Ametros:

A Technogenetic Simulation Game for Professional Communication Coursework

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis,

including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This dissertation develops a pedagogy of professional communication for online education that provides a degree of feedback higher than that of a classroom setting. In order to construct such pedagogy, I examine professional communication from three perspectives: cognitive, technological, and rhetorical. Cognition and technology are becoming, in many senses, indistinguishable.   Technology is extending and augmenting cognitive processes such as memory through databases, spatial awareness through various global positioning technologies, and especially the greater cognitive attention system via the sheer magnitude of media channels. Much of this extension and augmentation is happening beneath, or at least outside of consciousness; in most cases, we are not consciously aware of the cognitive effects of technologies such as SIM cards or databases. They are ubiquitous, deeply embedded, and routine. Katherine Hayles and Nigel Thrift designate this effect of technology on cognition as the "technological unconscious". I term this increasingly unconscious relationship of cognition and technology as *technogenetic*.

Following Niklas Luhmann, I argue that the autopoietic operationally closed nature of the human biological system forecloses purity; as Luhmann expresses it, "only communication communicates," not communicators. While machines experience the pure communication of digital code, human beings must rely on cognitive processes, constrained and afforded by mental affinities. This dissertation explores research in a number of disciplines from the work of Sperber and Mercier in cognitive psychology on the argumentative nature of human

reasoning to the work of Jeanne Fahnestock, Randy Allen Harris, and others on cognitive

rhetoric and figural logic to conclude that argumentation in its many facets is the key

rhetorical skill necessary to navigate a technogenetic world.

A technogenetic rhetoric engages writing as argumentation within the extra-discursive factors

created by the technological unconscious. Technogenetic rhetoric also assumes the

visuospatial aspects of technologically enframed communication. As a pedagogy,

technogenetic rhetoric follows a constructivist model; in this dissertation, realized by a

contextually authentic online simulation game that I call *Ametros*: A Professional

Communication Simulation Game. Ametros is a Greek word that means "without measure"

that I use to represent the complexity of contemporary technogenetic systems of

communication.

Ametros organizes and deploys the elements of discursive, extra-discursive, and visuospatial

rhetoric in a ludic environment that provides a combination of human and artificial

intelligence driven feedback superior to both existing online solutions and most large

classroom settings. The artificial intelligence, in turn, develops recursively through the

creation and of corpora of student communication using an annotation interface based on

ontologies of argumentation and figuration. These annotations will engage natural language

processing algorithms that will, over time, allow the machine to provide real-time feedback

on communication skills of the student. Ametros provides an experiential and ludic

environment that moves pedagogy of composition, in all of its forms from one of delimited

process to a procedural logic of iteration better able to navigate complex systems where

audiences as assemblages of human and technological actors determine and are determined

by, interactions of cognition and technology.

Acknowledgements

I am deeply indebted to my professors and colleagues in the English Language and Literature department of the University of Waterloo without whose support and guidance this project would not have been possible. Their acceptance and encouragement of such a multidisciplinary project allowed me to attempt the synthesis of a number of theories and technologies that bring together technology studies, artificial intelligence, cognitive science, natural language processing, social systems theory, writing studies and rhetoric into what I hope is a coherent potential solution to the problem of feedback in an online environment. The English Department of the University of Waterloo provided an environment that allowed me to extend into many disparate fields that touch on the issue of feedback in online coursework. Such an environment is unique in the academic world and I am eternally grateful for the opportunity UW English provided me.

I would especially like to thank Randy Allen Harris for his tireless work in the supervision and editing of this dissertation. His guidance was invaluable in my attempt to bring such divergent theories into a cohesive whole. Randy's many suggestions helped maintain a focus and direction for the project. I did not accept every suggestion and any errors or omissions are my own.

I extend many thanks to Chrysanne Dimarco for her encouragement and guidance in the field of natural language processing. Her openness and acceptance of my delving into a field

far removed from my own was invaluable. I would also like to thank Marcel O'Gorman for a series of conversations and classes that opened my thinking to unconventional pedagogies. In addition, I owe an intellectual debt to my committee members Jay Dolmage and Andrew McMurry for their advice and guidance in writing studies and social systems theory respectively. Both Jay and Andy provided a sounding board for my ideas while guiding me in two fields outside on my primary competencies.

Finally, I would like to thank my family for their encouragement and support.

Dedication

I dedicate this dissertation to my wife and partner Cathy, without whose support and understanding it would not have been possible.

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Introduction

The genesis of my dissertation can be traced back to a student survey on an online course that I had developed for the University of Waterloo Department of English in 2009. I was given the opportunity to redesign an early version of the wholly online *Genres of Business Communication* course. The original version contained excellent content, but was limited in delivery. Content was presented in text-based slides with little or no student interaction. Over six months, I recorded lectures, created multimedia presentations to accompany the audio, and developed case-study-based workshops to serve as practical exercises of genre theory. I eagerly opened the student survey of the first offering of the new course expecting to find high praise and wonderment for my *highly interactive* course. While the number of angry and disappointed comments was greatly reduced from the previous version, I was shocked as I read through comment after comment lamenting the lack of feedback on work; the lack of connection with the Instructor and Teaching Assistants; the inconsistent grading; finally, and most devastating, it was dull. A dramatic improvement in the digital delivery of content had not led to a level of student satisfaction remotely close to the levels achieved in a classroom environment.

The simple answer is that an online environment cannot compete with a teacher in a classroom. And in many respects this is true, but there had to be more to the dissatisfaction. Professional communication, by its very nature a praxis where theory must be engaged with practice in order to be mastered, would seem to be perfectly suited to the online environment where students are able to work through the content of the theory and apply it to workshops and case studies without time constraints. The problem, as I see it, with professional online

pedagogy is the direct modal transfer of classroom teaching methods to a digital environment. A recorded lecture is a lecture and automated PowerPoint slides are PowerPoint slides; workshops in a classroom are workshops online; instructor response to writing in an online setting is still response; and cases are case whether discussed in person or read online. What is different is the degree of interaction. In a classroom, the student is able to discuss and question the material and while this is available online through discussion boards and email, the asynchronous nature of the interaction, often considered the greatest positive of an online environment, actually has a negative impact on student perception of feedback. Comments on the length of time a question takes to be answered are common, as a student often needs support at the moment they are engaged in the work. When we mirror face-to-face lecture and slide methods in a digital environment, cognitive dissonance can easily arise, where student's expectations, geared to classroom structures, cannot match the off-synch reality of online feedback.

A less obvious reason than dissonant delivery methods for student dissatisfaction with an online environment is that of misplaced pedagogical strategies. Most professional communication pedagogies focus on a process method where students are exposed to a step-by-step, albeit recursive, model of audience, purpose, and scope analysis. The primary focus

of such pedagogies is textual composition with a limited focus on visual communication.[1]

Deploying process pedagogy in a digital environment creates another cognitive dissonance in the student. The environment does not align with the method; digital online environments require pedagogy capable of teaching the composition and delivery of routine, negative, and persuasive communications in an amalgamation of textual and the visual modalities. In other words, technologies in the form of online course delivery, as well as modes of communication from email to Twitter demand a new set of pedagogical methods.

The basis of a new set of pedagogical methods can be found in the scholarship of technogenesis and epigenetic change. A number of theorists including Katherine Hayles (2012), Bernard Stiegler (1998, 2009), and Gilbert Simondon (2006) have explored a theory of technogenesis where human beings have evolved in concert with technological development (Hayles 2012 p. 10). Such evolution can be found in the biological and psychological changes resulting from environmental factors defined as "epigenetic" changes (11). Hayles (2012) and Stiegler (2010) describe changes to cognitive patterns of human attention related to the volume and accessibility of contemporary digital media. Hayles relates a predilection of the native digital generation for hyper-attention over deep attention

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[1] A number of business and technical communication texts such as Carolyn Meyer's Communicating for Results are moving towards contemporary digital composition with chapters on social media and infographics, but the overall focus remains on text composition.

that results in neuroplastic alterations to cognitive behavior. Stiegler presents evidence of increases in diagnoses of Attention Deficit Hyperactive Disorder that parallel the development of digital media technologies. Technogenesis is also related to work in what is termed "extended cognition" by Andy Clark (2009) where cognitive activities such as memory and reasoning, once thought to reside solely in the mind/brain, leak out into the world in the form of technologies such as databases and processors. While such extended cognition existed before digital media (Clark 2009, xxv), for instance, relates physicist Richard Feynman's claim that his "work" was done "on" paper and not in his mind), but digital media has extended cognitive capabilities exponentially. The sheer volume of information available in a couple of finger swipes or mouse clicks is unfathomable and presents challenges to both composition and reception. Hayles (2012) refers to a "contemporary technogenesis" that finds that

> as digital media, including networked and programmable desktop stations, mobile devices, and other computational media embedded in the environment, become more pervasive, they push us in the direction of faster communication, more intense and varied information streams, more integration of humans and intelligent machines, and more interactions of language and code (11).

