Postdigital Visual Literacy: A Semiotic Perspective

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Abstract

Visual literacy, a literacy that involves the meaningful decoding of images, is often invoked when discussing environments rich with new media. Facebook, Instagram, YouTube; these platforms are image heavy. Major platforms such as these leverage the prosumer identity for economic means. The wider networking that the internet affords sees the intersection of the nominal democracy of participatory spaces with existing economic and social power structures. This increases the complexity of discourses of power that allow for meaning to emerge. Digital natives, students who grew up with networked technology as the norm, are often regarded as having a higher degree of visual literacy. This proposition, however, is not as simple as it seems on the surface. It is further problematised by postdigital theory. Postdigitality proposes that the distinction between digital and analogue, or online and offline, are arbitrary impositions upon the world. That arbitrariness challenges the essentialism inherent in the terminology 'digital native'. Postdigital theory and visual literacy discourse have three major intersecting concerns: the permeability between classroom teaching and the 'outside world', the role of criticality, and socially generated knowledge and authority.

A semiotic framework is employed in this research to reconcile postdigital theory within a reconstructed theory of visual literacy that meaningfully addresses the raised concerns. The semiotic theories of Charles Sanders Peirce, and the edusemiotic approach of Inna Semetsky, Andrew Stables, and others, inform an emancipatory vision of literacy, one that addresses the continuity between social lived experience and the classroom; and online and offline worlds. Peirce's theories of habit and habit change afford an approach to critical literacy that goes beyond a habit of scepticism.

The resulting theory of visual literacy that is proposed in the reconstruction has two components: use literacy and critical literacy. Use literacy is the ability to communicate using images but acknowledges that there is no one way to do this. As a result, notions of cultural literacy and institutionally mandated literacy, rather than standing in opposition, are folded into one another. The implication of this is that classroom practice should incorporate students' socially generated visually literacies, alongside teaching established conventions. The critical dimension of visual literacy, proposed by this research, involves aiming to develop students' semiotic awareness to resist habitual viewing. This dimension should not be relegated to an extension task but be taught alongside the development of a rich use literacy.
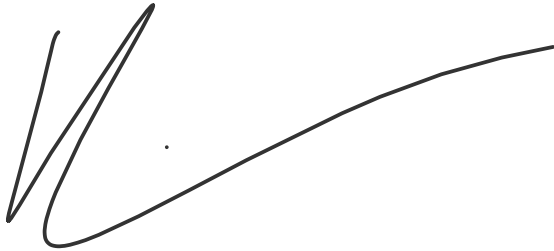
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Attestation of authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Richard Kearney
3rd March 2020

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Chapter One: Introduction

Context/background

Young people are engaging increasingly in networked publics (boyd, 2014) in which they navigate identity, society, and community. These social spaces which mediate the construction of identity are becoming more and more visual and image-centric. Snapchat is the preferred social network of choice for Gen Z and Millennials[1] (Statista, 2018a). In the last two years alone, active users of Instagram have doubled – from 500 million to one billion (Statista, 2018b) and in the United States 59% of all internet users accessed the application at least once a day (Statista, 2020a). Snapchat, while not boasting numbers quite as high, still maintains an impressive daily active user-base of 210 million (Statista, 2020b). People consume news media from online sources in higher rates than television and print combined (Statista, 2018c) and over 40% of journalists described the move from text-based to image- and video-based media as the most prominent shift in news media reporting (Statista, 2018d). It is clear that global culture is saturated with images, screens, and visual media. Yet there is concern over whether education is adequately providing young people with the tools to navigate this visually mediated world. Santos Costa and Xavier (2016) lament a "significant degree of visual illiteracy" (p. 201) while Brumberger (2011) concludes that millennials are "far from adept at producing and interpreting visual communication" (p. 44). Many scholars of visual literacy agree that explicit teaching of visual literacy is integral to an education that will allow for critical engagement in today's environment (Avgerinou & Pettersson, 2011; Brumberger, 2011; Kędra, 2018; Santos Costa & Xavier, 2016; Silverman & Piedmont, 2016).

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[1] Those born between 1995 and 2010 and those born within the early 1980s until the early 2000s, respectively (Weinbaum, Girven, & Oberholtzer, 2016; Seemiller & Grace, 2018)

What, then, is visual literacy? Nailing down a definition for this particular literacy is a matter of some contention, with wide ranging variations (Kędra, 2018). Avgerinou & Petterson (2011), in their attempt to find cohesion amongst the many theories acknowledge that it is "difficult to describe verbally a concept that is primarily nonverbal" (p. 7). John Debes coined the term 'Visual Literacy' in 1969 and gave a preliminary definition: "Visual literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences" (p. 27, cited in Avgerinou & Ericson, 1997, p. 281). Other scholars have elaborated on this definition to include elements of visual literacy that can be categorised into 'visual reading', 'visual writing', and 'other visual literacy skills' (such as thinking in images, assessing use of visual media) (Kędra, 2018). Felten's (2008, adapted from Kress, 2003) definition is concise and encompassing: "visual literacy involves the ability to understand, produce, and use culturally significant images, objects, and visible actions" (p. 60) but raises questions itself — whose culture? And what is the threshold for significance?

Michelson (2017) asserts that Debes' educational philosophy acknowledged that new information technologies had changed the way we learn, and that the "prevailing educational relationship between active teacher and passive student needed to be changed to respond to new technological conditions" (p. 96). Debes, writing his theory of visual literacy in 1974, seems prophetic here. The turn of the millennium saw the educational zeitgeist shift to calling for educators to respond to the learning needs of students who are instinctively familiar with screens, devices, and visual media (Oblinger & Oblinger, 2005; Prensky, 2001). This rhetoric of 'Digital Natives' has been roundly critiqued for assuming a level of skill or knowledge that today's students do not necessarily possess (Brumberger, 2011; Santos Costa & Xavier, 2016; Silverman & Piedmont, 2016). A more useful context in which to view contemporary students is that of the 'postdigital'. This term, like visual literacy, has varied definitions. Cramer

(2015) emphasises the hybridity of old and new media, the juxtaposition of the two, or one used in place of the other i.e. old media used as new media is used. This definition speaks to the assertion by Jandrić et al. (2018) that "contemporary student practices with technology are complex entanglements between physical and digital technologies, spaces, activities, and time" (p. 896). Contemporary writers on the topic seem to be in consensus that the term denotes a ubiquity of technology that renders distinctions between 'digital' and 'analogue' or 'online' and 'offline' as no longer useful (Bassett, 2015; Berry, 2015; Jandrić et al, 2018).

Another area that warrants further discussion is how visual literacy is actually acquired. Messaris (1994; 2012) maintains a position that visual literacy at a functional level is acquired through analogous perceptual experiences, and any further development through explicit teaching is only valuable for recognising manipulated images. Other scholars do acknowledge a social learning element (Carter, 2018) or that visual language is not universal (Avgerinou & Pettersson, 2011). Some studies conclude that an explicit teaching of visual literacy is necessary (Brumberger, 2011; Santos Costa & Xavier, 2016). Kędra (2018) says that seeing is a natural act and that "socialising and learning occurs through observation and acting" (p. 73) but that visual literacy is a competency that needs to be trained, especially in order to recognise manipulated content, decode advertisements and provide critical interpretations of an image. The tension between social or cultural learning and teaching that values the imparting of disciplinary knowledge (see Rata, 2012) is a space that contemporary educators navigate, and a theory of visual literacy that acknowledges our networked world will help to inform that process of navigation.

Rationale

While the previous section outlines the broad context in which visual literacy is importdant, there is a more localised goal for this research. The National Certificate of Educational Achievement (NCEA) is overwhelmingly the most common secondary school

accreditation in Aotearoa New Zealand. At the time of writing this thesis, the NCEA was undergoing a major review, with early documents suggesting systemic changes on the horizon. The Ministry of Education (MoE) received mixed feedback, some educators excited about the progressive direction that the initial 'big ideas' implied, while others lamented the shift further away from traditional examinations and teaching. The changes have since been walked back to a more predictable reform, but the *NCEA Change Package* (MoE, 2019) still offers some opportunities. Firstly, the changes require a radical review of achievement standards. This is something that is required regularly, but the change package imposes a major change in achievement standard structure. For instance, the current Level 1 English matrix has 40 credits available across eleven standards; the review will require this to shift to 20 credits across four standards — among other requirements. This presents an opportunity to make significant changes in assessment resources as the MoE consults Subject Expert Groups, focus groups, and the wider teaching sector. Furthermore, as these achievement standards are developed and approved teachers will need to adjust, or completely overhaul, their teaching programmes. A sound philosophical grounding will be beneficial to the development of meaningful learning activities. In addition to this, the *NCEA Change Package* uncouples literacy credits[2] from other achievement standards, proposing a standalone accreditation for literacy. This change raises issues around what literacy is without context, and what the term 'literacy' encompasses. An interrogation of the concept of literacy is pertinent at this time.

This research will inform curriculum development. I also have various roles that deal with the introduction of e-learning technologies and methods into the wider school. Beyond this personal sphere however, I am able to bring this research to a wider audience. I am currently the chairperson of Auckland Secondary Art Teachers Association (ASATA), and

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[2] In the New Zealand schooling system, some achievement standards are 'literacy' or 'numeracy' standards, and the credits count towards literacy and numeracy requirements in various accreditations (New Zealand Qualifications Authority [NZQA], n.d.a)

part of this role entails providing professional development for the Auckland sector of visual arts teachers, by way of the Networks of Expertise professional development model.

Researcher positioning

I am involved in the wider sector of teaching through professional networks such as ASATA, but also through less formal networks, such as the national visual arts teacher mailing list VisArtsnet. My impression from interacting in these spaces is that visual arts teachers are increasingly prioritising methods of achieving good examination results over any other approach. I see this as a worrisome development, as it means that assessment criteria is driving teaching practices and, inevitably, guiding the evolution of visual arts teaching in Aotearoa New Zealand as teachers collegially pass on what helped their students meet the coveted 'Achieved with Excellence' standard. I do not mean to lay the blame for this wholly at the feet of the teachers. There is a myriad of pressures to prioritise grades, not least of which is the desire of students themselves. It is with this concern, however, that I approach this research.

Research aim

The aim of this research was to reconstruct current theories of visual literacy in a way that addresses the needs of the postdigital era. These needs include intersecting concerns with contemporary theories of visual literacy, and engaging with the tension between the teaching of disciplinary knowledge and social learning processes.

Research questions

What is visual literacy in the postdigital era, and can an edusemiotic approach enhance understanding of its acquisition and use?

- What insights can postdigital theory and semiotics offer a theory of visual literacy?

- How do students learn or attain visual literacy in contemporary media and what
  teaching approaches or philosophies might support them?

- How is visual literacy defined in relation to the 'digital native'?

- How might a semiotic framework inform this inquiry?

Research design

This research engages the philosophical underpinnings of education, and the design of the study reflects that. I have opted for a non-empirical approach, i.e. no gathering of data by way of fieldwork or other methods. This approach is much less common in education research and, with this in mind, I have endeavoured to be as rigorous as possible in outlining my methodology in the next chapter. The method of systematic textual analysis that I have employed is reflected in the structure of the thesis itself.

Thesis organisation

Chapter one details the social and educational context for the research. It argues for the timeliness of a renewed foray into visual literacy theory, especially in the context of Aotearoa New Zealand education. Chapter two outlines the methodological approach used in this study, and argues for the value of a non-empirical approach to this kind of research. It defines the elements of systematic textual analysis which dictate the structure of the chapters that follow it. Chapter three reviews current theories of postdigital and aims to provide an understanding of postdigital in its original context. I explore some of the key ideas within the field and where it already intersects with the field of educational research. Chapter four reviews theories of visual literacy. I address the concept of literacy as a starting point, and then outline the key concerns of visual literacy theorists. Chapter five looks at the topics of the previous

two chapters, postdigital theory and visual literacy, and clarifies the overlapping concerns of these areas of study. Chapter six is concerned with semiotics and provides an in-depth look into the elements of Charles Sanders Peirce and his vast semiotic theory that I considered important in addressing the converging issues from chapter five. It also looks at the intersecting concerns of education and semiotics. Chapter seven draws together the three concepts: visual literacy, postdigitality, and semiotics. It clarifies the intersecting concerns of the three and reconstructs a theory of visual literacy that addresses the concerns of the postdigital era by way of a semiotic framework. Concluding the chapter is an examination of the implications that this might have in classroom practice and educational policy. Chapter eight summarises the findings from the preceding chapters in relation to the research question and subquestions. The limitations of the study are discussed, and finally, opportunities for further research are identified.

A note on Peirce

There are a number of conventions that are traditionally employed when citing Peirce's work. As his work was mostly published posthumously, and consists largely of collected lectures and correspondence, much of his work is accessed through collected volumes (Jappy, 2013). One of these, which is referenced frequently in this thesis is *Collected Papers of Charles Sanders Peirce* (Peirce, 1931-58). The convention of Peirce scholars is to abbreviate citations from this sizable collection which spans eight volumes as 'CP' followed by the volume number and paragraph e.g. CP 2.228 (Jappy, 2013). In this thesis, the format has been adapted to conform to American Psychological Association standards for in-text citation, however in the place of a page number, the volume and paragraph format has been used.

Chapter Two: Methodology

The core aim of this research is to reinterpret theories of visual literacy, acknowledge current working theories and their manifestation as definitions, while taking account of insights gleaned from postdigital theory and semiotics. This chapter outlines the philosophical paradigm, methodology, and research design used for this work. The philosophical paradigm for any research reflects the ontological and epistemological values of the researcher (Newby, 2014). This thesis deals with the philosophical underpinnings of visual literacy education. The philosophical paradigm, therefore, is important not only in informing my choice of methodology, but also in framing my approach to the research, as it provides an epistemological grounding - the demarcation of what I consider evidence of knowing the world (Newby, 2014). With this in mind, I have aimed in this chapter to give a sufficient explanation of the philosophical paradigm that informs the starting point and framing, and also the ongoing process of selecting, analysing, and synthesising of theories. This thesis presents research of a methodological category that has been described variously as non-empirical (Cropanzano, 2009), theoretical (Smith & Small, 2017), or philosophical (Holma, 2009; Sheffield, 2004). Any empirical research within the scope of this project would be too specific, so the work undertaken has been of a conceptual nature, with an aim of providing a basis for future empirical research. The methodological framework section of this chapter discusses the very notion of defining a methodology for research of this nature, and then outlines three domains which frame this research. Following that, the specific research process that I undertook is laid out, and the limitations of the project discussed.

Philosophical positioning

Lyotard's hypothesis in 1979 was that "the status of knowledge is altered as societies enter what is known as the postindustrial age and cultures enter what is known as the

postmodern age" (1989, p. 3). The postindustrial shift is referred to often in progressive

educational contexts, sometimes explicitly (see Gilbert, 2005), or implicitly, by deriding the

'industrial model' of schooling (see Robinson, 2010). In an educational context, the concept

of the postindustrial is concerned with preparing students for what is variously known as the

'knowledge society' (Gilbert, 2005) or the 'knowledge economy' (a term popularised by

Drucker [1969, as cited in Bastani, 2019]). Bell (1973) forecast the postindustrial society as

one in which knowledge replaced capital as the dominant factor of production. While

knowledge and capital remain, decades on, hopelessly interwoven, Bell (1973) also

documented a shift in attitudes toward knowledge — a valuing of theoretical knowledge over

empirical knowledge, and a scepticism of the ability of rationalism to solve world issues of

growing complexity. What Lyotard (1979/1989) described as 'the postmodern condition' is

the increasing difficulty of legitimating knowledge and truth in developed societies. Lyotard's

assertion contrasts with a modernist paradigm, which appeals to grand narratives of truth and

rationality. An example of the modernist paradigm is Marxism, in which the notion of

historical materialism considers technology as one of the most important elements in society

(Peović & Jandrić, 2017). Because the technological means of production remain in the hands

of the ruling class, the vector of oppression and power is unidirectional. This metanarrative, in

the Marxist framework, determines (and explains) society. Conversely, postmodernism, as

defined by Lyotard (1979/1989), is characterised by an "incredulity toward metanarratives"

(p. xxiv). Postmodernism does not, as its name might suggest, signal the 'end of modernism'

or a period following modernism. After all, metanarratives and myths (in the Barthesian

sense) still exist. In education in Aotearoa New Zealand, Beeby's (1986/2010) "The Place of

Myth in Educational Change" still rings true, and in the political economic sphere, the myth

of capitalist realism has dominated since the late 1980s (Fisher, 2009). The role of a

postmodern critic is to question these foundational beliefs. In an education context, this has

wide ranging implications, from a critical orientation to 'correct' knowledge, to scepticism toward the very purpose of education. Edwards & Usher (1994) suggest that postmodernism in educational research involves "a way of looking differently at education as a social practice, at educational processes such as learning and teaching, and at bodies of knowledge and the ways they are organized and transmitted" (p. 28, as cited in Campbell, 2018, p. 68). Lyotard (1979/1989) was critical of 'performativity' as the primary mode of legitimation of knowledge in postmodern society. He argued that maximising performance had become the goal of nation-states and, as a result, it had also come to consume educational institutes. Knowledge is subject to a threat that it must "be operational (that is, commensurable) or disappear." (Lyotard, 1979/1989, p. xxiv). Optimisation of performance as a goal presents the danger of venerating 'traditional' knowledge in service of a unitary or totalising truth, a practice that not only leads to mere reproduction of existing knowledge, but adopts a position that society is a giant machine (Lyotard, 1979/1989). Conversely, the critical function of knowledge, in the Marxist sense, could be counted on — but while this acknowledges that society is not a coherent unit, it embraces a simplistic dualism (Lyotard, 1979/1989). My research involves dealing with notions of literacy, a standard of knowledge that is legitimated through state policy, and frequently implicated in an individual's ability to contribute 'productively' (read: economically) to society. Literacy is, however, also about being able to make meaning out of particular areas of knowledge. It is this confluence of concerns that demands a philosophy that acknowledges complexities and paradoxes. Postmodernism as a grounding philosophy has led me to question widely accepted imperatives of education, in particular policy supported ideas concerning literacy and institutionalised legitimacy of knowledge.

Poststructuralism is closely related to postmodernism — both are suspicious of metanarratives, but where postmodernism is concerned with knowledge and its relationship to

power, poststructuralism is interested in power, its vectors in society, and how this gives rise

to meaning (Fawcett, 2008b). Peters (2017) distinguishes the two by their respective subjects

— postmodernism concerns itself with 'modernism', while poststructuralism has

'structuralism' (itself a modernist theory) as its subject. Structuralism holds that both

language and society is governed by an underlying structure and works to uncover those

essential structures (Fawcett, 2008a). The structuralist thought and semiotic theory are closely

related. Charles Sanders Peirce and Ferdinand de Saussure are the founders of the fields of

semiotics and semiology respectively — now consolidated simply under the term 'semiotics'.

This field concerns itself the study of 'signs', the structure of communication and meaning-

making, and our ascription of significance to things in the world (Chandler, 2002). While

semiotics is most frequently applied as a study of language and media, it can be used as a

metalanguage that describes human social interaction and action (Fawcett, 2008a; Semetsky,

2015). This structural linguistic approach of Saussure was adapted by theorists in other fields.

Althusser, in his interpretation of Marxism, theorised a structure in which ideological state

apparatuses governed the actions of individuals (Fawcett, 2008a). Levi-Strauss claimed an

objective validity in the structures of cultural myths and systems (Fawcett, 2008a).

Poststructuralism is not positioned as directly oppositional to structuralism, and instead

critiques the rigidity and supposed objectivity of structuralism (Fawcett, 2008b). In

poststructuralism "emphasis is placed on identifying meanings that are context specific and

that relate to the varying discursive practices operating" (Fawcett, 2008b, p. 666). Derrida, a

key poststructuralist thinker, developed the notion of 'deconstruction' (Fawcett, 2008b).

Deconstruction challenges structural notions of stability in reading. It expands on Saussure's

notion of an arbitrary connection between sign and meaning, declaring this connection not

only arbitrary, but unstable and uncertain (Trifonas & Jagger, 2017). A key notion in

deconstruction is différance (pronounced the same way as 'difference', a play on words by

Derrida that acknowledges the inherent critique of logocentrism3 within this concept [Trifonas

& Jagger, 2017]). Différance is the notion that meaning in language is understood through a

system of differences — what Derrida terms 'trace' — any sign will have traces of that which

is it is not; that which it differs from; that which it is contingent on (Harrison, n.d.; Trifonas &

Jagger, 2017). Thus, meaning is endlessly deferred (Trifonas & Jagger, 2017) and what

poststructuralist Umberto Eco termed 'unlimited semiosis' becomes evident (Jappy, 2013).

What this means, given that any sign contains a trace of absence, is that there is no possibility

of absolute knowledge (Harrison, n.d.) (here, the proximity to postmodernism becomes clear).

Derrida situates meaning in a network of signs, endlessly in flux. The implications of this on

conceiving of a notion of literacy are clear — it should allow for meaning that is socially

constructed and not appeal to stable meaning or use of language.

Foucault contributed to poststructuralism the idea that people interact with structural

systems in context, and, that power, rather than being held in institutions or positions, is

enacted in micropractices (Fawcett, 2008b). His notion of *governmentality* posits that

"practices of freedom themselves are a form of governance" (Fendler, 2017, p. 853).

Governmentality acknowledges that while top-down power structures (such as government

and policy) do influence everyday social interactions, individual acts of power as resistance

are also part of this system (Fendler, 2017). Foucault encouraged scepticism about the

individual/state binary present in some modernist narratives and sought "to undermine the

individual-versus-State dichotomy and replace it with a perspective in which we understand

freedom to be regulated by power relations and power relations to be defined in the context of

freedom and discipline" (Fendler, 2017, p. 854). The context for social relations is an

intersection of "places where what is said and what is done, rules imposed and reasons given,

3 A privileging of verbal expression over written word as more immediate to the signified, and therefore less
remote from true meaning (Harrison, n.d.)

the planned and the taken for granted" (Foucault, 1981, p. 5, as cited in Fawcett, 2008a, p. 836). Classrooms are sites where institutional power is enacted through policy, more or less directly through the process of certification, which explicitly includes literacy (in an Aotearoa New Zealand context). This enactment of power is not left unchallenged, as other literacies exist outside of institutional definitions and infiltrate the classroom. Defining a literacy inherently invokes the notion of institutional power, but in this thesis, I reinterpret visual literacy in a way that not only allows for poststructuralist notions of free play and unstable meaning, but also encourages students to adopt an orientation toward communication and language that recognises enactments of power.

A further concept within the poststructuralist paradigm that has guided my inquiry is Deleuze and Guattari's (1987/2005) concept of the rhizome. Deleuze set foundations in the 1960s for what is now known as complexity theory. Rhizomatic thinking and related Deleuzian theories (often formed in collaboration with Félix Guattari in their *Capitalism & Schizophrenia* project) have been valuable for scholars working to resist oversimplification in school curriculums (Gough, 2017). The rhizome as a model for thought challenges what Deleuze and Guattari termed the *arborescent* model of thought (Drummond, 2005). The arborescent model, as its name suggests, is structured like a tree. Drummond (2005) explains this model as being rooted in a dogmatic *image of thought,* in that it tends to "overcode things in relation to organization, signification and identity" (p. 257). Arborescent thought is thought in which ideas branch sequentially from pre-existing ideas or assumptions and "blocks the creation of new ideas, new concepts, new connections and diversities, not only between current approaches, but also mutations between their elements that may lead to something new and potentially more productive" (Drummond, 2005, p. 257). Rhizomatic thought draws similarly on botany for its name. A rhizome is a "horizontal, subterranean stem which sends out roots and leafy shoots at intervals along its length" (Oxford English Dictionary, n.d.) and

is an "[organ] of fundamental importance to plant competitiveness and invasiveness" (Jang et al., 2006, Abstract). This is an apt metaphor for the Deleuze-Guattarian "non-hierarchical, heterogeneous, multiplicitous, and acentered" (Gartler, n.d., para.1) model of knowledge. Sellers and Gough (2010) expand on the relationship between the two models,

> Deleuze and Guattari's rhizome ... is presented as a way to disrupt the hegemony of the popular arboreal metaphor for knowledge organisation. In one swift move, from the singularity of the tree of knowledge to multiplicities of rhizomes for knowing, it is possible to imagine other organising ways that perturb a predominant worldview (p. 18)

Drummond (2005) is careful to note that one should not consider the two as mutually exclusive to one another, or in opposition, as this creates merely another oversimplified binary, and would be "constructing an arborescent argument to critique and move beyond arborescence" (p. 259). Furthermore, Gartler (n.d.) describes the way in which a rhizome can infiltrate a tree, infecting the static hierarchical structure with fluidity and openness. The rhizome is a bringing together of previously disconnected ideas, as Drummond describes, "an experiment in connectivity between previously disparate elements, an engagement with a problem in which there was a creative dimension with no prior planned knowledge or content" (p. 260). It is with this rhizomatic disposition I have approached my research; a 'thinking in the middle' approach that de-emphasizes a linear drive toward a secure conclusion, opting rather for an inbetweenness, of growth and propagation (Gough, 2017). In their explication of the rhizome, Deleuze and Guattari (1987/2005) outline six principles that characterise it. Firstly, principle one and two: the principles of connection and heterogeneity. In their words, "there is no ideal speaker-listener, any more than there is a homogenous

linguistic community" (1987, p. 7) and "there is no mother tongue, only a power takeover by a dominant language within a political multiplicity" (p. 7). I have provided an open, non-prescriptive notion of visual literacy, that acknowledges the shifting nature of language, and the ongoing connections established between semiotic chains. Principle three, multiplicity, resists divisions of complexity into discrete units, and holds that ideas are constructed by connections to other multiplicities, and increase in complexity as they are divided, rather than simplifying. Principle four is the principle of asignifying rupture, which notes that a rupture in a rhizomatic structure will always tie back to the structure.

> That is why one can never posit a dualism or dichotomy, even in the rudimentary form of the good and the bad. You may make a rupture, draw a line of flight, yet there is still a danger that you will reencounter organizations that restratify everything, formations that restore power to a signifier, attributions that reconstitute a subject. (Deleuze & Guattari, 1987/2005, p. 9)

Principles three and four resist dualism and call instead for a characterisation of the world through principles of continuity. The recognition of the reconstitution of ideas in principle four is an important factor if education is to overcome what Foucault described as the "fascism in us all … in our everyday behaviour" (Deleuze & Guattari, 1984/2015, p. xii). Principles five and six, the principles of cartography and decalcomania, are the distinction between map and tracing (Deleuze & Guattari, 1987/2005). The rhizome is a map, "entirely oriented toward an experimentation in contact with the real" (Deleuze & Guattari, 1987/2005, p. 12), whereas a tracing stabilises and neutralises multiplicities — it translates the map into an image of thought (Deleuze & Guattari, 1987/2005). I have reimagined visual literacy as a

map, an active engagement and experimentation with the real, to search for new ways of

representation in language, rather than a tracing of existing knowledge.

A concept that has an important bearing on my topic of research is the 'digital', seen

in idioms in education such as 'digital learning', 'the digital age', 'digital native', and inherent

in other related terminology such as 'virtual learning environment'. Both poststructuralism

and postmodernism have informed postdigital theory and, by extension, my critique of

common conceptions of the digital in chapter three. I explore ideas that are critical of the

metanarratives surrounding so-called digital technology: the idea that there is some essential

difference between analogue and digital technology (Cramer, 2015; Pepperell & Punt, 2000);

that there is a meaningful division between online and offline (Bassett, 2015; Berry, 2015;

Jandrić et al, 2018); or that our online selves are somehow distinct from our offline selves

(Cavanagh, 2007). In some ways, what can be said about the current state of technology —

that people are more connected and networked than ever before — is inherently postmodern,

after all, as Locke (2004) says: "In these so called 'new times' … another [narrative] is just a

mouse click away" (p. 35). Foucault's notion of governmentality has been employed in this

thesis as a frame for understanding technology as an ideological apparatus in order to examine

often uncritical deployments of technological determinism in educational contexts. I argue

instead for a soft technological determinism (Hauer, 2017) that acknowledges the agency of

the individual while also acknowledging the discourses of power acting on them. Deleuze and

Guattari (1987/2005) offer this: "we are in a social formation; first see how it is stratified for

us and in us and at the place where we are; then descend from the strata to the deeper

assemblage within which we are held … [construct] your own little machine, ready when

needed to be plugged into other collective machines" (p.161). This is a useful model for

thinking about how education and literacy might function with the current state of technology:

networked and connected in an unprecedented way.

Methodological Framework

Textual or theoretical research does not require a methods section because it would be rather an ineffective process to write: "I read one hundred and three books, listened to six professionals in the field, read multitudes of current articles on the subject, thought about and weighed all of that, and came to the following theoretical conclusion". That method… becomes obvious as the material is presented and therefore does not need to be described in a discrete methods section. (Clingan, 2008, p. 2, as cited in Smith & Small, 2017, p. 204)

Clingan's sentiment is not dissimilar to that of Jane Kelsey, explaining her work on *The New Zealand Experiment*. Kelsey (1999) explains that her 'method' involved drawing on articles and studies that she had read previously, making connections between elements as they occurred to her, filling in any gaps with her own professional experience and social connections. I have certainly drawn on my own experiences and expertise as a visual art educator during this research. Visual literacy theory is something I reflect upon often when developing curriculum or while having an existential moment, contemplating the purpose of art education. The students I see on a daily basis bring endless permutations of literacy with them into the classroom, so my classes are a negotiation between students' socially learned literacies, and the ones that I am ostensibly teaching them. This experience has invariably influenced my thinking when evaluating current visual literacy theories, as I know what type of learning I value in my students, and what I (subjectively) think supports them to be better human beings, and interesting thinkers.

These comments do not mean, however, that my research is lacking in a methodological approach or structured research design. While my methodology and methods may not be that of a qualitative or empirical thesis, a rigorous process is engaged with in order to ensure I am not just recording my own private musings. Smith & Small (2017) critique Clingan's conception, noting her limited view of what 'methods' can entail, and a positivist overtone that suggests results might be the same if repeated by another researcher. Clingan's (2008, as cited in Smith & Small, 2017) conception is limited to an outline of "what exactly you did to gather your data, enough information to determine whether they see the process as objective and well-served, and the steps involved so that someone could essentially repeat the research if desired." (p. 205). They conclude that in a theoretical research thesis, such as this study, a methodology section is important if it assists in the clarification of the critique of educational problems (Smith & Small, 2017).

Cropanzano (2009) outlines three categories for non-empirical writing: Theory articles, substantive review articles, and critiques. He defines their objectives as follows:

- Theory articles seek to propose a new conceptual model.

- Substantive review articles seek to summarise and explain an existing literature.

- Critiques seek to explain why an area of study is moving in the wrong direction. (2009, p.1305)

This thesis includes elements of all three. Cropanzano (2009) says that most non-empirical articles "have elements of all three types. That is, they usually provide at least some consideration of conceptual issues, a strong narrative summary, and a critique of prior research" (p. 1309). This thesis consists of a review of existing literature using the method of systematic textual analysis, outlined in the methods section below; it thematically organises findings of previous visual literacy theory literature; and explains key findings, illuminating

areas that warrant further work (Cropanzano, 2009). Through systematic textual analysis, I propose a new conceptual model - a reinterpretation of visual literacy. I have then critically evaluated the proposed model by "examin[ing] how the application of such theory would solve or eliminate and educational problem, a set of learning problems or societal conflicts" (Cropanzano, as cited in Fidelis, 2017, p. 26). The third element that Cropanzano outlines, critique, is explored in the systematic textual analysis. There are many competing definitions for, and theories of visual literacy that currently exist, and these are critiqued to establish which are most suitable for reconstruction with postdigital theory. The final chapter provides valid argumentation that "come[s] to terms with the wider understanding of the educational realm, the empirical context in which the argument will have its purchase" (Holma, 2009, p. 334) and discusses possible practical implications in an "open and contemplative style of questioning [that serves] much better than any enterprise attempting to present watertight arguments." (Holma, 2009, p. 334)

This research has clarified how educators can approach visual literacy, potentially informing educational policy and practice. In this way it has fulfilled Sheffield's (2004) requirement of philosophical research: that it have a practical application in order to have value to education. There are three frameworks that guide this thesis, they are: philosophy as method, critical theory, and edusemiotics.

Philosophy as method

In his advocacy for theoretical, conceptual, and philosophical foundations for educational research, Lester (2005) suggested that too often educational researchers are concerned with explanations of educational phenomena, without concern for justifying why they are doing what they are doing. Instead, he argues, researchers need to have a deep understanding of the phenomena they are studying, rather than just finding solutions to

immediate problems. Researchers should also be looking at the big questions such as "What does it mean to understand a concept?" (Lester, 2005, p. 458). Bridges and Smith (2006) echoed this sentiment, lamenting the tendency of educational research to take 'evidence-based' research to a reductionist extreme; discovering just 'what works' in the here and now. Furthermore, Papastephanou (2006) argued that research methods such as action research, without a philosophical basis, can risk replicating the status quo. In educational research, one cannot underestimate what Cole (2017) calls "the force of now" (p. 410), noting that the role of philosophy is to look past "the banalities contained in the social forces of the contemporary situation" (p. 411). A philosophical methodology in educational research involves interrogating widely held beliefs to ensure that any empirical research is not conducted on unsound grounding (Holma, 2009).

Sheffield (2004) outlined a methodological approach to philosophical research he named 'philosophy as social practice'. Sheffield refers to Sherman's working definition of the philosophic method: "the analysis, clarification, and criticism of the language, concepts, and logic of the ends and means of human experience" (Sherman, 1995, p. 2, as cited in Sheffield, 2004, p. 762). He goes on to say that if the phrase 'human experience' is replaced with the more limited 'education', the relevance of this method to education becomes clear (Sheffield, 2004). He wrote that "philosophy attempts to make clear the way we think about human experience so that reasonable action (means) might evolve which can lead us to just and good socially established goals (ends) within the human experience" (Sheffield, 2004, p. 763).

But what is entailed within the methodological framework of 'philosophy as social practice'? Sheffield (2004) acknowledges that in widely accepted and validated research practices, each framework "has a particular set of tools that are used for understanding a particular type of experience" (p. 761). If philosophy is to be accepted in a similarly validated space, it must be able to demonstrate that it has a similar set of tools, and operate in a similar

fashion (Sheffield, 2004). As Sheffield (2004) notes, philosophers have been trying to explain

what it is that philosophers do, for as long as philosophy has existed as a concept. Smith

(2009), in a dialogue about Richard Rorty's distinction between *systematic* and *edifying*

philosophy, explains Rorty's two categories. Systematic philosophy being the kind of

philosophy that "[solves] problems so that they can move progressively on to solve more

problems" (Smith, 2009, p. 438) and is in search of a philosophical 'truth'. Edifying

philosophy, on the other hand,

> aims at continuing a conversation rather than at discovering truth. It is
>
> educative, in the sense of *Bildung4*, as a matter of forming the character of the
>
> individual. It is not concerned, or much less concerned, with the 'discovery,
>
> elucidation and justification of a core of fundamental truth' (Gutting, 1999,
>
> p. 189, as cited in Smith, 2009, p. 442)

Edifying philosophy considers a "notion of truth as what helps us get where we want to go"

(Smith, 2009, p. 440). This thesis is intended to be a tool for thinking about visual literacy,

rather than providing any kind of objective 'truth' or final word. Smith (2009), however,

disagrees with Sheffield (2004). He explains that in searching for the philosophical method,

we coast closely to an attempt to find a 'correct' way to do philosophy. This could lead to the

unusual situation of "philosophy [being] done by anyone who had acquired 'the method',

picked up an -ology, but was unfamiliar with the history of philosophy and its texts" (Smith,

2009, p. 437). A similar criticism could be levelled at this statement, as was levelled by Smith

& Small (2017) at Clingan, that Smith (2009) is expressing a somewhat limited notion of

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4 *Bildung* has no clear translation in English. Broadly it refers to the education and formation of the individual,
both the process and the result. It encompasses the enculturation of societal identity and selfhood through both
formal and informal education (Ødegaard & White, 2017)

what 'methods' can entail. Returning to Sherman's (1995, as cited in Sheffield, 2004)

working definition, some tools are already laid out: analysis, clarification, and critique.

Sheffield (2004) explains them as follows:

- Analysis: extracting concepts from experience and outlining them

- Clarification: ensuring that the concept in question is understood, establishing
  key constructs rather than taking them for granted

- Critique: making a value judgement of the concepts examined

Sheffield (2004) expands on critique, explaining that its role is to drive practice, improve

processes and to build better conceptual understandings. These three key tools have an

analogue in the main method of this thesis, systematic textual analysis, outlined in the

methods section later in this chapter.

> Philosophers apply their traditional tools to the 'language' (how we write and
> talk about human experience), the 'concepts' (the ideas), and the 'logic' (the
> relationships between the way we think, write, and talk) of human experience.
> In applying the traditional philosophical tools to these important aspects of
> lived experience, philosophers provide insights into what, why, and how
> ideology directs our decision making process. A philosopher, when doing
> good work, provides a reasonable understanding of how language, logic and
> concepts are used and how they might be improved to create a more just and
> humane society. (Sheffield, 2004, p. 763)

This explanation of how these tools might be applied gives an idea of what kind of texts are

engaged with in this research. Theories of visual literacy occupy all three categories, but in

particular the latter two: conceptions of what visual literacy is, and the logic of how it is expressed, assessed, taught, and so on.

