per cent of a student's total time on the Diploma course should be spent on complementary studies. Some serious studies in the history of art and design must form part of each student's course." Such a recommendation, intended to boost academic credibility in support of the imminent degree-awarding status of the art schools, did not address the need for developing cohesion between lecture theatre and studio activities; this difficulty, coupled with a dearth of tutors possessing the required versatility across both teaching spaces, and no wide recognition of the specifically-relevant theories of visual perception and visual communication, served to maintain the separation of theory from practice and failed to facilitate their integration in the pedagogy of drawing, since, according to Donald Preziosi (1998, p.521, original italics) the

functions of art history – all art histories - are to do with the "*fabrication of a past that could be effectively placed under systematic observation for use in staging and politically transforming the present.*" Common to all histories is the aim of positioning specifically-chosen objects so that their relations between themselves and with their socio-political circumstances of production, which may include their makers' biographies and the social contexts of production, could be constructed and presented visually in a way fitting the prevailing ideology. Such functions do not encompass the theoretical bases of perception and communication necessary for an informed drawing practice.

However, the recognition of the socio-historical contexualisation of arts practices *was* a valuable outcome of the Coldstream recommendations, one which, contrary to widely-held belief, is compatible with a formalist approach.-'Formalism', in its strictest sense, has described the assessment of aesthetic value of objects, including drawings, solely in terms of their formal, material properties: the arrangement of lines, shapes, tones, colours, textures in various compositional formats and framing devices, accessible through the direct perception of the object under scrutiny, and independent of any knowledge of the object's provenance or context of social production. But these factors are of value to a complete understanding of artworks, to which the Swiss art historian Heinrich Wolfflin (1941) alluded, even in his early, seminal articulation of the formalist position :

> There is in art an inner development of form. No matter how valuable it may be to relate the never-ceasing changes of form to the changing conditions of the artist's environment, and no matter how indispensable the character of the artist and the intellectual and social structure of the age may be to explaining the physiognomy of the artwork, it should not be overlooked that art, or rather the formative imagination in its most general possibilities possesses a life and development of its own. (Wolfflin, 1941, p.8; in Gaiger, 2022, p.189)

Wolfflin had first proposed his *Principles of Art History* in 1915, perhaps more accurately identified as 'fundamental concepts' (Nanay, 2017, p.106), as a contribution to the understanding of 'style', specifically the differences between Renaissance and Baroque

periods. Since then, they have been recognised as applicable to all historical periods, including the contemporary (Wiesing 2016). Most recently translated by Jonathan Blower (Wolfflin 2015), the *Principles* are still eminently suited for integration within a contemporary studio/seminar context:

1 *Linear versus Painterly*:
Linear: contrast boundaries between tones, colours or textures representing edges, depicted as sharp line.
Painterly: boundaries as blurred edges between shapes of tone, colour, texture.
2 *Planimetric versus Recessional*:
Planimetric: depicts the pictorial space as a sequence of planes.
Recessional: emphasises depth, as in the use of perspective geometry and occlusion.
3 *Closed versus Open Form*
Closed: composition dominated by the structure of verticals and horizontals contained within the picture; pictorial elements balanced around a central axis. The scene contained within the frame.
Open: use of diagonals to destabilise the balance contained within the frame; sense of scene continuing beyond the frame.
4 *Multiplicity versus Unity*:
Multiplicity: multiple single parts, components of the scene, appearing independent of overall cohesion.
Unity: abolishes visual independence of the parts in favour of a more unified wholeness.
5 *Clearness versus Unclearness*:
Absolute clarity: revelation of separate forms, distinct from spaces between, through clear lighting.
Relative clarity: pictorial objects and spaces between, integrated in pattern of light and shadow, no clear separation.

The Russian Formalists, as the name implies, were early advocates of Wolfflin's work (Mechelen, 1998), including the linguist and literary theorist Roman Jakobson, instrumental in setting up the Moscow Linguistic Circle 1915. By 1920 he had moved to Czechoslovakia and became involved with the Prague Linguistic Circle inaugurated in 1926, where he effected a transition from strict Formalism, focussed upon the specific formal, material properties of an artefact in order to define its aesthetic values, towards a position which recognised that:

> …ideological and emotional content was a legitimate object of critical analysis, provided that it is examined as a component of an aesthetic structure. Pure Formalism gave way to Structuralism (Erlich, 1965, p.159).