In such an environment, agents of communication include both human beings and technology. In fact, Bruno Latour (1987) places technological objects as actors in network interactions on the same ontological level as human actors. Humans and technology coevolve as complex systems.

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Braden Allenby and Daniel Sarewitz, in <u>The Techno-Human Condition</u> (2011) describe three systemic levels of human and technology interaction. Level I is technology in and of itself, for example, Skype as a code-based computer application. Level II is technological integration into greater systems of human/technology interaction. Keeping with the Skype example, Level II consists of the application in use on the greater Internet-based communication network. Level III involves the integration of technology and human in the world; for example, Skype and human as participants in systems of communication. The complexity of each Level builds exponentially; making the teaching process primarily aimed at Level I interactions problematic. Technogenesis makes process pedagogy problematic. Digital media expands the volume of communication, but also its form; visual communication is at least as prevalent as text. Professional communication pedagogy, whether delivered online or in person, requires a methodology that takes technogenesis and the epigenetic changes to cognitive faculties such as attention and memory into account.

The goal of my project is to develop a pedagogy of professional communication for an online environment that provides a sound foundation in a triangulation of three key areas of study—cognition, technology, and rhetoric—that I am defining as *technogenetic rhetoric*. Cognition, technology, and rhetoric are entwined in the communication of everyday life; my project entwines them in the pedagogy of communication. Technology affects and extends cognitive processes such as attention and memory while our rhetorical use of language and image reveals a confluence of cognitive affinities. There is a relationship of dependence and construction between the elements of technogenetic rhetoric; each element depends on the

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other two in order to construct its object (see Figure 1). Digital applications such as Twitter, for instance, at once demand and construct attention through their various technological platforms, through their cognitive appeals, and through their rhetorical dimensions.
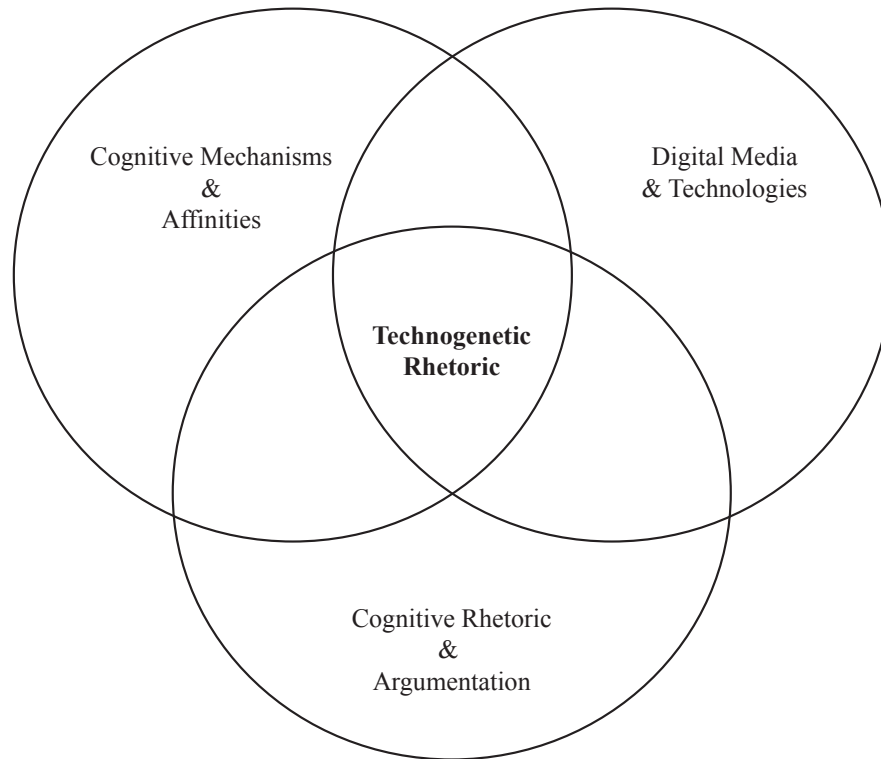
Figure 1: Technogenetic Rhetoric

Figure 2 is a graphical depiction of technogenetic rhetoric of professional communication. Context, pedagogy, delivery and objectives serve as the key components of my project.

Technogenetic Rhetoric of Professional Communication
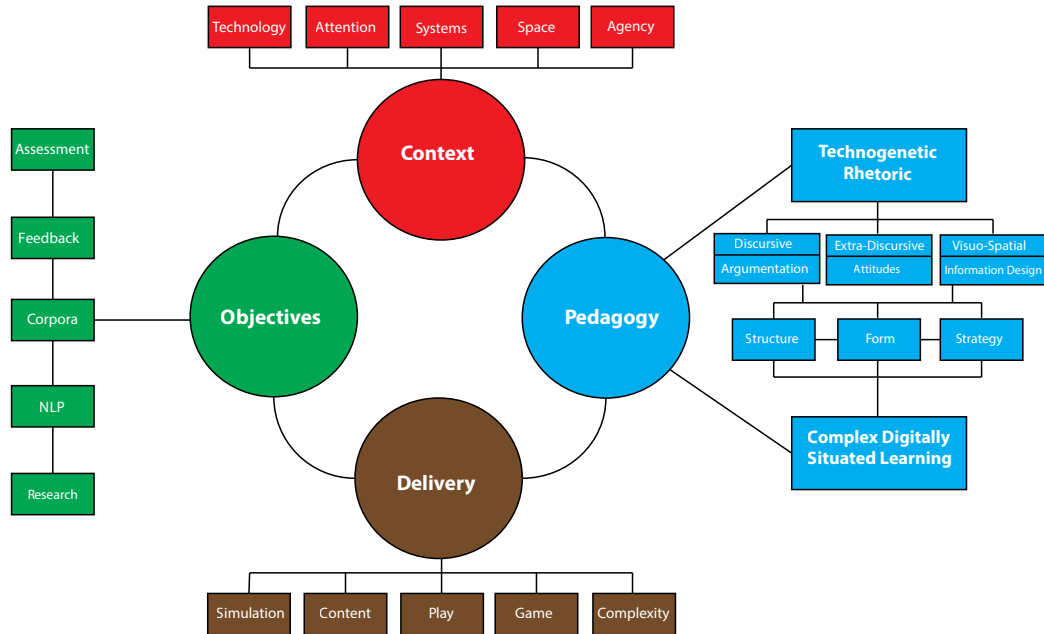
Figure 2: Technogenetic Rhetoric of Professional Communication

The autopoietic complex systems theory of Nicklas Luhmann in relation Jurgen Habermas' theory of communicative action are placed in a frame of Kenneth Burke's concepts of identification and consubstantiation to establish the context of professional communication in this pedagogy, while the cognitivist frameworks of Piaget and Vygotsky provide a theory of digitally situated learning. Technogenetic rhetoric of professional communication is defined through cognitive rhetorical theories of argumentation and figural logic in terms of discursive (text), extra-discursive (technological effects), and visuospatial (image) communication. In

terms of delivery and objectives, technogenetic rhetoric requires a pedagogical environment that includes applications and tools suited to feedback, response, and assessment in a digital setting. One promising delivery method, explored in this dissertation, is a simulation game based on the digital games and learning scholarship of Schaffer and Resnick (1999), Gee (2003, 2005), and Bogost (2007) that moves past the extrinsic nature of cases and workshops towards an immersive experience of professional communication.

We teach methods of professional communication to a world no longer recognizable to pedagogical processes of composition. Digital technology has made step-by-step process-based pedagogies if not obsolete, then at least less effective; reports are increasingly being augmented by infographics, memos, emails, even micro-blogging and IM messaging. Bullet points are overtaking paragraphs in routine professional communication, and communication is frequently truncated into one hundred and forty-four character messages. The design of a document is more important than ever with infographic synthesizing of image and text. The sheer number of communications has exploded, with the number of genres not far behind. Professionals receive hundreds of messages per day. People are texting and tweeting while listening to presentations, and presenters have their eye on Twitter as they speak. I am not arguing that the iterative process of writing does not have a place in pedagogy designed for such a proliferation of media genres; iteration is a foundational, but incomplete aspect of digital composition. I *am* arguing for pedagogy that subsumes current models of response and process into pedagogy capable of addressing technogenetic effects.