Critical Theory

Wodak (2001) stated that "dominant structures stabilize conventions and naturalize them" (p. 3, as cited in Locke, 2004, p. 32) and that discourse can replicate unequal power structures. The critical theorist seeks to uncover the ways in which dominant discourses enact power to maintain privilege (Steinberg & Kinchloe, 2012). Because research and thought is always mediated by socially and historically situated power relations and inevitably situated in an ideological space (Locke, 2004), researcher reflexivity was employed to avoid reproducing dominant narratives even though this research deals with something as seemingly innocuous as visual literacy. It is for these reasons that a critical disposition when dealing with documents and other texts, and appropriate concepts are employed when reinterpreting theory. Various texts are engaged with in this thesis, namely research documents when reading for a critical understanding of visual literacy theory, education policy documents that outline learning goals for visual literacy and other literacies in schools, and visual artefacts. These can be considered as discourse in the sense that they constitute aspects of the social reality of those that they pertain to. A discourse implies a political apparatus and institutional technologies through which power is affected and subjectivity constituted (Locke, 2004). A theory of discourse can facilitate an understanding of how people's identities are constituted and altered, of how social groups form and die out, of how cultural hegemony is secured and contested, and of the prospects of emancipatory social change (Olssen, Codd, & O'Neill, 2004, p. 36). In my experience, discursive relationships between the student and the policy document is one of unequal power that replicates a hegemonic ideal. An image posted on

Instagram is a text that is part of a discourse that constitutes the user's social identity, and the display of it in a networked public calls complex intertextual concerns into consideration.

When reading texts, policy documents in particular, a deconstructive approach is used. Deconstruction calls on Derrida's concept of différance, which acknowledges the instability of meaning in text, that signifiers "form chains of signification that radiate in all directions" (Aylesworth, 2015, "Deconstruction", para. 3). Deconstructive reading does not aim to decode meaning from within the text but instead it aims to investigate its function within a network of texts, meaning, and power (Aylesworth, 2015). This differs from a reading of a text which assumes that signifiers and signified meaning are unambiguously linked and that a text could be passively decoded by a reader (Jørgensen & Phillips, 2002).

Critical analysis and deconstruction as research dispositions ensures that this research considers the power relationships inherent in applying policy documents such as NCEA achievement standards in the classroom. A deconstructive approach acknowledges that such a discourse is 'nested' within larger power structures (Gallagher, 2008), for instance, wider governmental educational policy, as well as alongside other discourses in networked publics. Given the concepts inherent within these methods, reflexivity has an important role in this research. Notions of what it means to propose a theory, especially one which may directly influence educational discourse in a classroom, were considered. As in the previously outlined 'philosophy as method', critical theory is not detached musing, and seeks to improve the practice that it informs (Steinberg & Kinchloe, 2012).

Edusemiotics

Edusemiotics builds on the philosophy of semiotics, by proposing an educational theory to explore the foundational role of semiotics in education and learning (Semetsky, 2015). This philosophical standpoint was chosen to frame this research because of its relevance to the visual. It posits that learning is a result of undergoing constant recurring

semiosis, and synthesising more complex and nested signs (Olteanu & Campbell, 2018).

Edusemiotics resists Cartesian mind-body dualism, and instead regards the mind is "engaged

in continual participation with [the experiential world]" (Semetsky, 2015, p. 3). As Semetsky

& Stables (2014) point out, edusemiotics considers anything that has signifying potential to

also have educational potential - including art, images, and design. One implication of this is

that there may be consideration of a visual literacy without the need of translation to

alphabetic literacy5. The "dynamics [of edusemiotics] [defy] some pre-defined final product

as the goal of education; instead education is to be considered as a process of continuous

inquiry and exploration" (Semetsky & Stables, 2014, p. 1). While this notion brings to mind

the (often erroneously) invoked eduspeak 'lifelong learning', it does point towards an

emancipatory notion of "liberating the concept of learning from the domain of education, and

rethinking education as a system of program that works in the service of learning" (Olteanu &

Campbell, 2017, 1:00:41, as cited in Olteanu & Campbell, 2018, p. 254). The edusemiotic

framework will also problematise the very notion of literacy as edusemiotics resists perceived

standards for diagnostic testing (Semetsky, 2015). This thesis engages the philosophical

fundamentals of semiotics to advance the understanding of how visual literacy is acquired and

how new visual knowledge is created

Systematic Textual Analysis

The methodological framework of this thesis, based on the critical, philosophical

approach already detailed, has employed a research method outlined by Holma (2009) –

systematic textual analysis. Holma described this method as a "process of analysis and

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5 This terminology adopted from Kędra (2017), to refer to the literacy concerned with writing and reading texts consisting of *words*. Use of this terminology is to avoid confusion, as some scholars refer to the reading and writing of images, and furthermore, the term *texts* is used extensively in the literary theory sense.

synthesis, or philosophical reconstruction" (2009, p. 327) and set out the procedure for this method as follows:

1. Understand the concepts as used in the original context

2. Clarify the relationships and interconnections between these concepts

3. Reconstruct the concepts for understanding and interpreting it from a new perspective (Holma, 2009)

Holma (2009) sets out the practical operations for gaining a full understanding of the concepts, as stipulated in step one. The texts investigated were organised by filing passages under a range of rubrics that outlined key or repeated ideas. Holma (2009) noted that while this process results in a long and disorganised text to navigate, the process of disassembling the text allows researchers to uncover any incoherencies while also familiarising themselves with the wider argument. The next step was to map interrelations between concepts and, with a deep understanding, examining implications that the philosophical topics (edusemiotics and postdigital theory) had on the educational theory (visual literacy). The final step was reconstructing these concepts. As this research focused on clarifying a notion of visual literacy that can be applied and tested in future research, the concept that was reconstructed is that of visual literacy, and the new perspective draws on edusemiotics and postdigital theory. Holma (2009) notes that, in contrast to the previous steps which have a relatively rigorous procedure, this final step benefits from not following strict methodological rules. She does, however, advise researchers to "avoid slipping into the superficial everyday expression of opinion" (Holma, 2009, p. 334). This methodology is specifically applied in the following way:

1. Find and assess texts for appropriateness and relevance to the research topic

2. Read to develop a critical understanding of concepts within the texts

3. Sort and map the interrelationships between the three areas of study

4. Reconstruct the ideas to conceptualise visual literacy from a new perspective

5. Discuss how this could be implemented in policy and practice

Texts regarding postdigital theory were initially sourced through Jandric et al.'s (2018) editorial *Postdigital Science and Education* which outlines the origins and gives an overview of the theory. Sy Taffel's (2016) overview and critique of contemporary postdigital theories filled out any remaining essential readings while providing a sceptical viewpoint. *Postdigital Science and Education* journal was a key source of texts that explored the intersection of education and postdigital theory. Further texts were identified through database searches combining the keyword 'postdigital' with other key concepts as they arose.

Edusemiotic theory was initially encountered through Inna Semetsky's (2010) book *Semiotics Education Experience* and the later follow up *Edusemiotics: a handbook* (Semetsky, 2017). Charles Sanders Peirce's semiotic theories are cited by Semetsky as the most relevant to the educational context, so an understanding of his theories was gained through key authors on his work, including T. L. Short, Umberto Eco, Andrew Stables, and Winfried Nöth. Thomas Sebeok was responsible for expanding the field of semiotics to other fields, so his journal *Semiotica*, in particular, volume 164 from April 2007 — a special on semiotics and education — was instrumental in sourcing theoretical texts that examined the relationship between these two fields. Further to this, *Educational Philosophy and Theory* volume 45, issue seven was a special edition focusing on Peirce's speculative rhetoric as a framework for understanding education and learning, which allowed me to expand my view on Peirce's impact on educational philosophy.

In the field of visual literacy, a historical understanding was gained via Michelson's (2017) survey of visual literacy theory to date. To get a wider picture of contemporary understandings of visual literacy, an extensive database search was undertaken. Databases searched were Education Resources Information Center (ERIC [https://eric.ed.gov/]), Scopus

(https://www.scopus.com/), the Australia/New Zealand Reference Centre database via

EBSCO (https://www.ebsco.com), and Google Scholar (https://scholar.google.com/). The

tables found in Appendix A outline the exact search terms, boolean modifiers, and search

constraints used.

Google Scholar results proved to be overwhelming in more general searches, turning

up frequent duplicates and searching in citation lists even after this was disabled in options.

For that reason, in the larger searches on Google Scholar (more than 500 results), the first 100

results (sorted by relevance) were included in the next step. Result lists were perused,

assessing the relevance of each result by reading the abstract. The abstracts were evaluated on

the following criteria

- Contains a working definition of visual literacy

- Relates in some way to the decoding or encoding of visual media

- Level of specificity[6]

- Proximity to education

Selected documents did not need to have all qualities, and a holistic judgement was made in

order to narrow the field.

While reading these texts to gain a critical understanding of the concepts, key ideas

and concepts were identified as they arose. Using nVivo's code function, passages relating to

these key ideas were highlighted and coded to certain nodes. These nodes and the structure

employed can be seen in Appendix B. The top level headings were also able to be coded for

passages of note that were more general. The passages under these nodes were grouped using

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[6] Overly specific instances were selected out, as they offered less toward a generalisable theory, for example, *Revitalizing field trips in tourism: Visual anthropology, photo elicitation, rapid appraisal, participant observation and Habermas* proved to be too specific, given that it dealt with a specific situation and specific subject, rather than a wider look at visual literacy. *The language of pictures: Visual literacy and print materials for Adult Basic Education and Training* was included, because while it was applicable to a specific situation, it dealt explicitly with visual literacy and had a close proximity to education.
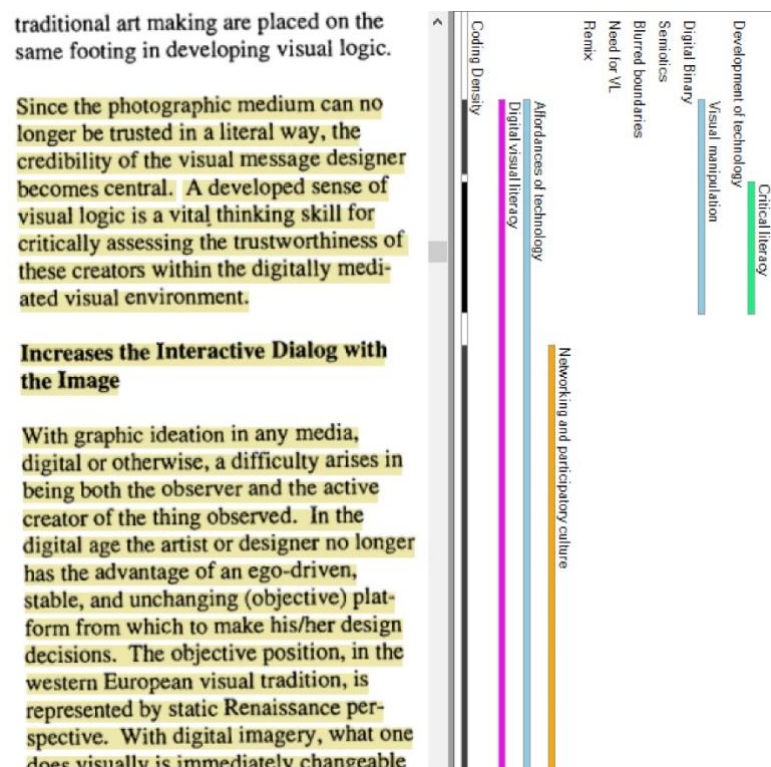
Figure 1. An example of overlapping coding in nVivo.

nVivo's query coding function. Single passages were often coded to various nodes, which gave early indications of networks of interrelated ideas (example in Figure 1). The resulting text was then reorganised in order to map out the interrelationships within these ideas and between the fields of study. Chapters three and four outline my critical understanding of the concepts of postdigital theory and visual literacy respectively. In the chapter following, I have mapped the interrelationships of some of the concepts and begun reconstruction by considering the concerns of both and outlining some specific features of my reimagined visual literacy.

Limits

The first, and probably most common, contention with research of this sort is that it lacks a connection to practice — that its data are not derived from 'the real world'. Standish (2001) says that some may consider philosophical research "vague and speculative, and oddly detached from the practical exigencies of education" (p. 499). While the relationship to

practice at this point in the research is removed by several layers, it does draw on secondary sociological research of youth culture. Aside from this, the philosophical nature of the research is intended to provide a starting point for practical implementation. Related to this concern, is the idea that academic discourse, particularly in the realm of philosophy, is not helpful, irrelevant to practitioners, or unable to be applied in day-to-day practice (Lester, 2005). Philosophy can, however, be used to reflect on current reality and the 'givens' of contemporary educational practice, but to do so first requires more than statistical data or practical do-nows (Papastephanou, 2006; Standish, 2001). Papastepahnou (2006) cites Derrida in her apt defence of a philosophical orientation towards educational research:

> For Derrida, theory (not as a mere outcome of immediate subjective experience but in a postmetaphysical a priori sense) still remains the critical force that undermines the stabilizing order to which other human cognitive endeavours may lead. Drawing from Kant's metaphor of philosophy as a *hypomochlium*[7], he states that in its leaps to an always shifting and unrealizable fulfillment, academic research finds in philosophy a motivating and activating force. (p. 197)

Another limitation of this research is that at this point it remains 'untested'. In the contemporary political context of educational discourse in which 'evidence-based' and 'best practice' are used to confer a tried-and-true approach, theoretical work such as this, on its own, may seem indulgent. But before a problem is tackled with research that measures a desirable outcome, the desired outcomes must be clear. Only then can the framing of the research can be determined (Smeyers, 2001). Chapter seven aims to contextualise the

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[7] *Trans*. Fulcrum, or tipping point

reconstructed theories by placing them within current and future practice. This will allow for the research to extend beyond this thesis into practical application.

Finally, as with any methodology, a risk remained of bias or partiality creeping into the study. With conceptual research such as this, the risk is potentially higher than other methodologies, and the consequences worse - with no data to reinterpret, the work can be dismissed as 'opinion'. As a researcher I employed reflexivity during the undertaking of this research. This involved taking into account my own investment in the research, i.e. my relationship to the field as a visual arts educator, my proximity to the 'millennial' identity, and engagements with some of the practices discussed, and understanding how that may shape my reaction or understanding of the work (Finlay, 2002). As Finlay (2002) suggests though, this is a fine line, and "personal revelation is only useful if links are made to analyse its relevance in terms of the broader study" (p. 226). A measured approach to this allowed me to draw on my experience in these areas but remain aware of my implicit biases. Further measures to ensure an impartial study involved ensuring that all sources used were authoritative as well as consulting with expert authorities within the field.

Conclusion

This chapter has outlined my methodological approach to research. It situates this thesis within the qualitative paradigm, but more specifically, within a non-empirical, philosophical paradigm. This theory and concept driven approach allows for a foundation to be built for further research based on interrogation of current practices and theories, rather than doing empirical research that takes a philosophical grounding for granted. The method of systematic textual analysis acknowledges what philosophical and theoretical research usually entails (to paraphrase Clingan [2008 as cited in Smith & Small, 2017]: reading some books, thinking about it, and then writing it down), while ensuring that the process is both rigorous

and methodical. It also allowed for me to fluidly incorporate the methodological frameworks

of philosophy, critical analysis, and edusemiotics when engaging with the texts in extended

literature reviews. The next chapter begins this process, examining attitudes towards the

concept generally referred to in education as 'digital' and giving an in-depth understanding of

what postdigital theory might offer for theories of visual literacy.

Chapter Three: The Postdigital

It should be uncontroversial to say that visual media consumed by contemporary youth is primarily done so on a networked device or a screen of some kind. Instagram boasts a user base of 1 billion, 37% of which are below the age of 24, and 69% are millennials or younger (Statista, 2019a; 2019b). This engagement is not limited just to their social lives, it proliferates the classroom as well. Visual arts students are far more likely to engage with established artist work on a gallery website than visiting the gallery itself. It is commonplace for an English class to study a film as a 'visual text'. Any attempt to define or elucidate what contemporary visual literacy might look like will intersect with these realities. I will, therefore, in my aim to re-examine visual literacy, examine the roles of, and attitudes towards technology in education. Most educators will fall broadly in one of two camps: the advocates for technology who campaign for adapting education to fit around new ways students interface with the world; and those in the 'kids today' camp who lament a shortening attention span, a lack of meaningful engagement, and who blame technology. Both camps are guilty of essentialising students in an us versus them binary. But things *do* change, and technology *does* advance, and this must have some bearing on education. In this chapter I will look at some of the issues inherent in the digital natives/digital immigrants argument, as both of the aforementioned viewpoints subscribe to this framework. A more nuanced view is desirable, one that allows for critical inquiry into technological practices, avoids essentialising entire generations, and is not reductionist when talking about technology. To this end, I propose postdigital theory as a framework to approach the various intersections between technology and education, and in later chapters, how this might be reflected in conceptions of visual literacy. This chapter outlines the key concepts and concerns of postdigital as used in their original context, so that in subsequent chapters I can examine the connections and intersections that this field has with the study of visual literacy and semiotics.

Digital natives and digital immigrants

For some time, discourse about the use of digital and networked technology in classrooms has involved the term 'digital native', and its counterpart the 'digital immigrant'. While the 'native' and 'immigrant' terminology were used as early as 1996 in the context of networked technologies in John Perry Barlow's *A Declaration of the Independence of Cyberspace* (1996), it was popularised in the education sphere by Marc Prensky in his 2001 paper *Digital Natives, Digital Immigrants* (2001). Prensky (2001) used the term digital natives to describe young people who grew up using digital technologies and whose formative years were shaped by "the arrival and rapid dissemination of digital technology in the last decades of the 20th century" (p. 1). He stretched this metaphor so far as to claim that digital natives speak a different language to the generations before them, and that any attempt by someone born before this digital revolution to engage in these technologies will be imprinted with their 'accent' – some behaviour that hints at their immigrant status (Prensky, 2001). Other educational theorists have used similar terminology and approaches to this supposed shift in contemporary students. Oblinger & Oblinger (2005) used the term 'net generation', aligning it with the now more commonly used 'millennial' generation. They claimed that the 'net generation' is "able to intuitively use a variety of IT devices and navigate the internet" (Oblinger & Oblinger, 2005, p 2.5). Both Prensky and Oblinger and Oblinger ascribe this shift to some technological break. The latter reference the experience of having widespread access to computers while growing up as the cause (2005). Prensky is more explicit about the shift, calling it a "discontinuity" (2001, p. 1) but remaining vague on exactly where during the late 20th century this break lies. There are two issues with the notion of a break or major shift. The first is that it predicates the existence of a digital native identity on grounds of technological determinism. Secondly, it misunderstands the development of technology and our engagement with it.

Dahlberg (2004) says that viewing humans as separate and distinct from objects such as technology or environments can only be understood through deterministic means. "either human agency drives technological change as 'social determinism' ... or digital devices define and govern how people use them, termed 'technological determinism'" (Knox, 2018, p. 265). Technological determinism is the position that cultural and social change is dictated by technology; that social structures adapt to technological change, and that technological change is governed by its own internal logic which is not culturally or socially determined (Bimber, 1990). It results in a reading of human history that is not governed by human will, but by responses to technologies in the form of social organisation or political resourcing – whether these responses are socially desirable or not (Bimber, 1990). The technologically deterministic argument that the digital native concept poses is that certain technologies becoming ubiquitous is the cause of social change in an entire age cohort (Jones, 2011). Digital native discourse proclaims that contemporary youth are so fundamentally different due to their engagement with certain technologies during formative years that new pedagogies are needed in order to engage them (see Oblinger & Oblinger, 2005). This discourse has led to pedagogy and educational policy being developed in response to the supposed 'digital revolution'. These range from major implementations such as the Digital Technologies subject area added as a compulsory area in the Aotearoa New Zealand curriculum, to the less likely to be implemented suggestion that couching educative material in first-person shooting games is a more effective way to get through to young people (Prensky, 2001). Jones argues instead that, in order to contend with the persistence of the digital native rhetoric, a different perspective should be adopted: "new technologies emerging with this generation have particular characteristics that afford certain types of social engagement" (2011, p. 42). This perspective avoids being technologically deterministic but does not encompass the continuum of technological and social development. A *soft* technological determinism perspective, a

view held by Lev Manovich (which has its roots in Marshall McLuhan's theories of media), incorporates sociological factors in the development and use of technology and new media — but does not hold that new technology always leads to change (Hauer, 2017; Wielgosz, 2017). Hauer (2017) explains the perspective of Manuel M. Castells, whereby "technology [is] a social process, [wherein] the society is formed by the technical change, and the technical change is shaped by the society" (p. 1). This understanding of technology as culture draws on Castells' orientation towards embeddedness — the understanding that social actors make decisions in a social context that includes economy, technology, and other networks of relationships (Hauer, 2017). The acknowledgment of a continuity between humans and technology and environments is a postdigital perspective, one that allows for open criticality towards new technology and technology-responsive pedagogy, without the need to adopt an indiscriminate pro-gadget stance, or a staunchly traditionalist approach to teaching.

Other theorists attest that technological development and social development interact on a class and economy-based field. Noble offers a Marxist perspective: "[Technology's] social effects follow from social causes that brought it into being; behind the technology that affects social relations lie the very same social relations. Little wonder, then, that the technology tends to reinforce rather than subvert those relations" (Noble, 1979, p. 19 cited in Dyer-Witheford, 1999, p. 52). More recently, Greenfield (2018), taking a pessimistic view, postulated that as networked digital information technology increasingly becomes the dominant mode through which we experience the everyday, that insight "into their function is distributed unequally across society, as is the power to intervene meaningfully into their design" (p. 6). He goes on to say that "our sense of the world is subtly conditioned by information that is presented to us for interested reasons, and yet does not disclose that interest" (Greenfield, 2018, p. 23) but it is important to bear in mind that while Greenfield presents these 'interests' as disembodied, behind them lies social relations and human actors

(Cavanagh, 2007; Herring, 2008). This intersection of economic interests and individual development is illustrated clearly in Apple's recent ban of screen time monitoring applications from their App Store (Nicas, 2019). This decision removes agency from consumers who want to use tools to manage their own, or their children's screen time. The move made it impossible for parents to monitor children's screen time. Apple then replaced the removed third-party applications with their own application. The functionality of the replacement application raises questions about Apple's vested interest in having consumers that are habituated to long hours of screen time; it offers a single button when the time cap is reached: 'ignore limit' (Nicas, 2019).

The second issue with this delineation of people who fall into either 'immigrant' or 'native' camp, is that technology simply does not evolve in huge shifts. Technological change happens incrementally, however fast that may happen (Buckingham, 2011). The early internet acted mostly as a repository for finding or publishing information, the latter of these functions only available to those with technical savvy. It had little effect on educational practice, perhaps offering an alternative to a library search for niche knowledge. It would be hard to argue that the World Wide Web in 1990 had a greater potential in the classroom than Teletext. What is often thought of as the key affordance of the internet today — networked communities and society — was already technologically afforded in the form of Bulletin Board Systems (BBS) before Tim Berners-Lee developed the World Wide Web. Early message board systems[8] are the web-based descendants of dial-up BBS. The concurrent evolution of personal web page publishing platforms such as GeoCities and Angelfire makes MySpace, with its personalisable profile page and attached message board, seem an obvious advancement in hindsight. The movement from text messaging on a cellphone to instant messaging apps to social networking platforms is a similar series of substitutions with small

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[8] Also known as internet forums

adjustments or improvements. When technology is considered as a continuum, it becomes obvious that the native and immigrant terminology is only useful if we can pinpoint a moment when things became digital instead of analogue (which is later shown as a problematic binary itself). Alternatively, it is a descriptor that will be needed to continue to describe a gap in knowledge between educators and their students, as technology marches relentlessly onwards.

Additionally, is the issue of essentialisation. The digital native rhetoric positions young people as exotic or 'other' from adults (boyd, 2017; Buckingham, 2011). Buckingham (2011) says this "overstates the differences between generations, and understates the diversity within them" (p. x). Similarly, boyd (2017) says that this othering means that adults can fail to see how youth use technology to participate in the social world, as well as fail to recognise the diversity of practice that has emerged. She says "the differences between how various populations of youth use technology are as important to understand as the differences between youth and their elders" (p. 32). Educational and cultural studies where technologies are concerned should not focus on the technologies themselves but instead should focus on the social practices that arise from engagement with them (Goel, Sanya, & Lin, 2018). Herring (2008) calls for a paradigm shift in research on youth practices with new technology and media, one that "encourage[s] young people to reflect on their media practices, rather than being swept along unreflectively on the technocultural tide" (p. 72).

Postdigitality

In his prophetic 1998[9] editorial, Nicholas Negroponte, among predicting self-driving cars, therapy dolls[10], and intelligent dog doors, envisioned a future in which "our sense of identity and community truly cohabitates the real and virtual realms" (1998, "The foothills of

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[9] For context, only 9% of households in the United Kingdom had Internet access at this time (Statista, 2019)
[10] https://www.japantimes.co.jp/news/2016/06/28/national/social-issues/osaka-startup-releases-updated-robot-doll-keep-seniors-company/

the future"). Contemporary young people navigate and construct identity within "networked publics" (boyd, 2014, p. 9) in ways that "encourage greater continuity between teens' online and offline worlds" (p. 38) It is this cohabitation and continuity of worlds that the binary conception of native/immigrant fails to address. In their 2000 book *The Postdigital Membrane: Imagination, Technology and Desire,* Robert Pepperell and Michael Punt coined the term 'postdigital' – a term "intended to acknowledge the current state of technology whilst rejecting the implied conceptual shift of the 'digital revolution'" (2000, p. 2). Pepperell and Punt are critical of the idea that a cultural break has been induced by some specific technological development, and instead propose the postdigital as a framework in which to develop "new conceptual models … required to describe the continuity between art, computing, philosophy and science that *avoid binarism, determinism or reductionism* [emphasis added]" (2000, p. 2). More recent scholars emphasise that binary concepts of digital versus analogue or 'online' versus 'offline' are rendered outdated by the ubiquity of digital technology (Bassett, 2015; Berry, 2015, Jandrić et al., 2018). They are entangled in such a complex way that previous understandings of 'the digital world' or doing something digitally are historical (Berry, 2015). Pepperell and Punt, however, use the example of gender as an analogy: while there may be an infinite number of variations of masculinity and femininity, "this does not negate the utility of either concept in as far as they are applicable to our daily experience" (2000, p. 161). They are not advocating for the abolition of these terms, but for a move away from the essentialisation of technologies that can then be used to justify tidy cataloguing of practice and social actors.

It is important to note that the 'post-' prefix in postdigital does not necessarily denote chronology. Postdigital is a framework that critiques and inquires into the digital world, digitality, and the consequences thereof (Peters & Besley, 2018). Cramer (2015) further illuminates these concepts as he clarifies the 'post-' prefix of the term in relation to other

'post-' concepts. Two of the analogies he proposes are: post-apocalyptic – descriptive of a time after the initial upheaval of a world-changing event, after which we are left to live with the repercussions; and post-colonialism – not an end to colonialism, but a critical engagement with new power structures and ongoing impact on cultures. Sinclair and Hayes (2018) simplify: the 'post' prefix signals that "there is something to talk about" (p. 129).

A definition was proposed at a gathering of researchers at transmediale Berlin in 2013:

> Post-digital, once understood as a critical reflection of "digital" aesthetic immaterialism, now describes the messy and paradoxical condition of art and media after digital technology revolutions. "Post-digital" neither recognizes the distinction between "old" and "new" media, nor ideological affirmation of the one or the other. It merges "old" and "new", often applying network cultural experimentation to analog technologies which it re-investigates and re-uses. It tends to focus on the experiential rather than the conceptual. It looks for DIY agency outside totalitarian innovation ideology, and for networking off big data capitalism. At the same time, it already has become commercialized. (Andersen, Cox, & Papadopoulos, 2014, para. 1)

While Andersen, et al. (2014) and Cramer (2015) seem to acknowledge a shift of some kind that Pepperell & Punt reject, they emphasise the historicity of digital: its shift into the background and reject the binary of digital/analogue. Jandrić et al. (2018) suggest that the term may be a shorthand for a crisis or related nebula of crises arising in the wake of the digital.

Like the perfunctory nature of the digital native/immigrant divide that oversimplifies and essentialises a continuity of social practice into a generational divide, the distinction

between digital and analogue oversimplifies a complex continuity. Postdigital positioning rejects simplification and calls for a recognition of the complex practices that emerge from networked media, economic interests, and evolving technological practices. It demands a nuanced perspective on the communicative actions between teacher and student; student and student; and students and the wider world, whether the action is technologically mediated or not — because regardless of intention, all classrooms are impacted by technology.

Rejection of the binary

When defining the postdigital, Cramer (2015) uses the example of a typewriter to illustrate the problematic of the digital/analogue binary. If we use the definition Cramer (2015) offers here of digital as "something that is divided into discrete countable units" (p. 17) then the typewriter, and even Gutenberg's printing press are digital, he argues. It follows from this that our conception of the digital media is not so clear cut as to offer a binary opposition to it. Our definitions for digital in other practices are questionable too. It would be easy to define a social interaction through email as digital, but what about a rotary telephone? Our voice is transmitted into an electronic signal, but one would be unlikely to describe a classroom with a rotary phone as using digital technology. And if the somehow more personal nature of voice makes this less digital, where does that place FaceTime? These arguments seem specious, but they serve to highlight the arbitrariness with which we might dictate digital-ness or analogue-ness. A postdigital approach acknowledges the messiness of these definitions, rejects their binary, and decentres categorisation when understanding social practices.

Oblinger and Oblinger say, of the 'net generation', that "their ability to move between the real and the virtual is instantaneous" (2005, p. 2.5). While this is similar to boyd and Negroponte's conceptions of worlds, Oblinger and Oblinger are imposing a binary - one or

the other, not a continuity between the two. The notion that we have an 'online' or an 'offline' world that are somehow discrete is now outdated (Berry, 2015). This is further illustrated in frequent concerns of the impact of the digital on social and material life - for instance frequent newspaper articles such as: "Smartphones, tablets causing mental health issues in kids as young as two" (New Zealand Herald, 2018), "Study reveals 'alarming' damages from pre-schoolers exposed to screens" (Russell, 2019), and "Screen time not intrinsically bad for children, say doctors" (The Guardian, 2019) highlight this concern. This stands at odds with the conception of the digital or the virtual as somehow other from the real world (Jandric et al., 2018).

Postdigitality rejects binaries and embraces continuity between things. At the same time, it acknowledges that temporary conceptions of certain things as bounded entities is essential in conceiving and describing the world, as long as we do not substitute bounded mental models for the things themselves. In the pursuit of a reimagined theory of visual literacy I have explored three particular areas where models of discontinuity are often applied. Firstly, in visual media, where digital and analogue are regarded as two distinct categories (Cramer, 2015) and information is considered as separate from the context that informed it. Secondly, in notions of the self, and identity, where the individual is considered as responsible for the course of their own development, rather than cultural experiences informing and traversing what Pepperell and Punt (2000) call "the organic indeterminacy of the body's limits" (p. 37). Finally, in education, where the proliferation of ideas concerning digital learning as being distinct from what might be called analogue or 'traditional' learning (Jandric et al., 2018) essentialises both technologies and students, and the conception of the classroom as somehow separated from other cultural experiences oversimplifies the complex interactions that happen in teaching and learning.

Postdigital media

A photography student in 2019 may opt to use film photography as their medium for producing work. When they take their film to get developed, they will receive their images as digital files — with the convenient options of having them transferred to a USB flash drive, or uploaded to the cloud so they do not even to be physically present to collect them. These images — already digital artefacts — will most likely be tweaked in Adobe Photoshop prior to publication of any sort. On the flipside of this, a student using a DSLR camera might take a photo, using the same capture process as a photographer using a film camera, except that the image is encoded to a digital artefact instantly. They may then later add grain to the photograph in Adobe Photoshop to achieve the 'feel' of a film photograph. It is this contraposing of 'old' and 'new' aesthetics and practices that characterises a postdigital handling of media. The 'analogue effect' has been subsumed into mainstream culture in the form of the Instagram filter. The Google Play app store returns fourteen results for 'light leak' that are specifically for adding an effect to photos that was *undesirable* in film photography. Dozens more offer 'retro', 'vintage', or 'analogue' effects. A peak example of this practice can be found in the KD Pro[11] application. KD Pro is a camera application that replicates the functionality of disposable cameras popular in the 1990s. A small viewfinder replaces the full screen viewfinder of a standard camera phone and an on-screen button takes a photo with a mechanical sound effect, replete with the winding sound of advancing to the next frame of film. The user does not get to view the images immediately, instead they must first complete the twenty-four shots on the 'film' and then wait twenty-four hours for 'development'. The application then allows you to view the photos, embellished with randomised light leak effects and time stamps. The effect this has on the user is to relinquish the control and choice that comes with the convenience of digital photography, and embrace the chance and

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[11] Previously known as Kudak Pro, presumably changed due to copyright infringement.

randomness that came with disposable cameras. The affordances of new technology are flipped on their head: we are afforded the limitations and aesthetic of old technology. It is media practices such as these that can help us to assume a postdigital orientation to visual media.

In the section above I have scrupulously adhered to using 'new' and 'old' when describing technology, and avoided digital/analogue as best I can. Not only is the line between digital and analogue hopelessly blurred, but if it is to be used as a chronological marker, it is no indicator of contemporariness. Media that evokes nostalgia now has a rich catalogue of 'old' computer aesthetic to draw on. Video game *Secret Little Haven* (2018) invites the player to use a simulated operating system based on Windows 3.1 or the original Mac OS. The player assumes the role of a teen girl in 1999 and "explores her computer for the treasures and curiosities of the early internet" (Hummingwarp Interactive, 2018). While the game is single-player, conversations with other characters are experienced through the window of a rudimentary instant messaging programme called 'Millenium Net Chat', evocative of MSN messenger or ICQ. Critic Chris Franklin suggests this allows the experience of the 'old' networked technology a "simulation of a sort-of social hang out interaction that we don't really see these days ... most instant messaging is done either in slack or discord in big groups" (2018, 12:37). The interface of *Secret Little Haven* restricts the player to interactions that would have been commonplace for internet use in the late 1990s. While this happens only in the diagetic space of the game, it still affords the experience of an earlier technology, much like KD Pro.

Cramer (2015) uses zines[12] and zine fairs as an example of postdigital media. He posits that a zine fair operates using 'new media' cultural practices, while the physical media

[12] Small self-published magazines often dealing with political issues or showcasing the creator's work.

itself (the zines) are 'old media'. He uses Manovich's (2001) principles of new media as a rubric for these cultural practices. These principles are:

- Numerical Representation: New media artefacts can be described mathematically and is subject to algorithmic manipulation

- Modularity: New media artefacts can be combined into larger objects while still maintaining their independence — a website for example can contain an animated gif file, but both the gif and the website remain discretely editable in the appropriate software

- Automation: Media creation, manipulation, and access can be governed at least partially by a rule set or algorithm, rather than human intentionality

- Variability: Where old media is characterised by reproduction of a single identical product for consumption, new media allows for users to engage in different sequences or for the artefact to be customised to suit the user

- Transcoding: A new media artefact has two layers — the layer of representation, where images interact with human culture; and a computer layer, the code and data level at which the artefact interacts with other new media, databases, or software

The zine fair, Cramer (2015) argues, with its collaborative making practices exhibits both modularity and variability. Modularity can be seen in the common practice of producing collaborative zines: collections of work from attendees, all created in their own mode. Variability applies more to the individual artefacts at the zine fair — where early zines were produced to inform about a political issue or fandom13 (and many still occupy this space) contemporary zines occupy an expressive space where identity can be curated. This is not dissimilar to early personalisable internet spaces such as GeoCities or MySpace, spaces of messy bursts of expression that have since been sanitised into the likes of Facebook and

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13 A community of fans. Now used frequently to describe large groups on social networks.

Wordpress. In a 2014 review of Phoebe Carse's *Mystery Meat*, I[14] called the zine "reminiscent of a Tumblr page made into a material artefact" (Richards, 2014, para. 5). "*Mystery Meat* is more crafty and handmade than you'd find on most Tumblrs, but it retains that new media 'curation' and appropriates with abandon" (Richards, 2014, para. 5). It is this activation of old media using new media practices that Cramer (2015) describes as typifying the postdigital.

Remixes, appropriation, and hybrid media are commonplace in online media communities. Whether it be the culturally dominant 'meme': an image with a structural meaning that is remixed with content ranging in specificity and niche; the dubiously-named underground community of Youtube Poopers who make aesthetically challenging videos rife with appropriation of well known commercial properties; or the algorithmically generated children's videos such as the vast array of variations on the *Finger Family Song*, these practices can be found at every level of the internet. But the practices are not new. Remixing, for instance, has its roots in hip hop music, but before the term was coined the practice can be traced back through literature (see William Burroughs, *The Soft Machine*) and art (see Tristan Tzara, *To Make a Dadaist Poem*) and can even be argued as the basis of invention itself (Ferguson, 2010). As professional or near-professional level software has become available, visual media designers and artists have experimented with its limitations and combined the functionality of programs in ways that were not necessarily intended by the software developers (Manovich, 2007). The resulting hybrid media — 2-dimensional typography incorporated into 3-dimensional space, video glitch effects applied to high fidelity CGI footage, etc. — is what Manovich (2007) calls *deep remixability*. What gets remixed in this process is "not only content from different media but also their fundamental techniques, working methods, and ways of representation and expression" (2007, p. 9). In this *metamedium*, individual elements retain the mode of communication that characterises them,

[14] Writing under a pseudonym

resulting in a piece of media that has modularity in both the production side, and in its semiotic function. It is evident, then, that the current state of media does not conform to binary understandings of digital/analogue, or even old/new. What emerges instead is a willingness to engage with media based on the affordances it grants, irrespective of where it rests in the continuum of technology. Cramer (2015) returns to the example of the typewriter in his concluding statement in *What is postdigital?* The context of this postdigital technology is a poet offering free personalised poems in the park. The affordances of this technology are what informed the choice — what piece of contemporary technology would allow for this postdigital practice?

