We live in an era of endlessly faster and more mobile technology that allows us to be constantly ‘connected’ through more ingenious devices each day. Cell phones, i-pads, i-pods, laptops, wi-fi networks, video games allow blogging, instant messaging, and browsing on the worldwide web. Blurring the boundaries of office and home, work time and personal time, days into hours, hours into minutes, minutes into seconds, and seconds into nano-seconds.

However rather than embracing this phenomenon of efficiency, I felt that the escalating and continuing valorisation of information and scientific rationalisation over insight was threatening to engulf my existence. With digital computer technology now standing behind so many inventions and processes in our lives such as cash registers, cars, T.V., traffic lights and even vacuum cleaners, I was increasingly seeking refuge from this modernity and most notably as an artist, in the ‘humble’ drawing.

Drawing that is so refreshingly unpretentious, so human in its immediate, intuitive, physical and intimate nature. Low-tech in its demands, using the sense of touch to encourage experimentation and deep connection, not just capturing a single image, space and time, but rather numerous moments, narratives or ideas embodied in the image. Absorbing, seeing, hearing, smelling, touching and thinking, retaining the all-important imprint of humanness that is vital to remembering who and what we are.

My first series of works ‘Rituals 1’ that I am presenting to you today, mirrors these thoughts and establishes drawing as a medium of research and notation within my practice. Marking the first point of discovery in my navigation of my mental landscape, that of my primal need to recapture the haptic and unconstrained kindergarten art creations of my past. Charlotte Huddleston writes in the catalogue for Diagram about my work; “Emma Febvre-Richards work Rituals 1 developed from
her timetabled life. Unlike Morris its genesis was not a studio exercise, but it is a way of working that is structured and worked into the demands of daily life. Febvre-Richards has referred to the process as a ‘forced spontaneity’. The 21 pieces of Rituals 1 all developed from one spontaneous beginning where Febvre-Richards got an A3 piece of paper put it in a tray, added a paint-covered marble and rolled it around on the paper. Febvre-Richards scanned this template and then methodically set about working on the drawing with Illustrator software going from left to right in hour-long blocks of time, changing all the curved lines to straight ones. Febvre-Richards’s imposition of the ordered line onto the spontaneous curve brings about a transformation in which has an inherent association of logic and analysis. Once the lines were created digitally the drawing was then etched laser cut onto a piece of paper. Each hour-long block of time is one piece of paper. The work describes the 21 hours it took Febvre-Richards to digitise and straighten the lines made by the trajectory of paint-covered marble. Like Morris’s diagrammatic and temporal accumulation of time on each canvas, the 21 sheets of Rituals 1 accumulate the hours spent on each section – the first sheet contains the marks inscribed in one hour, the last all 21 hours.” (2)

Ironically though, it was by making this work with Photoshop that my sensation of technological claustrophobia began to unravel. For it was only when I engaged with the software of Photoshop that I questioned my first ‘act’, which in this case was to choose a document size. I had originally created the spontaneous drawing on an A3 piece of paper and put it into an A3 box lid to roll the marble without any consideration of that fact that I was already working within a system of international paper sizing dictated by mass manufacturing. My unfamiliarity with Photoshop had triggered my consciousness to recognize this ‘step’ that normally ‘flew under the radar’, as it was part of my ‘automatic’ routine. Slowly it was dawning on me that maybe the drawing that I had seen as an outpouring of spontaneity was hemmed in. Had this outpouring of creativity now become a metaphor for our unwitting existence between boundaries and constraints? How much of my life was ‘molded’ in this unconscious manner?
Therefore, I returned to childhood creation again to investigate another given, language. Arguably one of the most vital and intricate forms of knowledge that we will ever acquire in our life times, that is the vehicle of our thoughts and indeed it is very difficult for me to imagine ‘thought’ without it.

Not all thought of course is linguistic as it is intimately tied up with emotion and intuitive reasoning, but I was wanting to concentrate on language, for just like the paper sizing, it is a system/process that we utilise often without conscious recognition of its structure or implications. Early in life we master the system of communication that has a limited number of signals (verbal, written and gesture) that can be combined within pre-determined rules to create an infinity of possibilities while representing the objects, people and ideas that are relevant to the community.