Problematically for composition pedagogy, technology wreaks havoc on the cognitive attention system by extending our ability to perform cognitive tasks related to memory. Katherine Hayles (2012) and Bernard Stiegler (2010) describe a state of "hyper-attention" where individuals move rapidly from one object of focus to the next without ever attending deeply to any. Hayles (2012) and Thrift (2005) view the effect of digital multitasking as forming a technological unconscious where the role of digital media technology has fallen below our conscious awareness. Heidegger (1977) called this effect, where technology becomes a part of our way of being, "enframing." Digital media technologies demand attention to the point that their hailing is no longer viewed as such. The effects and affects of technology slip beneath conscious recognition in an almost ideological fashion. We live in a state of hyper-attention without recognizing that we do or, when we do, without acknowledging the cause. The environment in which we teach is changing at an ever faster clip. We teach in a technogenetic world.

What has not changed is the need for rhetoric, particularly argumentation structure and schemes, as well as figural logic, a specialized project of argumentation theory developed by Jeanne Fahnestock (1999, 2005), to engage a technogenetic world. Rhetoric as argumentation and figuration is a cognitive activity. Cognitive rhetoric reveals the symmetry between how we form our communications and our cognitive activities. There is currently a divide in the scholarship of cognitive rhetoric. Cognitive rhetoric has taken two, so-far unconnected paths. On the one hand, in the work associated with Flower and Hayes (1981), it has strong connections with process theories of composition and situational cognition. This

approach emphasizes the dynamics of discourse, and therefore lends itself to cognitive side of a technogenetic theory rather naturally, but it ignores technology. On the other hand, the work of Mark Turner (1997), as influenced by the seminal book by George Lakoff and Mark Johnson (1980), *Metaphors we live by*, cognitive rhetoric has strong connections to developments in poetics and linguistics, and studies very closely the relationships between rhetorical forms and cognitive processes. In the same vein, Jeanne Fahnestock (1999) is developing a theory of figural logic that investigates rhetorical figures as epitomes of reasoning. Additional support for cognitive rhetoric is also found in cognitive psychology where Dan Sperber and Hugo Mercier (2011) propose a theory that human reasoning is fundamentally argumentative. These approaches emphasize the cognitive affinities our minds have to certain forms and configurations of language. But they do not explore the technological aspects of communication. They say nothing about technology at all. While scholars in the various streams of cognitive rhetoric seem only vaguely aware of each other, and rarely cite each other's work, the two strains together relate cognitive affinities of form to the dynamic processes of creativity vital to a technogenetic rhetoric. Technogenetic rhetoric is a synthesis of cognitive rhetorical theory with theories of digital media, extended cognition, and the technological unconscious. The purpose of technogenetic rhetoric is the development of pedagogy capable of preparing students of professional communication with the skills and insights necessary to communicate in a world of technologically driven hyper-attention.

The technologically driven hyper-attentive world is also the cause of the negative reviews

of my online course. We cannot paste old teaching methods onto an online course and

consider ourselves to have created digital pedagogy. Digital pedagogy has to mirror its

environment. Lectures, no matter how well designed the slides, are ineffective online if the

context remains confused. In other words, we cannot lecture online as if in a classroom. In

order to deeply understand theories of argumentation, figural logic, design, and visual images

crucial to communicating in a hyper-attentive digital environment, students need to

experience the material in a manner that aligns with that environment. My solution is based

on the work of James Paul Gee (2003) in video games and learning, and Schaffer and

Resnick (1999) in epistemic simulations, and Ian Bogost's theory of procedural rhetoric and

literacy.[2] I propose *Ametros,* a professional communication simulation game that places the

student in the role of professional communicator tasked with solving problems using theory

and techniques learned in the context of a professional genre such as finance, marketing,

operations, supply-chain, or technical. The Greek word *Ametros* means "without measure",

which I take to aptly represent the complexity of technogenetic communication systems. The

context of the simulated organization is guided by the work of Niklas Luhmann on complex

social systems. For Luhmann, both human beings and social formations such as the

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[2] Bogost provides a very wide definition for the term "procedure". He views a procedure as
culturally and socially defined interactions between agents both human and technological.
Procedure is not limited to rote, step-by-step measures.

professional organization are autopoietic, operationally closed complex systems whose properties emerge out of the operations of their existence. A human being is a combination of biological and mental systems closed off from the world and other human systems. Being operationally closed systems, human beings cannot communicate; "only communication communicates," as Luhmann puts it. In other words once we initiate communication, it is no longer in our control. Human systems can only receive communication without access to the mental processes of the sender that went into its formation. Communication between human systems is always incomplete.   A "double contingency" is formed where both the production and reception of communication is subject to hermeneutics (Luhmann 1984).

   Organizations for Luhmann are defined by communication. The genres and structures and flow-paths of communication are what make an organization an organization, and what makes a particular kind of organization (government, NGO, manufacturing plant, service industry) the particular kind of organization it is. Luhmann's conception of human beings and organizations as systems aligns with the enactive theory of cognition which views cognition as an interrelationship between mind/brain and world that cuts a middle path between cognitivism and connectionism. The term *enactive* refers to the perceptually guided action of the perceiver in her own local situation. The embodiment of the perceiver, not the internal or external representation of a preexisting world, drives cognition. Cognition is the interdependent coupling of the world and the systems of perception. Digital technologies mediate these couplings to two effects: (1) mediation drops below cognitive perception as it becomes ontologically entwined with the content where it is impossible to see the medium is

the message. And (2) this unconscious mediation through aspects of immediacy, ubiquity, and clarity, gives the illusion of communication no longer bound by Luhamn's double contingency. This illusion leads to the question of human agency; if communication between human beings and between organizations is doubly contingent and reliant on enactive "coupling" that is masked by digital technology, how is human agency and motivation possible in a world of technologically unconcious operationally closed systems? Luhmann's enactive view of complex systems poses some problems for rhetoric in the areas of agency and motivation that Kenneth Burke's conceptions of identification and consubstantiation help to alleviate. Rhetoric as argumentation and form creates couplings that are more effective at managing the movement of communication from one system to another.

Technogenetic rhetoric applies to communication, either produced or received via a technological medium, as it exists in a world of complex human, social, and organizational systems. Ametros creates such an environment of technology, complexity, and communication through pedagogical authenticity and experience developed with the cognitivist learning theories of Jean Piaget and Lev Vygotsky. Piaget offers a theory of experiential learning that aligns with relational theories of cognitive rhetoric where elements such as argument and form integrate with cognitive mechanisms and affinities. Piaget, through his stages of cognitive development, presents a basis for the simulation-as-learning pedagogy of Ametros. Vygotsky's "zone of proximal development" (1978) offers a theoretical basis for the design of Ametros where human and artificial intelligence agents move students into higher levels of development than possible in a traditional online teaching

environment. Ametros deploys the cognitivist theories of Piaget and Vygotsky by increasing

the interaction of instructor, both human and machine, in an experiential setting. And

increased interaction leads directly to more detailed and timely feedback, the problem

Ametros is designed to alleviate. Students in the game environment engage their own and

others' work from a number of perspectives, including composition, reception, and most

importantly, annotation. Students experience doubly contingent complex systems through

project-specific production and reception of communication; they respond and are responded

to, producing or not producing actions that move their progress through the course and the

game. On a deeper level, students engage communications through annotation; students

annotate their texts (and in the future, visual images) for elements of argumentation including

structure, form (figural logic), and scheme. These annotations are checked by human

Teaching Assistants, but as the database of Ametros grows, the artificial intelligence agent

will be able to help students in real time. The corpus of argument elements will allow the

student to engage a number of analytic tools that inherently provide feedback; visualization

tools such as Araucaria, dialogue applications such as Arvina, and custom-designed

applications (e.g., that provide analysis of argumentation schemes through an artificial

dialogue based on Douglas Walton's critical questions) are a few. Ametros, as an ongoing

research project, will produce a large and valuable corpus of professional communication

specific argumentation that can be sub-divided into genres such as marketing, technical,

supply-chain, legal, technical, and so on; into modes, such as bulletins, email, blogs,

microblogs, and so on; into discursive frames such as addressivity, reflexivity, referentiality,

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and so on; into rhetorical-figure clusters, such as repetitions, symmetries, contrasts, and so on; the pie can be sliced in as many ways, or as few, as the researchers choose. The growing general Ametros corpus, and its more specific corpora, will allow and encourage further research into a wide variety of professional communication areas. The ultimate goal of Ametros is the development of an online environment that provides a higher degree of feedback not by automating all existing functions of the Teaching Assistant and Instructor, but through the creation of a more effective division of labour between human and machine. The artificial intelligence engines suggested in the following dissertation will be capable of providing structural feedback in terms of argument construction through schemes and figures, providing more time for the Teaching Assistant to respond to the discursive, non-discursive, and visuospatial compositions of the students following the response models of Nancy Sommers (1982), Richard Haswell (2006), and modified version of Jeff Sommers' Response 2.0 architecture of audio response (2013). The goal is not only increased instances of feedback, but also a higher degree of compositional response.