Media, which now is predominantly networked in some form (even solo engagement such as watching a television program — Netflix offers other shows 'you may like' based on what others with similar viewing history watched), is part of the cultural experience that forms who individuals are. Whether it is through consumption of media that helps an individual form an idea of the world or the production of media, writing oneself into being in the disembodied online space, technology becomes the cultural and commercial compost from which we grow new ideas and ways of being (Negroponte, 1998).

Postdigital self

Cavanagh (2007) argued that, while identity and self are constructed in online spaces, this is not as multi-faceted or fragmented in the 'you are who you pretend to be' sense (see Turkle, 1995). She concluded that the "major trend in internet use appears to move directly away from the postmodern identity play … towards the opposite, but equally postmodern, dynamic of hyper-identity" (Cavanagh, 2007, p. 121). Cavanagh (2007) posited that, when considering online communities and networks, association does not construct self-presentation, but the opposite is true: "in order to generate a social circle, or the connections

necessary to develop an online presence, we must already have a clear sense of self" (p. 123).

Once part of an online community "we move from inhabiting identity to performing it"

(Cavanagh, 2007, p. 124), this performance, coupled with the commodified nature of identity

in online spaces, facilitates the formation of hyper-identity. Lev Manovich drew some similar

conclusions to Cavanagh in studies of visual culture on Instagram, particularly around

branding and commodification. He found that the boundary between 'independent' and

'commercial' identities is increasingly subtle. Manovich (2016) suggested that this permeable

boundary allows for constant borrowing between the personal and commercial expressions of

identity on the platform, a process that informs building a personal brand or visual identity,

conversely it allows a commercial brand to adopt a relatable identity (Manovich, 2016). In

contrast to Cavanagh, Manovich believed that some of this identity is constructed in these

networked spaces to set oneself apart from others, while still remaining within the community

space. He says: "Cultural identity today is established via small variations and differences –

and also hybridization among already established positions" (Manovich, 2016, p. 18). Ito et

al. (2008), in their three-year ethnographic study the *Digital Youth Project,* found results that

pointed to a networked and collaborative formation of identity. Not only did they find the

kind of hyper-identity common to both Manovich and Cavanagh, by way of hyperfocus on

particular niche interests, but they also observed that "youth engage in the specialized 'elite'

vocabularies of gaming and esoteric fan knowledge and develop new experimental genres that

make use of the authoring and editing capabilities of digital media" (Ito et al., 2008, p. 38).

These specialised vocabularies and knowledges can be used to perform an identity, signalling

to observers or peers their membership of a community or subculture. Ito et al. (2008) also

found that social learning and formation of identity intersected in online spaces:

By engaging with communities of expertise online in more geeked out

practices, youth are exposed to new standards and norms for participation in

specialized communities and through collaborative arrangements. These

unique affordances of networked publics have altered many of the conditions

of socializing and publicity for youth, even as they build on existing youth

practices of hanging out, flirting, and pursuing hobbies and interests. (p. 36/37)

In these communities Ito et al. (2008) found emergent practice that epitomises the 'learning

web' that Ivan Illich (2011/1971) proposed in his book *Deschooling Society*. The adults in

these communities, while not occupying a position of authority, played a role in setting

community norms and de facto learning goals and providing expertise (Ito et al., 2008). A

postdigital position reminds us that these communities and interactions are not separate from a

'real' or 'natural' human social life. The offline and online are no longer meaningfully

separate – and this is especially pertinent when considering the political radicalisation that can

emerge in these social spaces (Nagle, 2017). Postdigital selves are formed in vast

technologically mediated networks, the affordances of which are increasingly dictated by

capital interests. Students bring the sum total of these experiences with them into the

classroom.

Postdigital education

The educational sphere is plagued with not just the enduring rhetoric of the digital

native/digital immigrant divide, but hosts of other techno-centric terms that serve to reinforce

the separation of the virtual or digital and the real or physical (Fawns, 2018). Education is

haunted by the binary of digital and analogue. Either work is digital and using devices, or

analogue and handwritten in a textbook. Terminology such as *digital learning*, *e-learning* and,

the cloud serves to separate these from what we might see as the day-to-day or traditional

teaching. These metaphorical conceptions carry with them implications that the digital is "somewhat disembodied realm, decontextualised and free-floating" (Gourlay, Lanclos, & Oliver, 2015, p. 263) while material classroom spaces are the domain of embodied learning, the place where learning can incorporate an emotional connection to the environment (Fawns, 2018; Gourlay, Lanclos, & Oliver, 2015). It is not uncommon to hear a yearning for the way schools 'used to be', some state at which they were free of technology, usually coupled with the implication that technology is why students are not achieving. The flipside of this is the enthusiasts — those who have what Buckingham (2007) calls "a superficial infatuation with technology for its own sake" (p. viii). The booming[15] educational technology industry courts teachers by promising both camps what they want, proclaiming that new technology is both more creative and transformational than what came before, as well as expounding its instrumental function in improving test scores (Buckingham, 2007). If it is accepted that networked digital information technology now mediates almost all human experience (Greenfield, 2018) or that the virtual and digital are no longer 'other' or separate from a 'natural', 'physical' social human existence (Jandrić et al., 2018) then a reframing of the relationship between technology and education is in order.

Contemporary classroom and schooling practices inevitably involve interaction with networked media or digital surfaces. In an Aotearoa New Zealand context, primary and secondary schools are being prompted by the Ministry of Education to make a shift towards flexible learning spaces. These spaces offer a flexibility of practice, one of the opportunities being in relation to using ICT and networked mobile technology as appropriate (Benade, 2015). Even in more traditional secondary schooling environments it would be unusual to encounter a programme of learning that did not involve students interacting in some way with

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[15] A billion-dollar industry in Australia (Australian Trade and Investment Commission, 2017) and the United States (Wan, 2019), and a fast expanding multi-billion-dollar industry in China (Emmanuel, 2018)

networked media in the school environment, whether it be researching something on the internet in the school library or being shown a YouTube video on study habits in form period. In higher education it is far easier to imagine the fluidity of these interactions, as restrictions on the use of technology tends to be far more relaxed. Gourlay, Lanclos, and Oliver (2015) asked various users of a university campus environment to map their learning environments. She concluded that the resulting maps "might be characterised as 'post-digital' maps of practice, where the digital is implicit, and understood to be present or available across all aspects of practice" (p. 273) and that "for these students 'learning landscapes' are not just about physical spaces, but are complicated social networks of people, analogue and digital resources and nonhuman actors" (p. 274)

Aside from these more obvious intersections of technology and educational practice is the, perhaps more pertinent concern to postdigital discourse, consideration of students' practices with technology and networked media outside of the timetabled class. For example, in her ethnographic studies of online communities, Ito (Jenkins, Ito, & boyd, 2016) found that participatory and practice-based learning processes were happening in online fan communities and that "learning [was] a side effect of creative production, collaboration, and community organizing" (p. 93). These practices, or the lack of access to them, will influence not just what happens before and after the class, but will inevitably affect the way students interact with information during class (Fawns, 2018). Jandrić et al. (2019) highlighted that:

> To be on the 'worse end' of the 'digital divide' does not mean that you live an entirely 'analogue' life, unaffected by the encroachments of digitisation. Rather, it means that you have less agency in the digital era and that you are undoubtedly impacted to a greater extent by a technology infused global capitalism (p. 166)

A Stats NZ (https://www.stats.govt.nz/) study observed a similar phenomenon, concluding

that "Low household income and lack of formal qualifications appeared to be barriers to the

educational, cultural and economic opportunities available from participation in the

technological information environment, accessed primarily via the internet" (2004,

Conclusion). This can impact social engagement as well as academic engagement, as Ito et al.

(2008) observed:

> Sporadic, monitored access at schools and libraries may provide sufficient
>
> access for basic information seeking, but is insufficient for the immersed kind
>
> of social engagements with networked publics that are becoming a baseline for
>
> participation on both the interest-driven and the friendship-driven sides. (p. 36)

This impact on participation in common culture and sociability is further impacted when

public libraries and schools block central social hubs for youth, such as social network sites

(Ito et al. 2008). Even with this differential access to technology, quality of use and economic

context factor into the quality of formal and informal learning afforded. It is this complex

intersection of circumstances and contexts involving technology and education that a

postdigital framework will prove valuable for investigating. Technology and access to

technology should not be seen as independent from education, but nor should these be seen as

inherently positive or negative. Technology should be viewed as the "landscape in which

education is enacted" (Fawns, 2018, p. 136). While the notion of ubiquity in relation to

technology in education is rightly maligned by some (see Gibbons in Jandrić et al, 2019), the

postdigital framework acknowledges a ubiquity of influence and effect.

Conclusion

While so much discussion around the use of technology in classrooms employs the rhetoric of the digital native, anyone who has spent time in a BYOD classroom can attest that students are no more naturally fluent in the use of computer applications than they are in essay writing. This does not mean, however, that these technologies are not part of their lives — it may be the very fact that *they are* embedded and intertwined with our lives that appropriate fluencies and literacies need to be learned. A static literacy may not be the answer — Greenfield says that "conventions and arrangements that constitute our sense of the everyday now no longer evolve at any speed we'd generally associate with social mores, but at the far faster rate of digital innovation" (2018, p. 13). Postdigitality subverts the idea that technology can be pinned down as a certain set of tools and the use of those tools certificated as a fixed literacy.

It is not useful to categorise these technologies as broadly good or bad for young people or education, as inevitably the technologies that fulfill a social need will be adopted, but positive practices can be supported (Ito, 2017). Taffel (2016) said of the postdigital that the term itself holds little critical value, but that "particular tropes and figures it alludes to articulate numerous issues [that] are pivotal to comprehending the contemporary digital landscape" (p. 335). Sinclair and Hayes (2018) say that the 'post' prefix not only signals that "there is something to talk about" (p. 130) but reminds us that the "digital takes place in a material world as well as a virtual one" (p. 130). A postdigital framework sets technology as the backdrop against which education occurs. It acknowledges the networked and participatory nature of engaging with media both new and old and the synthesis of both. The rejection of the digital/analogue binary affords a way of critiquing technologically mediated practices that does not separate it from an embodied social world.

Chapter Four: Visual Literacy

In chapter three I examined in detail the theory of postdigitality as a basis to clarify the relationships between postdigital theory and the main focus of this study, visual literacy. This chapter will do the same for existing ideas about visual literacy. Visual literacy is not what is commonly referred to by the term 'literacy' — this honour belongs to alphabetic literacy, as evidenced by its use in Aotearoa New Zealand's University Entrance certification (NZQA, n.d.a). Therefore, I make a case for the importance of addressing visual literacy in education. I also outline the notion of literacy itself, a term that seems to have as many meanings as fields it is applied to. The notion of literacy undergoes continuing scrutiny in this thesis. Finally, the remainder of the chapter reviews current visual literacy theories and the various challenges and concepts that they grapple with.

The need for visual literacy

A point of some contention is whether or not visual literacy needs to be taught, or if elements of it can be taught — how important is it? The fact that visual literacy is not addressed in the *New Zealand Curriculum* (MoE, 2007) indicates that it is not regarded as important as other literacies, or at least not important enough to be regarded as its own separate literacy. One argument for it being taught is that the vast proliferation of visual media calls for an engagement beyond just being able to 'see' and recognise things. Proponents of visual literacy often espouse a desire for criticality when it comes to engaging with images. In an age of manipulated images, can a critical visual literacy discern the real from the false? And can it recognise the power structures that images reside within, from governmental to capitalistic? Images have a relationship with knowing, they are our default epistemological mode: *seeing is believing*. Their role in making meaning cannot be underestimated.

In his seminal work on contemporary visual culture, John Berger wrote: "In no other form of society in history has there been such a concentration of images, such a density of visual messages" (1977, p. 129). Decades on, this sentiment is echoed frequently. Berger was writing in the wake of the proliferation of television, during the golden age of advertising. Now, as technology advances, smartphones, networked technology, and image saturated social media tends to be the focus of this proclamation. The students of today have grown up bombarded by visual media from technological sources (Avgerinou, 2003; Avgerinou & Ericson, 1997; Bowen, 2017; Ervine, 2016; Felten, 2008; Oblinger & Oblinger, 2005; Prensky, 2001; Spalter & van Dam, 2004). What this means for education depends on who you ask. For some, this submersion in the visual has resulted in students who have a preternatural ability to think or learn in a visual way (see Oblinger & Oblinger, 2005; Prensky, 2001). Others, notably Felten (2008) and Brumberger (2011) reject this deterministic stance. Felten says, "living in an image-rich world, however, does not mean students naturally possess sophisticated visual literacy skills, just as continually listening to an iPod does not teach a person to critically analyze or create music" (p. 60, 2008). Brumberger (2011) goes further than this to suggest that, in fact, despite the saturation of images, students are not necessarily visually literate even at a basic level, unless taught.

Implied in Felten's (2008) quote above is the goal of critical analysis. For many, this is the motivation in advocating for visual literacy. For education to adequately aid young people in their navigation of a visually saturated world, a critical orientation towards visual media should be developed (Association of College & Research Libraries [ACRL], 2011; Avgerinou, 2003; Avgerinou & Ericson, 1997; Brumberger, 2011; Dake, 1994; Druick, 2016; Goforth, Metz, & Hammer, 2018; Spalter & van Dam, 2004; Zambo, 2006). Theorists writing during the emergence of early computer graphics, such as Dake (1996) and Messaris (1994),

Figure 2. Photograph of Joseph Stalin and Nikolai Yezhov walking along the Mosow Canal, c. 1930, photographer unknown. Before and after photo manipulation.

suggested the need for visual literacy in the interpretation of truth in visual meaning. Dake (1996) says,

> When a digitally altered (that is to say undetectable, modified, photographic-like image) enters the external world of visual communications it still conveys a convincing sense of real context to the viewer. When viewed against the conventional societal standard of singular meaning (which holds that this image must either be a true representation of the world as it exists or else it is false, misleading, or worse) the digital image poses new problems of interpretation. (p. 139)

Messaris (1994) has a more radical viewpoint, suggesting that beyond furthering aesthetic appreciation, detecting photo-manipulation may be the *only* worthwhile purpose for the teaching of visual literacy. It is true that the contemporary visual landscape is permeated by sophisticated image manipulation (which is so prevalent that 'photoshop' has entered the English language as a verb to describe manipulating a photograph [Photoshop, n.d.]), layperson-friendly photo retouching applications, and 'deepfakes' 16. But learning to spot these

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16 Algorithmically generated footage that replaces the face of a person speaking in a video with another, resulting in realistic fake footage

fake images simply by *looking* is increasingly futile. Deepfakes, for instance, are so

troublesome to spot from just viewing, that new digital forensics techniques are being

developed to combat them, this technique itself requiring extensive machine learning (Knight,

2019). Manipulating reality using visual media is not something that arrived with the personal

computer, or Adobe Photoshop. Not even early examples of photo manipulation, such as the

infamous photo (see Fig. 2 above) of Joseph Stalin and Naval Commissar Nikolai Yezhov

walking alongside Moscow Canal, a photo from which Yezhov was later completely erased (a

manipulation of photographic reality to rewrite history when Yezhov fell out of favour —

'Secretary Stalin has never associated with enemies of the state'), are at the core of the issue.

Although these may be particularly egregious examples of manipulation, photographic

media (including film and video footage) has always had an uneasy relationship with reality.

Susan Sontag (1977) outlines that, at best, we frame reality by "limiting experience to a

search for the photogenic" (p. 9) and that photographic media have a role to play in

manufacturing consent:

> A capitalist society requires a culture based on images. It needs to furnish vast
>
> amounts of entertainment in order to stimulate buying and anesthetise the
>
> injuries of class, race, and sex. And it needs to gather unlimited amounts of
>
> information, the better to exploit natural resources, increase productivity, keep
>
> order, make war, give jobs to bureaucrats. The camera's twin capacities, to
>
> subjectivise reality and to objectify it, ideally serve these needs as strengthen
>
> them. Cameras define reality in the two ways essential to the workings of an
>
> advanced industrial society: as a spectacle (for masses) and as an object of
>
> surveillance (for rulers). The production of images also furnishes a ruling
>
> ideology. Social change is replaced by a change in images. The freedom to

consume a plurality of images and goods is equated with freedom itself. The

narrowing of free political choice to free economic consumption requires the

unlimited production and consumption of images. (p. 178)

A recent example of this can be found in the controversy surrounding the publicity photos of

President Trump's inauguration (see Fig. 3). The Trump administration accused of instructing

the National Park Service to crop images to make attendance appear greater (Hohman, 2018).

While Time Magazine reported that "National park service didn't alter photos of Trump's

inauguration crowd" (Reilly, 2017, headline) the framing of the chosen photograph brackets

Figure 3. Photographs of President Trump's inauguration on January 20th, 2017 (National Parks Service, 2017). Two images overlaid to show extent of cropping.

the understanding of the world it depicts. It has been established that no one was instructed to

alter these photos to communicate a message about crowd size, part of the evidence stating

that cropping of this nature is standard practice when processing photographs (Hohman,

2018). The mere fact that the photos became such a point of contention, however, shows that

even nominally un-manipulated photographs are political, and as such require critical

engagement. This call for critical engagement is more pertinent than ever in the context of

networked and participatory media, where social knowledge creation is enacted on platforms

such as Instagram or YouTube. These are sites where social participation is deeply entangled

with capitalist enterprise and politics.

Visual media goes beyond the role of mere entertainment or illustration and plays a

part in the social and political world. Other advocates for critical visual literacy purport that a

critical orientation toward visual media would enable students to distinguish the superficial

and pseudo-sophisticated visual messages from those that are valuable (Avgerinou, 2003;

Avgerinou & Ericson, 1997), to understand the role that images have in communication

(ACRL, 2011; Thompson, 2019), and emancipate them from the regulatory powers of visual

media (Druick, 2016; Zambo, 2009). In her work on teaching critical visual literacy, Zambo

(2009) encouraged students to engage with images of disabled people and identify enactments

of power in the choices made creating and framing the image. She says, "When images are

critically read, individuals and objects representing power are exposed and those who are

oppressed find their voice" (p. 62). Learning programmes that deal with visual media tend to

treat criticality as the final point, or an extension task. In the NCEA Achievement Standard

91250 *Demonstrate understanding of representation in the media,*[17] the excellence criteria is

to "demonstrate *critical* (emphasis added) understanding of representation in the media"

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[17] This standard deals with 'media texts', so while not explicitly visual texts, most texts studied contain a significant visual component — this is evident in the online exemplars of student work for this standard with involve the investigation of how women are visually represented in fashion magazines and make-up advertisements.

(NZQA, 2019, p. 1). Criticality is an aspiration for students assessed against this standard. Compounding this orientation towards criticality is the assessment resource provided for this achievement standard by the MoE (2015) on *Te Kete Ipurangi*[18] (http://nzcurriculum.tki .org.nz). This suggests the following sequence of questioning:

1. how realistic they think the character is – what has been selected, exaggerated or omitted

2. what messages about teenage girls or values they think the representation communicates

3. what they think the effect of this representation might be on teenage girls who watch the film/programme

4. what effect they think this might have on wider society's attitudes to teenage girls

5. (optional) why the producers have represented teenagers this way (p. 6)

This sequence initially invites students to compare the text with what they already know (question one and three) and what they think is contained within the text (question two). Question four positions the text in a wider network of meaning. The final (and *optional*) question begins to interrogate discourses of power and is where students are asked to engage in a truly critical way. This once again reinforces the notion of criticality as an extension task. In contradiction to this common sequencing, Zambo's (2009) programme starts with the critical – examining power dynamics in the production of the image, engaging reflexivity as a viewer, and finally, addressing the affective properties such as "How does this image make you feel?" (p. 65). This, alongside repetition of the activity, aims to build a disposition that engages criticality before surrendering to the affect of the image.

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[18] A website of teaching resources provided by the MoE

Others still see visual literacy as having implications beyond just preparing students for 'life beyond school'. For some, the visual has a fundamental connection with the very nature of learning itself. Berger (1977) begins *Ways of Seeing* with the statement: "Seeing comes before words. The child looks and recognises before it can speak." (p. 7). Expanding on this concept, Song & Turner (2010) propose that visual literacy is the foundation for verbal literacy. They suggest that the line between verbal and visual literacy is blurred for students growing up in, what they call, 'the information age'. Song & Turner (2010) conclude by noting that a visually literate student will see parallels between visual and verbal language — a contention that will prove to be quite controversial among those seeking to define visual literacy. Related to this is the notion that the hierarchy of image and text in constructing meaning in networked media, so much so, that text is often subordinate to image (Szabó, 2016). Teaching has not adapted to this hierarchical disruption in the construction of meaning, and still uses images to supplement text, teaching *using* images, rather than *about* images (Villamizar, 2018) or treating them as mere illustration (Felten, 2008). Papadopoulou (2013) agrees and posits that teaching visual literacy will lead to "the transcendence of the limitations of logocentrism and the hierarchies that dominate it" (p. 56). She believes that, because "the management of digital information affects the way humans think, construct and experience day-to-day life at a local or global level" (p. 52) that a visual literacy is required in order to make order from what threatens to be an "unstructured 'wave' of visual information" (p. 57).

As Berger (1977) goes on to say in his introduction: "It is seeing which establishes our place in the world; we explain our world with words, but words can never undo the fact that we are surrounded by it. The relation between what we see and what we know is never settled." Images and the visual play a role in how humans construct meaning in contemporary society, whether it is images alone or in conjunction with text. The relationship between

seeing and knowing should be treated with the same rigour as the relationship between the written word and knowledge — with a criticality derived through a visual literacy.

Literacy as a concept

Since the coining of the term 'visual literacy' by John Debes in 1969, there has been no clear consensus on what the term actually means. There are as many definitions for the term as there are visual literacy theorists. Much literature is dedicated to documenting and comparing the various definitions (see Avgerinou, 2003, 2009; Avgerinou & Ericson, 2003; Avgerinou & Pettersson, 2011; Baca & Braden, 1990; Brill, Kim & Branch, 2007; Brumberger, 2019; Kędra, 2018). Before getting to the details of what these various definitions of visual literacy entail, it is important to frame an overarching concept: literacy.

In the *New Zealand Curriculum* (MoE, 2007), there are eight references to literacy specifically. Two are in reference to the English language in particular, and so deal explicitly with written/reading/verbal literacy. Two are specific mentions of visual literacy in the arts curriculum, and the technology and dance subject area also make mention of a literacy specific to the discipline. The remaining two are references to 'literacy and numeracy[19]', a concept present in the NCEA (NZQA, n.d.a), Aotearoa New Zealand's predominant secondary school qualification, and in the NZQA's University Entrance qualification (NZQA, n.d.b). The curriculum also includes a section under the Key Competencies: Using language, symbols, and texts (MoE, 2007, p. 12). This encompasses "working with and making meaning of the codes in which knowledge is expressed" (p. 12) and applies to "texts of all kinds: written, oral/aural, and, visual; informative and imaginative; informal and formal; mathematical, scientific, and technological" (p. 12). While this does not specifically mention

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[19] Numeric literacy

literacy by name, it acknowledges the presence of multimodality as defined by Kress (2003) and multiliteracy, such as in Cope & Kalantzis (2000). This broad view of literacy, however, is undermined by the emphasis placed on the literacy of the aforementioned 'literacy and numeracy'— the explicit mentions of literacy that are rewarded with certification. NZQA defines this more narrowly:

> Literacy is the written and spoken/signed language people use in their everyday life, learning and work. It includes reading, writing, speaking/signing, and listening/attending. Skills in this area are essential for good communication, active participation, critical thinking and problem solving (NZQA, n.d.a)

Considered alongside the fact that the resources provided for literacy on *Te Kete Ipurangi* are limited to written language only, the hierarchy of text above image becomes clear.

Kress (2003) laments that the term 'literacy' may be of questionable use, given that its origin in the written word, but the term when applied to other disciplines is generally understood metaphorically (Green & Beavis, 2013). Kress (2003) notes that "[literacy] refers to (the knowledge of) the use of the resource of *writing* (emphasis added)" (p. 24). Expanding on this definition, and considering the notion of *writing* as metaphorical, a broader definition that encompasses a wider range of meaning making systems emerges. It is in this sense that Leu (2000) employs the term, when he discusses literacy in relation to technology. Not only does he not specifically align literacy with the written word, he suggests that as new technologies emerge the notion of *being literate* should be replaced with an ongoing *becoming literate.* Leu (2000) says that "literacy appears to be increasingly deictic[20]; its

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[20] *Deixis* describes the quality of a word whose meaning changes depending on the time or space it is used (Leu, 2000)

meaning regularly redefined, not by time or space, but by new technologies and the continuously changing envisionments they initiate for information and communication" (p. 745). His notion of being literate in a language or technology is *being able to communicate with it.*

The *New Zealand Curriculum*'s (2007) Key Competency of *using language, symbols, and texts* goes beyond the ability to just *use* "the codes in which knowledge is expressed" (p. 12). It stipulates that students should learn to use them in a range of contexts, and "recognise how choices of language, symbol, or text affect[s] people's understanding and the ways in which they respond to communications" (p. 12). Transcending the ability to use a language and developing a reflexive approach when considering choice of communication method is an indicator of criticality in communication. Serafini (2013) suggests that literacy has shifted from being an individual cognitive skill to a social practice; literacy is something that is done in particular social contexts. Bill Green's model of 3d literacy incorporates both use literacy and critical literacy, with this additional contextual facet: the cultural dimension (Green & Beavis, 2012). Green's model is organised into the three aforementioned dimensions of *operational*, *cultural*, and *critical*. The dimensions are defined as follows:

- *Operational dimension:* the ability to use the communication system by recognising and decoding codes and conventions. This dimension concerns basic literacy skills and functionality.

- *Cultural dimension:* the ability to use a communication system in specific contexts with the competence to know how to apply particular conventions appropriate for the context. This dimension concerns meaning-making.

- *Critical dimension:* a disposition towards texts that acknowledges that conventions and cultural forms are laden with ideological choices and values, and reside within

societal power structures (Green & Beavis, 2012; Matthewman, Morgan, Mullen,

Hindle & Johansson, 2017)

These dimensions are interdependent and permeable, drawing attention to how classroom

practices privilege the development of the operational literacy dimensions (Durrant & Green,

2000; Matthewman et al., 2017). Green's model does not disregard the ability to use a

communication system, or aim to supplant it with 'critical literacy' but "complements and

supplements this by *contextualising* it with due regard for matters of culture, history and

power" (Durrant & Green, 2000, p. 97).

Many visual literacy theorists call for a focus in this area for the specific reason that a

critical engagement is desirable (ACRL, 2011; Avgerinou, 1997, 2003; Brumberger, 2011;

Dake, 1994; Druick, 2016; Goforth, Metz, & Hammer, 2018; Spalter & van Dam, 2004;

Zambo, 2006). Few would claim that the operational dimension of this literacy is lacking,

given the frequency that the proliferation of these images in contemporary society is the

impetus for the call for visual literacy in the first place — and where this operational literacy

is lacking, it is well addressed in current pedagogical models (the teaching of Adobe

Photoshop in photography classrooms, or the operation of digital video cameras in media

studies classrooms). Green's inclusion of a cultural dimension in his model will prove to be

important in the context of contemporary practice in which participatory and networked

communities form the background of student experience. Layered and intermingling cultural

practices problematise traditional notions of literacy in which a rigid standard is to be met.

Visual Literacy definitions

John Debes first defined visual literacy in 1969, as follows:

Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he (sic) encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication. (p. 27, as cited in Avgerinou, 2003, p. 3)

This early definition was acknowledged by Debes himself as being premature, the field of study then only in its infancy (Avgerinou, 2003). Since then, many alternative definitions have been proffered, and the task of consolidating these has been addressed by others, notably Avgerinou (2003), Avgerinou & Ericson (1997), and most recently, Kędra (2017). This section does not attempt to be an exhaustive review of theories, and instead outlines some definitions that have similitude with the literacy notions of the previous section. It also addresses some key tensions identified across definitions, namely: visual literacy's relationship to alphabetic literacy; contention as to whether visual literacy is a learned skill or not; tensions between universality and convention; and the role of other literacies in a visual literacy. A short review of definitions of visual literacy that are explicitly linked to 'digital technology' or various synonyms has also been conducted.

Felten (2008) defines visual literacy in part as "the ability to understand, produce, and use culturally significant images, objects, and visible actions" (p. 60). This definition addresses the cultural dimension of literacy outlined above, and this very notion of cultural significance allows for fluidity of the kind that Leu (2000) suggests is necessary. In her review of definitions, Kędra (2017) addresses this definition, focusing on 'cultural significance' clarifying it as *cultural image literacy*: "an ability to recognize images related to, or significant for, the viewer's culture" (p. 77). This clarification does not acknowledge that the individual in question inevitably inhabits many cultural spheres, and in a networked society, cultures relating to geography or heritage are only one among many. This divergence of understanding is illustrated in Brumberger's (2011) study evaluating the visual literacy of millennial learners. In the second section of this study, Brumberger (2011) aims to evaluate participants' "skills in interpreting images and being informed and critical consumers of visual material" (p. 21). To do this, participants are given a series of news media images (a young marine on the beach during the Vietnam war, a clash between a Jewish settler and security forces at West Bank, a funeral of a forest ranger, and an image taken at a shrine in Afghanistan) and for each image, four options to choose from to identify the image. Brumberger (2011) concludes, from her results, that millennial students are not visually literate (although she provides no comparison point to other generational groups). But these images are culturally coded in a number of ways — within the image the visual cues students are expected to pick up are culturally specific (for instance, as a New Zealand Pākehā[21], I was unable to differentiate between the badge of a forest ranger or a Canadian Mountie, which limited the visual cues to identify the funeral image. I also have limited knowledge of historical styles of American military uniforms, making it difficult to identify the era the

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[21] *Trans*. A New Zealander of European descent. Sometimes also used to describe any non-Māori New Zealander

Vietnam war photo was taken in, and the image is devoid of contextual cues beyond the uniform, and is in black and white) and at a metatextual level, the images may be more accessible to people who access news media frequently, or with a broader knowledge in geography and history. Images such as these, which are contextualised historical and locally, should not be regarded as universal or structurally fixed in order to assess visual literacy (Hassett, 2016). While the cultural dimension is important in a definition of visual literacy, the application of it should acknowledge the multiplicity of interpenetrating cultures that one individual might inhabit in a networked society.

Serafini's (2014) definition of visual literacy may help to clarify, as he substitutes the notion of 'cultural' with 'social contexts': "the process of generating meaning in transaction with multimodal ensembles, including written text, visual images, and design elements, from a variety of perspectives to meet the requirements of particular social contexts" (p. 23). Notably excluded from Serafini's definition is the act of 'creating' visual texts, substituting instead 'generating meaning' which can encompass both decoding existing texts and producing new ones. In the new media age, generating meaning using visuals does not necessitate creating new images, it may involve using pre-existing images, such as emojis or reaction images; or adapting or remixing existing visuals, as is common practice with internet memes. Also present in Serafini's definition is the acknowledgement of text and design elements. In texts where visual and written text are both present and contribute to the generation of meaning — Serafini calls these "blended structures" (2014, p. 17) — there are three systems of meaning making at work: language/text, picture/visual, and a third quality that derives meaning from the interaction of the two (Szabó, 2016). Visual literacy is implicated in the latter two systems.

Standing apart from most other definitions, is Song & Turner's (2010) definition that, "visual literacy is the active construction of past visual experience with incoming messages to

obtain meaning. In addition, visual literacy should include viewing, discussing, and creating

multiple modes of text and images from affective, compositional and critical aspects" (p.

188). This definition not only describes what visual literacy is, but begins to touch on how it

works. Taken alongside discussions around the cultural dimensions of literacy, it provides an

explanation for how an individual might be capably visually literate, but still unable to make

specific reference to a historical or geographic moment when decoding an image if their 'past

visual experience' has not included certain visual cues. Between Song & Turner's (2010)

definition that leans heavily into semiotics, and Serafini's (2014) definition that specifies

'particular social contexts', one may ask if the terminology should be broadened to 'visual

literacies'. Certainly in educational contexts these ideas have implications for policy — which

social context is of value? Whose cultural significance is the measure for this literacy?

Visual literacy, much like other literacies, is interdisciplinary at its core (Avgerinou &

Pettersson, 2011; Bowen, 2017; Song & Turner, 2010; Spalter & van Dam, 2008). Each

discipline has certain genres of image that a student is likely to encounter, and potentially

discipline-based methodologies for decoding the visual. Furthermore, within one visual text

multiple literacies or discipline knowledges might come into play in the decoding process.

This might be as simple as the interaction of text and image to construct meaning (Thompson,

2019), or, as in Brumberger's (2011) study, a grasp of historical or geographic facts in order

to accurately unpack an image. All literacies rely on other literacies or at least outside

knowledge — financial literacy requires a foundation of numerical literacy, reading literacy

requires knowledge outside of the text about what it refers to. Some theorists seek to

encompass this. Cope and Kalantzis (2000) developed a pedagogy of *multiliteracies*, that

"engages with the multiplicity of communications channels and media [and] with the

increasing salience of cultural and linguistic diversity" (p. 5). Kress (2003) advocates

multimodality as a framework for contemporary literacy. He says, "in reading, we need now to gather meaning from all the modes which are co-present in a text, and new principles will be at work" (p. 35). His encompassing theory engages with a semiotic framework to understand communication. These wide-reaching frameworks do the important work of acknowledging that all meaning and knowledge is situated within a vast relational network. Furthermore, they advance the notion that communication is productive, rather than a series of established rules in stagnating siloes. Networks of meaning that transcend discipline and mode contain "divergences that complement each other and that in their diversity create new and productive interrelationships" (Cope & Kalantzis, 2000, p. 147). Visual literacy is a useful bracketing to understand one of these modes, but like all other literacies, is a notion that is imposed upon a much vaster universe of communication.

Relationship to alphabetic literacy

The term visual *literacy*, to some, carries an implicit relationship to alphabetic literacy. This is understandable given the etymology of the word 'literate' from the latin *litteratus* meaning "learned, educated, scholarly" (Litteratus, n.d.) which builds on *littera* which refers to a letter of the alphabet, or handwriting (Littera, n.d). Since the late nineteenth century the term *literacy* has come to be associated with alphabetic literacy, but also a wider definition of "knowledgeable or educated in a particular field or fields" (United Nations Educational, Scientific and Cultural Organisation, 2006). Scholars of visual literacy have varying opinions on the association. Some, such as Dondis (1973) and Schamber (1986), suggested that the equivalence was a meaningful one, and that gestalt principles of perception could be employed as a vocabulary; and design, layout, and composition function as a syntax (Dondis, 1973; Schamber, 1986). This is illustrated in Figure 4.