This structuralist approach was summed up in Prague Circle member Jan Mukarovsky's (2015) *Aesthetic Function, Norm and Value as Social Facts,* first published in 1936, in which he argued that *any* material object could be interpreted as an aesthetic object, depending upon its position within a wider, contextual structure. Mukarovsky's intention was to challenge the trait of the dominant bourgeois aesthetic theory of the time, which served to mystify 'art' as a kind of 'creation', a word connotative of ineffable intuition not far removed from its original connotation of divine intervention, separated from its own material processes and, especially, from the production of commodities. Instead, he proposed an alternative: a sociological understanding of the aesthetic as a *function* of the artefact interacting within the social context in which meanings and judgements are made: its background of place, time or the person evaluating it:

> an active capacity for functioning aesthetically is not an inherent property of an object, even if it were deliberately created with that in mind; it only transpires under certain circumstances, specifically in a given social context. (Mukarovsky, 2015, p. 288)

He thus marked a distinction from the Formalist premise of the *aesthetic* as the sensory response to a property of the artefact itself. (Incidentally, he had also anticipated Arthur C. Danto's (1964) theorising such social context as the 'artworld'). Mukarovsky had developed an early version of what Bence Nanay (2016, p. 91) has called "Semi-Formalism", a way of expanding the range of purely formalist properties to include semi-formal properties, defined as: *"properties of the picture that depend constitutively on (or are identical to) the picture's formal properties."* (Nanay, 2016, p. 99, original italics). Such semi-formalist properties embrace the artist's intention, the social context of the work's production, as well as the art-historical context (Nanay, 2016, p. 111). Examples of a semi-formal property might include the actual materials of the work being uniquely associated with a particular place; or its geometrical projection system being identified with a specific period in history; directions of

the lines of gaze implied between two or more figures in the scene, or a particular style of cross-hatching influenced by precedents from art history.

Mukarovsky was an advocate of 'semasiology', better known today as semiotics, the science of signs first codified by Ferdinand de Saussure (1916). In 1946 he wrote:

> Everything in the work of art, and in its relation to the outside world…can be discussed in terms of sign and meaning; in this sense, esthetics (*sic*) can be regarded as a part of modern science of signs, semasiology. (Mukarovsky in Erlich, 1965, p. 159)

A more recent development which integrates the formalist and the social context approaches within aesthetic theory is the systemic-functional semiotic theory informed by the work of linguist Michael A.K. Halliday (1978) and adapted by Michael O'Toole (2011) in *The Language of Displayed Art,* O'Toole's three functions of visual communication are adapted in this article:

1 *Experiential* (O'Toole's *Representational*), to convey some aspect or experience of the world.

2 Interpersonal (O'Toole's *Modal* function), which refers to the maker's formal decisions affecting the mood and attitude of the viewer.

3 Poetic (O'Toole's *Compositional* function), relating to the maker's selection and combination of the visual elements which structure the work.

The role of visual perception, fundamental to the pedagogy of drawing along with the theory of visual communication, is recognised in the *Experiential* function, and its realisation in the *Poetic* function. Perception of our environment is a pre-requisite not only for moving within and acting upon it, but for reflecting upon and making sense of it, so as to share with others. Until James J. Gibson (1979) proposed his ecological approach to the understanding of visual perception, all theories were based on the assumption that the retinae are passive receivers of light stimulation, stimuli which are then processed into knowledge either by an assumed innate capacity for interpreting the stimulus (nativist theory), or by a process of unconscious

inference, matching the stimulation with stored previous experiences (empiricist theory).The fallacy in both these assumptions is the belief that the arrays of light arriving at the eyes contain no information about the world, (even though they have been structured by reflection from surfaces in that world), so they must be augmented through some kind of mental processing. The subsequent arguments over whether knowledge comes from innate knowledge embedded in the brain (nativist), or from previously stored knowledge (empiricist), beg the question: knowledge about the world cannot be explained by supposing that knowledge of the world already exists. Even so, Ernst Gombrich's (1960) *Art and Illusion,* based on a mixture of these nativist and empiricist ideas, is still better known in the art schools than Gibson's ecological approach to the understanding of visual perception. As Norman Bryson (1983, p. vii) observes, Gombrich's emphasis upon perceptualism and his suppression of the social character of images leads him to the false notion that drawing is a "record of perception". Contrary to Gombrich, Gibson (1979, p. 280) explains "A picture is not an imitation of past seeing…What it records, registers or consolidates is information, not sense data".