1.1 Chapter outline

This dissertation is divided into five chapters, each representing a key element of the project. Each chapter is headed by its appropriate section of the overall graphic depiction of technogenetic pedagogy. The figures serve as a visual abstract of the chapter contents.

Chapter 2 establishes a foundation for a technogenetic rhetoric of professional communication. In section 2.1, the effects of technology on professional communications

are examined, particularly in light of Heidegger's theory of enframing where technology slips below conscious awareness to form the essence of communicative action. Section 2.2 of the chapter defines and describes the Greater Attention System in terms of Nigel Thrift's concept of the "technological unconscious" where the ubiquity of technology causes it to sink below recognition as it expands our cognitive abilities. In section 2.3, the systemic context of professional communication is explored in light of Luhmann's theory of autopoietic human and social systems. Section 2.4 examines the contextual space of organizations as systems. Section 2.5 concludes the chapter by bringing Jurgen Habermas's theory of communicative action into contact with Luhmann's work by way of Kenneth Burke and Actor Network Theory. Defining the complex systemic nature of professional communication in terms of human agency is critical to the development of technogenetic rhetoric.

Chapter 3 introduces the discursive, extra-discursive, and visuospatial nature of technogenetic rhetoric. Discursive refers to the written and spoken aspects of communication; extra-discursive refers to elements of communication that fall outside of discourse and visual image; while visuospatial refers to the visual aspects of communication from typeface to digital image. In section 3.1 on discursive argumentation, I follow a review of argumentation in light of the Luhmann and Habermas debate on communicative agency with a discussion of Sperber and Mercier's (2011) work on argumentative reasoning. I conclude the section with a review of Stephen Toulmin's model of argumentative logic as the structural basis on my pedagogy. In section 3.2 on form, I explore the cognitive and

argumentative aspects of rhetorical figuration and figural logic focusing primarily on the work of Kenneth Burke, Richard Gregg, Randy Allen Harris, and Jeanne Fahnestock. In section 3.3, I discuss the strategic argumentation strategies of Chaim Perelman and Lucie Olbrechts-Tyteca, as well as the argumentation schemes of Douglas Walton. Section 3.4 details the extra-discursive and visuospatial elements of technogenetic rhetoric.

Chapter 4 develops a complex, digitally situated pedagogical basis for technogenetic rhetoric. Section 4.1 describes technogenetic pedagogy in relation to the cognitive composition work of Linda Flower and John Hayes. Section 4.2 defines shared and situated knowledge in terms of the constructivist pedagogy of Piaget and Vygotsky as a prelude to the introduction of a digital simulation game that aligns learning and experience. Section 4.3 further develops technogenetic pedagogy by introducing Gee's theory of semiotic domain as a strategy to deal with the complications of organizational space created by Luhmann's system theory. Section 4.4 reviews selected examples of current professional communication pedagogy in comparison to technogenetic pedagogy. Section 4.5 calls primarily on the work of Byron Hawk to establish a post-process pedagogy capable of dealing with the conception of audience as assemblage of technological and human systems. Finally, section 4.6 repurposes the work of Margaret Syverson on composition and complex systems, as well as actor-network theory to develop two analytical methods focused on the dimensions and attributes of communicative assemblages. These methods serve as the pedagogical underpinnings of the professional communication simulation game.

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Chapter 5 introduces the Professional Communication Simulation Game (Ametros) as a delivery medium for technogenetic pedagogy. The chapter opens with a discussion of three key scholars of gaming and pedagogy: James Paul Gee, David Schaffer, and Ian Bogust. Gee's work on semiotic domains and content is discussed in relation to Schaffer's theory of "thick authenticity", while Bogust offers a conception of procedural literacy important to the PCGS pedagogy. Section 5.1 reviews current research into digital gaming and pedagogy while section 5.2 investigates the relationship between content and learning in a digital world with special emphasis on the work of Sealy and Brown. Sections 5.3 and 5.4 introduce the game world and play of Ametros. The elements of play, games, content, and authentic situated learning are applied to the design of Ametros.

Chapter 6 outlines a series of Ametros objectives for online pedagogy that focus on feedback, a research program and protocol inherent to the PCGS involving corpora building and natural language processing, assessment, and finally, a brief outline of further research. Sections 6.1 and 6.2 develop pedagogical and natural language processing protocols that provide feedback superior to classroom-based courses by developing corpora of professional communication suitable for natural language processing. Section 6.3 describes assessment protocols that align the needs of the institution with the reality of the professional organization. Finally, section 6.4 suggests a research protocol and on-going program to study communication immersed in digital media through the construction of corpora and natural language processing applications.

Technology Attention Systems Space Agency

Context
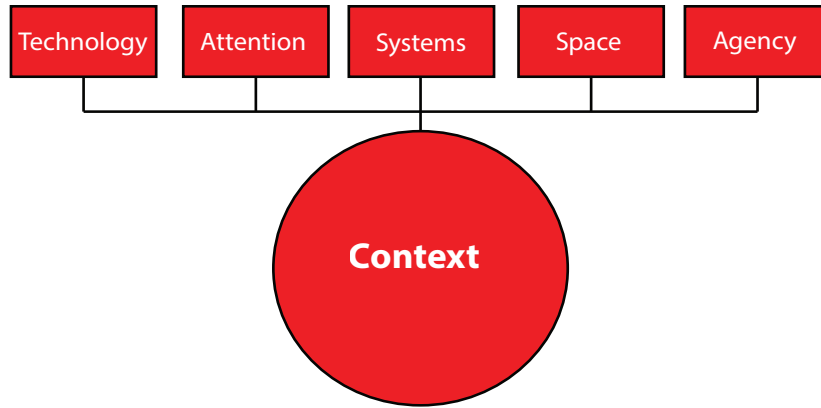
Chapter 2

Technology, Attention, and the Organization as System

Professional Communication involves the production and reception of audio, speech, text, and visuals, in spatial and temporal media. For the most part, traditional pedagogy is based on teaching process strategies to each element; students are taught the pre-writing process for textual production: purpose determination, audience analysis, and scope; students are taught the basics of presentation software: how many bullet points per page, where an image is placed and so on; students are taught the importance of volume, inflection, flow in an oral presentation; students are taught the angles, framing, composition, and so on, of visual semiotics; in some quarters, students are taught production concerns for video and other temporal media, such as juxtaposition, pace, camera movement, and so on. But, while there

is some cross over in processes, the technics of professional communication are proliferating at a rate that far outstrips our ability to teach to the medium or the mode. While text remains the basis of routine email communications, multimedia presentation software is fast becoming the medium of choice for all persuasive communication as a stand-alone document or accompanied by an oral presentation. Blogs, wikis, and social media are increasingly the space of technical information. Multimedia software applications that bring text, image, video, and speech into one communication event problematize pedagogy focused on media specific processes. The answer to such pedagogical problems is often an instrumental approach aimed at extending process learning; how can text messaging be incorporated into the writing process and so on. The instrumentalist view of technology is fixated on technological instances: this software application or that smartphone, examples of Allenby and Sarewitz's (2011) Level I technology interaction. I contend that the better pedagogical path lies in an understanding of what Heidegger would call the "essence" of technology. Heidegger (1977) eschews an instrumentalist view for a deeper relationship between human beings and technology; "[e]verywhere we remain unfree and chained to technology, whether we passionately affirm or deny it," he observed. "But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly blind to the essence of technology" (311). Technology "enframes" or reveals truth; enframing is the essence of technology where techne is a "bringing forth" that is more than a tool used as an end-to-a-means (320-

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25). In other words, technology in professional communication has an ontological function beyond its instrumental use as tool.

Enframing is on display in the modern meeting where presenters are communicating with speech, visual images, video, and text to an audience, some of whom are in the room while others are a continent away watching on a screen. The presenters speak and click while the audience listens and watches while simultaneously reading and producing other communications to other audiences who in turn are sitting in their own meetings listening, watching, reading, and typing. More is going on here than an instrumental example of the effect of video-conferencing, PowerPoint, streaming video, Blackberry use and so on. Communication is serving an exponentially constitutive role.