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PART..............................................WHOLE

        COMPONENT      VOCABULARY      SYNTAX        MESSAGE

VERBAL  character, ----→ word, ---------→ sentence, ------→ story,
        punctuation      number          paragraph         copy

VISUAL  point, line, ---→ type, art, -----→ layout -------→ design
        shape             space
```
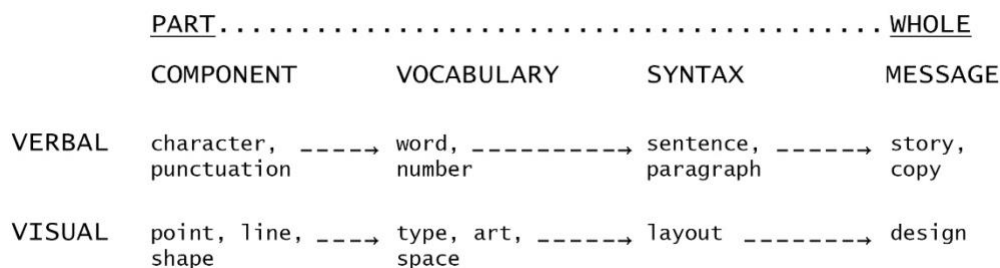
Figure 4. A verbal analogy for visual design, as proposed by Schamber (1986, p. 8)

This explicit analogy between forms seems to have receded in more contemporary theories of visual literacy. This way of thinking does persist in graphic design theory, often with an acknowledgement that there is no formal syntax or semantics, but a similar taxonomy is useful for *talking about* an image (Leborg, 2004).

The equivalence of these two literacies does have a useful metaphorical function in providing a framework for understanding visual literacy. It highlights that there is an encoding (writing) and decoding (reading) process when dealing with visual media (Avgerinou, 2009; Brill, Kim, & Branch, 2007; Kędra, 2017; Raney, 1999, Sinatra, 1988). This notion may also lend the concept of visual literacy legitimacy where alphabetic literacy has been historically valued. Raney (1999) notes that the association with alphabetic literacy in this way "is not to demystify visual representation but to dignify it" (p. 42). Expanding on that idea, she says that the appropriation of these terms challenges the assumption that alphabetic literacy is the most eloquent way to express complex ideas.

Particularly outspoken in his opposition to the equivalence, Messaris (2011), calls the approach of investigating the similarities between alphabetic and visual literacy "paradoxical, and perhaps even perverse" (p. 101). Messaris (2011) asserts that this approach "treat[s] pictures as if they were just another language, instead of focusing on the things that make pictures special and unique". His main contention is that in alphabetic literacy, meaning and the symbols that communicate the meaning are completely arbitrary — a notion derived from semiologist Ferdinand de Saussure (whose theories I expand upon in chapter six). Visual

media, on the other hand, meaning is derived from analogy — images function by having a connection to a previous perceptual visual experience, Messaris claims. Similarly, Emanuel & Challons-Lipton (2013) think an important distinction is that images can be interpreted whether or not the individual is literate, unlike alphabetic literacy. They assert that visual literacy occurs on a continuum. They do not elaborate on how alphabetic literacy differs in this regard, although presumably the step in which the arbitrary connection between word and meaning has to be learned is the main point of difference. This does not cause Emanuel & Challons-Lipton (2013) to disavow the notion of literacy altogether — in fact they go on to use the metaphor of a 'visual vocabulary' to describe an individual internalising a range of visual cues that can then be used to analyse other images. The analogy between alphabetic literacy and visual literacy is not a necessary one (digital literacy and financial literacy for instance, are accepted as concepts without this contention) but it has its uses, particularly as a framework for understanding that visual media can be encoded and decoded to generate meaning in a similar way as traditional texts. And it should be understood as merely a metaphor, to avoid restrictively defining visual elements in linguistic terms (Kędra, 2017) or promoting "institutional orthodoxy" (Raney, 1999, p. 42) in which certain images become codified as a standard for certifying visual literacy (see Emanuel, Baker, & Challons-Lipton, 2016).

Explicit teaching vs. social learning

There is an assumption that people — particularly young people — are so immersed in visual culture, that understanding visual media comes naturally. Little, Felten & Berry (2015, p. 2, as cited in Kędra, 2018, p. 68) succinctly state that "learning to look is quite a difficult task, because seeing is perceived as something natural, and thus should not require additional training". This is expressed by a number of visual literacy scholars who suggest that

contemporary young people are regarded as intuitively visual learners or possess an intrinsic

degree of visual literacy, particularly noted in their discussions of the notion of a digitally

native learner (see Brumberger, 2011; Santos Costa & Xavier, 2016; Silverman & Piedmont,

2016). In his 1994 book *Visual 'Literacy': Image, Mind, & Reality*, Messaris makes a similar

claim — that comprehending visual media relies on analogies with real perceptual

experiences, and as such learning visual literacy is not useful in order to make sense of visual

media, as people possess this literacy naturally. The example he gives is this: low angle

photographs or footage of people gives an illusion of power or of a 'strong leader' without the

viewer having learnt about the technique, derived from childhood experiences in which our

parents or authority figures tower over us. While it is telling that he repeats this example and

does not offer further analogous experiences in his 2012 update *Visual 'Literacy' in the*

Digital Age, there are other critiques to be made. The initial point at which viewer

understands their parents or other figure as an authority while they tower over them is the

initial learning event – then, as in Song & Turner's (2010) definition of visual literacy, they

apply this visual experience to the incoming message; just because they have not learned this

visual competency in relation to film, does not mean they have not learned it full stop.

Image removed prior to deposit as permission for use was not obtained. Image retrievable at
https://www.gocomics.com/nancy/2018/08/11 at time of submission.

Figure 5. Daily Nancy comic by Olivia Jaimes for August 11, 2018, cropped from website to include user comment

Additionally, this example works for film, photography and perhaps other highly representational visual media, but cannot be applied to symbolic images. Take for example the *Nancy* comic in Figure 5. In panel three Nancy has lines drawn vertically down the top half of her face. In the comments below, a viewer questions what is dripping down Nancy's face, as they understand this to be a representational element in the artwork. A viewer who is literate in contemporary comics or animation will understand this fluently — it signifies Nancy's awkward or embarrassed feeling — it is a common trope used to signify dark feelings (Fig. 6). This is important, as it clarifies the reading of the comic, where her tone may otherwise have been ambiguous. Conventional visual shorthand such as this does need to be learned, but it does raise questions about whether it is learned socially or if it needs to be taught, and if it is to be taught, who decides which conventions to teach?

Image removed prior to deposit as permission for use was not obtained. Image retrievable at https://www.netflix.com/watch/80117897?trackId=200257859 (2;22) at time of submission.

Figure 6. A frame from Japanese cartoon The disastrous life of Saiki K (Yokote & Sakurai, 2018)

Universal language vs. convention

Whether visual literacy should look towards a universal visual language, or whether the field should be more concerned with social and emergent conventions is a point of contention among visual literacy scholars. While Messaris (1993) might argue that there is no need to teach visual literacy due to a mechanical consistency in visual cognition among humans, others argue that — broken down to basic elements — there is a universal visual language, understood regardless of prior knowledge (Dondis, 1973; Schamber, 1986; Tufte, 2001, as cited in Papadopoulou, 2013). These arguments rest, more or less explicitly, on gestalt principles of perception, the human mind's propensity to group visually similar objects. This is uncontroversial, but, as in Messaris (1993, 1994, 2012), this visual 'language' is concerned with comprehension of forms, and recognition at best. When decoding images for more complex meaning, this can be distracting minutiae — for example, for someone viewing Eddie Adams' photograph of police chief General Nguyễn Ngọc Loan executing Nguyễn Văn Lém, a Vietcong prisoner, in the street (Fig. 7), it would be incomprehensible to comment about the convergence of the lines of the buildings creating a sense of perspective. Learning these concepts may be useful in the *production* of visual media however, especially in the case of graphic design. When producing an image, an understanding of visual concepts

Image removed prior to deposit as permission for use was not obtained. Image retrievable at https://en.wikipedia.org/wiki/File:Execution_of_Nguy%E1%BB%85n_V%C4%83n_L%C3%A9m.jpg at time of submission.
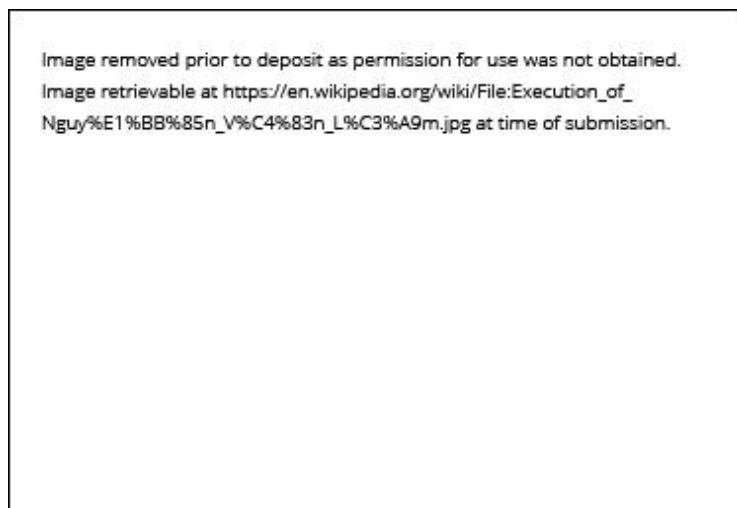
Figure 7. Eddie Adams' photograph *General Nguyễn Ngọc Loan executing a Viet Cong prisoner in Saigon* (1968)

such as closure, similarity, and proximity can allow for control over the viewer's experience. But as a viewer of graphic design, these will invariably be experienced as affect first and foremost.

Other scholars are less explicit in their desire for a universal language. In Brumberger's (2011) study, her conclusion shows that in order for her to consider her participants visually literate, they should have known the particular visual cues present in the images she tested them on. The inevitable follow-through of this thinking can be seen in Emanuel, Baker, & Challons-Lipton's (2017) project of codifying important cultural images in order to assess visual literacy. Codifying culture in such a way risks the reproduction of dominant value systems at the behest of other cultures' value systems. On the other hand, if the goal is to prepare students to engage with media already in existence, knowledge of these cultural images is essential — but a critical disposition is essential to deconstruct any regulatory apparatus that would come along with a project such as Emanuel, Baker, & Challons-Lipton's (2017).

On the topic of a universal visual language, Raney (1999), has this to say:

On closer scrutiny, the idea of 'visual language' reveals itself to be a loose analogy at best, and one which might merely repeat in the visual realm mistakes which have been made in thinking about word literacy. A common objection to the idea of 'visual literacy' is that it replicates the assumptions of an autonomous model of literacy – that there is a fixed or single 'code' to be learnt, that looking at things is a science, or that classifying and dissecting images will uncover their meanings. (p. 43)

This analytic position which presumes visual language as a closed system contrasts with a second position that Raney (1999) outlines, one that considers the "space between object and viewer" (p. 43):

> The driving force is prior expectations of meaning. These expectations are set up by the social fields in which an object is encountered. A visual representation from this point of view is a meeting ground where frames of reference jostle and clash, whether it is the frame of 'art', inclinations of gender, class identity or generation, or personal experience and associations. (p. 43)

From this position, conventions and the cultural dimension of literacy are constructed through a process of engaging with the social world. This suggests that visual literacy is constantly in flux as new meaning is constructed through negotiations with prior knowings. Visual literacy in this configuration is a semiotic process — semiosis — Charles Sander Peirce's model of creating meaning from signs. Semiotics and their relationship to visual literacy is investigated in more depth in a chapter six and seven.

Digital visual literacy

A few scholars have looked at visual literacy specifically in relation to the notion of 'digital'. While this term is critiqued in regard to its usefulness in the previous chapter, some of the concepts it generally encompasses are important to this study. In particular, the increasingly networked nature of technology, and the affordances of accessible technology for manipulating images. Some definitions that include the digital aspect, however, warrant

further critique on areas that seem relevant only to the current political and technological moment.

Spalter & van Dam (2008) set out the indicators of digital visual literacy specifically:

1. critically evaluate digital visual materials (two-dimensional, three-dimensional (3D), static, and moving);

2. make decisions on the basis of digital visual representations of data and ideas; and

3. use computers to create effective visual communications (p. 94).

The third bullet point, which is dependent on a skill-based competency, could be elaborated on further — applications used vary hugely in function and skill-level; the definition does not specify if smartphones are within its bounds — and what about digital cameras? These are, of course, similar critiques leveled at the notion of digital technology as a classification in general. The prior two points are indistinct from most definitions of visual literacy that carry a critical component. Firstly, the 'digital' context in which they are presented in will be nearly as variable as 'analogue' contexts, and secondly, this context should be considered when engaging critically with the media.

Some, such as the ACRL (2011) and Avni & Rotem (2018) include the understanding of legal use of images in their definitions. This may seem more pressing as technology allows for easier duplication, but including it in a definition of literacy seems superfluous — such a clause is not included in definitions of alphabetic literacy, or digital literacy (although often mentioned under the heading of *digital citizenship*). It may have importance as a contextual element in certain situations, such as images created using remix or appropriation methods, but otherwise should not be a consideration for judging visual literacy.

Dake (1994) noted, "because digital images are so manipulable, they challenge our traditional sense of visual reality" (p. 133). As noted earlier in the chapter, this ability to be manipulated is not unique to 'digital' images. Technological advances that allow for quick, easy, and convincing photo- and image-manipulation, however, are increasingly accessible. This proliferation means that the awareness of photo- and image-manipulation processes plays a part in critically analysing images (Avni & Rotem, 2018; Dake, 1994; Messaris, 1994, 2012). Messaris (2012) continues to muse on the need for visual literacy in this context. He asked "are a few eye-catching cases leading us to overestimate the extent to which amateur media producers are able to reach large online audiences?" (p.115). Several years on from his question, it may be suggested that the reach and impact has been underestimated. To illustrate this, consider two Instagram accounts. User 'cabbagecatmemes' (https://www.instagram.com/cabbagecatmemes/) has 714,000 followers. This user shares content produced by other people on the platform, and other social media platforms. In the period between March 15, 2019 and July 15, 2019, cabbagecatmemes shared 21 images, averaging 14,077 likes per image — and this only accounts for users who actively interacted with the image, not for how many who will have seen it. User 'gangsterpopeye' (https://www. instagram.com/gangsterpopeye/) shares her own created content, and at the time of writing, has 47,600 followers. Her posts over the same period average only 3374 likes per post, although in the same time period she has shared 180 images. These images are not the same type of manipulation that Messaris (2012) is discussing, but they serve the same purpose. The images gangsterpopeye creates are often intended to sway political opinion, addressing issues such as white supremacy, United States interventionism, and police brutality, with a veneer of dark humour and irony. Eight percent of Instagram's userbase have over 50,000 followers, and just under four percent have over 500,000 (Mention, 2018). These are significant audiences, held by a significant number of people — in 2019, Instagram had a billion active

users (Statista, 2019a). Messaris might protest that these do not count for 'amateur' media producers, but that line is increasingly blurred as networked communities become more embedded into our daily lives.

Conclusion

It is clear that there is some contention about the nature of visual literacy, there is consensus that it is critical to the education of young people today. Visual messaging in the age of networked media is increasingly pervasive, and more decentralised than it has been in the past. No longer simply a broadcast model of media, images are produced and consumed in a peer to peer model that demands new critical modes and dispositions. The speed of technology coupled with the churning production of content in networked spaces require a rethinking of literacy as a static standard to be met. This chapter has outlined some key concepts and concerns of visual literacy theory. The next chapter will explore the areas where the interests of visual literacy and postdigital theory converge. The clarification of those overlapping interests will establish the key concerns that a theory of visual literacy should address.

Chapter Five: Convergence Part One - Postdigital Visual Literacy

This chapter charts some of the concerns for what might be called visual literacy in a postdigital age. Three key areas of convergence have been identified. They are: concerns around conceptual binary divisions, calls for criticality, and questions around authority of meaning and knowledge. In this chapter I cross-reference these concerns with the intention of clarifying and mapping the connections between the two concepts. This clarification forms the foundations for a reimagining of visual literacy. Although the three areas of interest are addressed in turn, they are not distinct from one another. As Pepperell and Punt (2000) explained, while postdigital discourse rejects a break or shift implied in the 'digital revolution' it does acknowledge the current state of technology — and for this reason I have also addressed some contemporary technological circumstances that visual literacy might address.

Permeability - breaking down the A - B binary

We may wonder whether [binarism] is not a classification which is both necessary and transitory: in which case binarism would also be a metalanguage, a particular taxonomy meant to be swept away by history, after having been true to it for a moment (Barthes, 1967, p. 82)

Postdigital theory posits that binary conceptions such as digital versus analogue and offline versus online are limiting as models for our experience of technology (Berry, 2015; Cramer, 2015; Jandric et al., 2018a; 2018b; Pepperell & Punt, 2000). As I outlined in chapter three, binary ideas such as these are still dominant in everyday educational discourse,

embedded in ideas such as 'digital natives' and 'digital learning'. These terms imply,

respectively, a generational shift where some are raised after a certain (undefined) date when

digital technology was ubiquitous, suggesting a nonexistent, and unhelpful, division into

natives and immigrants; and the existence of some kind of analogue learning, untouched by

technology. Pepperell & Punt (2000) argue that divisions such as these have no *a priori* status,

and in fact are "distinctions that we impose upon the world" (p. 164) and as such, questioning

and reconfiguration of these distinctions is legitimate. They propose an acknowledgement of

the continuity between things – asserting that "things are made up of their consequences (and

other things)" (p. 33), "consequences attributable to a thing is a constituent of the thing" (p.

34) and "our awareness of a thing is part of that thing" (p. 35). These assertions considered in

relation to education and learning have implications for many ingrained practices — discrete

subject areas, for instance, are common practice that unnecessarily bracket bodies of

knowledge. In the area of visual literacy, it is commonly acknowledged that students are

impacted in some way from a prevalence of images on screens in contemporary culture (see:

Avgerinou, 2003; Avgerinou & Ericson, 1997; Bowen, 2017; Ervine, 2016; Felten, 2008;

Oblinger & Oblinger, 2005; Prensky, 2001; Spalter & van Dam, 2004). That this impact is

noted is an illustration of the unavoidable continuity between not only what some think of as

digital and analogue or 'non-digital', but also between in-school learning and learning "in the

wild" (Jenkins, Ito, & boyd, 2016, p. 90). Students bring the impact of their visual media

experiences to the classroom, the impact of their visual literacy learning in class is applied

(effectively or ineffectively) when they access Instagram, and, additionally, these intermingle

in numerous inextricable ways when students engage with social media designed for

education (such as Schoology, or Microsoft Teams) or research using any number of visual

platforms such as YouTube or Pinterest. It stands to reason that there is no classroom that is

not constitutive of the technological practices of its students. It is this complex entanglement

of technology and learning that sees a call for criticality as a primary goal of visual literacy, and that is the next point of convergence that I address.

Criticality

Many theorists of visual literacy advocate for a critical disposition toward visual media, given the apparent saturation of visual media in contemporary society (ACRL, 2011; Avgerinou, 2003; Avgerinou & Ericson, 1997; Brumberger, 2011; Dake, 1994; Druick, 2016; Goforth, Metz, & Hammer, 2018; Spalter & van Dam, 2004; Zambo, 2009). Schirato & Webb (2004) assert that visual media have responded to a cultural trend of 'visual speed-reading', and that despite a saturation of visual media, levels of visual complexity in media are generally lower. The visual texts that dominate media and communication are designed in a way that "lends them to the easy reading — or 'looking' — of habituation" (Schirato & Webb, 2004, p. 62). Similarly, Berry & Dieter (2015) note that "as the computational increasingly penetrates life in profound ways" (p. 1) the complexities of the machinery and infrastructure behind computation have been obscured behind a smooth, user-friendly veneer. This, they say, indicates a need for new types of critical engagement with what is generally termed 'digital' (Berry & Dieter, 2015).

Critical thinking is terminology that can be seen in curriculum literature or heard in curriculum discussions in schools. Ironically enough, it is frequently employed uncritically, something that can be attached to learning at a higher level, without distinctions as to what this means in particular contexts. Its inclusion in the P21 Network's *Framework for 21st Century Learning* as one of the '4 Cs' (Battelle for kids, 2019) has seemingly increased the tenacity of this terminology and its pervasiveness as an educational buzzword. Despite this, the term itself and critical approaches to knowledge, media, and society hold in importance in both postdigital theory and visual literacy. Bill Green's 3D model of literacy, described by

Matthewman et al. (2017), outlines that critical disposition toward texts should recognise that

"cultural forms and practices are themselves selective, value-laden, ideological, and

constrained" (p. 28). This understanding that learning resides within discursive societal power

structures is echoed by Thomas Ryberg, in relation to postdigital practice. He states that

"digital technologies are implemented in complex, dynamic, messy, political social and

organisational contexts that are constantly changing and that will shape, and will be shaped by

'digitalisation'" (Jandrić et al., 2019, p. 166)[22]. Juha Suoranta employs Freirian critical theory

in his postdigital position, arguing that "postdigital critical pedagogy will be critical towards a

commercial-capitalist internet controlled by the corporate-state-military-complex" (Jandrić et

al., 2019, p. 169). This position is understandable as action on the internet, in its few decades

of public use, has begun to converge and concentrate on a handful of corporate sites. Figure 8

and 9 visualise this concentration — the larger the circle, the higher the traffic to the site, and

the proximity to other nodes indicates users moving between these sites via hyperlink
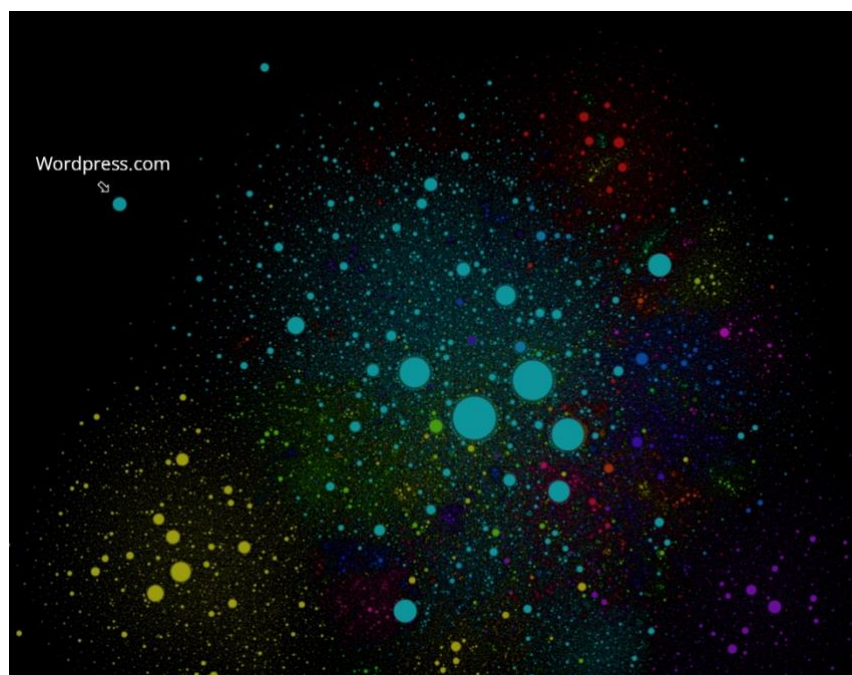
Figure 8. A screenshot of Enikeev's (n.d.) *The Internet Map* (http://internet-map.net)

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[22] This article, authored by twelve different authors, is split into sections, each written explicitly by a single author. Because of diverging voices, I have opted to note the section author in the narrative citation for clarity.

(Enikeev, n.d.). In terms of traffic Facebook, Google, YouTube, and Yahoo occupy the top

four spots, and Twitter features in the top ten. It is clear from the density that surrounds these

big nodes that they feature heavily in the interconnected experience of users online, compared

to the likes of Wordpress and BlogSpot — two online blogging platforms that have heavy

traffic, but sit on the outskirts, less connected. Sites such as Twitter and Facebook act as

technological apparatus of the aforementioned 'corporate-state-military-complex',

manipulating relations of force on their platform in order to maintain the position they hold in

the service of profits, whether they come from advertising or the sale of harvested personal

data (Zafarani, Abbasi, & Liu, 2014). Suoranta envisions "[reclaiming] the digital sphere as a

commons" (Jandrić et al., 2019, p. 169) with a utopian goal of "educational superabundance"

(Jandrić et al., 2019, p. 170). Wikipedia, while still maligned in educational contexts[23], is an

example of this. Suoranta's conception, however, does not account for the myriad of complex

practice that goes on within the social network platforms. Discourses of power are enacted

between social media participants and actions taken towards a plurality of aims. In the
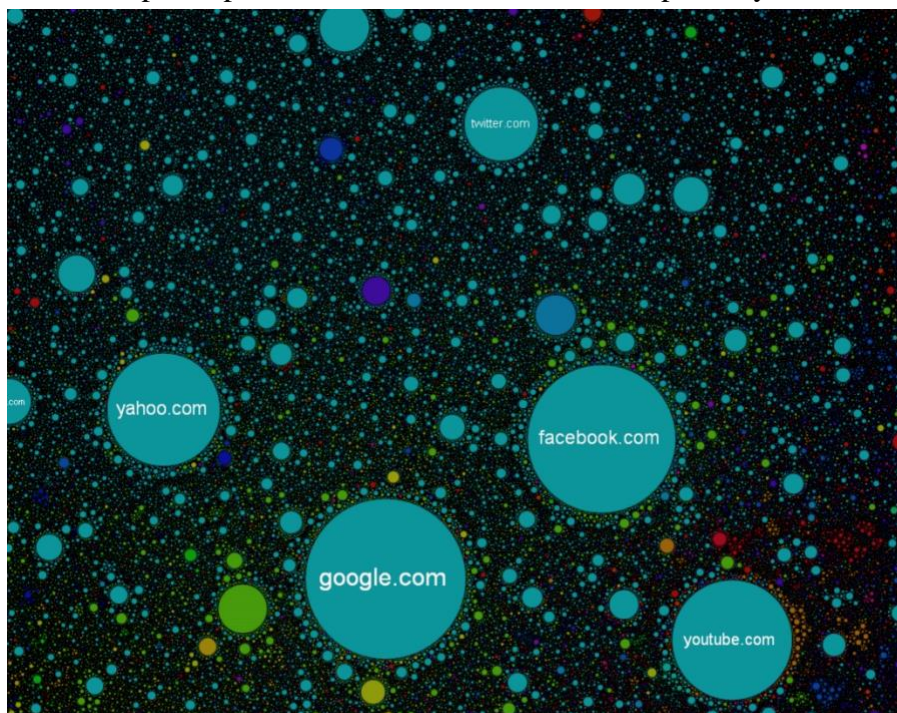
Figure 9. A screenshot of Enikeev's (n.d.) *The Internet Map* (http://internet-map.net)

[23] Studies have nevertheless shown it to be comparable in accuracy and reliability relative to traditional print and online encyclopedias (Casebourne, Davies, Fernandes, & Norman, 2012; Giles, 2005)

networked era the distinction between producer and consumer is increasingly nebulous. A

model that positions media ideology as determining of those who consume it seems

increasingly inadequate as a representation. A critical disposition should recognise the

complex and multidirectional dynamics of power in a social network with economic interests,

that consists of only the participants in the network. With vast numbers of visual texts being

encountered in networked spaces — which are now primarily social networks — a critical

literacy will include an understanding of the context in which it was viewed. This contextual

knowledge would necessarily include elements of the medium through which the text was

encountered. In many corporate technological spaces, what is seen by default is dictated by an

algorithm. Some content may be restricted, and viewer awareness of that restriction may be

transparent — or concealed. Understanding conventions of acceptable use at both the 'terms

of service'[24] and community level is important for interpreting levels of transgression or

subversion. A #FreeTheNipple[25] campaign, for instance, would be less impactful on Twitter

(where certain levels of nudity are acceptable under the terms of service) than on Instagram

(where female nipples must be censored according to the terms of service). Additionally,

knowledge of the visual conventions used within the text will enable students to "identify

inter-textual references and interpret rhetorical concepts used to persuade the viewer or

construct a particular argument" (Bowen, 2017, p. 713). In the context of networked and

participatory culture, this is a complex proposition, and must acknowledge what we might

think of as 'traditional' visual conventions, as well as conventions that are adopted and

developed in networked communities.

David Buckingham (2003) warns that some approaches toward 'critical' literacy can

end up flawed, despite good intentions. Speaking of media literacy, an area of study that

[24] Common terminology for internet platforms outlining acceptable use. Infringement can lead to various
sanctions, such as account suspension or demonetization of content ("Terms of service", n.d.).
[25] An online campaign protesting the double standards present in most terms of service regarding visual
depictions of women's nipples versus men's ("Free The Nipple", n.d.).

significantly overlaps visual literacy, he says that a 'demystification' approach is often

employed, in which students are guided to uncover a 'hidden persuader' (Buckingham, 2003).

Buckingham is warning against an oversimplification into a binary that divides viewers and

an adversarial other. It is an inadequate model for critical literacy, even without considering

the impact of the prosumer[26] inhabitant of participatory culture. An approach to criticality that

embraces the complexity of discursive power can resist such a simplistic approach. After all,

for contemporary students, the YouTube video essay that reinforces hegemonic values about

gender may have been made by the 22-year-old that they watch play Fortnite[27] on Twitch[28]

every Friday evening.

Buckingham (2003) instead proposes that a more valuable critical perspective comes

from a social-semiotic orientation:

> Adopting a social theory of literacy means enabling students to understand
> those contexts, and to recognise how their responses are formed and
> produced. It means recognizing that meanings are not simply located in texts,
> waiting to be deciphered with the 'correct' tools of analysis; but that they are
> inevitably constructed within the social relations of everyday life (p. 121)

Bowen (2017), in her profile of a critically visual literate student, incorporates such an

orientation. She outlines that a critical visual thinker will read images "from varying

perspectives and integrate the knowledge gained from those readings with existing knowledge

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[26] A person who both consumes and produces a product. Coined by Alvin Toffler in his 1980 book *The Third Way*. It can be used to describe, for instance, an Instagram user who both produces the images shared on the platform but is a consumer of the platform (and the other media offered on it).

[27] A free-to-play video game that is incredibly popular, with over 250 million registered accounts, and grossing nearly 2.5 billion USD since 2017 ("Fortnite", n.d.).

[28] A video streaming platform, owned by Amazon, used primarily to broadcast users playing video games while engaging with their audience ("Twitch [service]", n.d.).

gained from other modalities such as language and text" (2017, p. 708). This acknowledges that the decoding of an image for meaning requires, as Buckingham (2003) says, more than just what is contained within the image. Bowen (2017) goes on to say that a critical visual thinker "recognizes how we bring our own ideas to images to make meaning" (p. 713). This positions criticality in visual literacy as an understanding of the metalinguistic features of decoding images. The complex intertextual relationships that inform the understanding of visual communication encompass not just other images, but other forms of knowledge. This knowledge, visual and other, is not only attained in traditional hierarchical knowledge structures such as classrooms. Family histories, cultural stories and myths, popular culture, conspiracy theories; these are just a few of the multitudes of narrative knowledges that our students might carry with them. Socially constructed networks of meaning accompany students into the classroom. In order to be critically visual literate, one must not only be able to critique the discourses of power which inform the creation and distribution of images, but must also be reflexive. Understanding how one comes to create meaning from an image necessarily involves an examination of the systems of signs and meaning that have been previously interpreted and internalised. To do this authentically, the sources of this meaning cannot reside solely within the educational institute. An honest critique will acknowledge all systems of meaning.

Socially generated knowledge and authority

Jandrić et al. (2018) suggest that the postdigital surreptitiously infiltrated the classroom by way of mobile devices, and in the process dissolved the spatial division between formal and informal education. They are, of course, employing a metaphor, but this metaphor raises an important idea: that knowledge and learning are not solely the purview of the classroom, and that technology need not enter the classroom for its impact to be evident. It

has long been acknowledged that students do not reach teachers as a blank slate — whether it is the 'common sense' understanding outlined in the *New Zealand Curriculum* that effective pedagogy, "[makes] connections to prior learning and experience" (MoE, p. 34) or the more sociological underpinnings of Bourdieu's *habitus* (Harker & May, 1993). As students and teachers alike spend more time engaging with networked technology and the broadened participatory culture that comes with it, those who try to nail down a standard of literacy face some tricky questions about authority and power. As Manovich (2016) discovered, visual cultures on social networks such as Instagram are not static, and instead hybridise, remix, and transform over time.

Kress (2003) and Felten (2008) defined visual literacy as an ability to manipulate and use culturally significant images, and Serafini (2014) similarly notes that visual literacy should meet the needs of the social context in which one is communicating. Young people participating on social networks have to learn social rules and etiquette, switch between genres and language registers, and read subtle cues — skills that are learned through exploration and experimentation (Buckingham, 2008). Inclusion in networked communities often involves a kind of implicit knowledge, an online cultural capital. Katz & Shifman (2017) note that participation "both requires and signifies community-based knowledge" (p. 838) and that contribution to the visual community requires adherence to a set of unwritten rules that create communication tools that simultaneously excludes outsiders while affirming the legitimacy of group membership (Katz & Shifman, 2017; Pelltier-Gagnon & Diniz, 2018). "The ability to [use these tools] serves as a phatic reminder of belonging" (Katz & Shifman, 2017, p. 838). It follows then, if students are to be fully visually literate, that visual literacy education should include socially developed literacies appropriate to networked communities and participatory culture.

Lyotard (1979/1989) might have said that this poses a problem of legitimation. Education, he asserted, "is affected by the predominance of the performativity criterion" (p. 47), in which legitimation is granted based on the contribution of education to the efficiency of the social system. Hegemonic knowledge is legitimated because of its efficiency under dominant power structures, at the exclusion of other knowledges. For Lyotard (1979/1989), "knowledge and power are simply two sides of the same question: who decides what knowledge is, and who knows what needs to be decided?" (p. 9). If literacy is to be reframed as an ongoing process of *becoming literate* (Leu, 2000) then literacies learned in the rhizomatic space of networked technology should do more than encroach on the borders of established knowledge. Foucault, in his introduction to Deleuze and Guattari's (1984/2015) *Anti-oedipus*, said that in order to counter the microfascisms of everyday life, one must, "develop action, thought, and desires by proliferation, juxtaposition, and disjunction, and not by subdivision and pyramidal hierarchization" (p. xiii). Deleuze and Guattari described a similar alternative:

> a horizontal relational attitude that [induces] one to be inspired by a multiplicity of things rather than guided by a unique dominating principle, to become multiplied into a crowd rather than remain the same individual; in other words, to produce a life in collaboration rather than obey the exclusive and solipsistic logic of a dominating ego. (Portanova, 2016, p. 96)

Because images reach individuals in ways that are inevitably technologically mediated, visual literacy is often seen as correlative to technological change (see Oblinger & Oblinger, 2005; Prensky, 2001). As such, there is, or should be, an acknowledgement of the constant flux of visual language and modes. Visual literacy has this advantage over alphabetic literacy, which

is enshrined in policy as a static benchmark for judging students' readiness to be efficient in society (MoE, 2109). The standardisation of alphabetic literacy implies that either written communication is static or reinforces the idea that a particular form of alphabetic literacy is more valuable than others — a hierarchical structure of knowledge. A visual literacy, given its current freedom from institutional validation, should embrace the changeability and social construction of language, to avoid reinforcing dominant knowledge structures.

Applications of postdigital visual literacy

Three areas that are covered in this section are broadly encompassing of the pressing concerns of visual literacy in the postdigital era. They are: the role of algorithms in visual media consumption, images created by technology, and participatory visual culture. Respectively, these deal with how consumers and technology collaborate to produce visual media; how producers and technology collaborate to produce visual media; and how individuals collaborate with one another to produce visual media. These are issues of how knowledge is generated and the authority it holds. The permeability between online and offline spaces, and classroom and non-classroom spaces reinforces the necessity for visual literacy. While postdigital rejects the binaries of digital/analogue and online/offline, it does not discount the importance of technology — merely the compartmentalising of technologies into neat categories. Postdigital visual literacy must address challenges arising with the current state of technology. The following section is not an exhaustive catalogue of all areas that a postdigital visual literacy would address as such a list would be extensive and constantly expanding.

Algorithms

As of May 2019, 30,000 hours of video content was uploaded to YouTube per week, on average (Statista, 2019). For a point of comparison, it is estimated that 27,000 hours of content are produced for television in the United Kingdom *per year* ("Television in the United Kingdom", n.d.). Instagram, likewise, boasts over 100 million images uploaded per day. This phenomenal volume of content is overwhelming to even contemplate. If perused unfiltered, the signal-to-noise ratio would all but guarantee negative efficiency. Enter *the algorithm*. Social networks and content platforms such as YouTube use algorithms to narrow the volume of content, and target content at users (YouTube Team, 2019). It is important to note that, generally speaking, algorithmic recommendation processes do not restrict users from accessing content, but instead bracket the vast volume of information available, affording easy navigation of a particular section of information. In YouTube usage, this affects what recommendations the user will see displayed on the sidebar when watching a video, what results will be displayed first when they search for content, and what recommendations will display on the YouTube frontpage when they are logged in (YouTube Team, 2019). The algorithm uses a machine learning process[29] which collates data of previous searches, cross references with other users with similar viewing habits, and predicts, ostensibly, what a user will want to watch next (YouTube Team, 2019). Guillaume Chaslot, a former artificial intelligence engineer at YouTube, noted an important distinction — that the algorithm is designed to "increase the time people spend online, because it leads to more ads" (Chaslot, 2019). Chaslot (2019) goes on to say that the algorithm considers the viewer as a model that "should be reproduced". Anthropomorphising aside, Chaslot illuminates the driving motivation for the algorithm's processes of decision making: advertising revenue. This may

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[29] The exact details are closely guarded, as YouTube has previously made major changes as a response to content creators gaming the system (YouTube Team, 2019)

hardly seem like a revelation, but it betrays a neoliberal inclination to value the efficiency of

the network to produce capital, rather than regulating the content of the video.

Algorithms, whether driven by capital or a genuine desire to streamline access to vast

swathes of information, come with a caveat. Because they are based on previous actions, they

serve, at best, to reproduce knowledge, and at worst, to deepen undesirable attitudes. In 2019,

The New York Times published an exposé entitled *The Making of a YouTube Radical.* It

documented the experience of user Faraday Speaks, real name Caleb Cain, and his descent

into what Emerican Johnson (2019a; 2019b) calls *the alt-right pipeline*. Cain, over the course

of three years, was radicalized toward the far-right, adopting extreme ideologies, including

racial eugenicist, islamophobic, and anti-feminist views (Roose, 2019). Johnson (2019a;

2019b) outlines that YouTube, but also other visual media such as internet memes, plays a

significant role in supporting far right ideologies. In his two-part video essay, *The*