Basic language skills are established mainly through informal means such as parents, peers and media. However my project ‘Rituals of Control: 1A7’ considered more closely the early formal scholastic education, which uses basic language skills to cultivate reading, writing, thinking, and problem solving skills. My starting point was again pre-school art creations, this time the technique of dipping string into Indian ink and splattering it onto an A3 page. This was in turn scanned and overlaid by the sentence structure and spacing of a phrase that I as a child had used repeatedly at primary school to improve letter formation, as it used every letter from the alphabet, “A quick brown fox jumps over the lazy dog”. Photoshop allowing me to investigate how text’s learnt cultural ‘code’ of serial processing could affect the original image.

This exploration produced seven bodies of laser-etched works whose formats are affected by the exercise book model that it uses, namely the sizing of the pages and line spacing, starting from learning to write 9mm space to college sized lines. Each series are etched at 5 sentence intervals revealing a process of deletion, overlapping and an aesthetic of code. The final piece of each series revealing the elements of the drawing that remain, as they were spaced within the accepted word structure
system of intervals and sentence structure. All other mark making has been erased, the words have now become the allowed space of creation according to the system.

This lead in turn to 2 points of interest, firstly that visually the physical and immediate process of writing produced an aesthetic that could be easily misinterpreted as a computer code and intriguingly as Maori Toku Toku panels, cross stitch and western habitation patterns; and secondly that the methods that I had employed in Photoshop such as the layering function had led to a further avenue of enquiry, as to whether rather than perceiving software as being an impediment to our ‘natural’ thinking processes, was it a reflection of our own brain function? Constantly moving back in forth in layers, infiltrating and embroidering our every action and thought?

‘Rituals of Code: Volumes’, started developing and emphasising the above by referencing aerial photography of habitation, architecture, craft, cultural and mental rituals. ‘Join the dots’ diagrams implying our constant desire to find mental connections and patterns within two and three, dimensional space. However the complexity of my subject had become very apparent and even though I had responding to my findings in an instinctive manner, further investigation became necessary.

Now seemed that time to begin to explore the vast and complex ‘machine’ of brain function. Our nerve cells capacity to communicate to each another by a hundred trillion interconnection (O’Shea 1) leading to the metaphor of the brain being the most sophisticated complex computer in existence! Please note that this is not to say that the brain is isolated in its function as it is influenced by our body, with breathing, heart beats, emotions, movements, environment, cultures and so forth, but rather that we recognise that the computer provides a useful analogy when considering our capacities to acquire, remember and use information. I have selected for consideration schemata and Information-Processing and problem solving.
Schemata are the cognitive structures, organised patterns of action or thought that people construct to interpret their experiences (Rider and Sigelman 211), like setting a series of rules that adapt to new environments. Children systematically and unconsciously combining existing schemes into new and complex ones all the time, for example, classifications of objects to performing mental actions on objects such as adding and subtracting.

The Information-Processing approach is used to understand the basic cognitive processes people rely on to learn, remember and solve problems (Rider and Sigelman 276). By using the computer analogy it shows that the minds schemata is ‘software’ with rules strategies that specify how information is to be registered, interpreted, stored, retrieved. The human ‘computer’ taking in information through sensory registers, which hold the information for a brief period, if this information is of any worth to the person the information is registered into the short-term or working memory, eventually leading to the possibility of long-term memory. We then retrieve this information through recognition, recall and cued recall.

Explicit memory involves deliberate, effortful recollections of events (for example history dates and so forth), changing over a life span while implicit memory, is automatic occurring unintentionally (for example knowing how to ride a bike), is learnt earlier in life and is relatively stable. Both of the mentioned being different components of long-term memory and are stored in different parts of the brain. The reason that this is an important factor is that stored memories are instrumental to problem solving or to achieving a goal. As adults become experts in particular fields they develop highly effective, specialized and automated ways of retrieving and using their knowledge. (Rider and Sigelman 271) How would this then apply to creative processes?