Following the work of Niklas Luhmann, organizations are presented as networked systems that autopoietically establish their form through communicative acts. While organizations are collections of individual subjects, the boundaries that separate and define their existence are created by communication. A collection of lawyers is only a law firm if they produce and receive communications relating to their operations. The firm is distinguished from the environments it inhabits by the communications it produces specific to its cases and administration. Physical presence or even its members do not define the organization; it is the networked system of communications produced that establishes its ontology. These networked systems of communication are complex in that boundaries formed by communication also prevent communication. To put this idea in a less postmodern way, organizations can only imperfectly communicate with other organizations. For example, a

lawyer member of a law firm (organization as networked system) produces communication

in the form of a summation for a judge, a member of a number of nested systems (the overall

legal system, the local jurisdiction and so on). The summation is a communicative instance

that defines the boundaries between the various organizational systems in play – but as soon

as the communication leaves the lawyer's mouth, it is out of her control. How the judge

interprets and engages the communication are now constitutive elements of the

organizational systems in which the judge resides. In this sense the organizations are

operationally closed systems. Even though Luhmann believes only communication

communicates, organizations do not (2013, 78-9). The transactional communication model

at the organizational level is complex. Encoding and decoding not only define the

transaction, they define the organization, with neither sender nor receiver in control. In

sections 2.3 and 2.4, I discuss in detail the autopoietic nature of organizations as social

systems.

To further complicate the make-up of the organization as system, human beings within

such systems are themselves operationally closed autopoietic systems. One mind cannot

know the contents of another. We can hope and predict and calculate, but we cannot *know*;

we can only produce communication that is at the mercy of interpretation. The enframing

nature of technology combined with Luhmann's autopoietic theory of human and

organizational (social) systems create a challenge for professional communication pedagogy:

if human beings and organizations are systems defined by their own biological and

communicative actions bombarded from all directions by technologically driven

communication, how do we develop a rhetoric capable of working with complex and closed systems while navigating multiple streams of arrangement and delivery in the form of text, image, and voice? Kenneth Burke's (1950) concept of rhetoric as identification, with the goal of consubstantiation, serves as a guiding theory. Rhetoric fulfills the need of the individual to feel connected in the face of what Burke describes as "division". Actor network theory developed by Latour, Law, and Callon provides a perspective of technology suitable for such a rhetoric.

I suggest a "technogenetic rhetoric" that builds on the pioneering work in composition studies of Linda Flower and John Hayes while incorporating scholarship in the cognitive nature of argumentation, linguistic and image-based figuration, visual rhetoric, information design, as well as educational simulation and game studies. A technogenetic rhetoric of professional communication maintains a focus on technologically situated invention while attempting to establish more effective links with audience as operationally closed system. The remainder of this chapter establishes a foundation for a technogenetic rhetoric of professional communication. Section 2.1, Technology, explores of the effects of technology on professional communications, particularly in light of enframing. Section 2.2, The Greater Attention System, introduces Nigel Thrift's concept of the "technological unconscious" where the ubiquity of technology causes it to sink below recognition as it expands our cognitive abilities. Section 2.3, Organizations and Human Beings as Systems, explicates Luhmann's theory of autopoietic human and social systems. Section 2.4, The Space of Organizations, briefly articulates the importance of conceptual space to such systems, and

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section 2.5, Communicative Agency and Social Systems Theory, completes the chapter by bringing Jürgen Habermas' theory of communicative action into the fold and bridges it to Luhmann's work by way of Kenneth Burke and Actor Network Theory. Defining the complex systemic nature of professional communication in terms of human agency is critical to the development of technogenetic rhetoric.

2.1 Technology

Heidegger's concept of enframing, a calling of attention to the underlying truth or form of things as the essence of technology, ironically aligns with the most pressing question society has concerning technology: is it good or bad for us? Technology pundits such as Nicholas Carr (2012) believe hypermedia available over the Internet is degrading our ability to focus on complex tasks while others such as Stephen Johnson (2005) see only positive changes in the brain as we adapt through neural plasticity. The debate rages on with one side looking backwards at our pre-Internet practices of linear task completion, our ability to focus on the solution of complex problems with unwavering concentration, while the other looks forward to an increased ability to multitask forming lateral connections of ideas that lead to greater innovation. Theorists such as Clay Shirky (2010) believe digital communication media create psychologically and socially beneficial uses of our cognitive surplus, while Philosopher Bernard Stiegler (2010) feels we are letting down the younger generation by allowing digital media to appropriate the role of caregiver creating a "battle for intelligence" (16). One side believes we are getting smarter and the other that we are losing our cognitive ability to engage in deep attention. The debate itself, however, as Cathy Davidson (2011)

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feels, is moot; the Internet is here to stay, whether it is good or bad for us is not the question we, as teachers of professional communication, need to be asking. As technology enframes the underlying core of our professional practices, we need to be asking how and what do we teach that will help a person succeed in a system of hyper-communication.[3]

Organizations are constituted by communication and operate as autopoietic operationally closed systems in an environment of human beings, themselves autopoietic operationally closed systems of consciousness. Individual members of an organization are incapable of pure communication. Thought is not directly transferable into language; nor language into thought. Communication exists as the non-material, although not formless, substance of an organization (Luhmann 1996). Communication technologies have changed the *density* of organizations through ever faster modes and ever more prolific media. Communications--as a letter delivered by messenger on horseback, carried as telegraph sent through a pneumatic tube in the nineteenth century, as a telex in the mid-twentieth century, or as an email in the early twenty-first century--constitute social systems and organizations. As technology has evolved, the quantity and speed of such transmissions has increased organizational density. The professional of the mid-twentieth century, opening the dozen or so letters delivered by

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[3] I am not suggesting that the debate over technology and intelligence is moot in an ethical sense, the debate is important and vital. I am suggesting that, in a pragmatic sense, teachers of professional communication have no choice but to function in an technogentic and epigenetic world.

the mail carrier, could work through the hermeneutic activities of production and reception of language as text in a linear manner, dealing with situations or problems one after another as ingrained by the predominant, Fredrick Taylor influenced, management theories of the day, where work was subdivided into tasks and processes (see Taylor, 1911). On the other hand, the professional in the twenty-first century struggles to maintain a linear path in her work while being deluged by hundreds of communications per day. This observation seems so banal and obvious that it is hardly worth discussing, but by taking a Heideggarian approach to the problem of the twenty-first century professional, technology brings forth the truth of the situation. Technological shifts uncover the manner in which we work. As Catherine Davidson states in Now You See It: "we had to be *trained* to inhabit the twentieth century comfortably and productively. Everything about school and work in the twentieth century was designed to create and reinforce separate subjects, separate cultures, separate grades, separate functions, separate spaces for personal life, work, private life, and all the other divisions" (13). Taylorism dominated workplace practices of the twentieth century. Tasks were identified and separated and then completed in a linear and orderly fashion. In professional management settings, theories such as management-by-objective, where agreed upon goals are linearly pursued, dominated the field. Technologies in the instrumental form of notebook computers, iPads, BlackBerrys, and Skype, have made such practices problematic. It is not that management-by-objective (MBO) strategies are now obsolete. Technology, however, has revealed the direction in which we worked, from goal back to plan, looking for a linear path that the sheer volume of communication makes difficult to

follow. In *Permanence and Change* (1935), Kenneth Burke invokes Veblen's (1914) theory

of "trained incapacity" as "that state of affairs whereby one's very own abilities can function

as blindness" (7); technology has in essence, revealed a degree of trained incapacity where

operational schemas such as MBO lose their inherent logic. In *The Philosophy of Literary*

Form (1974) expands his use of Veblin's concept to serve as a marker of opportunity where a

change in perspective (as through the lens of technogenetic rhetoric) reveal the "paradoxes",

or what I define as communicative complexity, are in fact opportunities to escape trained

incapacity (247).

The non-linearity of communication is made more complex by the existence of both

discursive and visuospatial rhetoric. Discursive rhetoric is familiar—the structure, form, and

strategy of arguments and appeals. Visuospatial rhetoric applies to the non-discursive

rhetoric of image and space; how we take in a visual scene; are moved by cognitive

perceptions of colour, movement, expectations, relationships, and so on. Visuospatial and

discursive rhetoric are combined in the rhetoric of the Nigel Thrift's "technological

unconscious" (2005), the unconscious extension of cognition into the world through

technology. The technological unconscious is the rhetoric of word and image in their myriad

forms, both visual and linguistic. Burke alludes to the discursive and non-discursive nature

of rhetoric by allowing for the addition of "attitudes" to the more traditional "propositions"

of rhetoric. Burke describes attitude in terms of the coming together of the symbolic and

non-symbolic:

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[a] *personal mediation* between the realms of nonsymbolic

motion and symbolic action. Its 'how' refers to the role of the

human individual as a physiological organism, with the

corresponding centrality of the nervous system,

ATTITUDINIZING in the light of experience as marked by the

power of symbolicity (1937, 394).

Technology as technological unconscious is both symbolic and non-symbolic by definition

and, in the case of visuospatial rhetoric; technology serves as a mediator in the formation of

Burke's "attitudes". Visuospatial rhetoric allows me to argue that every aspect of

professional communication is rhetorical in a non-discursive sense—the layout of an email,

the use of colour, space, graphics, as well as digital media such as streaming video.