PewDiePipeline: how edgy humor leads to violence he asserts that those who share 'edgy' far

right memes or use dog-whistle signalling (such as Pewdiepie[30]) are part of a framework of

stochastic terrorism. Stochastic terrorism differs from traditional conceptions of terrorism in

that it is characterised by random acts of violence, rather than a hierarchical structure in which

a controlling authority has direct contact with the perpetrator. It is a reimagination of the

notion of the 'Lone Wolf' terrorist, a single deranged individual acting alone, in which the

responsibility for the act is borne by the perpetrator alone. Violent acts of stochastic terror sit

atop the pyramid of discrimination and violence (Figure 10) while 'edgy' online memes and

humour range between the second and third stage of the pyramid (Johnson, 2019a). Johnson

says "a person who commits microaggressions frequently and without any resistance from

peers will become increasingly comfortable engaging in harmful, discriminatory behaviour

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[30] Real name Felix Kjellberg, a youtube gaming personality popular with young gamers. He has over 100 million
subscribers (Statista, 2019) and has been involved in several scandals involving, among other things,
antisemitism and use of racial slurs (Johnson, 2019a).
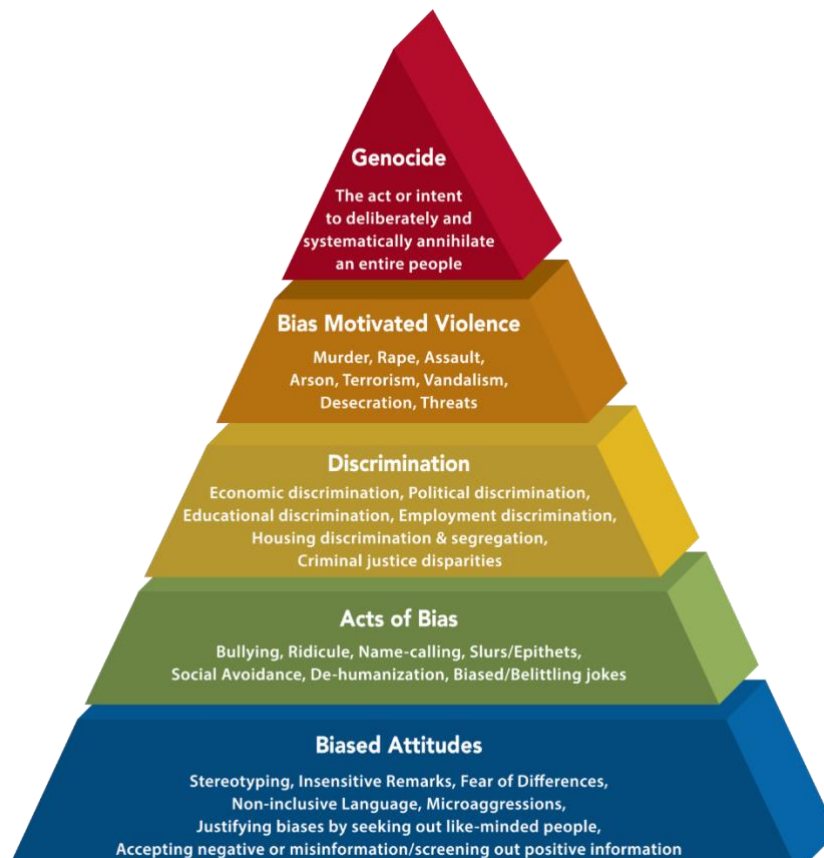
Figure 10. Anti-Defamation League's *Pyramid of Hate* (2018)

and speech, which makes them much more likely to move up to the next tier on the pyramid"

(2019a, 8:08). Cain followed rabbit holes of recommended viewing that YouTube's algorithm

suggested, slowly honing his viewing towards more specific and extreme content (Roose,

2019). While this may on the surface appear to appeal to technological determinism, it is

important to remember that the content is produced and uploaded by human beings. While

YouTube may provide videos on ways in which to craft your videos in order to be favoured

by the algorithm (YouTube Creators, 2017), producers of content are welcome to ignore that

advice (but they may get less exposure to their views) and while a certain selection of videos

are offered as recommendations, users are free to implement their own search methods

(although they will have to navigate a vast magnitude of content). A soft determinism is at

work; while an individual user may rebel against the afforded methods of engagement, they

are disadvantaged by a system built to favour the efficiency of the economic model.

Recommendation algorithms, such as the YouTube algorithm, but also found in other visual social networks such as Instagram and Facebook, are designed to show you what you already want to see. They encourage what Schirato & Webb (2004) call 'habituation', the opposite of a critical engagement. In this way they reinforce and deepen hegemonic knowledge structures, their aim to send users down a rabbit hole of agreeable content, generating advertising revenue as they go. Critical self-reflection and a critical disposition towards visual media and its context (not just its content) can help to evaluate and shift habituated ways of engaging.

Bridle (2018) notes that machine learning is not neutral as some claim it to be, and in fact, technology "is a reification of a particular set of beliefs and desires: the congruent, if unconscious dispositions of its creators" (p. 142). He is speaking specifically of a 2016 effort to use machine learning on a database of photos of 'criminals' and 'non-criminals' in order to derive a "'typical' criminal face" (Bridle, 2018, p. 140). The project faced criticisms of a regressive technological analogue to phrenology and conjures terrifying notions of 'future crime' à la Phillip K. Dick's 1956 *Minority Report*. Bridle (2019) explains that the technology was built out of a belief in the notion of 'criminality', a "legacy of nineteenth-century moral philosophy" (p. 142). It is easy to see how this technology, if it were embraced, could go on to reinforce existing racial biases about criminal inclination. In both cases the technology grew from an embedded ideology, in the latter example, from the idea that we can judge someone's moral character on their appearance, and in YouTube's case, the idea that delivering content that actively reinforces existing biases is acceptable — as long as it is in service of generating profits. Capitalistic concerns have a vested interest in habituated viewing. A critical visual literacy that acts beyond just the notion of uncovering hidden meaning in the text, and instead addresses contextual meaning and actively reflects on habitual viewing, is more effective in revealing discourses of power that are increasingly obfuscated.

The algorithms that dictate what visual media is delivered to users of platforms such as Instagram, YouTube, and Facebook are closely guarded secrets. While a google search for the specific phrase 'how does the Instagram algorithm work?' returns 45,600 results, many of them purporting to have the answers, the specifics of the algorithm remain a secret (Cotter, 2019). In 2018, when Instagram's team did release some information about the functioning of the algorithm, they outlined six vague categories: interest, timeliness, relationship, frequency, following, and usage (Constine, 2018). The details of how these interact or function individually was left undetailed — how, for instance, does the algorithm gauge how interested a user will be in an image? They even note that machine vision is 'potentially' used in judging interest (Constine, 2018). Apart from the clear commercial reasons the details of the algorithmic functioning are kept secret — to prevent users from gaming the system, therefore maintaining a veneer of 'fairness' (Cotter, 2019) — there may be another reason for this

Image removed prior to deposit as permission for use was not obtained. Image retrievable at https://www.graphcore.ai/hubfs/images/alexnet_label%20logo.jpg at time of submission.

Figure 11. A visualisation of the machine learning process of AlexNet, a deep neural network developed by Graphcore (Graphcore, n.d.)

vagueness. When it comes to machine learning, what goes on 'inside' is incomprehensible for humans (Bridle, 2018). The sheer enormity of the data and the number of variables and vectors across which it is referenced means that trying to comprehend it would be, according to Google Brain engineer Quoc Le, when interviewed, akin to "trying to visualize thousand-dimensional vectors in three-dimensional space" (Lewis-Kraus, 2016, "The Linguistic Turn"). Graphcore, a company developing accelerators for machine learning processes (Graphcore, n.d.), created graphical representations of artificial intelligence 'minds'. Rendering Alexnet, a deep neural net for visual recognition, involved "converting a description of the network into a computational graph of 18.7 million vertices and 115.8 million edges" (Fyles, para. 11, 2016). While the images are visually arresting (see Figure 11) their use as a device for understanding is limited to comparisons with other similarly complex visualisations (Fyles, 2016). The comparison, by Fyles (2016), of these images to brain scans is erroneous. The constraints of the visualisation process are set by the software engineers, dictating the shape, colour, and density of the image — the key elements that allude to brain imaging visualisation. The process inside a machine learning 'mind' is as inscrutable as the decision-making process inside a human mind to an outside observer. Input enters the black box, and content exits. The nature of the content that is produced is not evaluated for goodness, truth, or morality, but on its performativity in service of capital. Lyotard (1979/1989) predicted that as technology advanced, mercantalisation of knowledge would shift from nation-states to technology companies (quaintly, he used IBM in his example), but he could hardly have foreseen that these companies would not necessarily possess that knowledge, but an algorithmic machine mind that was capable of interpreting it — the means to monetise it. In the case of algorithmically driven technology, such as YouTube, Instagram, and Google Image Search, the legitimation of knowledge is partially dictated by incomprehensibly

complex non-human processes. The algorithm "enacts specific technocultural logics whereby information can become culturally relevant and valuable" (Langlois, 2012, p. 100).

Technologically generated images

While algorithmic processes play a role in which images we encounter, they also generate new visual information. The current state of technology allows for images that are created by technology with, nominally, no human intervention. Generative Adversarial Networks (GANs) are one such method used to generate images. A GAN functions by pitting two competing machine learning algorithms against one another (Goodfellow et al., 2014). One of the artificial intelligences (AI) generates images based on a dataset of images it seeks to imitate, while the other works to discriminate between the data generated by the AI, and that of the initial dataset (Goodfellow et al., 2014; Horev, 2018). This leads to both AIs learning to become better at their job. Website *This Person Does Not Exist* (https://www. thispersondoesnotexist.com/) demonstrates the capabilities of consumer level GANs by generating convincing imitations of portrait photographs (Figure 12). GANs have been applied in generating images of a person from different viewpoints given only an initial source image (Bhattacharjee, Banerjee, & Das, 2018) a method applied in creating 'deepfakes'.

Figure 12. portraits generated by a machine learning algorithm

Children's YouTube is an area where algorithmically generated visual media has found notoriety. Only a few 'up next' clicks away from any regular children's video you can find videos depicting incomprehensible remixes of children's songs or surreal narratives acted out by copyright-infringing characters, with titles such as "Superheroes pregnant soccer balls fidget spinner spiderman joker hulk cartoon funny kids video pranks" (Olson, 2017, 5:50). The videos themselves exude the aesthetics of procedurally generated media, 3d models haphazardly applied over wireframes, and wholesale duplications of the same action with characters switched for others. Due to the mysterious origin of the videos (see Olson, 2017, for an investigation into the YouTube channels producing these) it is unknown if the videos are actually generated by humans or not. Bridle (2017) notes the "impossibility of determining the degree of automation which is at work here; how to parse out the gap between human and machine" (para. 16) and Olson (2017) elaborates that "even if made by humans, they function as if they were assembled by machines" (5:40). Regardless of whether these videos bearing the hallmarks of automation are themselves created that way or not, the origin of their content is algorithmic. Bridle (2018; 2019) notes that whether they are 3d animations or amateur actors in superhero costumes, the videos illustrate the nonsensical titles that are otherwise "irrelevant beyond [their] function as search engine optimization" (Olson, 7:58, 2017). What results is a peculiar ecosystem of procedurally (or not) generated videos being guided by the algorithmic functions of YouTube, that in turn is guided by the, at best, semi-coherent decision making of toddlers with iPads. While the videos generally have a sense of being a bit 'off', the non-discerning nature of algorithms means that unsavoury elements can be incorporated, allowing sinister narratives to be amplified by increased user engagement. In *BURIED ALIVE Outdoor Playground Finger Family Song Nursery Rhymes Animation Education Learning Video,* Spiderman, Elsa from *Frozen*, The Hulk, and the serial killer from Scream bury each other alive and act out other animation sequences lifted from the

controversial video game *Grand Theft Auto* (Bridle, 2017). In other videos, the inclusion of

'injection' has led to disturbing variations of 'lethal injection' or 'crying injection' into the

metadata title. This has resulted in juxtapositions such as a family of gummy bears receiving

injections from a realistic medical syringe before going to ride a rollercoaster (Kids Nursery

Rhymes, 2017). These examples of visual media generated by algorithms stretch outside

simple understandings of intentionality and call for a critical nature that not only looks outside

of the text, but to the algorithmic origins — with an understanding of how an algorithm might

amplify hegemonic attitudes. The media being delivered to viewers through an opaque

method, and also the increasingly undetectable nature of altered, fake, or imitation images

means criticality must increasingly rely on contextual knowledge.

Participation and new visual knowledge

> What inspires [my] memes? Transformative media that exist beyond their
>
> former uses and how that has resulted in a seemingly infinite number of
>
> internet subcultures stemming from common interests (Thanos Collective,
>
> 2019)

So far, I have largely focused on negative structures that require a critical engagement,

and as a result of that, largely on the 'decoding' part of a visual literacy. There are, of course,

positive opportunities offered by the current state of technology that do not simply serve

economic ends. New visual knowledge is created and developed in participatory and

networked spaces that allows for more nuanced and rich communication, even across cultural

borders (Danesi, 2017). Communities coalesce around shared visual languages (Katz &

Shifman, 2017; Phillips & Milner, 2017) and as they interpenetrate in vast social networks,

they hybridise and change (Manovich, 2016), developing new cultural forms. Not only does this open up new avenues for cultural expression, and the generation of culturally significant images, but it can lead to increased political and civic engagement (Phillips & Milner, 2017).

Dewey (1916) stated that in a plurality of societies, such as the one that makes up our social world, interests are mutually interpenetrating. He said that progress comes by the negotiation and readjustment between groups and the retention of desirable characteristics in these social groups. He asserted, "numerous and more varied points of contact denote a greater diversity of stimuli to which an individual has to respond" (p. 68). Manovich's (2016) study of Instagram photo-communities illustrates how this readjustment happens, through small adjustments and hybridisation of positions as ongoing feedback occurs. If the phenomena of niche communities in online spaces is taken into account (Jenkins, Ito, & boyd, 2016) alongside an acknowledgement that users do not belong to just one group, but a plurality — then the nature of this advancement becomes more complex indeed. Networked publics are spaces where knowledge develops as a rhizome; they are "acentered systems … in which communication runs from any neighbor to any other, the stems and channels do not preexist, and all individuals are interchangeable, defined only by their *state* at any given moment" (Deleuze & Guattari, 1987/2005, p. 17). With this as the setting for visual communication it is no wonder that the remix, hybridisation, and assemblage have become the norm.

Some have misgivings about the increasingly niche avenues of expression. Sabbah (1985) explained that "new media [determines] a segmented, differentiated audience that, although massive in terms of numbers, is no longer a mass audience in terms of simultaneity and uniformity of the message it receives" and that "the targeted audience tends to choose its messages, so deepening its segmentation, enhancing the individual relationship between sender and receiver" (p. 219, cited in Castells, 2010, p. 368). In conversation with boyd and

Ito, Jenkins (2016) noted his interest in videos shared that get hundreds, or thousands of views, rather than millions. These videos, in a broadcast model, would never have been shared. In response boyd raised her concern of a shrinking common ground, and asked, "does it behoove us to challenge people's views because it's for the greater good, or should we be focused on giving people what they want most?" (Jenkins, Ito, & boyd, 2016, p. 104). Dewey (1916) noted this dichotomy long before networked technology, that "after greater individualization on one hand, and a broader community of interest on the other have come into existence, it is a matter of deliberate effort to sustain and extend them" (p. 68). He saw diversity as necessary for change and advancement, but a project of common interest as necessary to maintain a democratic society. Jenkins sees a shift in the role of literacy in the era of participatory culture, from "capacity to produce and consume information to the capacity to participate in some larger social system" (Jenkins, Ito, & boyd, 2016, p. 97). The role of a postdigital literacy involves acknowledging the inherent paradox between the value of individualised social knowledge and institutionalised knowledge, resisting the binarisation of these concepts. Similarly, a postdigital literacy should expunge the notion that learning from outside of a classroom is fundamentally separate from the learning that happens within the classroom. Instead, like Pepperell & Punt (2000) say of the analogue/digital duality, a divide may be made out of necessity, but it must always be acknowledged as arbitrary.

Participatory culture has thrived with the expansion of the internet, and as a result, new visual cultures have evolved. New forms of visual communication have been developed, owing to the affordances of networked technology. The video essay has risen to prominence on YouTube, functioning as a kind of substitute for inaccessible academic publishing, with the added engagement factor of visual cues such as video clips, diagrams, and animation. Internet memes, a form of visual communication that originated in the early days of Bulletin Board Systems have evolved from a device for humour to a mode of political engagement

(Kearney, 2019). Emoji, with pre-internet origins, have evolved into a system of visual language that ranges from extremely niche community based to a near encompassing universal language (Danesi, 2019). As new forms such as these emerge, new literacies develop and diffuse out into networked society. Ito says that engagement in the participatory era "has to start moving beyond 'how can I protect myself from media corporations?' and towards 'how can I contribute in an effective and responsible way?'" (Jenkins, Ito, & boyd, 2016, p. 109). As simultaneous producers and consumers of visual media, users not only have to engage critically when decoding visual texts, but also when producing them. The growing pervasiveness of social networks such as Twitter and Facebook has led to the crowd-sourcing of legitmation — by way of the 'share' button (or on Twitter, the retweet). Langlois says,

> the governance process in the participatory media environment is not primarily about censorship, that is, deciding who can express themselves and who cannot. Rather, it is about enabling and assigning levels of meaningfulness: what matters more and should therefore be more prominent and visible. This requires not only techniques to assign a cultural value to information but also strategies to foster specific cultural perception of the platform and processes of delineating communicative agencies (2012, p. 100)

A critical responsibility has emerged in participatory culture, as the participants themselves contribute towards the legitimation of knowledge. Cultural value and prominence are assigned to visual media through users' interaction: by producing or remixing new visual media, by sharing it and granting tacit approval, or merely by consuming it with the knowledge that the algorithm will then make it more visible to others.

Conclusion

Concerns that are prominent in the study of visual literacy and the postdigital intersect in three key ways: acknowledging the permeability of binaries and boundaries, a need for a refreshed critical approach, and the study of new ways in which knowledge is socially generated. All of these involve the legitimation of knowledge. First, how knowledge interpenetrates different *umwelten*[31]; second, how individuals can determine what is meaningful knowledge; and third, how communities develop consensus on knowledge. Visual media, photographs in particular, are tied to our ideas of truth. As Berger (1980) noted, in the 20th century photographs transcended their role of referring to the world and "replaced the world as immediate testimony" (p. 48). In the 21st century, video dominates, but is no less vulnerable to manipulation be it by framing, alteration, or outright fabrication. Static images too, play a role in contemporary discourse. The political internet meme has become a mainstay in online rhetoric. In the networked participatory space, it is too simplistic to adopt a critical visual literacy that merely aims to demystify media's hidden purpose. There is a tension between the emancipation that participatory media offers and the new and subversive ways that hegemonic powers reassert themselves (Jenkins, Ito, & boyd, 2016). A postdigital visual literacy must include a critical dimension that acknowledges "the paradox between freedom of communication and control over the networking of information" (Langlois, 2012, p. 94). Now that the intersections of these two fields of study have been clarified, the next chapter will outline key semiotic concepts that will aid in reconstructing a visual literacy that addresses these shared concerns.

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[31] Commonly translated as *lifeworld*, the concept of *umwelt* acknowledges that while individuals may share an environment, their experience of it will be different (Sebeok, 1976).

Chapter Six: Semiotics

The very essence of human memory is that human beings actively remember

with the help of signs (Vygotsky, 1978, p.51)

In chapter four, I noted in my review of visual literacy definitions that Song & Turner's (2010) definition stood apart for its inclusion of the following phrase: "visual literacy is the active construction of past visual experience with incoming messages to obtain meaning" (p. 188). Where most other definitions focus on dispositions or aptitudes, Song & Turner (2010) start by succinctly outlining the practical and pragmatic function of the literacy. While an initial reading might suggest that this describes the operational function of literacy, I use a semiotic lens in chapter six to outline how this definition also encompasses the cultural and critical dimensions of visual literacy. This chapter will comprehensively examine the concepts of semiotics which I employ in chapter seven's reconstruction of visual literacy. Semetsky (2018), credited with amalgamating semiotics and learning theory into *edusemiotics*, defines semiotics as "the study of signs, especially as regards their action, usage, communication, and signification (or meaning)" (p. 704). A sign is "something that stands for something, to someone in some capacity" (Peirce, 1931-58, 2.228). Signs in semiotics are the building blocks of communication, and how humans derive meaning from the world. In this chapter I provide an overview of concepts of semiotics relevant to visual literacy, in particular the semiotic theories proposed by Charles Sanders Peirce: first, an overview of Peirce's semiotic theory; next, a deeper look into the mechanics of semiosis and the role it plays in developing habitual ways of thinking; and finally, I have outlined the implication of these concepts on education and learning in the postdigital age.

Charles Sanders Peirce

Semiotics is a wide field with many contributors, and Peirce was certainly not the first to investigate the relationship between signs and the world. He is, however, generally credited with the rebirth of the study of signs in the modern age (Danesi, 2007). Peirce never published a book, and what is known of his semiotic theories come from extensive writings spanning from the 1860s to the 1910s, across which he tinkered and revised his theory endlessly (Atkin, 2010; Short, 2007). He is also well known as the founder of pragmatism[32], a philosophy that permeates his semiotic theory.

Peirce's conception of signs and semiotics saw the human subject as immersed in signs, constantly negotiating and reforming meaning in ongoing semiosis (Semetsky, 2015).

> Peirce's semiotics presents the whole universe as perfused with signs. In such a universe, the human mind is not separate from the environing physical world but is engaged in a continual participation with it, thus forming a holistic process-structure, a network, encompassing sociocultural and natural aspects (Semetsky, 2015, p. 706).

This speaks to a process of education and learning that goes far beyond the boundaries of education institutions and beyond conscious learning processes. Peirce's semiotic theory has its roots in Locke's 1690 *Essay Concerning Human Understanding*, in which Locke posits that ideas themselves are signs.

> Since the things the mind contemplates are none of them, besides itself, present to the understanding, it is necessary that something else, as a sign or

---

[32] In education, the name most often associated with pragmatism is John Dewey, but Peirce originally developed the concept, and it was advanced by his contemporaries John Dewey and William James (Smith-shank, 2007)

representation of the thing it considers, should be present to it; and these are

ideas ("Bk. IV, Chapter XII", as cited in Short, 2007, p. 3)

Peirce considered thoughts and ideas to be signs (Short, 2007). One of the key maxims of Peirce's work has been described variously as infinite semiosis (Atkin, 2010), unlimited semiosis (Eco, 2014; Jappy 2013), and continuous semiosis (Jappy, 2013). Short (2007) notes that if a thought is a sign then "we have an infinite *progressus*: each thought must produce another, *ad infinitum*" (p. 6) and "an infinite *regressus:* each thought-word must express a preceding thought word, *ad infinitum*" (p. 6). Peirce acknowledged infinite semiosis, and while he revised his theory in a way that reduced its prominence in his later work, he was untroubled by its presence (Atkin, 2010). There are two reasons for this. Firstly, this principle of continuity is the basis for learning through signs and semiosis (Jappy, 2013). The meaning of a sign relies upon one's interpretation according to information one has already encountered and systematised. Gallie (1952, as cited in Jappy, 2013, p. 23) said: "Symbols grow. They come into being by development out of other signs, particularly from likenesses or from mixed signs partaking of the nature of likenesses and symbols". Because a sign is only ever a partial representation (a sign never signifies in full; the map is not the territory), meaning is derived in a network of significance. As semiosis occurs, signs are further infused with meaning. Secondly, Peirce's staunch position against Cartesian duality relied on this continuity principle (Atkin, 2010). In his later work he developed this into a theory he coined *synechism*, proposing that physical and psychical phenomena are not distinct but continuous.

Thus, materialism is the doctrine that matter is everything, idealism the doctrine that ideas are everything, dualism the philosophy which splits

everything in two. In like manner, I have proposed to make synechism mean

the tendency to regard everything as continuous (Peirce, 1931-58, 7.565)

It is for these reasons that I chose Peirce's semiotic theory over others in this research — the

implication that it has for learning, particularly in the constructivist mode, and its rejection of

dualism. Peirce's semiotics are often favoured for studies in education for his prioritising of

process over product (Semetsky, 2015), which is particularly pertinent when considered

alongside Leu's (2000) notion of becoming literate.

Saussure's *Semiology*

A contemporary of Peirce's is often also credited with the modern study of semiotics,

and that is Ferdinand de Saussure. The two happened to be developing a theory of signs at the

same time, although it is unlikely Peirce was aware of Saussure's work (Short, 2007). In this

section I provide a short overview of what Saussure termed *semiology* as a contrast, to further

characterise the value of Peirce's theory in an educational context. Saussure divided

communication into *langue* and *parole*. *Langue* is the system of linguistic rules, or arbitrary

social conventions, and *parole* is the acts of speech in which a person employs *langue*

(Scholz, Pelletier, & Pullum, 2016; Short, 2007). Saussure's semiology was largely concerned
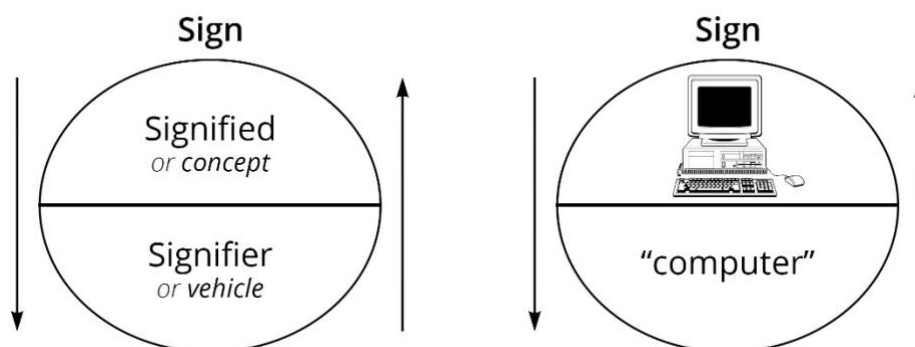
Figure 13. Saussure's model of the sign

with the study of *langue*. He proposed a binary33 model of the sign, made up of the *signifier*,

an utterance, for instance the word 'computer' and the *signified*, the idea of a computer

conjured by the sign (Chandler, 2002; Danesi, 2007). This model lent itself to structuralism;

underlying structures, largely unbeknownst to the social actors, determining action (Short,

2007). Marxism and Freudianism, and their material and psychical determining structures, are

understood through Saussurean frameworks (Short, 2007). Saussure proposed that signifiers

are *arbitrary*. The link between the signifier and signified derive purely from convention

(Danesi, 2007). This contrasts with Peirce, who contended that

> our sensory and emotional experience of the world influences how a sign is
>
> constituted and why it is brought into existence in the first place. We construct
>
> a semeion34 not because we simply want to refer to something in particular or
>
> classify it as part of some category, but because we wish to experience
>
> something in a sensory-based way (Danesi, 2007, p. 10)

It is in this distinction that Peirce's relevance to contemporary education becomes clearer. His

is a relational theory, where Saussure proposes a composite entity of study, separate from

lived experience (Short, 2007). This is perhaps the biggest difference between the two

conceptions of semiotics. Contentiously, Short (2007) suggests that Saussure and Peirce's

models are not only significantly different, but fundamentally incompatible. He argues,

> if Saussure was right that systems of arbitrary signification can be studied in
>
> abstraction from their particular uses and in abstraction from natural signs and

---

33 Often also referred to as a *dyadic* model in semiotic theory (see: Short, 2007; Stables, 2010)
34 *Trans*. sign

other nonarbitrary forms of significance, then Peirce was wrong. And if Peirce

was right that language can be understood only in the concrete context of its

uses, in cooperation with other kinds of signs, then Saussure was wrong. One

system cannot be part of the other, because one contradicts the other (2007, p.

20)

Saussure's sign model does not reference the world independent of language and thought, and

in fact, his theories do not attempt to explain how language manages to be about the world

(Chandler, 2002; Short, 2007). In the following sections I will outline how Peirce intended his

semiotic model to do that in particular.

Peircean Semiotics

In this section I outline the concepts of Peirce's semiotic theory that are important to

this study of visual literacy. It is by no means a full account of all Peirce's semiotic theories,

but instead covers the most important features and elaborating on elements that aid in

reinterpreting visual literacy in a practical way. First I outline his triadic model of semiosis.

Next, I examine Peirce's categories of firstness, secondness, and thirdness — the magnitudes

of conventionality. These categories are elaborated upon to give an account of Peirce's

taxonomy of signs.

The triadic model of semiosis

Unlike Saussure's binary model, Peirce's model contains three key components. They

are as follows. The *representamen* is the thing that does the representing, the form of the sign.

The *interpretant* is the sense that is made of the sign by the interpreter, analogous to

Saussure's *signified* (Chandler, 2002). Finally, is the *object*. The *object* in Peirce's model is

that which the sign stands for, and it is this element that is not present in Saussure's model. In

Peirce's words:

> A sign, or *representamen*, is something which stands to somebody for
>
> something in some respect or capacity. It addresses somebody, that is, creates
>
> in the mind of that person an equivalent sign, or perhaps a more developed sign.
>
> That sign which it creates I call the *interpretant* of the first sign. The sign stands
>
> for something, its object. It stands for that *object*, not in all respects, but in
>
> reference to a sort of idea, which I have sometimes called the *ground* of the
>
> representamen. (Peirce, 1931-58, 2.228)

Before elaborating on this, it is worth noting a further distinction here between Saussure and

Peirce which can often be confusing. Peirce, in the above quotation refers to the
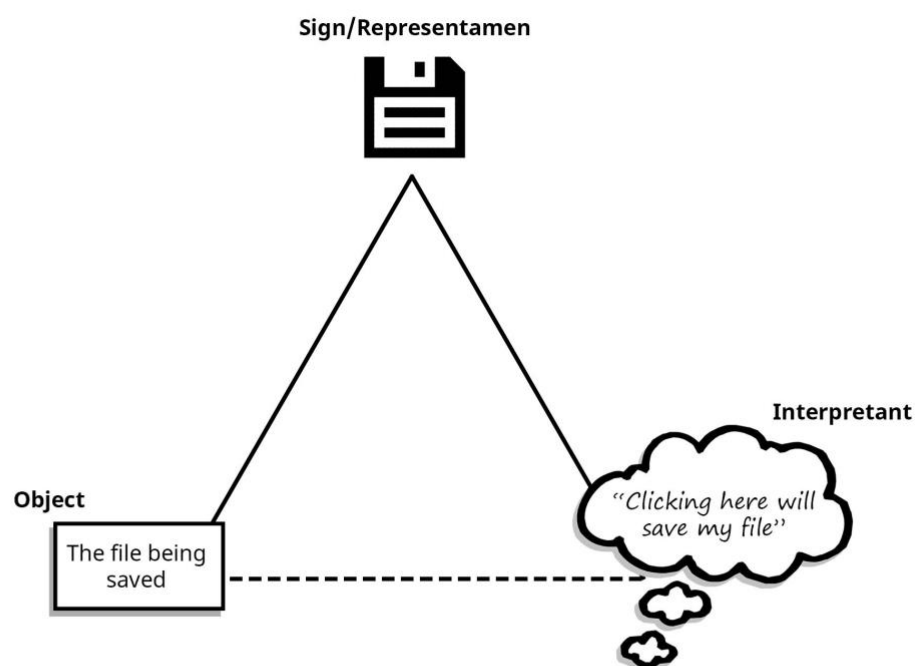
Figure 14. Peirce's triadic model of semiosis

representamen as the sign. Recalling Saussure's model, it is the binary pair of

signifier/signified that make up the sign. In Peirce's model the sign makes up one element of

the triadic model — and it is only a sign in relation to the other two items in the triad (Short,

2007). To clarify the model and its relations, consider the following example (illustrated in

Figure 14). A student has a document open in an unfamiliar word processing program. They

look to the toolbar at the top of the screen and see the icon for the diskette, this is the

representamen. This icon, in the student's mind, evokes the idea that if they click the icon the

document will be saved — this idea is the interpretant. Finally, the object to which the

representamen refers is the document being saved. The representamen is seen (in this case, as

we are dealing with a visual sign), it is interpreted, and sense is made of it, which is the link

between the object and it's representamen. The dotted line between the object and

interpretant indicates a relation that does not exist without mediation of a representamen

which could only exist "in some outlandish theory of telepathy"[35] (Jappy, 2013, p. 6). I will

give two further examples to cement this idea, but also because I intend to refer to them in a

later discussion of Peirce's categories of signs. Stables (2010) uses the example of a

thermometer. The representamen in this case, is the thermometer, or the reading on the

thermometer. The object to which it refers is the temperature of the air. If the thermometer is

'read' by a person, the sense made of it, the meaning-making process, gives the interpretant.

In this example, Stables (2010) notes, the relationship between representamen and object

exists without a human observer creating meaning. It is in this way that Peirce's semiotic

extends past arbitrariness and "fully integrates human interpretation into the ongoing business

of the universe" (Stables, 2010, p. 24) by acknowledging natural signs and images as well as

---

[35] Some other conceptions of the 'semiotic triangle' place the dotted line between the object and the representamen, asserting that the dotted line represents the fact that there is "not necessarily an any observable or direct relationship between the sign vehicle [representamen] and the referent [object]" (Chandler, 2002, p. 34) but this relationship is often direct or observable and covered in Peirce's taxonomy of signs. In my opinion a more important element of his semiotic to describe is the immutable disconnect between object and interpretant without a mediating representamen.

conventional ones (Short, 2007). My third example is a simple one. Consider a portrait

drawing of a person, done in a realistic style. This portrait is clearly the representamen, the

person who sat for the portrait is the object, and an observer viewing the image will make

meaning of the image — and this meaning is the interpretant. I have included this final

example to illustrate that the object can be an actual physical object, as well as a conceptual

object or imperceptible object as in the first two examples, respectively. Returning briefly to

Peirce's above quotation, he stipulates that when a sign is decoded "[it] creates in the mind of

that person an equivalent sign, or perhaps a more developed sign" (Peirce, 1931-58, 2.228). It

is this which led Umberto Eco to coin the notion of 'unlimited semiosis' in which a chain of

signification can go on, potentially ad infinitum (Chandler, 2002). This is represented in

notation in Figure 15.

Through this process of continuous semiosis, mental signs are refined and changed

over time. Eco (2015) uses an example of a housewife in a detergent commercial, exclaiming

that she thought she had seen white sheets, until she had seen the result of the advertised

product. The object 'whiteness' was present as a sign when she observed her sheets, and the

interpretant in her mind became a sign of the property of whiteness. She observes the

advertisers resultant sheets and observes "I was sure [before] I had seen something white, but

now I recognize that there are different degrees of whiteness" (Eco, 2014, p. 513). Her general

mental category of whiteness has been reinterpreted. This notion of the growth of mental

signs has clear implications in education and literacy. It can be used to understand how

students learn concepts, and how some conceptions of teaching might forge only conventional

links between a representation and an interpretant. A simple example of this is the difference

$$O > S > (I_1 = S_2) > (I_2 = S_3) > (I_3 = S_4) \ldots (I_N = S_{N+1})$$

Figure 15. The continuous nature of semiosis (Jappy, 2013)

between a student being told the outcome of an experiment as compared to the student completing the experiment themselves. In the first instance, they will understand by convention alone; an arbitrary relation. By completing the experiment and finding the outcome themselves, the student's phenomenological experience informs the sign directly. It is in this way that Peirce's triadic model incorporates the lifeworld of the sign user into the semiotic process.

The classification of signs

Peirce stipulated three phenomenological categories in his sign system. Named for their magnitudes of abstraction from an original object, they are the categories of firstness, secondness, and thirdness. Firstness is the category of qualities, feelings, and possibilities (Jappy, 2013; Short, 2007). "Firstness is the mode of being of that which is such as it is, positively and without reference to anything else" (Peirce, 1931-58, 8.328). An object in the category of firstness is itself, "independently of its being perceived or remembered" (Peirce, 1931-58, 8.239). Secondness is the category of reaction, brute force and actuality (Jappy, 2013; Short, 2007). Unhelpfully, Peirce describes secondness as "the mode of being of that which is such as it is, with respect to a second but regardless of any third" (Peirce, 1931-58, 8.328). The quality of secondness describes individual instances of objects, or signs that have a dyadic relationship with their object regardless of the presence of an interpretant (Jappy, 2013). Thirdness covers habit, convention, and law (Jappy, 2013; Short, 2007). "Thirdness is the mode of being of that which is such as it is, in bringing a second and third into relation to each other" (Peirce, 1931-58, 8.328). Short (2007) says of thirdness: "a combination of two things is triadic, the whole being the third relatum" (p. 84). The representamen is a first, the object that it evokes is a second, the interpretant that brings them into relation is a third. These concepts become clearer as they are applied in Peirce's taxonomy of signs.

Consider the triadic model from the previous section. Peirce conceived that each element of this was divided by trichotomy (Peirce, 1931-58, 5.73). (i) The sign-in-itself; (ii) the representamen's relationship to its object; (iii) the representamen's relationship to its object in the interpretant; all of these are either monadic, dyadic, or triadic; they belong, respectively, to the categories of firstness, secondness, or thirdness (Short, 2007). Any given sign will fall within one of these categories in each typology (i), (ii), and (iii). Table 1 clarifies the relationships between these triadic divisions. To explain the interrelationship between the phenomenological categories and the typologies, I will start with the most well known of Peirce's divisions: the typology of the sign and its relationship to its object. This divides into three modes, *iconic, indexical,* and *symbolic*. The icon represents an object "by virtue of a character which it possesses in itself, and would possess just the same though its object did not exist" (Peirce, 1931-58, 5.73). In my examples in the previous section, the portrait, which represents through the quality of visuality (which it would retain, whether the person it depicted existed or not), is an icon. Danesi (2007) succinctly deems iconicity as "simulative semiosis" (p. 41). The icon represents by acknowledging the link to initial sensory perception (Danesi, 2007) and is therefore the *second of firstness*. While it is easy to give examples that are visual, icons can represent by other similarities (Chandler, 2002). Danesi (2007) gives the

Table 1

Peirce's categories of sign framework

	Firstness	Secondness	Thirdness
(i) Sign-in-itself			
(ii) Sign's relationship to object			
(iii) Sign's relationship to object in interpretant			

example of artificial food flavouring as an icon of the authentic flavour. Peirce did not limit it

to mere sensory similarity either; he considered graphs, for instance, to be structural

resemblances of that which they represented (Chandler, 2002; Jappy, 2013). The next mode,

the indexical, refers to its object through a causal link. Peirce says the index "fulfills the