Creativity is historically renown as a type of intellectual ability that is difficult to measure through traditional intelligence tests, as they designed for convergent thinking, “converging” on the best answer to a problem. Creativity being defined as the ability to produce novel work that involves divergent thinking, which means
coming up with a variety of ideas or solutions to a problem when there is no single correct answer. It is interesting to compare this definition to Jean Paiget’s (Qtd in Papalia, Wendos Olds and Duskin Feldman 323) definition of intelligence in general, “Intelligence is a basic life function that helps an organism adapt to its environment” while others such as Steinberg have suggested that intelligence is the ability to think abstractly or to solve problems. But do these definitions mean that artists do not follow the Information-Processing approach to cognitive processes?

Aaron Kozbelt (80) paper is of particular relevance to this question and discusses how artists develop particular strategies to enhance functioning in the visual field. Suggesting that these strategies operate in two ways (a) Declarative (explicit) knowledge of the “structure of appearances” of objects and scenes and (b) motor priming (implicit) achieved by proceduralization of declarative knowledge through extensive practice in an artistic medium. The former referring in length to Gombrich’s (Qtd Kozbely 81) argument of schemata, such as how-to manuals, verbal descriptions, techniques and so forth that are used to train artists and influence artist perception in characteristics of, an object or scene, in placement and proportion, and desired rendering effects. Establishing general systems that bias artists perceptions of what to attend to when translating what they see into drawing and painting. Anderson (194) pointing out that this knowledge/memory and schemata need not be static and it is through extensive practice it can be applied to different points of the problem solving process, allowing quicker resolution and the ability to execute even more complex motor actions. Fitts (243) extending this further by documenting how the next stage transitions from reliance on the conscious to more automatic control by testing tasks and associating them with success or failure, finishing with more automatic phrase that requires little conscious effort (implicit).

Therefore it would seem unlikely that the basic principles of information processing are radically different in the artist and the non-artist, but rather in the schemata that we choose to acquire. Remembering that a person must be well grounded in their
field before they can see its limitations, envision radical departures and develop new and unique points of view (Duskin Felman, Papalia and Wendkos 508).

There are few case studies of artist’s processes while they are actually making work with the majority of studies concentrating on that factors that contribute to artistic activity such as personal history. But I continued to seek qualification of phrases such as “Drawing is the language of the visual mind. Drawing is the mind’s best, fastest, and most flexible way of thinking” (Brown 142)

Betty Edwards book Drawing on the Right Side of the Brain aligns drawing skills to the right hemisphere of the brain. The right hemisphere being that of the non-verbal, intuitive, spatial that thinks in holistic patterns and pictures and is used for visual perception processing, while the left hemisphere is affiliated with science and maths because it houses the verbal and analytical, working in a serial, linear fashion, reducing thoughts to numbers, letters and words. Certain skills and demands, such as drawing, stimulate stronger hemispheric responses than others.

Nevertheless further research using MRI, PET and EEG technology has shown that all tasks stimulate bilateral processing activity (Schiferl 76), suggest that linear and holistic thought are not in opposition but are rather a complimentary team, a hemispheric partnership.

Paul Locher in his chapter “How does a Visual Artist Create an Artwork?” (140) confirms this finding by pointing out the art draws on many areas of the brain. These including the functions that lead to visual creativity such as planning, structural organisation and drawing skills to that of visuomotor processes which are involved in the formation of symbolic and linguistic concepts, and emotions. He then goes on to discuss Solso (Locher 141) study of the brain activity of a skilled portrait artist to that of a non-artist. Findings showing that the artist while drawing a portrait, showed greater activity in the right-middle area of the brain than the non-artist with the same activity, this area being associated with more complex associations and manipulations of visual forms, and planning of fine motor responses of the hands.
Solso concluding that this would show a higher level of interpretation of the subject and that an artist ‘thinks’ portraits more than he sees them.