Let's not forget that the intelligence of seeing is inherently interdisciplinary, operating across the domains of visual perception and visual communication, which should therefore inform the theoretical context for any pedagogy of drawing. Firstly, a pedagogy of drawing can extend perception, by developing an awareness of how to 'change channels' so as to organise information about different aspects of the world: *distal* values, information about the viewer's position in relation to surfaces in the *visual scene* – the spatial environment under scrutiny; *haptic* values, related to the textural qualities of the surfaces in the scene; and *proximal* values, relating to the overall pattern of the *visual field* – the total area visible whilst the eyes focus upon a central point in the scene. These 'channels' may be tuned to different

levels of attention to the visual scene; attention distributed across the visual scene as it appears in the visual field, and/or attention focussed upon specific features in the scene. Secondly, the practice of drawing through an informed pedagogy can develop the sensibility to communicate, to articulate ineffable meanings: to select and combine visual elements from the paradigms of line, shape, tone, colour and texture, producing drawn equivalents, transforming perceptual experiences relevant to the functions of the specific communication as identified above.

The Poetic function operates through the twin processes of *selection*, made from the paradigms or 'systems' of choices available, and the *combination* of those selections to produce the syntagm, the composition. (Figure 2):

Paradigms of Elements (Selection)	**Syntagms of Elements (Combination)**	**Communication**
		Spatial depth
Point	Contrast	Force
Line	Proportion	Direction
Shape (2D)	Scale	Movement
Texture	Pattern	Volume, Mass, Weight
Tone	Rhythm	Balance
Colour		Symmetry
Plane		Structure
		Form (3D)
		Surface properties
		Observer's position(s), mood, attitude

Figure 2 Paradigmatic selection, syntagmatic combination of visual elements.

The paradigms of choices, labelled 'systems' in O'Toole's (2011, p. 11) model, available in order to realise those functions, are identified under each function at each level of engagement, hence the term 'systemic-functional' semiotics. (Figure 3).

Function / Level of Engagement	**EXPERIENTIAL** (*what* is represented: experiences of the world)	**INTERPERSONAL** (how the viewer is *positioned* in terms of mood and attitude)	**POETIC** (*how* perceptual and emotional experiences are represented)
Drawing as Displayed	*Proximal* Perceptual Values Theme Narrative content Genre Representational/abstract Interplay of episodes.	Attitude, Modality: Intimate/Monumental Public/Private Active/Passive Rhythm/focal points Dynamic/Static Calm/Agitated	Overall format and size Gestalt relations: horizontals, verticals, diagonals Framing devices Colour palette Rhetorical tropes
Episodes of the Drawing	*Distal* Perceptual Values Primary geometry (layout of surfaces and edges) Actions, events central to narrative. Distance between surfaces in the scene	Position relative to scene (orientation of viewer) Gaze/eyework Modality: happy/gloomy, calm/excited etc.	Secondary Geometry: (systems of projective geometry) Interplay of figures/passages Contrast of tone/texture
Combinations of Marks (sub-assemblies)	*Haptic* Perceptual Values Edges: occlusion of surfaces Direction Transparency/opacity Atmosphere Time of day	Sense of 'affordances' in the scene. Heavy/lightweight Flatness/illusions of depth	Textural qualities of media/ground Relative positions of marks Relative sizes of marks Division of picture-plane: ratios, angles Overlap of shapes/tones
Individual Marks	Effects of light on surfaces in the environment. Spatial depth Scene Primitives	Sense of textural differences Indices of mark-maker's movements: speed, pressure	Position and size of marks within picture plane Interaction between medium and surface. Picture Primitives.

Figure 3 A systemic-functional semiotic model for drawing. (Riley, 2019, p.137)

O'Toole demonstrates the potential of the systemic-functional semiotic model for making sense by integrating the formal properties of artworks with their socio-political contexts, but despite these developments in communication theory and the demonstration of their efficacy in the pedagogy of drawing (Riley, 2006; 2014; 2014a), recent research indicates

that drawing's perceived importance in the art school curriculum is still waning (Fava, 2019), this time caused by the narrow assumption – the 'category mistake' mentioned above - that its main function as a means of representation is better served by digital means.