function of a representamen by virtue of a character which it could not have if its object did

not exist, but which it will continue to have just the same whether it be interpreted as a

representamen or not" (Peirce, 1931-58, 5.73). The thermometer from my earlier example will

be found in this category. You might also find smoke that indicates fire, or a series of

footprints on the beach indicating a person has walked there. Indexes have a relational quality,

to a sign-user they place things in relation to one another (Danesi, 2007). In written language,

demonstrative nouns such as 'this' or 'that' are indexes. Proper nouns indexically refer to a

specific object. The final division is the symbol. The symbol is in the category of thirdness,

the domain of law and convention. Thus, any meaning derived from a symbol is done so not

by an imminent property or relationship, but through an arbitrary code. Peirce (1931-58) says

that a symbol has no factual connection to its object. Many language features fall into this

category — the word 'happy' and the feeling of happiness that it denotes are associated only

through social convention and the English language. Colour symbolism is another example,

Table 2

Peirce's categories of signs: Second trichotomy – Sign's relationship to object

	Firstness	Secondness	Thirdness
(i) Sign-in-itself			
(ii) Sign's relationship to object	Icon	Index	Symbol
(iii) Sign's relationship to object in interpretant			

such as red referring to passion or love in a Western tradition, where in Chinese custom, for instance, it evokes the idea of good fortune and prosperity.

The different ways in which an image can represent are important in any theory of visual literacy. A critical literacy necessarily engages with the ways in which a sign represents its object. Recognising the difference between a sign that signifies through immediate firstness and a sign that is mediated by cultural convention is a key element in criticality.

Also important, though, is how the sign is represented in its interpretant (iii). This typology is an integrated metatextual layer through which a sign-user understands how a sign is interpreted. It will become clear later that this is one of the most important elements of the sign when considering habit and convention, and therefore literacy. This typology is also a trichotomy. The three categories of the sign's relationship to its object in the interpretant are *rheme, dicisign,* and *argument* (Peirce, 1931-58). As I began with the second typology for ease of explanation, here I begin with the second trichotomy for the same reason. The *dicisign*36 Peirce says is "the kind of sign that conveys information, in contradistinction to a sign [such as an icon] from which information may be derived" (Peirce, 1931-58, 2.309). As the name and its position in the taxonomy might indicate, the dicisign is dyadic, consisting of two parts. For instance, take the sentence 'Auckland is a city'. This is a dicent sign, consisting of the index 'Auckland' and the rheme '_____ is a city'. The *rheme* is the monadic form of this typology, as Peirce (1931-58) said, a sign from which information can be derived. This category includes common nouns, propositions with subjects removed, diagrams with labels removed, proper nouns, and even images (Atkin, 2010; Jappy, 2013). To clarify, consider this passage from Peirce (1902):

---

36 Sometimes *dicent sign* in Peirce's own writings

> Thus, in the assertion, "Mary is red-headed", "red-headed" is not an icon
> itself, it is true, but a symbol. But its interpretant is an icon, a sort of composite
> photograph of all the red-headed persons one has seen. "Mary" in like
> manner, is interpreted by a sort of composite memory of all the occasions
> which forced my attention upon that girl. The putting of these together makes
> another index. (p. 323, as cited in Jappy, 2013, p. 147)

Here, Peirce has described the logic of the rheme. 'Red-headed', in its relationship to an object, is a symbol, as it by convention alone that it brings to mind the sense of red-headedness. But that sense in the interpretant functions in the iconic mode. As for 'Mary', Peirce (1893-1913) argued that a sign that referred to an individual was a type of index (thus covering proper nouns and demonstrative nouns), so 'Mary' is an index, but as he points out in the above quotation, in the interpretant it functions in iconic mode also. So the preposition 'Mary is red-headed' combines the two rhemes in a relational function to form a dicisign.

Where the rheme calls attention to something without offering further information, and a dicisign professes information, an *argument*, as the name implies, appeals to the interpreter's reason (Short, 2007). In Peirce's (1931-58) words the argument, "is a Sign which has the

Table 3

Peirce's categories of signs: Third trichotomy – Sign's relationship to object in interpretant

	Firstness	Secondness	Thirdness
(i) Sign-in-itself			
(ii) Sign's relationship to object	Icon	Index	Symbol
(iii) Sign's relationship to object in interpretant	Rheme	Dicisign	Argument

Figure 16. Untitled still life photograph (photograph by author, 2018)

Form of tending to act upon the Interpreter through his own self-control, representing a

process of change in thoughts or signs, as if to induce this change in the Interpreter" (4.538)

The final typology to address is the immanence of the sign — the sign-in-itself. Peirce

termed these *qualisign, sinsign,* and *legisign*, relating to the domains of firstness, secondness,

and thirdness respectively. The naming conventions Peirce used for this typology are

explanatory: a qualisign consists of a quality; a sinsign is a singular object, an occurrence or a

fact; and a legisign is a sign that is a law (Danesi, 2007). Consider the image in Figure 16.

The quality of red is a qualisign, here it is embodied in the apple in the photograph. As Jappy

(2013) notes, a qualisign "[has] no independent existence and [is] only to be perceived

inhering in some existent object" (p. 32). The photograph itself is a sinsign, as are all

photographs — it is an individual occurrence. Peirce (1893-1913) said that a sinsign can exist

"only through its qualities; so that it involves a qualisign, or rather, several qualisigns"

(2.291), as it is through the colours and tones of the photograph that we perceive it. If we

draw inferences from the photograph — perhaps the apple represents original sin, or the

Table 4

Peirce's categories of signs: First trichotomy – Sign-in-itself

	Firstness	Secondness	Thirdness
(i) Sign-in-itself	Qualisign	Sinsign	Legisign
(ii) Sign's relationship to object	Icon	Index	Symbol
(iii) Sign's relationship to object in interpretant	Rheme	Dicisign	Argument

framing and composition of the image evoke the conventions of vanitas[37] — we are interpreting legisigns. The legisign is the most pervasive of the signs in contemporary culture (Jappy, 2013). Its role in literacy and learning cannot be understated — written language functions in this mode, as do cultural conventions and associations. As I alluded to earlier, any given sign will occupy the domain of firstness, secondness, or thirdness within typology (i), (ii), and (iii). Certain combinations, however, are impossible. As Short (2007) outlined,

> A symbol signifies by a law that relates instances of one type (the symbol) to another type or to its instances. But a type is a 3rd. Now, legisigns alone are 3rds; for sinsigns are 2nds and qualisigns are 1sts. Therefore, legisigns alone may be symbols. Similarly, an index signifies via an existential relation, and, therefore, it must be a 2nd or something — a 3rd — in which 2ndness is implicated. For that reason there can be no indexical qualisigns. In a like manner, we see that an icon can be a rheme only. For that which signifies only through the possibility that it is or that it embodies or that its instances

---

[37] Vanitas is "A still life artwork which includes various symbolic objects designed to remind the viewer of their mortality and of the worthlessness of worldly goods and pleasures" (Tate, n.d., "Vanitas")

embody can neither profess anything nor appeal to the interpreter's reason.

(p. 236)

Upon examination of a sign, one will find that the sign's relationship to its object is the same level of complexity, or less, than the sign-in-itself. The same is true of the relationship of (iii) to (ii). The quality of red cannot be indexical, for instance, because it is necessarily embodied if it is to refer to something outside of itself, in which case it is a sinsign (or part of one), and if a relationship between red and an object is formed as a law or convention, it is a legisign. Some examples will help to clarify. First, consider the sentence fragment '_____ is a city'. The sign itself is a legisign, as it relies on the cultural convention of language, its relationship to its object is symbolic, as the words bear no resemblance to their object, nor do they draw attention to a particular, and while it brings to mind a set of qualities, it does not profess anything — so in the interpretant it is a rheme. '_____ is a city' is a rhematic symbol. Next, consider the photograph in Figure 16. An individual photograph is a sinsign, it consists of many qualisigns, but is not one itself, and does not rely on any law or convention to exist. Its relationship to its object is not as clear cut. One might think that it is clear that the photograph is an icon — it resembles its object — but in fact Peirce often used the photograph as an exemplary case of an index (Jappy, 2017). The photograph does not depict skulls or apples *generally*, but in fact directs the viewer to a *particular* skull, and a *particular* apple that were arranged in a studio. The photograph also has a physical relationship with its object, when the light reflected from the object reaches the film, or the sensor — much like a thermometer and the temperature. Jappy (2017) contends that a photograph without a caption contains only the potential for information. One cannot derive 'the apple is too red' from the photograph alone, this is a further interpretant. Peirce (1931-58) himself states, however, "the mere print does

Table 5

The possible combinations of Peircean sign categories

(i)	(ii)	(iii)	
1st	1st	1st	(Rhematic iconic) **qualisign**
2nd	1st	1st	(Rhematic) **iconic sinsign**
2nd	2nd	1st	**Rhematic indexical sinsign**
2nd	2nd	2nd	**Dicent indexical sinsign**
3rd	1st	1st	(Rhematic) **iconic legisign**
3rd	2nd	1st	**Rhematic indexical legisign**
3rd	2nd	2nd	**Dicent indexical legisign**
3rd	3rd	1st	**Rhematic symbol**(ic legisign)
3rd	3rd	2nd	**Dicent symbol**(ic legisign)
3rd	3rd	3rd	**Argument**(ative symbolic legisign)

Note. The bracket elements are redundant in the naming schema, and so the sign classification is referred to by the bolded term

not, in itself, convey any information. But the fact, that it is virtually a section of rays projected from an object otherwise known, renders it a Dicisign" (2.320). The photograph itself is a dicent sinsign, but this is just the surface layer. Within the world of the photograph, more sign relations are evident, in this case, symbolic signs using metaphor and convention. Table 5, adapted from Short (2007), indicates the possible combinations.

In order to illuminate the bearing of this, rather complex, taxonomy for units of communication on literacy and education, I will return to my earlier example — the diskette. In Figure 17 is the graphical sign used commonly in word processing programmes to indicate the save function. This sign, or something very similar, can be found in most contemporary word or image processing programmes, however when attempting to classify it, something interesting occurs. Classifying the sign from my perspective, or indeed, from the perspective

of anyone born in the 1980s or earlier, my reasoning goes as follows: the sign is a legisign, as it is through habit that I understand what clicking it will do, it is an icon, because it bears a resemblance to a physical diskette (Fig. 18) which I understand as an object that has the express purpose of storing documents, and it is necessarily a rheme, as it does not profess information, but perhaps brings to mind the other instances in which I have saved documents using this sign. The sign is an iconic legisign. In 1990, when I upgraded to an IBM desktop computer and first encountered the sign, it had a direct visual connection with its object, and given the physical connection, thus one could argue it functioned as an iconic sinsign — much closer to direct experience. For the contemporary secondary school student, it is different again. The sign itself is a legisign still, governed by habit, but even more so, given that the sign's connection to the object is purely arbitrary — a symbol. Thus, semiosis is not a

Figure 18. A common save icon for word processing programmes
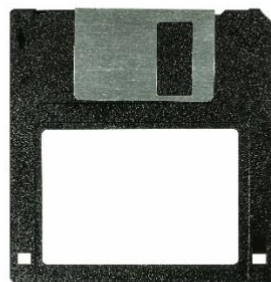
Figure 17. A physical diskette which inspired the iconic sign
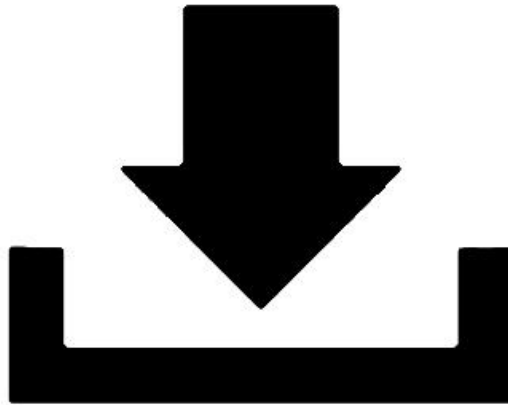
Figure 19. A contemporary alternative to the diskette 'save' icon

stable construct, but is constantly in flux. "A sign invariaby generates another sign, or interpretant, which in turn becomes itself a source of semiosis" (Danesi, 2007, p. 32). In this case the sinsign of the initial encounter becomes a habit, a legisign within the mind of the interpreter — this information passed on without the direct experience, generalising the information to an arbitrary symbol. The symbol, in some more recent applications, has been replaced with Figure 19, which functions as an icon, a structural resemblance to the act of storing a document. Although he espoused the notion of unlimited semiosis, Peirce believed that in order for humans to understand and classify the world, semiosis must coalesce into a stable set of forms, at least temporarily (Danesi, 2007).

> This set, Peirce claimed, generates a system of beliefs that guides our actions and shapes our behaviours unconsciously, Doubt arises when our current beliefs are not accounted for through the set — that is, when the character of signs in the set does not fit our understanding of the experience. To remove doubt, we resort to inference, and this leads, in turn, to new sign creations. Thus, according to Peirce, it is doubt that drives the making of knowledge. (Danesi, 2007, p. 32)

Habits, Habituation, and Habituesence

Peirce (1931-58) wrote extensively on the role of habit — the domain of thirdness he deems the domain of habit. Habit is instrumental in literacy, as literacy relies on conventional symbols (such as words, or visual association). Symbols are signs that "represent their objects, independently alike of any resemblance or any real connection, because *dispositions* or *factitious habits* [emphasis added] of their interpreters insure their being so understood" (Peirce, 1893–1913, 2.460). It is through habit that conventions are adopted. But habits are not restricted to the recognition of arbitrary signs, Peirce also conceived of habits of thought and habits of feeling (Nöth, 2016). Habits are acquired through interaction with the world and signs, and as the word itself connotes, are not always positive. Schirato & Webb (2004) cite 'habituation' to particular visuals and ways of viewing as one of the primary reasons that visual literacy needs to be taught. Peirce did not have a behaviourist perspective on habituality though (Nöth, 2010; 2016). He thought of habits as having 'plasticity' that they held, until "strained beyond its limit of elasticity" (Peirce, 1931-58, 6.261). For Peirce, habit change was a fundamental force in the creation of knowledge (Nöth, 2016).

The technical notion of habit in human behaviour comes from the school of thought known as psychological behaviourism (Danesi, 2019). After Pavlov's famous bell experiment[38], Andrews (1903), in the *American Journal of Psychology*, defined *habit* as "a more or less fixed way of thinking, willing, or feeling acquired through previous repetition of a mental experience" (pg. 121, as cited in Danesi, 2019, p. 32). More recently, sociology has applied the theory of *habitus*, best known from Pierre Bourdieu's work in explaining the role of social context and upbringing in shaping cultural habits (Harker & May, 1993). Peirce's

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[38] Pavlov's experiment involved ringing a bell every time he presented meat to a dog, and found that, after several repetitions, the dog would salivate when the bel was rung, anticipating meat. This is a *conditioned response* (Danesi & Perron, 1999)

conception of habit differs from the former account in two ways. Firstly, Andrews' (1903) account that habit is "more or less fixed" (pg. 121, as cited in Danesi, 2019, p. 32) is in complete contradiction with Peirce, who was very clear that the change of habit was a fundamental for human progression (Nöth, 2016). Secondly, Andrews' (1903 as cited in Danesi, 2019) definition is restrictively deterministic. Danesi (2007) noted that the contemporary practice of semiotics in the understanding of psychological growth as "a safeguard against determinism in any of its modern forms" (p. 23). This statement on semiotics certainly owes more to Peirce than Saussure, the latter's semiology positing that *parole* was determined by *langue*, an underlying structure of rules (Short, 2007). For Peirce, a habit is formed in collaboration with the world but can be changed through habits of thought. Peirce (1931-58) describes that during the act of putting a coin into a machine to receive a chocolate the expectation of receiving a chocolate manifests in the imagination — a "previous practical experience ... resulted in a habit of imagining that the same would happen again under the same circumstances" (2.148). The repetition deepens and reinforces the habit, but "a man (sic) may become aware of any habit, and may describe to himself the general way in which it will act" (1931-58, 2.148). Peirce was insistent that habits of thought, belief, and action were not fixed and could be consciously acquired (Cannizzaro & Anderson, 2016). Thoughts could be reiterated in one's inner world to form a habit of thinking. Peirce called this concept *habituescence* (Anderson, 2016; Danesi, 2019). Nöth (2016) noted that the idea of habit change as a habit of thought seems paradoxical but that "this apparent self-contradiction is due to the self-referentiality of the concept of habit in combination with the law of the growth of habits" (p. 40). While habits deepen through reinforcement, habit change itself is a habit (Nöth, 2016).

Habit falls under the domain of thirdness in Peirce's taxonomy of signs, but it is not restricted to the phenomenological category of thirdness. "Peirce also considers habits of

Table 6

The categories of sign that relate to thirdness

	Firstness	Secondness	Thirdness
(i) Sign-in-itself	Qualisign	Sinsign	Legisign
(ii) Sign's relationship to object	Icon	Index	Symbol
(iii) Sign's relationship to object in interpretant	Rheme	Dicisign	Argument

feelings, which are phenomena of Firstness, and habits of bodily actions, which are phenomena of Secondness" (Nöth, 2016, p. 40). Thus the rheme, the thirdness of firstness, and the dicisign, the thirdness of secondness, relate to habits of feeling, and habits of action respectively.

A semiotic shift in the sign-user can be seen in habit acquisition. Like my earlier example of the diskette, and my own experience of it as an iconic sinsign shifting to an iconic legisign, in habituation a similar shift occurs.

> Peirce stresses that Thirdness is a category of habits and habits tend to become subconscious. So, the evolutionary way of Thirdness is that semiosis through Thirdness forms a habit. This habit gradually becomes more and more subconscious, and Thirdness begins its regress to Firstness. Not the monadic Firstness in nature but the Firstness of Thirdness — the Rheme. (Thellefsen, 2000 cited in Cannizzaro & Anderson, 2016, p. 326)
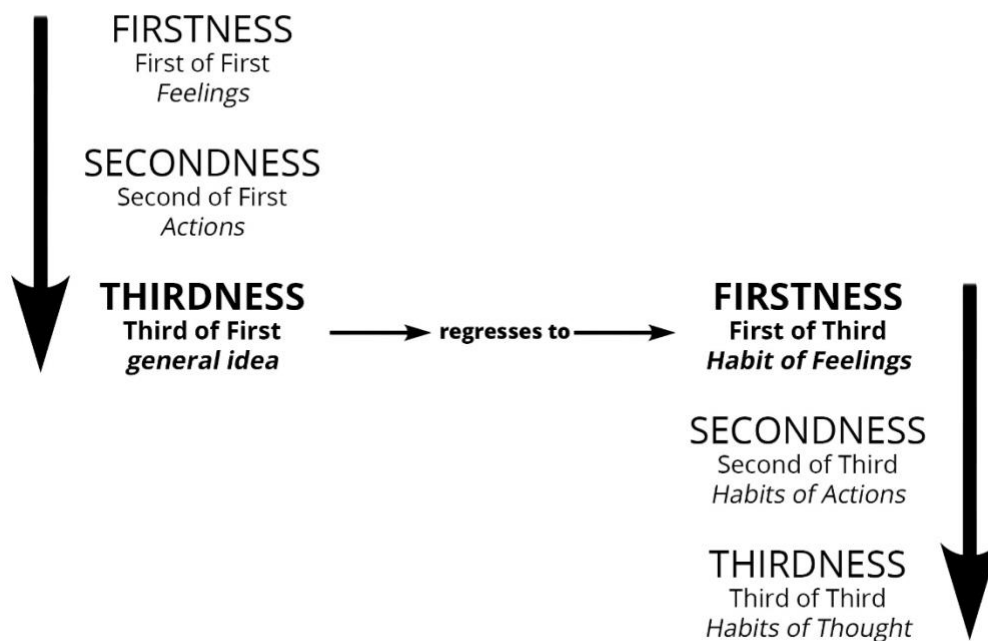
Figure 20. Regression from thirdness to firstness (Cannizzaro & Anderson, 2016)

A regression from a general idea to a habit of feeling is a shift in perception. What once

happened through association becomes a perceptual judgement: "the first judgment of a

person as to what is before his senses" (Peirce, 1931-58, 5.115).

Semiotics and education

Semiotic theory has historically been applied to education by reducing the field to its

instrumental functions, for instance, understanding the role of teaching aids in the classroom

(Semetsky, 2016a). But this thesis aims to reimagine a theory of visual literacy. It is true that

semiotics in an instrumental capacity can be used effectively as a tool in the classroom to help

students decode images (see García-Sánchez, Sánchez, & Isla, 2014; Lackovic, 2019). Of

more interest to this thesis is how the philosophical fundamentals of semiotics might advance

understanding of visual literacy acquisition and how new visual knowledge is created. A fully

semiotic view on education acknowledges that, in the classroom and in the wider education

system, signs, both intentional and unintentional, have potential to play roles in learning (Stables, 2010). Stables (2010) claimed,

> there are no grounds for assuming that learning is a distinctive form of life … rather, certain examples of human interactions with sign(al)s are construed as learning … in effect, learning does not 'happen' but is rather determined to have happened (p. 26)

In an edusemiotic39 view of educational philosophy, 'learning' turns out to be a selectively used term for certain interactions (Stables, 2010). A consequence of an edusemiotic approach is that learning turns out to be a symptom of living in a world of signs.

Semiotics and the philosophy of education

An approach to the philosophy of education that considers semiotics as a foundational framework (an approach coined *edusemiotics* by Marcel Danesi [Deely & Semetsky, 2019]) is transformational in respect to dismantling the neoliberal turmoil that contemporary schools face. Edusemiotics supports a project of liberal education, and its continuation in progressive education — a project Olteanu says education institutions have largely abandoned in favour of "the success models [of capitalism], the corporate [business] models, which are ideological" (Olteanu & Campbell, 2019, p. 283, parentheses in original). The cartesian dualism that informs education, supported by notions of binary opposition derived from structuralism (Stables, 2014; Semetsky & Stables, 2014) has led to a positivistic approach to education (Deely & Semetsky, 2019), one that "'collapse[s]' learning into 'that which produces achievement'" (Stables, 2014, p. 31). In contrast, edusemiotics adopts a process philosophy,

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39 A field of study that brings together semiotics and educational theory (Semetsky, 2016a)

the philosophy of *becoming* (Semetsky, 2015), and acknowledges that humans' engagement with the physical world is continuous and in flux. What Deely and Semetsky (2019) call the "imperialism of the natural sciences" (p. 212) has led to a fragmentation of knowledge and the instrumentalisation of education for the sake of performativity: the "fixation with maximising the quality of outputs in schooling" (Munday, 2018, p. 870) in order to maximise efficiency. The transmission model of learning (or *banking* model [Friere, 1970]) which characterises "teacher as active sender of messages and student as passive receiver" (Semetsky & Stables, 2014, p. 158), employed in schools (presumably) as the most efficient method to improve achievement, is a tacit embrace of the cartesian philosophy (Semetsky & Stables, 2014). The teacher/student dynamic is presented in this model as two binary opposites, a dyadic relation. Semetsky and Stables (2014) posit that in an edusemiotic framework, especially one employing a Peircean perspective, the model is triadic, with teacher and student converging on a third point — the semiotic interpretant, or meaning. What seems like a simple classroom interaction is suddenly a far more complex and rich process of interpretation (Olteanu & Campbell, 2019). The acknowledgement that teaching is a contextualised communication method in which students interpret meaning using their own repertoire of signs and habits problematises the notion of an education system that relies on standardised testing. It is in this way that a semiotic perspective can help to reframe education as a system for learning, rather than a cyclical process that justifies its own existence. Peirce (1903a, p. 326, as cited in Strand, 2013, p. 792) proclaimed "experience is our only teacher". Compare this to Dewey (1897) in his *Pedagogic Creed,*

> all communication … is educative. To be a recipient of a communication is to have an enlarged and changed experience. One shares in what another has thought and felt and in so far, meagerly or amply, has his own attitude

modified. Nor is the one who communicates left unaffected. (p. 6, as cited in

Nöth, 2014, p. 8)

So, a constructivist understanding of education benefits from a semiotic understanding. In fact, Peirce's (1931-58) notion of collateral experience helps to elucidate the constructivist learning process. Collateral experience is the sum of internalised signs in a person's mind, essential to making sense of new signs, and thus essential to learning (Smith-shank, 2007). Peirce (1931-58) gave an example using Napoleon:

> A person who says Napoleon was a lethargic creature has evidently his mind
> determined by Napoleon. For otherwise he could not attend to him at all. But
> here is a paradoxical circumstance. The person who interprets that sentence (or
> any other Sign whatsoever) must be determined by the Object of it through
> collateral observation quite independently of the action of the Sign. Otherwise
> he will not be determined to thought of that object. If he never heard of
> Napoleon before, the sentence will mean no more to him than that some person
> or thing to which the name "Napoleon" has been attached was a lethargic
> creature. For Napoleon cannot determine his mind unless the word in the
> sentence calls his attention to the right man and that can only be if,
> independently, habit has been established in him by which that word calls up a
> variety of attributes of Napoleon the man. Much the same thing is true in regard
> to any sign. (8.178)

While this example is somewhat of a reductio ad absurdum, it can be extrapolated to contain a universe of learning. Peirce (1931-58) goes on to expand that the partial object lethargy must

also be understood through collateral experience — part of which, upon hearing the initial

proclamation, is what we know of Napoleon's character. After internal reasoning, if we accept

the proclamation as true, both our interpretant of Napoleon and of lethargy are expanded. The

signs contain traces of the signs which were used to make sense of them and consist the vast

network of meaning used to make sense of the world. The implications for education here are

far-reaching. When students are taught a particular concept, unless the teacher scaffolds from

the very beginnings of experience, they are reliant on previously internalised signs. If a

school's primary concern is achievement, then the most efficient way towards this is with a

sufficiently homogenous sign system. This is not to say that examinations reward conformity,

visual arts for instance, often does the opposite, but that teaching will be streamlined if sign

interpretation is nested in similar networks of meaning between students and teachers, and

students and their peers. The Bourdieusian notion of *habitus*, that explains how class systems

are perpetuated by ways of being that are learned through upbringing (Harker & May, 1993)

(itself a function of semiosis) illuminates how a school prioritising efficient achievement may

cement inequity, due to incentivisation of a homogenous student body.

Stables (2014) takes a semiotic critique of education even further, suggesting that

contemporary education systems and learning are only bound together by cultural myth. He

asserted that while widely held educational values believe in the liberatory potential of

education, "a failure to recognise learning as a cultural construct could in extremis lead to

formal educational practice becoming nothing more than either self-fulfilling prophecy or a

vehicle for totalitarian government" (Stables, 2014, p. 35).

If schools are places where students internalise signs (which must be accepted if

communication is consisted of signs, and teaching involves communication) then, taken at

face value, a certain set of culturally agreed upon signs are presented or habitual sign uses

encouraged, and then their uptake measured. As Stables (2014) notes, the extreme version of

this is indoctrination. He concludes, contentiously, that, "there is no evidence, other than anecdotal, of 'education' enhancing the capacity to learn, or, indeed, of there being any such distinct capacity. The meaning of learning is always 'deferred', in Derridean terms; it never actually 'happens'" (Stables, 2014, p. 38). There is another way to view education, though. Because the interpretation of signs is always imperfect, and because students have agency, new ideas and new knowledge *are* created through the engagement with signs in education. In this view, education is a series of *significant events* that result in students forming or reforming their own sign systems. Of course, it would be naïve to suggest that school curricula are designed with this in mind. Stables (2014) suggests that a way to navigate a semiotic understanding of education involves a "reconceptualisation of what constitutes 'good teaching'" (p. 40). Deleuze (2004) also suggested that the role of the teacher be reconsidered, as

> we learn nothing from those who say 'Do as I do'. Our only teachers are those who tell us to 'do with me', and are able to emit signs to be developed in heterogeneity rather than propose gestures for us to reproduce (p. 26)

Peirce (1931-58) himself had a similar view on teaching to Deleuze's proclamation. He gave an example of a mathematics teacher instructing students on a method of solving an equation, one that the teacher themselves understood through familiarity, and thus did not encounter a need to reason their way through. The students, encountering a similar problem outside of the teacher's assistance would either find it easy, if it falls within the bounds of the logical rules they have replicated, or too difficult, lacking any independent reasoning ability in order to solve it. A good teacher, in Peirce's conception, "takes the time to induct students into independent reasoning, thereby arming them with the capacity to make their own

reasoned judgments in situations they may not have previously encountered" (Quay, 2017, p. 81). Stables' (2014) solution to this is to propose that learning should not be student-centred "since the child is never a pre-existing 'finished article' or learning machine" (p. 40), but it should also not be content-centred "since content only makes sense when you do something with it" (p. 40). He proposes that teaching/learning should be activity-centred, and what he coins *learner-aware*. Teaching, he says, should generate considered significant events that encourage positive identity formation through semiosis. This approach not only satisfies both positions of the progressive versus traditional debate in education philosophy (see Gilbert, 2005, Chapter four in particular), but demystifies learning in a way that liberates it from its problematic coupling with the domain of education (Olteanu & Campbell, 2019).

Habit and literacy

Habit and habit change are, in Peircean semiotics, the fundamentals of knowledge (Nöth, 2016). Growth of knowledge and understanding occurs when "old knowledge is abandoned [and] when new evidence leads to the insight that it is incompatible with experience and reality" (Nöth, 2016, p. 57). Dewey (1922/1988 as cited in Semetsky, 2016b), whose pragmatism owes a large debt to Peirce's theories, considered habit as the unconscious foundation for conscious thought. He "positioned habits as capable of constituting one's self by way of forming desires and ruling thoughts" (Semetsky, 2016b, p. 142). Habit is both an organisational force that allows us to bracket existence in such a way that one can find meaning in it, and a malleable system allowing humans to "constantly change, expand, elaborate, or even discard the habits of thought imprinted in sign systems … to encode new knowledge and modify previous knowledge" (Danesi, 2007, p. 25). Vygotsky (1978), noted that signs were ways that knowledge was encoded in the mind to allow for higher mental functions. He observed that while reliance on signs seems to disappear as functioning

increases, it is illusory, the external operation having been internally reconstructed. This is analogous to the process of habituation, of thirdness regressing to firstness. Vygotsky (1978) saw this as an exponential process: "development, as often happens, proceeds here not in a circle but a spiral, passing through the same point at each new revolution while advancing to a higher level." (p. 56) As established by Cannizzaro and Anderson (2016), habit is represented in a shift from thirdness to firstness in the sign system. This can be thought of as a shift from something consciously reasoned to what might be colloquially described as 'second nature'. This is no clearer than when it is observed in second language learning, wherein a student's initial experience is translating a word by 'looking it up' in their mental catalogue, and as time goes on, an encounter with the word is immediately decoded. The sign in this case is still a symbol, but the interpretation of it moves from the phenomenological domain of thirdness to firstness. This is operational literacy as defined by Green & Beavis (2012). A shift to firstness in interpretation allows one to use a sign system (whether that system is reading a passage in a language or completing an operation in a computer programme) with fluency. The cultural dimension in Green & Beavis' (2012) model is implicit in a semiotic understanding of literacy — literacy is always acquired in a particular context, and this includes the classroom. In fact, semiotics, like Bourdieu's habitus (see Harker & May, 1993), problematises the conception of the classroom as a neutral space. Thus the cultural dimension of literacy and 'culturally significant images' (Felten 2008; Kress, 2003) are products of engagement with the world minus the formal instruction that is branded as 'learning'. Cultural literacies are, in a semiotic framework, in continuity with formal literacies.

Rhizomatic network of
significance

Rhizomatic network of
significance (bracketed)
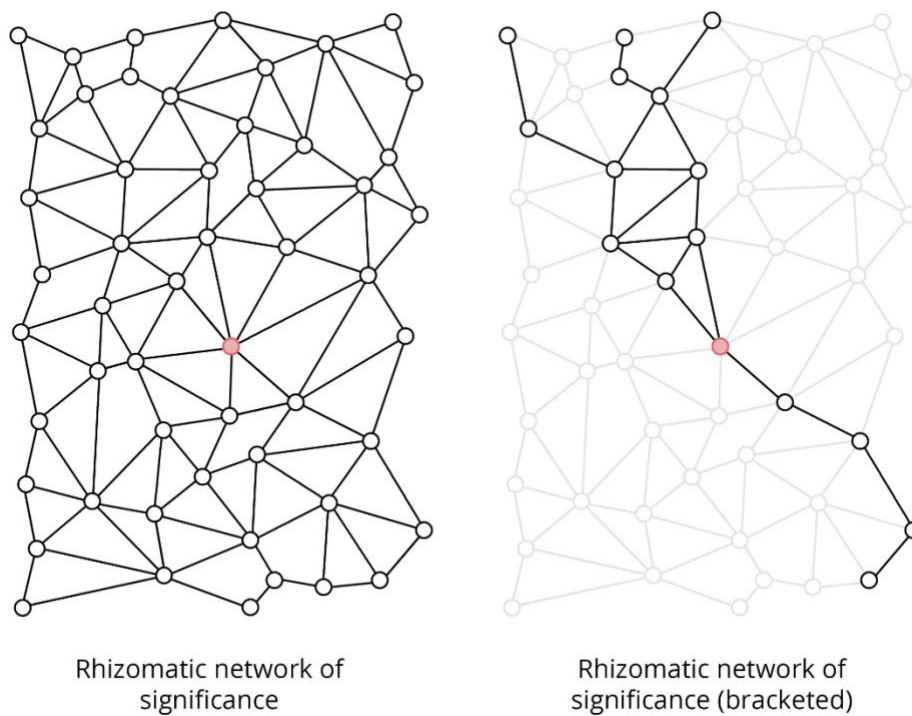
Figure 21. The universe of signs is bracketed to make sense of the experience of the world

The third dimension of literacy, critical literacy, is perhaps where a semiotic

framework may have the most purchase. Signs are how humans make sense of the world, they

are the means of bracketing of experience in the vast sea of sensory input. "Even if any

terminology is a reflection of reality, by its very nature as a terminology it must be a selection

of reality, and to this extent it must function as a deflection of reality" (Burke, 1966, p. 46, as

cited in Danesi & Perron, 1999, p. 67). The signifying order that allows for mediated

perception of reality is an essential component of human development (see Figure 21). The

conundrum that results is as Danesi (2007) points out "we let our culture (which is a network

of signs) 'do the thinking' for us when we use signs unreflectively" (p. 25) and in general, we

do not desire to re-complicate our experience.

After a while no one realizes anymore that the habits were acquired in a specific

situation and no one cares why they do so. The reason is that people and,

indeed, entire societies do not desire to engage typically in self-analysis.
(Danesi, 2019, p. 33)

Habits, Cannizzaro and Anderson (2016) point out, are neither inherently good nor bad. The value of a habit is formed through cultural consensus. Although Nöth (2016) notes that habit is more likely to be regarded as negative, as it "[connotes] immobility, immutability, conservativism, and stagnation rather than mobility, change, development, and evolution" (p. 56), the latter qualities are those that are culturally valued.

The notion of criticality that Buckingham (2003) maligns is a habit of thought. This habit involves scepticism toward the true goals of the producer behind the media being decoded. Buckingham is correct in his critique as it replaces one cultural habit of thought (the uncritical viewing of media) with another (searching for the adversarial other, trying to 'get one over' on the viewer). He is not, of course, arguing for an end to teaching criticality — most scholars of literacy would agree that teaching students to overcome habituated viewing is an aspirational goal. Buckingham's (2003) proposed solution is to adopt a social theory of literacy that enables students to understand the contexts in which responses to media arise. This too, is replacing habituated viewing with another habit, but in this case, it is the habit of tracing networks of signification, or critical reflection. Building on this, the "habit of habit change" (Cannizzaro & Anderson, 2016, p. 57) can be incorporated into critical literacies. This habit is the conscious reflection on one's own habits and, of particular interest in this case, habits of thought. Peirce (1931-58) said of habit that "every man (sic) exercises more or less control over himself by means of modifying his own habits" (5.487). As physical habits form through reiterations in the physical world, and change through conscious resistance, so too, are habits of thought changed by way of conscious process. "Reiterations in the inner world — fancied reiterations — if well-intensified by direct effort, produce habits, just as do

reiterations in the outer world; and these habits will have power to influence actual behaviour in the outer world" (Peirce, 1931-58, 5.487). The habit of habit change, in a critical literacy, both interrogates habitual viewing or reading processes as well as avoiding settling into a new habituated decoding habit.

Semiotics and postdigital education

A semiotic framework for literacy addresses two key areas that postdigital education is concerned with. Firstly, it affords a more robust critical approach to media, as outlined in the previous section. The contemporary networked experience demands a complex approach to criticality beyond just 'demystification'. Secondly, semiotics fundamentally presents the world of experience as a vast continuum, stretching out in all directions. Semiotic continuity frames experience in a way that discourages simplistic binary conceptions in education such as digital/analogue and online/offline. Peirce (1903b) himself stated, "experience can only mean the total cognitive result of living, and includes interpretations [just as much] as it does the matter of sense" (p. 197, as cited in Strand, 2013, p. 794). The continuity between the internal and external world weaves together all contexts in which individuals make meaning. Strand (2013) explains that experience "is not something presented in small pieces, bit by bit, then glued together by the human mind" (p. 794), which educators must keep in mind as student experience is not only divided into specious categories such as online and offline, but further compartmentalised by "historically determined discipline boundaries" (Smith-shank, 2007, p. 228). Students use socially attained knowledge when interpreting signs in the classroom, and they take the signs from classrooms to apply to their life outside (or at least, that is the goal of institutionalised education). Understanding how collateral knowledge informs sign interpretation across contexts can only serve to deepen an educator's ability to create significant learning experiences for their students.

Conclusion

Semiotics has wide reaching implications for not just visual literacy, but education in general. The complex technicalities of Peirce's taxonomy of signs is useful in understanding the mechanics of decoding visual media, and how ways of interpreting become habitual; how one becomes visually literate. The broader philosophical position that is implied by semiotics reframes conventional understandings of teaching and learning. It calls into question the purpose of education, and education's relationship to learning (Stables, 2014). This unstable position is not problematic; rather, it allows for an interrogation of power and democracy in education and provides a context in which visual literacy should be situated. It is within this context that the following chapter aims to reconstruct a postdigital visual literacy.

Chapter Seven: Convergence Part Two - Drawing together

A theory of postdigital visual literacy would include a critical consideration of technological developments, and the ways in which power is enacted through new technological developments. An acknowledgment how visual knowledge is created in the context of networked participation, and how that context informs, and is present, in the classroom, would also be beneficial. In the preceding chapters I have provided an overview of the postdigital framework, a review of current theories of visual literacy, and have identified areas where these converge. Having now considered semiotics and its relevance in education and learning, I endeavour to bring this into the equation. This chapter looks at how semiotics might inform the ways in which visual literacy is understood in a postdigital context. Here, I aim to reconstruct a theory of visual literacy that acknowledges the state of technology while not ascribing it any special deterministic properties. It is more encompassing than the existing theories reviewed in chapter four, if not entirely concise. The structure of this chapter borrows from Green's model of literacy which describes literacy as being made of the following dimensions: operational, cultural, and critical (Green & Beavis, 2012). Each of these dimensions has been revisited in light of semiotic theories of learning. I conclude the chapter with some implications that this theory might have on classroom practices of visual literacy teaching and learning.