Professional communication pedagogy must include strategies and methods for deploying

both discursive and visuospatial rhetoric. Modern communication technologies call for a

discursive and visouspatial rhetoric that moves beyond traditional and visual rhetoric to

become a key element in digital literacy (Murray 2009). A technogenetic rhetoric is called

for. The simultaneously discursive and visouspatial technological unconscious plays havoc

with the greater cognitive attention system, problematizing and making more complex both

the teaching and execution of professional communication. The following section details the

cognitive attention system and further develops and defines the technological unconscious.

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2.2 The Greater Attention System

Modern communication technologies simplify and speed production and reception, a simplicity that seduces through interruption; email, Linkedin, Twitter, the blinking BlackBerry Messenger light on my smartphone, and the ring of a Skype call, beckon while I write. The twenty-first century professional is seduced into what some deplore as superficiality and others champion as multitasking. As Davidson observes, we have always multitasked. If we did not we could not drive a car (signal, steer, brake, and follow a sports talk show on the radio), cook dinner for our family (dice for one dish as another simmers and a third sautés, all the while talking about geometry with a teen-ager doing homework), and so on. Whether or not multitasking is good or bad is less important than what it reveals about our professional activities. What technologically induced multitasking brings forth is the absolute necessity of accounting for the cognitive faculty of attention in the study and teaching of professional communications. The old adage that *perception is everything* needs to be amended to *attention is everything*. Todd Oakley (2009) summarizes the relationship between attention, perception, memory, and learning: "when we attend, we perceive. When we attend and perceive, we remember. When we attend, perceive, and remember, we learn" (25). The importance of attention may have been less evident when professionals answered letters and phone calls—linear, serial activities that rarely competed against each other for our attention. Even the classic mid-twentieth century businessman with twenty phone lines going attended to one call at a time. What attend to and how we attend to it define the

essence of the organization, making attention paramount to a technogenetic rhetoric of professional communication.

Catherine Davidson begins her book Now You See It with her experience of the now famous Harvard "attention blindness experiment". In 1999, psychologists Christopher Chabris and Daniel Simons devised an experiment that would highlight attention blindness. Subjects were asked to view a video of six basketball players passing balls back and forth. Three were wearing white shirts and three black. Subjects were asked to count the number of passes between white shirted players. While the players were passing basketballs, a person in a gorilla suit entered the shot and began thumping her chest. The vast majority of subjects do not see the gorilla (2011, 1-3). We become attentive to the task at hand and develop an attention blindness that prevents us from seeing significant events even when they are in our immediate perception. Davidson asks: "is it possible for a whole society to have attention blindness? We're so busy attending to multitasking, information overload, privacy, our children's security online, or just learning a new software program…that we haven't rethought the institutions that should be preparing us for more changes ahead" (12). The danger is that as teachers of professional communication we have developed attention blindness to the true essence of the technological developments that have increased the communicative density of organizations. It is not the hardware and software of communication technologies themselves, it is not a matter of the pervasive Internet sucking up all our attention and scattering it in tiny pieces to the point we accomplish nothing; nor is it particular modes or products such as social networking, text messaging, Wikipedia, and so

on. Communication technologies make undivided attention a challenge, but that does not mean that we should strive to return to a more linear, task oriented way of functioning. Even if it were possible, and for most of the digital generation, it is not, we would lose what technology is opening up for us, more efficient opportunities to establish identification and consubstantiality with other human beings in the form of communicative action towards common professional causes. What we need to establish are rhetorical strategies capable of engaging communication and hypermedia.

In his book From Attention to Meaning, Todd Oakley develops a model of what he terms, "The Greater Attention System" that consists of three individual systems: *signal, selection,* and *interpersonal* (26).[4] The signal system is composed of the *alerting* and *orienting* attributes of attention; the selection system is composed of the attributes of *detecting*,

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[4] I should note that the idea that a signal attention system operates in the mind is controversial. In her book, How We Think: Digital Media and Contemporary Technogenisis (2012), Katherine Hayles makes the argument that the vast majority of thought occurs in the unconscious mind. Hayles, is supported by social psychologists Ap Dijksterhuis, Henk Aarts, and Pamela K. Smith (2005) who believe that "strictly speaking, conscious thought does not exist. Thought, when defined as producing meaningful associative constructions, happens unconsciously. One may be aware of some of the elements of a thought process or one may be aware of a product of a thought process, but one is not aware of thought itself" (81). They go on to discuss the composition of a text: "Thinking about the article we want to write is an unconscious affair. We read and talk, but only to acquire the necessary materials for our unconscious mechanisms to chew on. We are consciously aware of some of the products of the thought that sometimes intrude into consciousness…but not of the thinking - the chewing – itself" (quoted in Hayles, 2012, 95).

sustaining, and *directing*, while the interpersonal system is comprised of the *sharing*,

harmonizing, and *directing* attributes (26). The three systems of attention "operate on a

continuum such that targets within the field of attention can occupy a place on a scale from

inactive to *active* to *salient*" (26). Salient items or situations are present in conscious thought

and require little cognitive effort, while active items are also in consciousness but require

more effort, and finally, inactive items require the greatest effort. Objects and situations

move towards the salient end of the continuum through the senses or from long-term

memory. The signal system represents our ability to distinguish signal from noise. Signals

may be situational, such as a car coming at you as you cross the street; the car is a visually

perceived signal from the visual noise of the scene in a figure/ground gestaltist manner.

Signals may also be cultural; Oakley gives the example of language; oral speech can serve as

a signal to which human beings are predisposed to attend, standing out from the other

acoustic phenomena in the environment, the noise. Oakley presents two axioms of the signal

system relevant to professional communication:

1. not all information is equally important and

2. different organisms are alerted to different items (27).

The first axiom is self-evident in terms of professional communication. The second,

however, requires modification; different professionals (as operationally closed mental

systems), as individuals and also as classes (chemical engineers, product managers, technical

writers) are alerted to different items and situations. The signal attention system "alerts" by

recognizing information in the form of objects, situations, and language, while it also "orients" information by placing the source and cultural context; in other words, the cognitive attribute of orientation decides what information is important. The subject line of an email sent to a sales manager that reads "URGENT: CUSTOMER WANTS TO CANCEL SALE" will alert and orient a signal that will quickly move along the attention continuum to salient. The rhetorical features of this line trigger that signal responsiveness—the visuospatial "shouting" of all-caps, the placement of *URGENT* as the first word in our conventional left-to-write literate attention sweep, labeling and framing the following sentence and the propositional semantics contained in both the label and the following sentence alert and orient the reader.

The selection system "detects" objects, situations, and language, moving towards or away from a signal on the basis of salience. The selection system deploys our cognitive ability to detect; "detecting is the process that initiates conscious execution of a task or set of tasks" (30). The selection system is put under duress by digital communication technology. The professional who receives two hundred plus emails on their smartphone, tablet, and desktop computer in addition to dozens of voice calls, voicemail messages, Skype calls, and text messages is putting her selection system into hyper drive. As Oakley states, "detecting facilitates mental processing of one task while inhibiting the completion of other tasks" (30). The professional must decide which messages to read and respond to at the expense of the others. The detection function of the selection system is crucial to a cognitive rhetoric of professional communication as it serves as a foundational process in the treatment of

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audience in my theory of cognitive rhetoric. The next cognitive attribute of the selection

system is *sustaining* of attention. Sustaining attention is the reduction in scope achieved

through focused concentration on an object, situation, or language and is challenged by

omnipresent digital communication. In fact it is the inability to sustain attention that Carr,

Stiegler, and others hold to be the greatest negative impact of digital media. In terms of

professional communication, sustaining focused attention is difficult in the presence of

smartphones and computers. The pressure to respond to emails and text messages

immediately makes it difficult to concentrate on the message of a live or online presentation.

Oakley presents two sub-categories of sustaining: "vigilance" and "search." Vigilance is the

continuous focus of attention on a situation; the example he provides is the constant attention

of a museum guard on patrons. Search is the continuous scanning for signals of a certain

type. Search differs from detecting in how cognitive effort is directed; in detection, attention

reacts to an exigence while in search mode, attention is dedicated to the observance of

signals. The search attribute plays a role in professional communication as digital media

produces constant signals to be scanned; the inbox, the flashing light on the smart phone, the

twitter feed, and so on. The final cognitive attribute of the selection system is "controlling"

of attention. There are two types of control, "switching" and "oscillating". Switching is the

conscious directing of attention from one exigence to another, while oscillating directs

attention from one exigence to another and back again; oscillating attention is the primary

mode of multitasking where, for example, the professional listens to a presentation while

reading and responding to emails while keeping an eye on the organization's Twitter feed.