Further analysis of Edward’s theory also illuminates that the Western ‘realistic’ approach that it condones requires the suspension of natural visual recognition (Schiferl 78). Survival is the driving factor of eye function and Findlay and Gilchrist (Qtd Schiferl 75) point out that the constant movement of our eyes darts to significant forms, sensing movement in the environment to alert us to danger, with constant changing points of view creating the illusion of seamless sight. Thus by drawing in a Western ‘realistic’ manner Schiferl suggests that one is suppressing natural visual processing, suspending normal hierarchy of vision to treat surfaces, edges and distance as an end in itself unrelated to the significance of the object to the viewer. In a sense producing stylised method of rendering objects.

Art making is influenced by many factors such as personality of the artist’s personal history and pictorial conventions. Motivation, culture and historical factors also playing their part in the content and style of an artwork and creative processes employed. Current brain imaging techniques, showing how neural pathways can be differently activated from handling different writing systems (Mangen and Velay 385). MRI experiments revealing Japanese readers use different pathways- when reading kana (a syllabary used mainly for foreign, or newer words) their activated pathways are similar to English readers but in contrast when they read kanji (an older logographic script influenced by Chinese) they use pathways that are comparable to those used to the Chinese.

Park and Huang in ‘Culture Wires the Brain’ discusses how there is evidence that sustained exposure to a set of cultural experiences and behavioral practices will affect neural structure and function (393). One of the examples being the behavioural data from Kitayama, Duffy, Kawamura and Larsen (201) that indicates that East Asians have a bias towards holistic, contextual processing, whereas Americans prefer focal objects in visual stimuli. Further data from (Chiu, 235);(Ji, Zhang and Nisbett, 57) supporting that East Asians prioritise relationships between
objects (e.g., cow-grass) whereas Westerners categories (e.g., cow-chicken) with Westerners being more likely to rely on formal reasoning than intuition when presented with a dilemma but the reverse being true for East Asians (Norenzayan, Smith, Kim and Nisbett 653).

Could we then question the commonly held belief by scientists and philosophers that our ‘brain circuit’ minds and behaviour are ‘hard-wired’? Alvaro Pascual-Leone (Qtd Carr 345) would think so, as he shows that our brains are constantly changing and reworking their circuitry through experience and behaviour. With Neoplasticity studies revealing that cellular components in the brain do not form permanent or rigid roles, but in fact are flexible, changing with experience, circumstance, need and the tools they use.

Recent studies in writing and literacy have addressed the physical and tangible writing device of pen on paper, computer mouse and keyboard or digital stylus pen and writing tablet (Mangen and Velay 385) indicating that perception and motor action are reciprocally dependent, with changing technologies of writing having profound implications on structuring sensorimotor and hence cognition processes. Different technologies set up different spatial, tactile, visual and temporal relations between the writer’s material body and their material text, writing has always been reliant on crayon or stylus or laptop but each entails distinct differences in haptics. Handwriting is unimanual, where typewriting is bimanual, handwriting is a slower, requiring intense visual focus on the tip of the pen while during typewriting the visual attention is continually oscillating as it is detached from the haptic input namely that of hitting the keys (motor space) to that of the screen (visual space).

Therefore what effect do ‘thinking’ technologies have on our brains? Nicolas Carr (201) shows that there is growing evidence that it is the tools we use to extend or support our mental activities that have the most effect on how we think. Technologies affecting how we deal with information direct our attention, how we forget and how we engage our senses. Emphasising that even though each individual and community make decisions about the tools, we are rarely conscious of the fact
that our routines often follow paths laid down by these technologies. The more practised skills becoming the most dominant.

Marshall McLuhan (Qtd Carr 203) who published ‘Understanding Media: The Extensions of Man’, pointing out that “the medium is the message”, with the medium’s content mattering less than the medium itself in influencing how we think and act. Jaron Lanier (2) in his book makes the connection from tool use to that of behaviour and thinking. “You are not a Gadget,” points out that software engineers’ design decisions that ultimately shape and ‘lock-in’ users’ behaviour. Emphasising how software design may yield “defining, unchangeable rules” for generations to come, strengthening new neural pathways on our brains while weakening others. Nevertheless I would indicate that any ‘repetitive’ gesture, such as handwriting also locks in behaviour, and Paiget’s definition of intelligence was “Intelligence is a basic life function that helps an organism adapt to its environment”.