Operational visual literacy

Green's operational dimensions of literacy concerns the ability to use the communication system by recognising and decoding codes and conventions (Green & Beavis, 2012). Adapting this to visual literacy, it concerns the ability to recognise images and understand their meaning, whether they are representations, such as photographs, or more

abstracted symbolic images. This is the notion of visual literacy that Messaris (1993; 1994; 2012) broadly addresses when he minimises the importance of teaching visual literacy. We do not need to learn to see, he says, because visual literacy is derived from analogies with real visual experience. This view, while initially objectionable, has an interesting synergy when considered in light of Peirce's theories of semiotic meaning making (although it still remains untenable). Peirce (1931-58) considered all meaning to be rooted in experience in the world. Messaris' notion describes meaning making in the realm of firstness, or the iconic mode. The subject sees an object (perhaps in a certain way — in Messaris' example, a parent, seen from a low angle) and associates this instance of viewing with other elements of the experience (Messaris' example again — associating this with the authority of the parent) and then having incorporated this element of the experience with the visual experience, recalls[40] the firstness of experience once encountering a similar visual experience (a low angle shot in a political poster). This, Messaris (1993; 1994; 2012) attests, is how people attain an operational visual literacy. This is the literacy one uses to 'get by'; a basic level literacy that will let one get on in the world. A fully semiotic perspective problematises this notion of a 'basic' literacy.

Firstly, Messaris' example does not account for a breadth of experience. Notions of parental authority have fluctuated over and within generations — does the photography student with liberal parents have the same experience as an engineering student with authoritarian parents? They may interpret the image as having similar meaning, but have reached this position by different means. Again, Peirce's semiotic theory can help to elucidate. The photography student may not have had the experience of firstness of Messaris' account, but they may have observed others interpreting the image in that way — a secondness. Furthermore, they may have, in their schooling as a photography student, been told of the convention of low angle photography to signify authority — thirdness, the domain of conventions. These all draw on

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[40] 'Recall' is a simplistic word to use here, as the feeling is instantaneous once it becomes a habit of thought

direct experience with the world, but with different degrees of engagement with the sign, or

representamen, itself. Having established that operational literacy may not be universally

drawn from a direct experience of firstness (and even if it is, it assumes a universal

experience) a second problematic arises: on whose experience is this basic literacy founded?

Signs grow and change as new ideas are incorporated as collateral experience (Peirce, 1931-

58). In any given experience of a visual image, the vast range of different collateral

experiences that are brought to bear on the interpretation cannot be estimated. Each individual

student in a classroom will have a different experience of the world, and thus different signs

that they draw on to interpret a new sign. This leaves two positions: 1) that the boundless

variety of collateral experience makes it impossible to establish a base level of operational

literacy; or 2) that operational literacy is a function of convention in order to be consistent, an

authoritarian extremity. Semiotics offers a view of learning and meaning that can reconcile

these two positions. Consider the example used earlier in Figure 16. Suppose this image is

shown to a class in which there are two particular students. In this instance, one student

(Student A, Figure 22) has had little exposure to art historical conventions that assert the
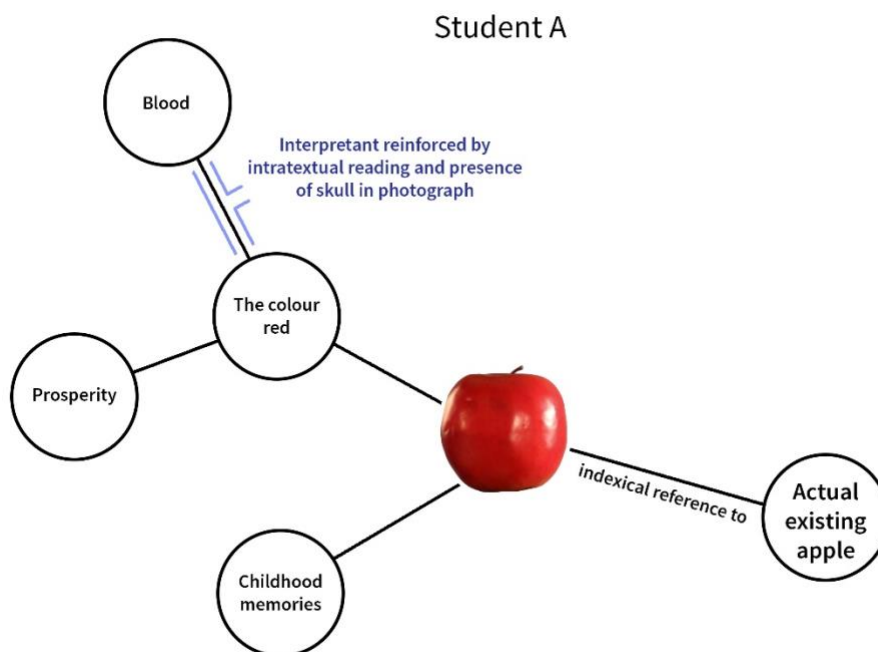
Figure 22. Student A's network of significance
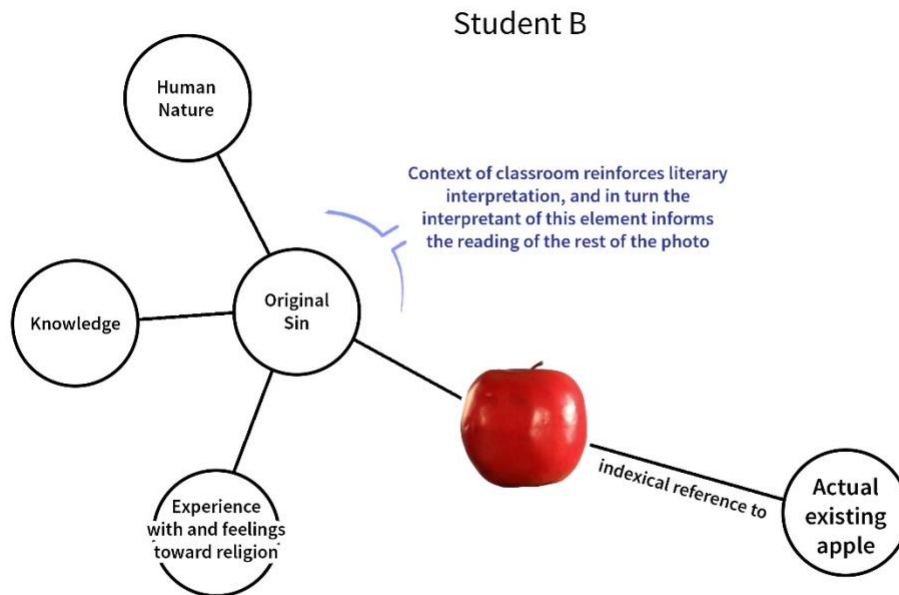
Figure 23. Student B's network of significance

symbolism of the apple. Student A has, however, had other experiences that can be associated with the apple. For instance, the bright red of the apple might be appealing to them due to associations with other things they appreciate; the apple may have been a favourite childhood fruit; and, of course, they will have seen the apple in other media, and may not have actively interpreted it. Student B (Figure 23), on the other hand, has had a religious upbringing, and understand the significance of the apple in Christian scripture, and so brings an experience more closely related with the convention that is likely to be espoused by the teacher. Each student, despite having an operational literacy that allows them to decode and interpret, has a different interpretant depending on their collateral experience.

Once an image has been decoded in a certain context, the sign in the mind of the viewer becomes more complex, and informs further sign use. Take, for example, the smiley face image (Figure 24). Upon first encounter, this image will be treated as an icon — not unlike Messaris' example, the structural similarity of the image to the real life encounter of a

Figure 24. A typical smiley face image

smiling face (itself a biosemiotic41 index to the associated emotion) allows the viewer to

connect the image with that which the signs user intends to communicate: happiness. Viewers

who encounter this same image later, having experienced the sign in other contexts, will have

a different experience. The viewer illustrated in Figure 25 understands the smiley face as an
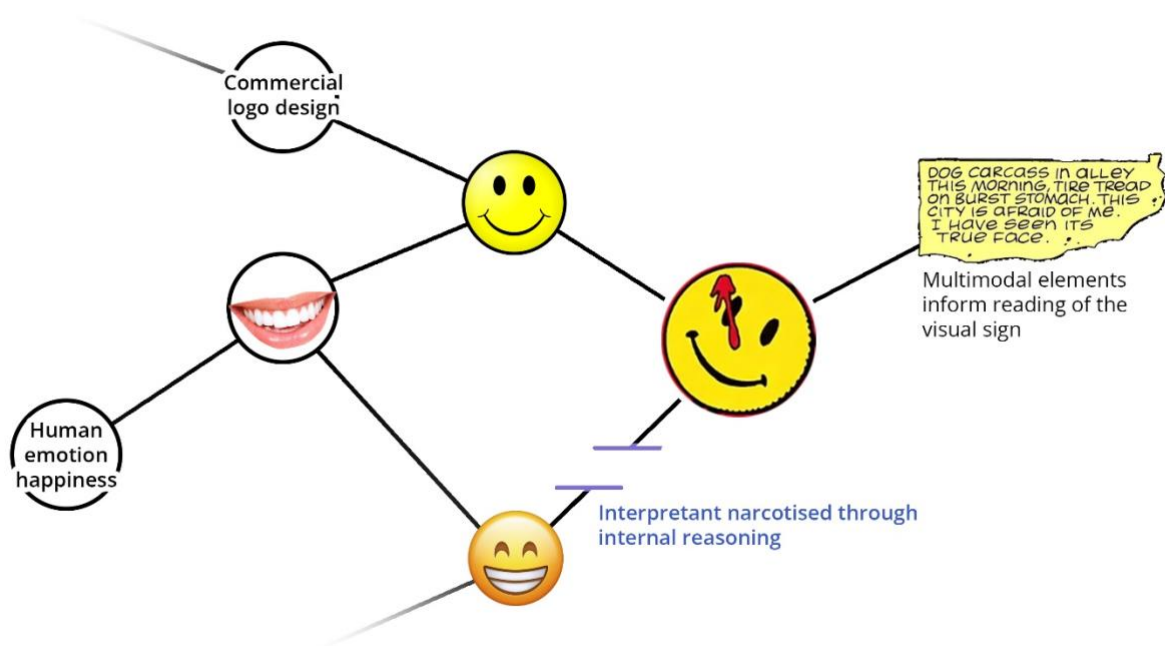
Figure 25. Network of significance

41 A branch of Semiotics implemented by Thomas Sebeok, that explores the prelinguistic sign systems in the biological field.

icon of a smiling human face but also as working within the conventions of logo design, a system of conventions. The interpretant of logo design will have different implications depending on the student's past experience – they may see it as an icon of cynical corporatism, or as something innocuous, even endearing. Finally, they recognise the image as similar to the smiley face emoji commonly used in networked communication. All of these contributions to this complex sign will be employed when the viewer encounters the first frame of Alan Moore and Dave Gibbons' *Watchmen* (Figure 26). Along with contextual cues that afford a subversive reading of the smiley face ("I have seen its true face", the drop of blood that streaks across the eye), the viewer brings the convention of using the image as an icon of cynicism towards society in a narrative, while internal reasoning rules out the emoji as part of the sign (due to context, or perhaps the mere fact that emojis were not in common use when *Watchmen* was published). All signs involved grow as a result of the interpretation, opening up new potential interpretants. As the sign system becomes more complex, the necessity for bracketing experience and habituating interpretants to streamline thought increases.

Image removed prior to deposit as permission for use was not obtained.
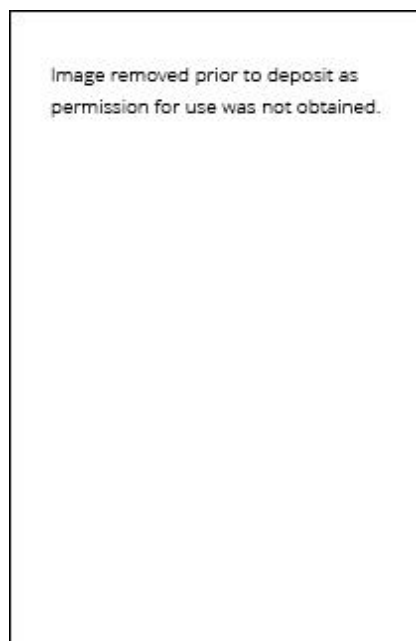
Figure 26. Opening frame of *Watchmen* (1986, Moore & Gibbons, p. 1)

This semiosis that draws from multiple experiences and informs multiple experiences complicates the notion of a 'basic' or 'operational' literacy. Eco (2014) contrasts theories of meaning as being either like a dictionary, or, like an encyclopaedia. The dictionary mode presumes a stable meaning, and the viewer is "expected to take into account only those properties *necessary and sufficient* to distinguish that particular concept from others" (Eco, 2014, p. 3, emphasis in original). This is not unlike Saussure's semiotic in which the connection between form and meaning is "sustained by the force of social convention" (Kress, 2003, p. 41). Eco (2014) describes the encyclopaedic model as:

> a "map" of different territories whose edges were jagged and often imprecise, so that one had the impression of moving through it as if it were a labyrinth that allowed one to choose paths that were constantly new, without feeling obliged to stick to a route leading from the general to the particular. (p. 26)

This labyrinthine model of interpreting meaning is also described by Eco (2014) as resembling a network of nodes, a rhizome. Like Deleuze and Guattari's (1987/2005) rhizome, any point can branch out to connect to any other — and the process of connection is an ongoing reconfiguration of connection and disconnection (Eco, 2014). This is analogous to the diagrams in figs. 22-23. Connections flow in both directions, the agency of the viewer allows for connections to be made or ruled out through reasoning. While they may resemble the tree structure of what Deleuze and Guattari (1987/2005) deride as arborescent thought, as Eco (2014) points out "every local section of the rhizome can be represented as a tree, as long as we bear in mind that this is a fiction that we indulge in for the sake of our temporary

convenience" (p. 54). As semiotic chains extend outwards in all directions, they form

connections in a vast network of meaning.

The notion of ongoing connection making, that "the process of connection is also a

continual process of correction of the connections" (Eco, 2014, p. 53) speaks to Leu's (2000)

assertion that *being literate* should be envisioned as an ongoing process of *becoming literate*.

Meaning shifts when signs are employed in different contexts, and the act of interpreting a

sign itself is an act of creation: "the sign is always new, whether it is the sign made in

interpretation or the sign made in articulation" (Kress, 2003, p. 40). Leu (2000) considers the

ability to communicate in a given media as the hallmark of literacy, a conception a pragmatist

such as Peirce would certainly appreciate. This ability, when situated on the shifting sea of

meaning, requires a disposition of adaptation. Any attempt to codify a standard of literacy, to

trace the current state of meaning, will either simply become outdated and irrelevant, or

facilitate the replication of meaning — holding everything to a hegemonic standard.

A semiotic approach elucidates how students draw on previous experience in order to make

meaning. This is true even of the most basic levels of literacy which, it turns out, are not all

that simplistic. In what Green coined the 'operational dimension' students may use the sign

systems impressed upon them by their teachers – conventional signs – but they will also draw

on signs that they have internalised in their own individual cultural contexts.

Cultural visual literacy

It is easy to imagine the definition of cultural visual literacy in a colloquial sense:

students from different cultural backgrounds enter the classroom with visual literacies that are

unlike that which is taught in school. This may very well be true — as a pākehā visual arts

teacher I have a particular set of visual literacies myself, and what I teach is necessarily based

upon them. It is not encompassing of some cultural visual literacies that I encounter in my

classroom, such as kōwhaiwhai42. This definition, however, is concerning. My visual literacies are also the product of my upbringing and environment and as such are also 'cultural'. Specifically, these literacies are embodied cultural capital, what Bourdieu (1986/2006) describes as a "hidden form of hereditary transmission of capital" (p. 108). This concept is a hypothesis to explain the unequal achievement of those from different races or economic classes — the hegemonic majority "receives proportionally greater weight in the system of reproduction strategies" (Bourdieu, 1986/2006, p. 108). It should be self-evident that this is counter to achieving a democratic education system. Green's three-dimensional model of literacy defines cultural literacy as using a communication system in particular contexts (Green & Beavis, 2012). This definition navigates the aforementioned problem, but raises a new question: if all semiotic communication is informed by context, then what need do we have of a delineation between operational and cultural literacies? Even in a pragmatic view of meaning-making, interpreting a text is a relational undertaking, one that is necessarily borne of encounters with previous texts in an academic environment or otherwise (Rorty, 1992). Operational literacy folds into cultural literacy as a contextual literacy that is normalised by schooling.

Culture and context

Green acknowledges that operational and cultural literacy (and in fact, all three dimensions of his literacy model) work in synchronicity (Green & Beavis, 2012). He says that most often a text or situation involving communication is read in a cultural context foremost, in order to make sense out of it. This admission by Green further cements the idea that operational literacy is a hegemonic construct. Fish, in his 1980 essay *How to recognise a*

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42 Māori painted scroll artwork that often appears in rafters of meeting houses, and in other artworks by Māori artists

poem when you see one, notes that a common understanding of contextual reading is that "recognition is triggered by the observable presence of distinguishing features" (p. 326) and then appropriate interpreting dispositions are adopted. He argues, however, that what triggers a certain interpretation is the source. Fish uses the example of a list of authors on his blackboard that were interpreted as a poem by the students in his poetry class, but it could be equally demonstrated if I were to show an art history class a photograph of a tabletop from an art classroom — it would be read first as abstract expressionism. The reason for this, I touched on in the previous section. If all connections of significance, all interpretants, were to be entertained, sense could not be made. "Interpreting the expression in context means magnifying certain interpretants and narcotizing others, and narcotizing them means removing them temporarily from our competence, if only for the duration of the current interpretation" (Eco, 2014, p. 54). This presents a paradox — signs systems that are employed in the school context may not translate to outside contexts and vice versa. In a democratic education system this is surely the goal, or it is as Stables (2014) cautioned: a self-fulfilling exercise in which information is taught for the purpose of successfully completing examinations. There are several ways of reconciling this, although Peirce himself never shied away from paradoxes (nor for that matter, do postdigital theorists).

One way is to consider the semiotic of the classroom as a context. While teachers employ signs in communication to students, a fully semiotic perspective encompasses unconscious and non-human prompts as having semiotic significance — these "might be regarded as instinctive" (Stables, 2010, p. 22). The context of the education, the site of the school, and the classroom are all loaded with semiotic significance. They communicate that a certain type of interaction happens at these sites. What that communicates to different students will vary for every student, but for many it will communicate that to be 'correct' they leave their own visual languages at the door and adopt those valued by assessment. So how

does a teacher encourage their students to activate a wider scope of interpretants when creating visual meaning in the classroom, and to take the more complex interpretants they internalise with them when they walk out of the classroom at the end of the day? The answer may lie in Manovich's (2016) study of instagram image cultures. He observed that change occurred through hybridisation between already established, but similar positions. It was noted in chapter five that Manovich's observation has common ground with Dewey's (1916) understanding of interpenetrating communities in a democratic education system. With this in mind, I suggest that by bringing the classroom experience closer to other cultural experiences, dispositions and literacies are more likely to be hybridised into outside-the-classroom activity. For instance, the crown motif that appears frequently in the paintings of Jean-Michel Basquiat — on its own, exploring the meaning and use of this motif may not make an impact, but incorporating the use of the motif in contemporary hip-hop culture will enable a more habitual understanding of the motif and its relation to issues of race and class. Working with digital imagery and manipulation in a participatory or remix method that is common in networked spaces is more likely to internalise notions of ethical image use than a lecture about copyright concerns. Arguably, classrooms should be modelled as communities of inquiry where students can see themselves as authentic practitioners, and that "their contributions may result in further enhancement of that community" (Liszka, 2013, p. 787). Bringing the classroom experience closer to the semiotic experience of a participatory community leaves students more likely to apply those interpretants in other cultural experiences. The converse is also true, for as classroom experience becomes a closer analogue to other cultural experience, the more likely a student is to introduce interpretive dispositions from other contexts, diversifying the semiotic experience in the classroom.

Soft Contextual Determinism

Peirce argued against deterministic conceptions of the world. This does not mean he believed in free will uncoupled from material conditions, far from it. Peirce's conception was that while there are deterministic laws, they are constantly being violated in some way, through human agency or chance (Cosculluela, 1992). Habits of mind are processes to streamline cognitive processes (as in Fish's [1980] example) but they are "partial, varying, approximate, and non-deterministic" (Macedo, 2018, p. 1041). A fact that is affirmed when Fish reveals to his class that what they have been analysing as a poem is in fact a list of names — now doubt and uncertainty enter the game, and through a process of semiosis students will adapt and reconcile with this new information. So habits of mind — regressions of thirdness into firstness — can be unravelled back into the realm of thirdness, of reasoning. While Deleuze (2000) might note that learning is an "apprenticeship to signs" (cited in Bogue, 2004, p. 328), the teacher does still have a role. The teacher can introduce uncertainty into the classroom, encouraging students to call on existing sign systems to reconcile. They may do that through an activity or task, but equally it might occur in a lecture — if I were to provide an image for my students to interpret after spending several lessons discussing composition they would use the language of compositional conventions to discuss it. But if I were to start discussing the symbolism in the work, and had not heretofore covered the topic at all, even with the most detailed explication they would use analogues from other contexts. They may understand it in the context of an English literature classroom, or from having seen an instance of symbolism used in film that they understood. The elements within the work that I choose to opine on as symbols will be checked and negotiated against each individual student's internal sign system — resulting in either an internalisation or reinforcement of 'the apple in the photograph is a reference to original sin', or (and this is the undesirable outcome) '*in the art classroom* the apple in the photograph is a reference to original sin'. The context in
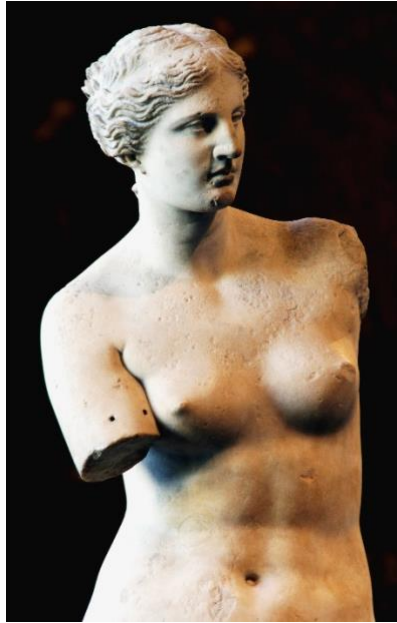
Figure 27. The *Venus de Milo.*

which the sign system is employed is not deterministic of how the sign system will be used,

but it does guide the "magnifying [of] certain interpretants and narcotizing [of] others" (Eco,

2014, p. 54). One of the roles of the teacher is to frustrate that contextual force to facilitate the

growth of signs: "the human being nurtures his or her own self-perception by interaction with

other individuals, which exercises an opposing force … further, the understanding of the

concepts of error and ignorance is only made possible by interaction with other individuals."

(Macedo, 2018, p. 1042)

Teachers can encourage a habit of introducing other sign systems. It is easy, especially

in assessment driven circumstances, for a 'correct' interpretation to inform a teleological

Figure 28. A common vaporwave image including antiquity imagery.

process of interpretation. For signs to grow, and new knowledge to be created rather than just replicated, new information must enter the system, by chance, mistake, or human agency. For instance, If I introduce an image of the Venus de Milo (Figure 27) into my class, it is likely that I will have a student note that its likeness to a motif from the internet-based art movement 'vaporwave' (Figure 28). Instead of devaluing this contribution or questioning its relevance this introduction of a collateral sign should be embraced. In fact, in a semiotic aware view of visual literacy it would be difficult to argue for the preeminence of the image of antiquity based on chronology. The student in question will likely have the same immanent experience of both, and the photograph of the Venus de Milo will signify back to vaporwave — and vice versa — only if I do my job correctly. A student whose contribution is overlooked, who is told that the interpretant embedded in their network of meaning and attached to that image is incorrect, will no more internalise the teacher's replacement meaning than a student who was told by a teacher, 'Napoleon was a tall man'. They would leave the classroom, returning to a network of meaning in which 157cm is not signified by 'tallness', and prune that particular interpretent from use except for in circumstances they were called to prove that they had been listening in class. Engaging with this different sign, this cultural literacy, that has entered the classroom with the student has an important purpose. Not only will learning about the Venus de Milo inform instances of engaging with the motif in popular imagery such as vaporwave, but the vaporwave imagery can inform the significance of statues from antiquity. It uncovers associations and connotations that they are employed for in other cultural contexts, growing the sign even in the teacher's mind. The significance in the vaporwave imagery grows, as the student may have had only an aesthetic engagement, gathering connotations only through extended exposure to vaporwave imagery. They can now extend the semiotic chain to the meanings and connotations of the antiquity statue. Both signs grow and become more complex.

Culture in the postdigital era

A primary concern of postdigital theory is the rethinking of the perceived digital/analogue or online/offline binary. Pepperell and Punt (2000), pioneers of the postdigital concept, argued for the permeability of these concepts into one another. Several writers (see *Postdigital Science and Education* journal, edited by Petar Jandrić, and Jandrić et al [2018]) have applied this thinking to the educational space in the wake of the 'digital revolution' in teaching. A semiotic view of education accounts for an expanded worldview, one of continuity, acknowledging that "experience is not something presented in small pieces, bit by bit, then glued together by the human mind" (Strand, 2013, p. 794). Visual literacy is constructed in a web of meaning, a rhizome that weaves among interpretants whether they were formed online or offline, and that context simply becomes a component of the sign. Students' engagement with visual culture is not limited to what they see in the classroom, nor was it ever. The cultural dimension of their visual literacy is an amalgamation of their experiences with images online and offline, in the classroom and out, whether they are permitted to employ it in the classroom is another matter. There are two areas of interest. First, the traversal of sign systems between classroom and outside contexts, across what I have called 'the classroom membrane'; second, the problem of the legitimation of knowledge when socially generated knowledges enter the classroom space.

The Classroom Membrane

As I addressed in the previous section, sign systems enter the classroom space in the same way that Jandrić et al (2018) describe the digital entering these very spaces – covertly, whether teachers want it or not. A postdigital perspective, rather than "assuming as a starting point a dichotomy between analogue and digital educational forms of life, … assumes that

they are always already plugged into one another" (Lewis, 2019, p. 1). Cultural visual literacy

can be framed in the same way. A student's collateral knowledge should not be framed as

separate and distinct from institutional knowledge — one is essentially plugged into the other

in the semiosphere. The membrane as a model, employed by Pepperell and Punt (2000) as a

heuristic for the postdigital, applies here too. The transfer of sign usage from within the

classroom to without is in continuity, but an imperfect continuity — the membrane that

separates the two spaces is permeable. In fact, in a semiotic framework this metaphor can be

extended. The membrane is far more likely to be permeated by a semiotic chain if there is a

scarcity of signs on the other side (illustrated in Figure 29). To make sense of new

communicative information one must necessarily rely on existing sign systems, regardless of

the context in which they were learnt (Nöth, 2014). The membrane model too, is paradoxical.

It asserts the continuity of these things and then the metaphorical separation of them by a

membrane. This is simply because the distinctions do exist, but only as impositions upon the

world by human epistemology (Pepperell & Punt, 2000). Acknowledging that these

distinctions are produced makes it "legitimate for us then to question and reconfigure them,

especially if they no longer seem useful or relevant" (Pepperell & Punt, 2000, p. 164).

Elements of visual language and the interpretants and signs that compose it traverse both the
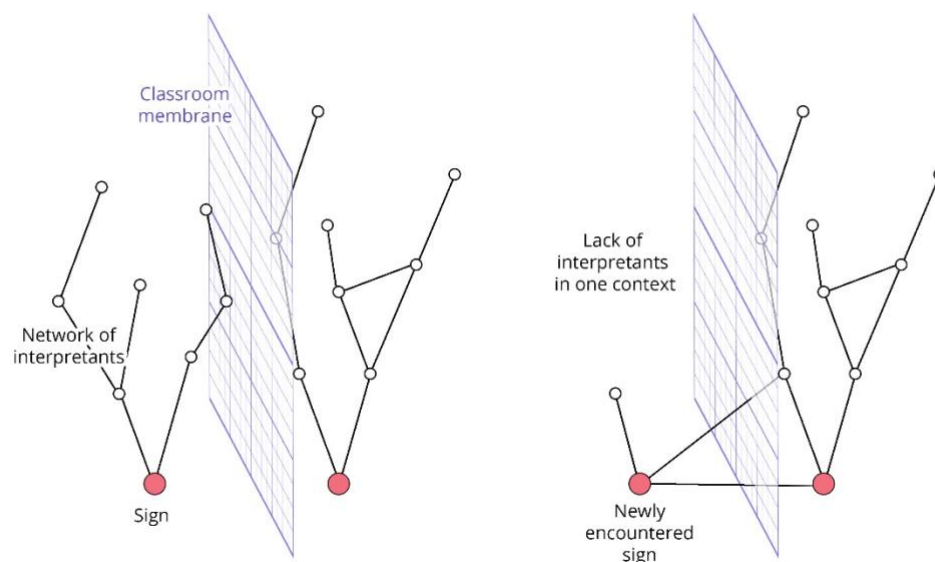
Figure 29. A visualisation of how signs interact across the classroom membrane.

postdigital membrane and the membranous boundary of the classroom. Cultural visual

literacy describes this flow and encompasses all the collateral knowledge that is applied in

decoding an image.

The Problem of Legitimation

As a visual arts teacher, I have often had other teachers sympathise with my

assessment process. 'It must be so hard to mark; art is so subjective!' they say. While they

certainly mean the more colloquial definition of the term, referring to stylistic preferences

(and the NCEA achievement standards by which they are assessed broadly avoid this type of

subjectivity), this is a pertinent concern if read in the context of my previous few assertions

about cultural visual literacy. The suggestion that visual literacies from outside of the

classroom should be allowed, or even encouraged (foregoing, for the moment, the notion that

they are necessarily being employed already) threatens established visual knowledge that is

nominally 'taught' in the classroom. It poses what Lyotard (1979/1989) termed a problem of

'legitimation'. This is a criticism faced by Fish (1980) when developing his reader-response

theory[43], and also by other theorists, such as Derrida and Eco, who embrace freeplay and

unlimited semiosis. The "fear that, in the absence of impersonal and universal constraints,

interpreters will be free to impose their idiosyncratic meanings on texts" (Fish, 1980, p.9) and

would "[lead] directly to solipsism and anarchy" (Fish, 1980, p. 7), resulting in a culture in

which "no text can mean anything in particular" (Abrams, 1977, p. 21 as cited in Fish, 1980,

p. 305). Eco (1986) acknowledges a departure from a formalist structure in his encyclopaedic

conception of the semiopshere:

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[43] A school of literary theory and criticism that focuses on the reader, rather than authorial intention or the form
of the text - "Interpreters do no decode poems; they make them" (Fish, 1980, p. 327)

The universe of semiosis, that is, the universe of human culture … is virtually

infinite because it takes into account multiple interpretations realised by

multiple culture … it does not register only 'truths' but, rather, what has been

said about the truth, or what has been believed to be true. (Eco, 1986, as cited

in Rorty, 1992, p. 99)

Rorty (1992) expands on this, disavowing the very notion of objectivity in the semiosphere.

He says that, through unlimited semiosis individuals

[build] up a potentially infinite labyrinthine encyclopedia of assertions. These

assertions are always at the mercy of being changed by fresh stimuli, but they

are never capable of being *checked against* those stimuli, much less against the

internal coherence of something outside the encyclopedia. The encyclopedia

can get *changed* by things outside itself, but it can only be *checked* by having

bits of itself compared with other bits. You cannot *check* a sentence against an

object, although an object can *cause* you to stop asserting a sentence. You can

only check a sentence against other sentences, sentences to which it is

connected by various labyrinthine inferential relationships (p. 100, emphasis in

original)

Revisiting Lyotard's (1979/1989) argument on legitimation, in which the legitimator of

knowledge is part of the equation, an appeal to a transcendental signified is ruled out. Fish

(1980) suggests that the terms of the argument are flawed, and that the subjectivity/objectivity

dichotomy is a division imposed upon interpretation by those who think that "in the absence

of the controls afforded by a normative system of meanings, the self will simply substitute its

own meanings for the meanings … that the texts bring with them" (p. 335). This of course, does not solve the quandary. How is new visual meaning created if some consensus must be met in order for communication to occur? Fish (1980) conceived the notion of *interpretive communities* to explain this.

> If the self is conceived not as an independent entity but as a social construct whose operations are delimited by the systems of intelligibility that inform it, then the meanings it confers on texts are not its own but have their source in the interpretive community (or communities) of which it is a function. Moreover, these meanings will be neither subjective nor objective … they will not be objective because they will always have been the product of a point of view … and they will not be subjective because that point of view will always be social or institutional (p. 335)

The student is not unconstrained, forming nonsensical semiotic chains serving to make meaning unintelligible, they are of course first inclined to observe similarity or reaction (firstness or secondness) to form a semiotic link. The teacher cannot force the student to learn something, as in a semiotic model this is functionally impossible. But both will bring their own sign systems of interpretation, from their own interpretive communities, and, in an open and free classroom, both will inform the other. Like Peirce's community of inquiry (Liszka, 2013), the interpretive community can be a model for active literacy learning in the classroom. The classroom becomes a site of collaboration, where visual literacy is in an ongoing state of becoming. Institutional literacies can be informed by what had previously been denoted 'cultural' literacies, and vice versa. The teacher maintains a role as the site of

authoritative, but with its power diminished. The teacher's authoritative knowledge is engaged in an interpretative process with the cultural literacies that students bring with them.

As operational literacy and cultural literacy fold into one another, new opportunities for thinking about visual literacy arise. All usable sign systems (ones that are 'operational') arise in a context. Sign growth happens when one informs another, and with a broader and more diverse visual culture than ever, to restrict the classroom to an institutionalised visual literacy in the name of performativity seems like a missed opportunity at best, and as Stables (2014) notes, a pathway to fascist thought at worst. This is not an argument for the dissolution of existing knowledge, or discarding established meanings of significant images or conventions, but for employing these to create *significant events* for students. The teacher's role is to be learner-aware, acknowledging that students, while they have their own sign systems, are still, and will always be, in the process of becoming (Stables, 2014). Cultural visual literacy is an ongoing process, a process of becoming literate, of being able to use and create significant cultural images that acknowledges the contingent nature of significance.

Critical visual literacy

The operational and cultural dimensions of visual literacy are the foundational elements that equip students to understand and 'read' or decode images. Thompson (2019) noted that images that necessitate a deeper understanding require critical decoding skills, beyond the 'surface-level' understanding afforded by social media feeds and various online media. The notion of a critical visual literacy extends beyond just the reading of 'difficult' images. Even visual media that has adapted to the culture of 'visual speed-reading' (Schirato & Webb, 2004) can be engaged with critically. The images that arrive effortlessly on screens in front of viewers are not apolitical, they are infused with mechanisms of social and political ideology obscured in algorithmic software and vast data collections. A critical reading should

help to make these aspects of experience transparent (Zambo, 2009). This concern for

criticality is common both to visual literacy studies (see ACRL, 2011; Avgerinou, 2003;

Avgerinou & Ericson, 1997; Brumberger, 2011; Dake, 1994; Druick, 2016; Goforth, Metz, &

Hammer, 2018; Spalter & van Dam, 2004; Zambo, 2009) and postdigital theory, the latter

concerning itself with the way in which capitalist interests are obfuscated behind the glowing

blue veneer of user interfaces (Berry & Dieter, 2015; Cramer, 2015).

In Green's 3d model of literacy, the critical dimension is defined as:

[involving an] awareness that all social practices, and hence all literacies, are

socially constructive and 'selective': they include some representations and

classifications — values, purposes, rules, standards, perspectives — and

exclude others … the critical dimension of literacy is the basis for ensuring

that individuals are not merely able to participate in an existing literacy and

make meanings within it, but also that, in various ways, they are able to

transform and actively produce it (Lankshear, Snyder, & Green, 2000, p. 31)

Green's definition of literacy speaks to all texts residing in networks of meaning, one that is

malleable, with meaning that is provisionally afforded. The critical dimension of this literacy

is a pulling-back-the-curtain to expose how particular power dynamics can shape what

meaning is legitimated and to what end. A semiotic framework informs the critical dimension

of visual literacy. Developing a semiotic consciousness allows students to trace a semiotic

chain to understand how, as an active creator of meaning, they have interpreted a sign (Deely

& Semetsky, 2017). A critically literate student will reflect on values and biases that have

informed their interpretation, and furthermore, they will consider the values and biases of the

structures within which they are operating (whether this be the classroom, mainstream news outlets, or YouTube).

A semiotic approach to criticality can circumvent the problems presented by Buckingham (2003) in his criticisms of teaching criticality. His argument is that the style of teaching criticality he dubbed 'demystification' oversimplifies into a consumer vs. producer dichotomy. Buckingham (2003) also noted that it implies that meaning is contained entirely within the text, a surface level meaning, and then a 'hidden' meaning that can be uncovered through objective analysis. It suggests that there is something that a text *intrinsically* means, as opposed to what it means *relationally* (Rorty, 1992). The semiotic approach does have elements of what one might describe as demystification, but instead it is a demystification of how meaning is constructed. It acknowledges that images are created to communicate, but that both the sign systems of the producer and the meaning systems of the viewer inform the resulting interpretant. Rather than trying to strip away subjective responses and experiences, requiring the student to become some kind of mythical objective viewer, it invites the student to use those responses for further analysis (Buckingham, 2003). This might involve the reading of 'difficult' images as in Thompson's (2019) example of asylum seekers protesting at an immigration detention centre, persuasive advertising images, or it might involve seemingly mundane images that serve to reinforce stereotypes and hegemonic knowledge through repeated viewings.

Semiotic awareness

One facet of a critical visual literacy is simply having a semiotic awareness. The first step toward this is the awareness that meaning in images is constructed through a system of signs, and as Buckingham (2003) says, "constructed within the social relations of everyday life" (p. 121). Semiotic awareness involves knowing that while images do communicate,

without an interpreter they have no meaning, and that while a viewer cannot be truly objective, they can reckon with their own subjectivity. While a full understanding of Peirce's taxonomy of signs is not required, a knowledge that some signs are meaningful through social conventions (thirdness) or that meaning is fixated through reaction or relation (secondness) is a step toward understanding that "literacy … is socially constructed and selective, and also … can be acted upon and transformed" (Lankshear, Snyder, & Green, 2000, p. 31). When interpreting images, students will not merely justify the meaning they find by citing the text alone. They will recognise their role in the creation of meaning.

> Semiotic consciousness is the explicit awareness of the role of the sign. The actual field of semiotic investigations exists as a demand of the *future* put on present thought — that is, on the development of the semiotic consciousness of the community of inquirers. Since, however, the whole of experience is constituted by signs, it follows that the history of semiotics will be first of all a tracing of the lines which lead to that moment when [the] role of the sign in the constituting of this very experience came to be realized. (Deely & Semetsky, 2017, p. 213)

A semiotic awareness places emphasis on "the actual relational being of the sign, [the] complementarity between observer and observed involved in any interpretation process" (Olteanu & Campbell, 2019, p. 287). This relational quality then situates the sign in a vast network of meaning, opening the door to intertextuality and contextual reading.

In the postdigital age, these intentional modes have become more important. The medium through which images reach consumers have increasingly complex concerns, and discursive practices become more difficult to unravel. Contextual reading becomes an

essential element of criticality. Consider YouTube, where a video might reach its viewer via an algorithmic suggestion, and a critical viewer must reckon with not only the obscured interests of YouTube as a corporation, but also their own biases manifested in the selection criteria of the algorithm. Without touching on the content of the video itself, it is already clear that the interpretant is dependent on the context through which it reached its viewer. Intertextuality, and its related notion collateral knowledge, support the creation of new meaning. While an uncritical reader might habitually 'narcotise' certain interpretants in certain contexts, one who intentionally employs intertextuality opens up potential for a wider range of interpretations. Rorty (1992) said that reading (or interpreting) is something that is done "in the light of other texts, people, obsessions, bits of information, or what have you, and then seeing what happens" (p. 105). New meaning is created, and, if "too weird and idiosyncratic to bother with" (p. 105) it can be disregarded, but it may be that a new interpretation is exciting or convincing, so much so that it changes the interpreter's way of thinking. They continue to become literate.

Critical creation

Visual literacy is not just limited to the decoding of images, for instance, Kress' (2003) theory involves the understanding, use, and *production* of culturally significant images. While many theories of visual literacy cite a need for people to become critical consumers, the critical aspect of literacy is often not addressed when it comes to the creation or production. This is likely because 'critical' is often paired with 'analysis', and, as Buckingham (2003) described, seen as a method in which the student works to find the 'true' meaning of a text. In the *New Zealand Curriculum*, for instance, criticality is mentioned as a process to "[make] sense of information, experiences, and ideas" (MoE, 2007, p. 12). In the

NCEA English matrix[44] at level three, out of nine achievement standards, five begin with the

imperative "*respond* critically" (MoE, n.d., "Level 3", emphasis added). The exception is