This has led to a range of efforts to redeem drawing, but the most prominent of them adopts a simplistic attitude which can only be described as reactionary, and therefore unconvincing: Jason Gaiger (2022, pp.159-60) critically evaluates the thrust of this conservative, emotive argument specifically for painting (but, I would argue, equally relevant to drawing) which vaunts the "expressive warmth and subjectivity" of painting (and drawing) over the "cold functionality" of digital means. More measured and therefore more convincing, are the arguments based on research into perception and cognition (Chamberlain 2022; Fan, Bainbridge et al 2023).

Drawing and Pedagogy

The provenance of drawing in human history as outlined earlier might be considered persuasive enough to withstand any ill-informed attempt to usurp its centrality in the educational curriculum. However, the infusion of neoliberal values in the artworld, and their subsequent infiltration of the art school curriculum indicates the opposite…and here we begin to understand why digital tools have become ubiquitous: education managers, oblivious to drawing's potential for nurturing intelligence let alone its provenance in human development, allay their concerns about its demands on the curriculum time-table (under the influence of external pressures from a competitive employment market applied through government policy), by embracing digital tools which they misunderstand to be the most direct and economical means – a quick fix - for courses involved in visual communication. Digital applications using built-in algorithms for transforming 3D to 2D are much faster (and therefore misunderstood as cheaper, more efficient) than the time required for drawing

practice which nurtures the development of neural processes transforming the visual scene *via* the visual field into new understandings of our human condition.

Such decisions ignore completely how drawing relates – integrates – many disciplines, as identified by Seymour Simmons (2021, p. 323, my italics):

> …architecture and design *(geometrical projection systems)* with their dependence on mathematics; observational drawing with its relevance to natural science *(particularly theories of visual perception)*; experimental approaches to drawing as aligned with experimental science; expressive drawing with its link to therapeutic psychology; and semiotics connecting the "languages of drawing" with other graphic symbol systems.

All of which afford the development of another faculty mentioned earlier; a versatility of levels of attention.

Drawing exercises may be directed by each of four modes of attention (Nanay, 2016):

1 Distributed attention to objects, and focused on their properties
Awareness of the *proximal* values, the general pattern of the overall scene, with a focus on the *haptic* values – the variety of textural qualities in the objects, or contrasts in their size, shape and colour.

2 Distributed attention to objects, and distributed across properties
Awareness of the *proximal* values of the scene, the overall pattern of 'positive' object shapes normally labelled with language and the 'negative spaces' between those objects. General awareness distributed across the *distal* and haptic values.

3 Focused attention to objects, and focused on properties
Concentration on an individual object within the scene, focused on its attributes: texture, colour, size, shape, edge qualities,

4 Focused attention to objects, and distributed across properties
Attending to the *distal* values, the cues for depth at edges of objects, construed as contrast boundaries between tones and textures; and aerial perspective, the gradation of density of tone between foreground and background,

The four modes of attention inform the proposed drawing pedagogy which is structured as a series of themes relevant to the nurturing of an intelligence of seeing, with potential to exercise those modes.

The individual steps of the teaching strategy offered below, each familiar to all competent teachers of drawing, are here coordinated, based upon post-doctoral research reported in Riley (2014) and Chamberlain et al. (2015) which indicates a correlation between the ability to draw objectively and the development of an intelligence of seeing, explained to students as

an awareness of the inter-relationships between ways of seeing, social belief systems and ways of drawing. The eight-step teaching strategy is inclusive, based upon the students' conscious knowledge of their own patterns of behaviour in a learning situation, developed from procedures devised by Sherrie Nist and Donna Mealey (1991) to aid dyslexic students, summarised by Tilly Mortimore (2003, p.113), and tested in drawing workshops at the Royal College of Art (Rankin, Riley et al. 2017):