Carr in turn points out that even though the Internet has developed users’ hand-eye coordination, reflex response, fast problem solving, and processing visual clues, with Web surfing engaging many brain functions that are beneficial in old age, the Internet tends to overwhelm us with information and inundate us with mental stimulation it constantly divides our attention. “The Net’s cacophony of stimuli short-circuits both conscious and unconscious thought, preventing our minds from thinking either deeply or creatively. Our brains turn into simple signal-processing units, quickly shepherding information into consciousness and then back out again” (119) By embracing technologies conveniences and possibilities he suggests we are at sensory overload.

But lets consider what drawing is, as drawing has never existed only as a medium on a page. Traces in the sand, cave painting, 1960’s post-minimalist explorations such as Smithson’s ‘Spiral Jetty’ (1970) and Mona Hatoum’s ‘Cube’ (2008) has shown us that drawing is an ‘expanded field’. Drawing implements/ tools mirroring technological advances, whether that be from pigment to paint to crayon to coffee stains and now to computers. Each medium and technological advance dictates new limits and ‘looks’ for the art making process, such as watercolour washes, pre-mixed oil paints
in tubes heralding ‘Impressionism’, and now the computer technology bringing animation, graphics for video games and complex architectural drawings to the mix. Man is a tool using animal, and as such every art form evolves from this base and as Garrels (2002) states, “Drawing has sustained an enormous vitality, unfazed or perhaps in part even energized by the proliferation of mechanical and electronic means of image –making –photography, film, video, the ever growing range of computer technologies. Works we can legitimately call drawings are being made today that could not have been imagined were more traditional practices their only foil. As both concept and craft, drawing is remarkably resilient, residing as closely as any art to the immediacy of the mind, with its recalcitrant and inventive resistance to summation or closure.”(Garrels 6) Artists have always revelled in the struggle to do something ‘new and creative’ within different mediums, and indeed Cohen and Bennett’s (1997) findings show that medium-specific technical skill may be the way of explaining perceptual differences between artists and non-artists, as the choice of artistic medium cues the way the artist analyses visual inputs (finer details with drypoint etching than in fresco painting). Therefore why would we now stop denying artists historical experimentation with media at the computer? Haven’t these medias now just moved to include software programs like Google Sketch, Illustrator or Photoshop?

Computer aided design (CAD) was introduced in the early 1980’s and has showed us how to produce complex forms by simply superimposing basic elements, that can be transformed, copied, pasted and undone at a push of a button but it is intriguing to observe that even though animation companies such as Pixar use this software extensively, they still insist that the first stages of idea generation be executed by sketching in pencil. Why? Is ‘thinking with a pencil’ unique? As infants we explore our environment by touching as well as looking, smelling or listening, and as adults we often demonstrate the overriding need to touch an object of intense interest as our hands are important means of perception and exploration, representing an access to our lifeworld which in some cases cannot be established by any other sense modality. Allen et al. (2004) saying, “If new media are to support the development and use of our unique capabilities, we must acknowledge that the
most widely distributed human asset is the ability to learn everyday situations through a tight coupling of action and perception” (Allen, Otto and Hoffmann 229). Hence traditional drawing’s connection to ‘touch’ makes us remember that our connections between our mind and body are just as valuable as other sensory inputs.

My latest series “The Human Terrain” aspires to these connections by illustrating how the mind’s intricate thought patterning and pathways of ‘divergent’ problem solving can also reveal intrinsic tactile associations. By translating the tonally scanned ‘primal’ gestures of scrunching and folding the surface of an A3 into millions of circular laser cut out cells, the series produces impressive layers of delicate lace organisms that entice touch. Each series concentrating on particular elements such as: visual illusion through density and placement; exposing unpredicted pathways of laser spatial efficiency through halting the laser technology at hourly intervals; and how simple interventions such as dividing the rectangular surface can significantly transform networks. The scrunched surface producing laser meanderings reminiscent of pioneer craft while partitioned pages favour linear construction of aerial architecture plans.