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Attention engages the search and controlling attributes to oscillate between information. The sustaining function is held in reserve or engaged for short time periods as for example, when our professional reads an email and types a response; sustained attention is completely removed from the signal information coming from the presenter. The selection system is key to teaching professional communication strategies with both the producer and receiver of communication being taken into account. The selection system Oakley invokes is also closely related to a complex social systems view of organizations and human beings. The fact that we detect, sustain, and control signals demonstrates Luhmann's insight that only communication communicates. We perceptually attach ourselves to communication using attributes of the selection system; communication may be directed at us, but that does not mean we receive it. Reception is determined by the degree of structural coupling engaged by the mode in question, be it language, text, or visual. Cognitive rhetoric of professional communication should develop strategies of identification that increase the likelihood of reception.

The third system in Oakley's model of attention is the "interpersonal". The interpersonal attributes deal with the linking of minds in common action. The attention system must account for the operational closure of mental systems; how do we use attention to achieve common goals? The three cognitive attributes of the interpersonal system are "sharing", "harmonizing", and "directing". Shared attention is "the peripheral awareness of another" (34). Shared attention can be as innocuous as watching a movie in a crowded theatre, but it is also a requirement for identification and consubstantiation. In order for a communicative

event to be successful, both producer and receiver need to have dedicated sufficient attention to the information. Shared attention occurs during a conversation and also, to certain extent in the composition and reading of text. The writer dedicates attention to the production of the message while the reader to the reception; simultaneity is not necessary for sharing. Writer and reader are sharing attention to the information, but how the information is understood cannot be shared as a result of Luhmann's double contingency where communication is contingent upon both production and reception (discussed in detail below). Shared attention, while shaping and facilitating meaning, does not lead to meaning in a deterministic manner. Meaning requires the second cognitive attribute, harmonization or joint attention. Oakley (with help from Tomasello, 1999) argues that "children do not develop language and symbolization without being able to (1) know that others are subjects of experience, (2), maintain an interest in them as subjects, and (3) track the attention that others pay to objects or subjects in the environment. Human attention requires the harmonization of minds onto a focal item of attention" (34). Oakley uses the word *harmony* as the metaphor for meaning or what Luhmann terms understanding. The professional in our example will not generate understanding of the presenter if she does not share common background knowledge, values, terminology, and so on. In order to gain shared and harmonized attention, one must be able to deploy the third attribute, the directing of attention. The presenter in my example attempts to direct the attention of the listener/viewer through non-discursive elements of vocal tone, pace, volume, as well as through the use of visual images in the form of a PowerPoint display. The interpersonal system conceived by

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Oakley aligns with my use of Luhmann's complex social systems theory and Burke's conceptions of identification and consubstantiality in developing cognitive rhetoric of professional communication. Oakley's model accounts for the division that exists between human beings as operationally closed mental systems; the signal, selection, and interpersonal attention systems presuppose minds incapable of pure communication and that communication must engage the three systems of attention in order to be effective.

For example, let's look at how attention and mental systems engage in the production and reception of an email message. The producer of the email coalesces thought into language through thought signals that alert and are oriented by the signal attention system of the conscious mind. The selection system detects the relevant signals and sustains attention towards a coherent textual message while the controlling attribute avoids moving to other foci of attention. The interpersonal system engages rhetoric to imagine strategies of delivery, argument, and figuration. The communication is developed through an enactive engagement of perception; the touch of fingers to keyboard and vision that scans and corrects the text being digitally produced. Once composed the communication exists in digital bits that are no longer a part of the mind of the mental system that produced it. The communication as bits are sent via the Internet to the inbox of the intended recipient who, alerted to the information, orients the signal of the computer's ping, engages the selection system to detect the message among others in the inbox, and sustains attention long enough to determine whether she needs to control her attention by blocking out other signals. Finally, she reads the message. If the communication is rhetorically effective, harmonization will occur leading to

identification and consubstantiation between the two individuals in terms of the information put forward. Harmonization that leads to identification can no longer be controlled by the sender (as opposed to harmonization achieved through a conversation that is still subject to the three systems of attention, as a dialogue of rapidly produced communications) and is subject to the operation of the receiver's systems of attention. The key cognitive attribute is the directing function of the interpersonal system where the producer attempts to engage the attention systems of the receiver with the goal of harmonized identification.

Language is a structural coupling medium between operationally closed mental systems; an attention system such as Oakley's model of signal, selection, and interpersonal is required to bring thought into consciousness as language. The greater attention system is the key to communication both in production and reception. Digital communication technologies frequently serve to make the directing of attention more difficult. Somehow the professional communicator, attempting to acquire funding for a project she believes crucial to the success of the organization, must rely on her own greater attention system to bring unconscious thought into conscious language and then attempt to direct the attention of another towards taking language from consciousness to unconscious thought. When viewed from a perspective of complex systems and attention, the task can seem impossible. Rhetoric—discursive rhetoric as argumentation and figuration, and non-discursive rhetoric as information design—shapes the way such a communicative exchange takes place. This is hardly an earth shattering idea. Organizing language, devising strategic arguments, and presenting visual images with rhetoric has been accepted as a method of persuasion for

thousands of years. I believe rhetorical argument as strategy and form have a cognitive

function similar to Oakley's attributes of attention. Before presenting rhetoric in its

relationship to cognition, I need to clarify the relationship between consciousness,

unconscious thought, and technology.

Nigel Thrift (2005) conceived of a relationship between technology and mind that presents

a starting point for my discussion. Thrift examines the notion of "position and juxtaposition"

of human activity—in other words, the space in which we exist and take action. This space

makes up what Thrift terms the "technological unconscious," where technology has

pervasively entered our lives to the extent that it is out of direct conscious cognition.

"Whereas 'computing' used to consist of centers of calculation located at different sites," he

says, "now, through the medium of wireless, it is changing its shape...computing is moving

out to inhabit all parts of the environment..." (3712). Sim cards in cell phones, global

positioning software, and mobile wireless hotspots expand the space of work and by doing

so, change its temporality. The workday is no longer eight hours long; communication

technology makes one available 24/7. Even if the computer is shut down and the smartphone

silenced, the attention system unconsciously, and at times consciously, fires up the cognitive

attributes of vigilance and search of the selection system. The technological unconscious is

created by unseen or unnoticed technologies, which function largely outside of

consciousness, but are a part of our cognitive activity. The technological unconscious serves

working memory through databases such as the smartphone address book and calendar, but it

also stresses the attention system. When communication is ever-present and continuous the

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attention system does not truly shut down. Before BlackBerrys, Twitter, and tablet

computers, the majority of professional communication occurred in the physical workplace,

the office. The physical space of work was defined and the actual space of the organization

formed through communication, now, the physical space of work is largely superfluous and

the actual communicative space has extended to everywhere the professional and her

technology reside. The technological unconscious aligns with theories of enacted and

extended cognition. Our cognitive attributes are distributed creating cognitive action that

occurs interactively with technology, an interaction that is altering the manner in which our

greater attention system is engaged. As both Hayles (2011) and Swift (2005) point out, the

technological unconscious has always existed and it has always placed a strain on our

cognitive abilities. Both authors give the example of the strain placed on an individual as

they rode the first passenger trains in the nineteenth century; a person accustomed to the pace

of a carriage could not cognitively deal with the speed at which the landscape passed through

the visual system. Catherine Davidson (2012) gives the example of the fears some had for

the operation of the automobile requiring the driver to steer, shift, watch the road, watch the

fuel gauge and so on. We can project very similar scenarios back to the domestication of the

horse, the harnessing of fire, and so on. The technological intervention in the 'natural' world

brings with it cognitive demands that go beyond what our minds evolved, in nature, to

encounter. The technological unconscious also develops cognitive ability as Stephen

Johnson (2005) points out in his example of the increase in narrative and plot complexity in

television shows. Cognitive abilities adapt and shift as a result of the technological

unconscious. It is yet to be seen whether the ubiquity of communication in our professional lives will have peripheral effects on social relationships and identity.