1 To practise the four levels of focusing attention upon the subject-matter and its relationships with the surroundings (*figure/field* relations); relationships of *format* (portrait, landscape, square, or other), and *scale*, (related to the choice of drawing medium, since medium dictates scale); and positioning of the drawing within the picture-plane (the drawing sheet itself) relevant to the *main axes* of the drawing sheet: the central vertical axis, the central horizontal axis, the two diagonal axes, and others, such as the Golden Section.
2 To construct a general structure, or *scaffolding*: in terms of life-drawing, this would relate to the main axes of the model's pose, using the '*N-grid'*, lines running across the figure that connect salient points such as *N*ose, *N*ipples, *N*avel, (k)*N*ees, and (k)*N*uckles. These axes serve as the means by which students hone their skills of accuracy in drawing angles and lengths in proportion, so that the repetitive, low-level exercise is perceived to have contextual meaning for the student.
3 To understand and apply concepts such as *contrast boundary* in place of the common term 'outline'. This immediately engages the student with the variety of tonal and textural values across the whole subject-matter and, in particular, allows the student to notice how the contrast boundary fluctuates at the edges between figure and field. The concept of *negative space* (spaces between those items normally labelled with language in the visual field), can also aid students to look without language, to apply specifically non-verbal methods in the process of drawing. Thirdly, to pay attention to the visual vertices, simply described as *T and Y junctions* apparent as edges where two surfaces are occluded by a third. (Biederman 1987; Ostrofsky and Kozbelt 2012)
4 To repeat these first three steps at the beginning of every new drawing. The tutor might demonstrate the steps at this point.
5 To discuss with the tutor the process under way on the drawing board.
6 To repeat the recommended strategies with support from the tutor.
7 To draw independently at unsupervised open-access drawing sessions.
8 To reflect upon and critically assess the practices and strategies in order to reinforce them. This procedure takes the form of a group pin-up crit session with guidance from the facilitators.

This strategy for the teaching of drawing may be integrated in themes amenable to the structuring of a whole academic year, as suggested here:

1 *Levels of Perception*: introducing terminology of the drawing studio: *haptic, distal* and *proximal* values: textural qualities (Fig. 4) depth of field (Fig. 5) and pattern information

(Fig. 6) contained in the structure of light arrays arriving at the eyes; *negative spaces:* the shapes between objects in the scene; *contrast boundaries:* edges in the scene, visible because of different tones or textures either side of the boundary; *T and Y junctions*: vertices, patterns of edges where one surface overlaps two others in the scene (these may be seen at various levels of scale, i.e. fractal structures).

Key text: Ian Gordon (2004) *Theories of Visual Perception.* 3rd edition London: Routledge.

Figure 4 Amanda Maria *Haptic values*

Figure 5 Howard Riley *Distal values*

Figure 6 William Reimnitz *Proximal values*

2 *Seeing and Believing*: awareness of how cultural beliefs inform *1)* ways of seeing, and *2)* ways of representing those beliefs in visual work. Geometric projection systems representing space on a flat surface (Fig. 7). Key text: John Willats (1997) *Art and Representation.* Princeton, NJ: Princeton U.P.