The simple acts of overlapping and layer ordering in two and three dimensional space being comparable to mind function, with both exploring the constant adaption, absorption, re-positioning and embroidering of the strata of the inner and outer human landscape.

In summation we have focused on, firstly how we all utilise schemata influenced by our environment, personal history, culture and behavioural factors. These organised patterns of thought are then in turn stored in our brains as ‘explicit’ and ‘implicit’ memory, waiting to be cued for problem solving and goal achievement. The more expert we become in a field the more specialised and automated we become at retrieving this knowledge. The creative process differing only through the expert ‘software’ that the artist chooses to develop and their ability to engage in ‘divergent’ as well as ‘convergent’ thinking to problem solving. Secondly, artists do not favour right hemispheric brain function but rather their ‘implicit’ schemata memory allows
us to develop hemispheric partnerships that are necessary for the complex associations and manipulations of ‘thinking’ visual forms. Thirdly, artists are not opposed to technology but exploit each medium’s possibilities by treading the fine line of balancing the haptic with the holistic, visual analytical and linear processes. Lastly, there is growing concern that the digital computer repetitive systems are ‘re-wiring’ our neural pathways and hasn’t to date fully resolved the use of the sensory input of the touch that provides the coupling of mind and body.

But what does this mean for our original questions, “Is the drawing that I had seen as an outpouring of spontaneity become a metaphor for our unconscious existence between boundaries and constraints?” “ Was the computer ‘software’ an impediment to our ‘natural’ thinking processes, or a reflection of our own brain function? Constantly moving back in forth in layers, infiltrating and embroidering our every action and thought?”

Computer analogy to brain function has clearly demonstrated that we must access systems (that are conditioned by numerous factors) to execute actions or solve problems, with familiarity of the ‘software’ rendering our actions to a more unconscious level of understanding that allows us to explore ‘expert’ possibilities of creation. This ‘programming’ highlighting the impossibility of the truly human spontaneous act, and as such, validating the original metaphor of a page edge being representative of our limits. However if we balance the self-awareness that our brains are not completely ‘hard-wired’, and are attentive that particular formats can influence outcomes and thinking, drawing will still be able to continue to push these boundaries, notating new journeys within the established points of the cerebral map, for it is how we choose to connect and use these points that will preserve the tradition of drawing supplying commentaries that continue to defy closure, as its strength and indeed its secret for its longevity is teasing out ideas in its flexible translation of thought.
Reference List


Drawings coming in from all over the world helping @sachajafri transmit the emotion and the soul of children on his record-breaking painting. Visit www.humanity-inspired.com to participate on this amazing project that aims to connect 1 billion people across the globe and raise $30million USD to save the lives of 10 million children in the poorest and most in-need areas of the world. One World, One Soul, One Planet. When I was seventeen years old, we did life drawing as part of our A-Level Art course. Once the giggles had subsided, I found it a fascinating challenge. To capture the form of human life in two... I created a slice of humanity. It was so tall, and you could see the human body through it from all angles, like a bizarrely fashioned piece of stained glass. I loved it. It was so completely different from anything I'd ever done, or that anyone else in the group had done. The Artist's Journey book. Read 79 reviews from the world's largest community for readers. No one's insights about the craft and journey of being an artist have guided me in the day-to-day struggle of this profession more than Steven Pressfield. Wherever you are, whatever you've been called to make, you need to read this book...and everything else he has written. Ryan Holiday, Bestselling Author of Ego Is the Enemy and The Obstacle Is the Way. You are an artist. You may wonder as you sit in your cubicle designing a gun down scene for Call of Duty Black Ops 4, if you're really advancing the cause of humanity? You are. Your artist Journey is unique to you.