achievement standard 91479, *Develop an informed understanding of literature and/or*

language using critical texts, which suggests that texts can be critical, and, in the explanatory

notes, that this includes visual texts (NZQA, 2016). This achievement standard only covers

the *use* of already existent texts, as opposed to the creation of new texts. This trend situates

the one who is critical as being critical in the *receiving* of information or, if a semiotic view is

adopted, in the making of meaning (through interpretation). A semiotic view of criticality

allows for a theory of critical creation in the visual domain. To expand on this, I use two

examples from achievement standards that deal with creating visual products[45]. The first is

from achievement standard 91455[46], from the visual arts subject area: *Produce a systematic*

body of work that integrates conventions and regenerates ideas within design practice. The

explanatory notes for the excellence criteria elaborate that this "involves bringing together

critically selected (emphasis added) ideas and methods from different sources" (NZQA,

2016). This suggests a cache of ideas from which the student can select, acknowledging that

visual products that are created draw on the established sign systems of the producer.

Semiotic awareness supports the selection process and its critical dimension with the

awareness that social practices such as producing artwork or images or videos are socially

constructive. It informs the understanding of how meaning in signs is constituted (and hence,

how ideas are communicated through visual signs). As a community of inquiry, a class or

group of students will further develop signs by observing responses to their visual

communication and seeing how others create meaning when interpreting their visual products

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[44] The matrix for each subject area outlines the available achievement standards for the student to be assessed against

[45] I searched all level 3 achievement standards that fit this description, These two were the only examples that included the term 'critical' or were adjacent to the definition of 'critical' that I have identified.

[46] 91455/91456/91457/91458/91459 all use the same wording, just for different visual arts disciplines, respectively, they are design, painting, photography, printmaking, sculpture.

— in turn growing the signs they have used, and the sign systems of those who interpret the work. With a semiotic awareness, this process it not just making meaning within the social context but understanding how their contributions change and shape it. The second example comes from the design and visual communication subject area. Achievement standard 91627, *Initiate design ideas through exploration*, contains this passage in its explanatory notes: "[the excellence criteria involves] using visual communication strategies to challenge thinking, and extend and transform ideas to form design ideas" (NZQA, 2016). This does not explicitly mention criticality, but the notion of challenging thinking, and the transformation of ideas using visual communication reflects Green's critical dimension of literacy. In a sense, a successful student is actively producing their own literacy by reflecting and reforming their own visual sign systems. Additionally, this standard encourages the bringing together of diverse ideas to be read in consideration of one another, not unlike Rorty's (1992) explanation of interpretation, in this instance in the mode of creation. It suggests that in the early generation of ideas, "[initial] ideas do not necessarily have obvious connections to a brief context or address functional and aesthetic qualities associated with design ideas" (NZQA, 2016, Explanatory Note 3). This is the productive nature of signs: all encounters with signs add new knowledge and expand the signs involved (Smith-shank, 2007). A critically literate student is aware of their role in the production of new knowledge through sign action. They can form new ideas and connections without thoughtlessly narcotising interpretants that fall outside their habitual way of thinking.

Habits and criticality

As outlined in chapter six, habit is an essential element in literacy. It is once the process of decoding a sign becomes 'second nature' that a person could be said to have a basic literacy. If a person needs to decode the words of a sentence written in a foreign

language by actively referencing their mental catalogue of translations, they would unlikely be deemed 'literate' in that language. This process of translation is within the domain of secondness, as the sign within the sign user is indexical and dyadic: [word in foreign language] means [word in native language]. As this process becomes more embedded, it will regress to firstness, an immanent understanding that needs no conscious decoding. This is the nature of habit and literacy. In the visual domain habit works similarly. Returning again to the analysis of Figure 16, the apple in a vanitas setting and its metaphorical or allegorical relationship to original sin as a sign is in the realm of thirdness, as it is a visual arts convention. In Peirce's taxonomy it is a symbol, conveying its meaning through cultural convention. Symbols themselves contain no information. They must be informed by an indexical sign of some kind — in a classroom setting this might be the teacher informing the student that the apple represents the aforementioned religious concept. In the mind of the student this is now represented as an *argument*, namely, 'the teacher should be correct about the meaning of the image, therefore, the apple represents the idea of original sin'. Reinforcement of this idea by other input, such as hearing Student B's interpretation of the image or further evidence in other images (perhaps the teacher shows allegorical paintings depicting the 'fall of man'), will aid in the regression of the argument, the thirdness of thirdness, to a dicent sign, the secondness of thirdness. In this form, the student has internalised the sign as a proposition — 'an apple in a vanitas may signify original sin'. As this example is of such an active interpretation, it is unlikely to regress to a rheme — a habit of interpreting a sign in such a way that it is read transparently. The method of decoding, however, can become a habit. A desirable habit in the art classroom too, is the act of interpreting an artwork as second nature. This is not to say that images do not become habitually read in the same way as words. Emojis, icons (such as the save icon in Figure 17), or other 'iconic' images such as the Christian cross are all subject to habitual reading to

varying degrees. These examples are fairly innocuous, and most will be, the process is one of

streamlining and allowing for more complex configurations of reasoning and argument.

Habitual decoding and encoding of text is essential to literacy, but the critical dimension of

literacy involves conscious reflection on those habits.

> To become conscious of our visual habits, and to acquire alternative ones,
>
> constitutes a third kind of visual literacy which has to do with critical
>
> knowledge. This would include knowledge of the ways that visual images have
>
> been used throughout history, awareness of different kinds of intentionality, of
>
> how an image, object or event is put together to offer a particular experience or
>
> to set up a certain kind of spectator. (Raney, 1999, p. 45)

An example of where habitual reading in a postdigital context becomes problematic and

benefits from a critical engagement is illustrated in Figure 30. These screen captures of

websites all display visual signifiers that, to most people, habitually signify 'digital news site'.

An uncritical and habitual association of these signifiers with notions such as 'reputable' or

'trustworthy' can contribute to the sharing of deliberate misinformation. Of the three websites

pictured, two are rated between 'strong' and 'tin foil hat' for conspiracy level on website
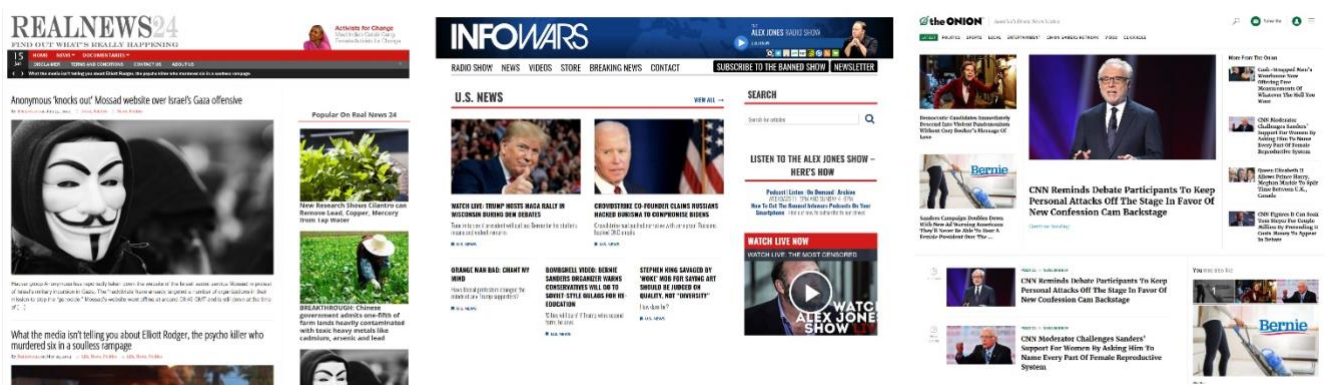
Figure 30. Screen captures of sites employing a newsmedia aesthetic, RealNews24 (http://www.realnews24.com/), InfoWars (https://www.infowars.com/), and The Onion (https://www.theonion.com/)

Media Bias/Fact Check (https://mediabiasfactcheck.com/) and the third is satirical site *The Onion* (https://www.theonion.com/). It is not desirable, however, to replace this habitual viewing with a habitual scepticism. Instead, habitually reflecting on one's own habits, the habit of habit change, should be encouraged. It is in forming this habit that the teacher's role is of utmost importance.

> Education changes from an activity of transmission of knowledge to students, to an activity in which teachers actively help students become aware of ways in which cultures code knowledge. Teachers help students develop the wherewithal and power to explore these codes as they become aware of them. (Smith-shank, 2007, p. 230)

The development of a critical dimension of literacy is the kind of learning that requires teacher guidance (Raney, 1999). It is through an encounter with something unexpected or unsettling that one can be prompted to re-evaluate habitual thought (Bogue, 2004). This is the role of the teacher in developing criticality: to provide significant events (that is, events that engage and alter signs) that challenge habits of thought, and guide students as they reflect on existing social systems of meaning.

Conclusion

Visual literacy is complex and further depth could be explored in some of the above sections. As a working theory of visual literacy, the level of depth I have entered into in this chapter is appropriate for a theory that can be practically applied in curriculum planning and classroom practice. This section seeks to summarise the reviewed theory of visual literacy in a convenient way for application.

Use literacy: The dimensions of cultural and operational literacy (as described in Lankshear, Snyder & Green, 2012) fold into one, as is necessary if classrooms are to be democratic spaces. *Use* literacy is the sign systems that are activated to decode images and employed when creating images. It is the literacy that is employed in the immediate understanding of an image without conscious decoding or interpretation. This dimension of literacy is attained in a variety of contexts, transcending the classroom membrane, and is always socially learned and reinforced. Elements of literacy relying on convention (i.e. in the symbolic mode) unless reinforced through secondness (i.e. seeing a cause and effect relationship) will not become habits of thought and will not be internalised.

Critical literacy: This dimension of literacy might also be called metaliteracy. It involves a knowledge of how meaning and communication function in oneself and in others. The two following components overlap and inform one another:

- Semiotic awareness – an understanding that meaning is not situated solely within a visual text and is constructed partially by the viewer using their previously internalised systems of meaning. This affords contextual reading and intertextual reading as networks of significance come into play.
- Habit of habit change – reflecting on one's own habits of thought and habits afforded by context when decoding or encoding text to create new meaning or knowledge.

The two are necessarily intertwined as without a semiotic awareness, as a person cannot reflect on their own systems of meaning, and knowledge can be mistakenly understood as grouped into 'things I know' and 'things I don't know', rather than as fully relational. Lacking the habit of habit change, a person's ability to draw on alternative sign systems rather than contextually suggested ones becomes limited.

Implications in practice

The prevailing takeaway from this research for teachers in classes that teach visual literacy, is to acknowledge the membranous nature of the classroom. Progressive teachers ostensibly do this, allowing students to pick their own visual material to work with in an inquiry style. This disregards the role that existing conventional knowledge plays in creating new knowledge. More conservative teachers might argue that the dispositions applied in the classroom are transferable to 'real world' contexts, but the contextually activated nature of sign systems renders this implausible. Further study is required for a more developed understanding of how sign systems traverse contexts. In the meantime, teachers can opt for an approach that introduces conventional knowledge but embraces the collateral knowledge that students possess. In this approach, students can appropriate accepted social knowledge and transform it. (Stables, 2014). "Transformation refers to ways in which feeling and thought are represented in new forms of particular significance to their creator" (Stables, 2014, p. 41). This new knowledge is then either internally or socially evaluated and either discarded or reconventionalised (Rorty, 1992; Stables, 2014) in a process not unlike the one described by Manovich (2016) in his work on Instagram cultures. Intersecting cultural forms hybridise and evolve through small increments. A classroom environment modelled on this process could be called a community of inquiry, with students regarded not as vessels for information, but practitioners, actively producing new knowledge: "any semiotic system considered within an Umwelt uses cultural signifiers as building blocks of society's current knowledge base, and also serves as the catalyst for new ideas and understandings that are outside a community's own cultural codes" (Smith-shank, 2007, p. 230) The teacher's role in the visual literacy classroom is to channel conventional cultural understandings of the visual world, so that students might use this knowledge to transform their own understanding. In this sense, the knowledge the teacher offers is *other* to the collateral knowledge of the students. Deleuze

(2004) said, "learning takes place not in the relation between representation and action (reproduction of the Same) but in the relation between a sign and a response (encounter with the Other)" (p. 25). The implication of this is that education, by assessing based on the resemblance of their product to an expected outcome, prevents the formation of new knowledge. Instead, unexpected outcomes should be valued, and a processual focus should be adopted.

This addresses the implications of my theory of use literacy, but critical literacy comes with different concerns for practice. First and foremost, critical literacy should not be considered as the 'advanced' version of literacy; in visual literacy it should be the goal. In visual literacy, students will arrive in the classroom with use literacy of various forms, and teachers engage with it in the teaching process. That engagement by the teacher should be in service of fostering critical visual literacy in the student. Firstly, engendering a semiotic awareness in students. Demonstrating how meaning is socially constructed, formed at the intersection of the text and the students' own network of meaning, rather than embedded in the text, waiting to be uncovered. Making this semiotic process explicit open the door to reflection and habit change. Teachers should not aim to teach a method of criticality – as this leads merely to ingraining a new habit of thought. They should be attempting the more challenging task of instilling a critical disposition: the habit of habit change.

These implications inevitably call for a different approach to assessment, one that values creativity and process in thinking, as opposed to outcomes and finished products. This is not to say that finished products no longer have a place in teaching. In the domain of media studies, the assessment of the skills used to create a film using a certain set of conventions is still a useful metric. In the teaching of visual literacy, however, a static standard of literacy to achieve does not acknowledge the ongoing *becoming* of the literacy process. Stables (2014) concludes that a productive way to assess teaching and education is "in terms of its impact on

positive identity development rather than as meeting external standards or supporting an

aspiration such as social justice" (p. 41). This approach, he says, allies subject matter with

personal development, generating sign systems that will be used practically, rather than

internalised simply as something for assessment.

Chapter Eight: Conclusion

My aim in this research was to review theories of visual literacy and understand their relevance to the current state of technology and the concerns raised by postdigital theory. A review of existing theories and definitions of visual literacy in chapter four revealed they are varied and sometimes contradictory. A semiotic framework was employed to reconstruct and synthesize the convergences of these fields into a working theory of visual literacy that has relevance to the current state of technology and concerns raised by postdigital theory. Inspired by the edusemiotic approach developed by Inna Semetsky, I employed a semiotic framework through which to view this educational challenge. I was interested in not only adopting a fully semiotic outlook for education, but also in how the philosophical fundamentals of semiotics might advance understanding of visual literacy acquisition and how new visual knowledge is created. Because visual literacy is largely unaddressed by policy, the field remains free of institutionally enforced hegemony. I aimed to create a theory of visual literacy that avoided enforcing standards, and remained open and democratic. Speaking on knowledge in the postdigital age, Langlois (2012) noted "while there might be a radical decentralization of communication online, it does not mean that power relations have disappeared" (p. 99). Similarly, boyd (2016), in conversation with Ito and Jenkins, asked "who has the power to make certain that their perspective is heard above the fray? In a world where theoretically anyone can participate, who gets to control the public narrative?" (p. 101). While this thesis on visual literacy cannot fully address the intersection of economic concerns and knowledge, it does seek to support a critical disposition beyond that which is just critical of mainstream media sources. Instead, chapter seven proposes a criticality that is relevant to the increasing complexity of vectors of power in networked society. Chapter seven drew together various threads to reconstruct the converging interests of the fields studied, casting existing visual literacy in a new light. That chapter directly addresses the research question outlined at the

start of this thesis. In the following section I summarise the conclusions to the sub-questions that comprise the main question.

Reflection on research sub-questions

What insights can postdigital theory and semiotics offer a theory of visual literacy?

Postdigital theory (initially proposed by Robert Pepperell and Michael Punt, and applied to the educational field by Petar Jandrić, Jeremy Knox, and Thomas Ryberg) primarily introduces the challenge to binary divisions in education and visual media. This informed several approaches to formulating a theory of visual literacy, the overarching concern being the critique of the notion of the digital native, a notion that relied on the binary divisions of digital/analogue and online/offline. Barthes (1967) called binarism "necessary and transitory" (p. 82). Pepperell and Punt (2000) asserted that binary definitions can be useful distinctions but carry no information about the essential nature of technology and should be acknowledged as human impositions onto the world. They coined the term 'postdigital membrane' to describe how permeable binary divisions between digital and analogue are. The metalanguage of binaries is useful for discussion but distinctions should only be retained if the continuity between categories is acknowledged (Pepperell & Punt, 2000). The metaphor of the membrane was used to describe the relationship between classroom and non-classroom contexts, an analogy supported by Peircean semiotics. Peirce (1931-58) himself theorised about the continuity of experience. Semiotics and contextual reading help to explain how these divisions act to impact the way media are understood. Both Eco (2014) and Fish (1980) developed theories holding that contextual semiotics first and foremost inform the sign systems used to decode a text. This problematises the notion of a visual literacy that is learned in a classroom context having any impact in non-classroom contexts.

Peircean semiotics offered a model of how visual media is decoded, and how students learn to decode it. As all images are signs, it is an appropriate framework. Peirce's (1931-58) phenomenological categories of firstness, secondness, and thirdness delineate the different ways in which a viewer might understand an image. His theory of habit, habits of thought, and habit change are tied closely to the idea of learning and literacy. As an interpretant becomes habitual, it becomes part of what might be called literacy.

How do students learn or attain visual literacy in contemporary media and what teaching approaches or philosophies might support them?

A Peircean semiotic framework elucidates how images are understood or interpreted within networks of significance. Peirce's taxonomy provides a useful distinction between signs learned through observing a reaction and signs understood through convention. This describes the distinction between social learning (where one sees a sign employed and observes others interpreting the sign in a certain way) and the extreme version of transmission teaching methods (the teacher informs the student that a certain sign signifies a certain thing, with no further reinforcement of the arbitrary link). The theory proposed by Peirce and advanced by others (see Cannizzaro & Anderson, 2016; Nöth, 2010, 2016) of habit that extends beyond physical habit and into habits of thought explains how interpretation of signs become 'second nature'. The regression from conventionality that requires active interpretation to an instantaneous cognition that habitual thought describes is the process of becoming literate in a particular sign system. In the reconstructed theory of visual literacy presented in this thesis, this is described as 'use literacy'; the literacy that lets someone participate in communication using that sign system with fluency. Fostering a community of inquiry approach (such as described by Dewey [1916]) – a space in which students work as practitioners, developing social knowledge together – is an approach that has the potential to

develop a robust level of use literacy in the classroom. The community of inquiry approach

allows for the mutual interpenetration of diverse culturally informed literacies that is

necessary for the creation of new knowledge.

The other facet of the visual literacy outlined in chapter seven is 'critical literacy'.

Whereas use literacy describes the multifarious sign systems that students carry with them

into the classroom, critical literacy involves a metatextual understanding of how media

communicate. The critical dimension of visual literacy benefits from more active teacher

intervention. Firstly, by fostering a semiotic awareness in students, demystifying the

mechanics of communication, and cultivating a knowledge of how meaning is created at the

intersection of the signs of the text and the sign systems of the viewer. A semiotic awareness

allows students to 'step outside' the world of the text, as it were, and develop a metatextual

understanding of meaning. This avoids an oppositional disposition to text, in which students

develop a habit of suspicion toward media. It opens the door, instead, to reflection on both

one's own habits of thought, and habits of thought that are afforded by textual devices and

context. Secondly, activities developed by the teacher should be designed to engender the

habit of habit change. Deleuze (2004) maintained that shifts in knowledge happen through an

encounter with the other. Similarly, Peirce (1931-58) asserted that habits of thought changed

through the encounter with a sign that cause irritation or doubt. The teacher's role is to

provide that opposition or otherness in the classroom, whether it be through a course of work

designed to challenge existing ways of understanding, or simply introducing new visual

worlds that are not easily interpreted with existing use literacy. A teacher who approaches

instruction in a way that guides students as they reconcile new signs rather than insisting on

connections between sign and signifier will potentially see students create new, more

advanced habits of thought and, over time, develop a habit of habit change.

How is visual literacy defined in relation to the 'digital native'?

The term, 'digital native' is used to describe students who have grown up with certain technologies, and thus presumably have more developed capabilities with those technologies. Some educational theorists (notably Oblinger & Oblinger, 2005, and Prensky, 2001) conflate this technological era with increased exposure to visual media, and therefore also include a notion that students are more fluent with visual media. This is not an uncommon proposition to hear in schools and other education spaces. Postdigital theory problematises this positioning, by suggesting that the division between digital and analogue is arbitrary, a line marked at some point on the continuum of technology (Cramer, 2015). What the terminology of 'digital native' and 'digital immigrant' does do, however, is describe an experiential gap between age groups with contemporaneous technologies. Furthermore, visual literacy theorists who address the digital native concept or similar, generally agree that students who fall into this loose category do not possess any preternatural visual literacy ability. Brumberger (2011) concluded in her study that the participants, who were digitally native, did not meet her criteria for visual literacy. Felten (2008) is more specific, noting that it is the critical dimension of literacy that is lacking. Santos Costa and Xavier (2016) suggest that mobile technology affords more streamlined ways of building critical literacy in students, tacitly acknowledging that it does not necessarily exist without teacher intervention. The reconstructed theory of visual literacy presented in this thesis reconciles these positions. It separates the critical dimension from the notion of use literacy, and acknowledges the role of the teacher and education in developing critical dispositions. More pertinent to this sub-question though, is the dimension of use literacy. This dimension acknowledges not only that a difference in experience through engagement with different sign systems exists, but that its existence is a fundamental necessity in the formation of new knowledge. The approach to teaching so-called digital natives is not necessarily to cater curricula to their knowledge base,

but to be 'learner aware' (Stables, 2014) and acknowledge the collateral knowledge that students bring with them into the classroom. This formation both future proofs the notion of literacy beyond the digital revolution (young new teachers entering the workforce in 2020 will not remember a world without Facebook) as well as avoiding imposing authoritarian notions of literacy on students, leading to the replication of hegemonic knowledge.

How might a semiotic framework inform this inquiry?

The Peircean semiotic framework employed in this thesis has provided a foundation for the understanding of visual literacy acquisition. Peirce's triadic model of semiosis outlines how humans assign meaning to signs in a non-arbitrary way. It allows for conventional signs – signs that are arbitrary in their representation – but explains how through tangible social action this meaning can be fixed. This conceptually aligns with the anti-dualistic approach of postdigital theory, most prominently outlined by Pepperell and Punt (2000). A fully semiotic approach, as described by Stables (2010), describes a mode in which all components of the classroom environment can be considered as doing semiotic work. This further illuminates the acquisition of visual literacy, as teacher and peer response (formal and informal) informs meaning in the realm of secondness. Additionally, the fully semiotic approach advances a deeper understanding of the classroom as a context that informs meaning. Theories of contextual reading, asserted by Eco (2014), Fish (1980), and Rorty (1992), hold that context is significant in dictating which signs will be used to decode a text and which will be narcotised. This problematises the notion of literacy, as meaning-making processes learnt in the classroom context may not be applied in other contexts in which the student has more fluent, socially acquired literacy. For instance, a student may be less likely to apply the same standards of interpretation on Instagram as they do to images unpacked in the media studies classroom, despite the goal of education to nominally 'prepare students for life'. This is a

productive problematisation, however, as it opens up opportunities to investigate *how* the transmission of meaning making systems across the classroom membrane can be facilitated.

A broad semiotic understanding in visual literacy deepens the concept of 'prior learning' as stipulated in the *New Zealand Curriculum* (MoE, 2007), through Peirce's (1931-58) notion of 'collateral experience'. This expands what teachers might expect a student to bring to the classroom beyond just what they have previously learned in earlier institutional education and encompasses all sign systems that students use to decode meaning. With the acknowledgement that students have a level of use literacy in visual media that they bring into the classroom, must come an understanding that this collateral experience is fundamental in how they will initially engage with visual media.

Finally, the semiotic framework informed the reco of the critical dimension of literacy presented in this thesis. Peirce's conception of habits of thought describes a way of meaning making being subsumed into literacy. The engagement of this habit of thought to decode a text is how one streamlines interaction with the world of signs without becoming overwhelmed by multitudes of interpretants, but it is also what might be called an 'uncritical' approach. Criticality, especially in relation to mass media, is usually taught in a way that the student is suspicious of the text, seeking to uncover the hidden 'true' meaning (Buckingham, 2003). This approach denies the agency of the viewer when it comes to the creation of meaning, assuming meaning lies solely within the text. Furthermore, this approach, at best, will regress to a habit of thought and become a method of interpreting all texts in a uniform way. The habit of habit change, and the fostering of a semiotic awareness in students in order to reflect on their own habits of thought, are more desirable pathways to a criticality that can be employed effectively in the postdigital environment.

Limitations of the study

Some might suggest that the lack of empirical data backing the claims in this thesis is a limitation. Lester (2005) argues that educational research too often focuses on the explanation for educational phenomena, rather than interrogating the reason that teachers do what they do. This is the space that this thesis is intended to occupy. Papastephanou (2006) points out that there is value in having a rigorous philosophical foundation secured before embarking on empirical research. This work provides that for my own further research, and hopefully it will serve as such for others also.

Some of the work in this thesis addresses notions of literacy as a wider prospect, and certainly a semiotic framework and a postdigital lens could be applied to other literacies (media literacy in particular). It is important to note, however, that this research was completed with visual literacy in mind, and by someone with experience in teaching visual literacy. This chosen distinction, of visual over other forms of sign, in this thesis, may be regarded as an imposition onto the vast network of signs. It may be that it is isolating this form "only for the duration of the current interpretation" (Eco, 2014, p. 54), or it could be as Barthes (1967, p. 82) noted on binaries, that it is a distinction "both necessary and transitory", useful until it is not, or until it is absorbed into a larger model, such as multiliteracy (Cope & Kalantzis, 2000) or multimodality (Kress, 2003). This thesis entertains the isolation of visual literacy from other literacies in view of the fact that education systems generally segment learning and assessment into such categories. Even in a model of multiliteracy, there is value in isolating elements in order to understand how one literacy might impact or interact with another.

Further research

This research paves the way for a number of potential research avenues. The most logical progression is into a more conventional research project that looks to observe the effects of visual literacy in context. One option would be to conduct a quantitative study that measures the effect size of the various teaching practices recommended by this work. Perhaps a more suitable endeavour would be to undertake qualitative research of some kind, observing student practices in classroom contexts as they develop visual literacy, or interviewing students to get a narrative perspective on the ongoing development of semiotic awareness. As a philosophical project, some areas have been identified in this work that could benefit from further development, but to do so would have been outside the scope of this thesis. The notion of the membrane, a model adapted from Pepperell and Punt (2000), to describe the activation of signs in a context different to the one they were internalised in, is pertinent in the further understanding of use literacy. It is also potentially generalisable past the field of visual literacy. Critical visual literacy, and critical literacy in general, are areas that warrant further theoretical investigation through a semiotic framework. Peirce wrote extensively on belief and doubt, concepts relating to the fixing of habit, and theorists such as Wells (2007) have asserted the relevance of these concepts to critical thinking. The implications of this, in secondary education in particular, would be an appropriate extension of this work. Finally, a review of Aotearoa New Zealand education policy and how it might support visual literacy in classrooms could be undertaken. This critical policy analysis might be best suited to take place after the NCEA review (MoE, 2019) has been completed, and new achievement standards are adopted in schools.

Final Remarks

As education slips ever further into neoliberal performativity, it is important that the philosophical underpinnings of education are interrogated. It can be easy in the context of a school to forget that the aim of teaching is not simply to prepare students to meet the criteria of an institutional standard. Teaching is communication, and Dewey (1897, p. 6, as cited in Nöth, 2014) said that in communication "one has to assimilate, imaginatively, something of another's experience in order to tell him intelligently of one's own experience" (p. 8). As societies interpenetrate in the classroom space, cultural signifiers interact, and if nurtured by the teacher, can act as a catalyst for new knowledge, and new understandings. A semiotic philosophy of learning supports an emancipatory education system, one that shifts the emphasis from economic potential to personal growth. "Teaching could (once again?) become something that is seen as stretching rather than proscribing human experience" (Stables, 2014, p. 43)

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Appendix A

Visual literacy, default search				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	visual literacy.mp. [mp=abstract, title, heading word, identifiers]	TITLE-ABS-KEY ("visual literacy")	"Visual literacy"	"Visual Literacy"
Results	1721	831(657)[47]	162	42,000 approx.

Visual literacy, title search only				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	visual literacy.ti.	TITLE ("visual literacy")	TI "Visual literacy"	Allintitle: "Visual Literacy"
Results	353	260(213)	21	2,530

Visual literacy mentioned within five words of the terms 'definition' or 'defining'				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(visual literacy adj5 (definition or defining)).ti,ab.	TITLE-ABS-KEY ("visual literacy" W/5 definition OR defining)	"visual literacy" N5 (definition OR defining)	Function unavailable
Results	13	3	2	-

Visual literacy mentioned within five words of the terms 'definition' or 'defining' in title				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(visual literacy adj5 (definition or defining)).ti.	TITLE ("visual literacy" W/5 definition OR defining)	AB "visual literacy" N5 (definition OR defining)	allintitle: definition OR defining "visual literacy"[48]
Results	2	0	2	11

[47] Scopus allowed for limiting of subject area, so the bracketed results are when the search results were limited to 'social sciences', 'arts and humanities', and 'psychology'. This was to limit the larger search pools, the smaller search pools were scoured without the limits, in case of serendipitous moments of parallelism across distinct subject areas.

[48] Function unavailable, but considering that the majority of paper titles would be ten words or fewer, the 'adjacent' or 'within x' functions were foregone.

Visual literacy mentioned within five words of the terms 'digital'				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(digital adj5 visual literacy).mp. [mp=abstract, title, heading word, identifiers]	TITLE-ABS-KEY ("visual literacy" W/5 digital)	"visual literacy" N5 digital	Function unavailable
Results	19	76	1	-

Visual literacy and digital native OR millennial OR generation z				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(visual literacy and (millennial or digital native or generation z)).mp. [mp=abstract, title, heading word, identifiers]	TITLE-ABS-KEY ("visual literacy" AND (millennial OR "digital native" OR "generation z"))	"visual literacy" AND ("digital native" OR "generation z" OR millennial)	"visual literacy" AND "digital native" OR ; OR millennial; OR "generation z"
Results	7	6	0	44

Visual literacy and postdigital[49]				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(visual literacy and (postdigital or post-digital or post digital)).mp. [mp=abstract, title, heading word, identifiers]	TITLE-ABS-KEY ("visual literacy" AND (postdigital OR "post-digital" OR "post digital"))	"visual literacy" AND (postdigital OR "post-digital" OR "post digital")	("post-digital" OR "post digital" OR postdigital) AND "visual literacy"
Results	0	0	0	90

Postdigital, default search				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(postdigital or post-digital or post digital).mp. [mp=abstract, title, heading word, identifiers]	TITLE-ABS-KEY (postdigital OR "post-digital" OR "post digital")	(postdigital OR "post-digital" OR "post digital")	(postdigital OR "post-digital" OR "post digital")
Results	9	227(120)	62	8890

[49] Alternative spellings 'post-digital' and 'post digital' were included.

Visual literacy and Semiotics OR Edusemiotics OR with Semio- as a root				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	(Visual Literacy and (semiotics or edusemiotics or semio$)).mp. [mp=abstract, title, heading word, identifiers	TITLE-ABS-KEY ("visual literacy" AND (semiotics OR edusemiotics OR semio$))	"visual literacy" AND (semiotics OR edusemiotics OR semio$)	"visual literacy" AND (semiotics OR edusemiotics OR semio$)
Results	67	49	8	13,300 approx.

Visual literacy and Semiotics or variations in paper title				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	Visual Literacy.ti. and (semiotics or edusemiotics or semio$).mp. [mp=abstract, title, heading word, identifiers]	TITLE ("visual literacy") AND (semiotics OR edusemiotics OR semio$)	TI "visual literacy" AND ((semiotics OR edusemiotics OR semio$))	allintitle: semiotics OR edusemiotics OR semio$ "visual literacy"
Results	11	36	1	5

Visual literacy and Semiotics or variations in paper title				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	Visual Literacy.ti. and (semiotics or edusemiotics or semio$).mp. [mp=abstract, title, heading word, identifiers]	TITLE ("visual literacy") AND (semiotics OR edusemiotics OR semio$)	TI "visual literacy" AND ((semiotics OR edusemiotics OR semio$))	allintitle: semiotics OR edusemiotics OR semio$ "visual literacy"
Results	11	36	1	5

Postdigital or variant and Semiotics or variant in general search				
Database	ERIC	Scopus	EBSCO	Google Scholar
Exact search term	((postdigital or post-digital or post digital) and (semiotics or edusemiotics or semio$)).mp. [mp=abstract, title, heading word, identifiers]	TITLE-ABS-KEY (postdigital OR "post-digital" OR "post digital") AND TITLE-ABS-KEY (semiotics OR edusemiotics OR semio$)	(postdigital OR "post-digital" OR "post digital") AND (semiotics OR edusemiotics OR semio$)	(semiotics OR edusemiotics OR semio$) AND (postdigital OR "post-digital" OR "post digital")
Results	0	1	0	981

Appendix B

- Nodes
  - Postdigital
    - Affordances of technology
    - Algorithms
    - Blurred boundaries
    - Development of technology
    - Digital binary
    - Dualism
    - Generational break
    - Habitus
    - Instrumentalism
    - Networked and paticipatory culture
    - Old media as new
    - Online identity
    - Remix
    - Social construction of knowledge
    - Technological determinism
    - Technology as background
  - Semiotics
  - Visual Literacy
    - Acquisition
    - Alphabetic ilteracy analog
    - Challenges defining
    - Digital visual literacy
    - Green's 3d literacy
      - Critical literacy
      - Cultural literacy
      - Operational literacy
    - Multimodality
    - Need for visual literacy
    - Text and image
    - The notion of literacy
    - Visual literacy defiition
    - Visual manipulation