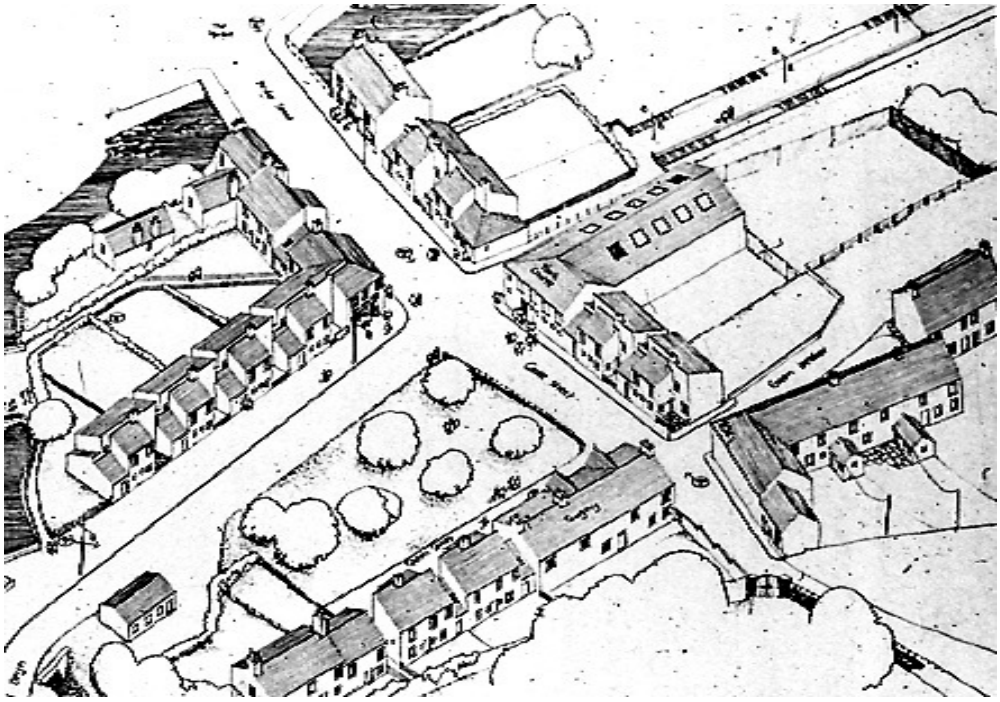

Figure 7 Howard Riley *Planometric projection*

3 *Functions of Drawing*: Experiential (subject matter); Poetic (how subject matter is presented in visual form); Interpersonal (how compositional choices position viewers in terms of mood and attitude towards the subject-matter).
Key text: Michael O'Toole (2011) *The Language of Displayed Art.* 2nd edition. London: Routledge.

4 *Strategies of Visual Communication*: Rhetorical tropes: metonym, metaphor (Fig. 8), oxymoron, pun, ways of enhancing perceptual and conceptual intrigue.
Key text: Marcel Danesi (2017) Visual Rhetoric and Semiotic. In *Oxford Research Encyclopaedias, Communication.* Oxford: O.U.P.

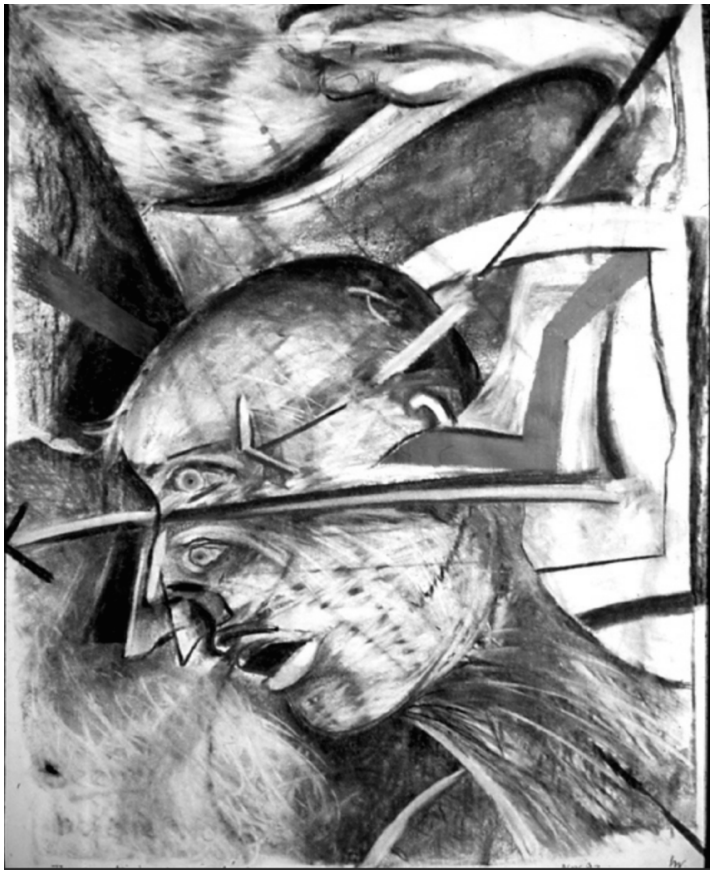

Figure 8 Howard Riley *The Uncertainty of Perception*

5 *Drawing as Process of Transformation*: from primary geometry (3D) to secondary geometry (2D) (representationalism); from cultural values into material form; from individual feelings to social communication (expressionism); from mental concept to visible percept (Fig. 9).

Key text: Patrick Maynard, (2005) *Drawing Distinctions.* Ithaca, NY: Cornell U.P.

Figure 9 Howard Riley *Drawing Precedes Writing*

Last word

This article has argued that drawing is an interdisciplinary research process which deserves to be at the heart of education. It has indicated how a pedagogy of drawing can enhance an intelligence of seeing, and the extension and sharing of knowledge. *Education;* from the Latin *educare:* to draw out…

> Since…we make the world…we can unmake it. We can then fit the parts together in different ways…this is what a gathering of arts teachers should be up to: exploring the possibilities of remaking the world.
> (Leach, 1983, p.5)

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