In addition to the greater attention system and technological unconsciousness, another important element of professional communication pedagogy is what Katherine Hayles (2007) terms "cognitive style". Hayles sees a generational shift in the manner in which we engage the greater attention system; networked media has lead to a predominantly hyper versus deep attention style in the first generation exposed to digital media for most of their life, individuals born after 1987 or "Generation M" (187). Deep attention is the ability to concentrate on an item or situation for an extended period of time. Hayles gives the example of reading a Dickens novel. Hyper attention, on the other hand "is characterized by switching focus rapidly among different tasks, preferring multiple information streams, seeking a high level of stimulation, and having a low tolerance for boredom" (187). Deep attention is required for the solving of complex problems, developing strategies, and internalizing complicated material. Hyper attention "excels at negotiating rapidly changing environments in which multiple foci compete for attention" (188). Hayles highlights the problems that develop when an education system built around activities of deep attention is attended, or more to the point, not attended by a generation that prefers hyper attention to the degree that they are almost incapable of deep attention. Both deep and hyper attention involves the controlling attribute of the selection system of the greater attention system. Hyper attention engages the switching component of the control system, the individual engaged in hyper attention is able to switch focus from one item or media to another in a

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seamless fashion, sustaining attention sufficiently to acquire the thread of meaning before switching to another item and focus. The inability to sustain attention on one medium, however, reduces how much information enters working memory to be used in more complex cognitive activities such as association and synthesis.

   The conference call may be producing information crucially important to a strategy of product development, but the hyper attentive style has caused the professional to not internalize information into working memory that could have led to a breakthrough idea. Deep attention also involves the control element of the selection system, but relies on the cognitive attribute of oscillation.   Oscillation is similar to switching, as it moves focus from one item to another, but differs in that the movement occurs within one domain. In our conference call example, the professional maintains sustained attention on the information in the call, but moves attentive focus from one element to another. For example, the professional attends to a suggestion by the speaker for a price reduction program allowing it to enter working memory; attention then oscillates to a report on the negative effects of a price reduction on customer loyalty produced by an internal department. With both related items in working memory, long-term memory is accessed to recall a previous meeting with the vice-president of sales in which she voiced disdain for a price drop. The professional synthesizes the information into a recommendation against the price reduction. Oscillating attention, within the control component of the selection system, lead to the solving of a problem.   I am not arguing that one style is better than the other (for good-versus-bad arguments, see Carr, 2010, Stiegler, 2011, Johnson, 2005, Shirky 2010); both styles have

their advantages and disadvantages. The key is being able to move from one to the other as required by the exigence of the situation. The pedagogical challenge, as Hayles presents, is in teaching a generation seemingly incapable of deep attention. There is also a challenge in what and how to teach rhetorical strategies that engage deep or hyper attention.

A greater attention system enactively engaged with a technical unconscious, drawn to a hyper attentive style presents a number of pedagogical challenges. What manner of rhetoric will provide the basis of effective communication in an environment and organizations, constituted by communication, and members incapable of accessing the thought and minds of one another? Communication, a product of unconscious thought coupled with language and a technological unconscious, exists apart from rational exchange. In other words, once a communicative object is crafted it is at the mercy of the receiving mind in terms of understanding. The rhetoric suitable to such an environment must be linked to the cognitive attributes and affinities of both producer and receiver. It is not enough to consider purpose and what an audience will be amenable to (although this is still important). The professional requires knowledge of the forms of language and image that provide the best opportunity for mutual understanding between producer and receiver in this new environment. It is indisputable that rhetoric as argumentation and form are inherently cognitive in nature. We are more attracted to messages that have been rhetorically constructed to leverage the cognitive dispositions of the human mind.

Communication and attention take place in an environment of human and social systems. The next section outlines Niklas Luhmann's theory of social systems and its relationship to rhetoric, specifically Kenneth Burke's conceptions of identification and consubstantiality.

2.3 Organizations and Human Beings as Systems

Niklas Luhmann's social systems theory holds that individual members do not define societies. Social systems theory does not view society, and by reduction organizations, by their members but by their events, or what actually happens (Moeller 2006). These events manifest through communication. Communication can be linguistic, but also more generally symbolic; paying for a sandwich at the cafeteria is a form of economic communication that is constitutive of the economic system. Human beings are required for communication to take place, but they sit outside of communication itself. "[H]umans cannot communicate; not even their brains can communicate; not even their conscious minds can communicate," according to Luhmann. "Only communication communicates" (1994, 371). For example, in Luhmann's framework, this dissertation is not a direct transcript of my conscious thoughts. I am incapable of transferring my consciousness directly onto the page or through speaking. You only have access to the content on the page as a communication. Your reactions to my thesis, written or verbal, are not direct transcripts of your conscious thought. Eva M. Knodt, in her forward to Luhmann's Social Systems, describes the inability to access the mind of another as the "hermeneutic despair", common sense tells us we understand another person only in an incomplete and partial sense. Luhmann scholar Hans-Georg Moeller adds that "we can, in communication, only connect to the communication of others, but never to their

minds or brains, much less to the 'human being' as such in any given case. While

communication cannot take place without human beings, human beings are, paradoxically

enough, still totally inaccessible within communication" (2006, 9).

   Kenneth Burke observes the same paradox in <u>A Rhetoric of Motives</u> when he writes of the

individual's desire to *identify* with others as way of bridging the *division* of individual minds

(1950, 19). In a sense, Burke's belief in rhetoric as the architectonics of symbol use that

leads to consubstantiality where two or more people identify with each other's interests and

are in substance both together and separate is an answer to the hermeneutic despair Luhmann

offers. In fact, as a program, cognitive rhetoric has as an objective the establishment of

rhetoric as an architectonic and a framework for harmonization. As we explore Luhmann's

conception of the individual, organization, and communication, we will find that Burke's

conception of rhetoric serves a cognitive function that eases this dilemma.

   Luhmann establishes three types of systems: psychic (or mental), biological, and social

(organizational). Each of the three systems serves as environment for the other two. They

exist as a trinity with no system sitting hierarchically above or below the other. Physical,

mental and social systems require each other for existence. Mental systems consist of

consciousness; biological systems are made up of cells, organs, etc.; social systems as

organizations consist of communication. The contents of the first two systems are self-

evident, but communication as the content of a social system seems counterintuitive. In

order to grasp the system-as-communication argument Luhmann puts forward, we have to

look at the self-organizing autopoietic nature of the three system types. Autopoiesis is a

concept developed by biologist Humberto Maturana that explains how living organisms are products of their own activities. His research partner Francisco Varela describes autopoiesis:

> A living system is an organization that preserves itself as a result of its organization. How does it do this? It produces components that produce components that produce components. This is no mystery: enzymes produce enzymes. The boundary of the cell is its membrane. The membrane again is a process that limits the diffusion and thus preserves the internal network of production that produces the membrane. Everywhere you see systems that exist due to a kind of Munchhausen-effect: they manage to grab themselves by the hair and pull themselves out of the swamp...This is the case in many areas. [Biological] autopoiesis is only one example. Other examples are language, and, possibly, families, firms, etc. (1997, 148-49)

The concept of autopoiesis applies to all self-organizing systems. There is a large body of research on the autopoietic nature of organizations (Magalhaes and Sanchez, 2009, Zelney, 2005). Organizations exist and are preserved as products of their components. Where autopoietic theory of organizations differs from traditional organizational theory is in the make up of these components. Traditional theory takes either a humanistic or scientific

approach, both of which place the subject as the key component (Weber, 1978, Taylor, 1911, Mayo, 1949). Max Weber places the individual subject in a bureaucratic hierarchy that presupposes rational action and division of labour. Fredrick Taylor studied the processes engaged by individuals in a scientific, and reductive manner, while Elton Mayo studied the psychological foundations of human behavior in a group setting. Autopoietic organizational theory diverges from this tradition most dramatically by removing the individual from the equation. Organizations are not collectives of individuals, in this view, although individuals are necessary for organizations to form. Organizations are self-organizing entities that arise and reconfigure as a result of their own activities. Magalhaes and Sanchez define the autopoietic perspective on organizational structure in these terms: "*organization* means necessary relationships or network of rules that govern relations between system components and that thereby define the system conceptually. *Structure* means the actual relations between components that integrate the system in practice and that satisfy the constraints placed by the *organization*" (5). The system, as constituted by communication replaces human beings as the key self-organizing components in an organization. In his classic essay "The Autopoiesis of Social Systems" (1986), Luhmann describes how the system is defined by communication:

> Social systems use communication as their particular mode of
> autopoietic reproduction. Their elements are communications
> which are recursively produced and reproduced by a network
> of communications and which cannot exist outside of such a

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network. Communications are not 'living' units, they are not

'conscious' units, they are not 'actions'. Their unity requires a

synthesis of three selections: namely, information, utterance,

and understanding (including misunderstanding). This

synthesis is produced by the network of communication, not by

some kind of inherent power of consciousness, or by the

inherent quality of the information. Also - and this goes against

all kinds of 'structuralism' - communication is not produced by

language. Structuralists have never been able to show how a

structure can produce an event. At this point, the theory of

autopoiesis offers a decisive advance. It is the network of

events which reproduces itself and structures are required for

the reproduction of events by events (174).

When Luhmann says that communication is not "produced" by language, he is referring to

the genesis of thought into language, or in other words, how communication actually comes

about. Most linguists do not view language as thought; language serves a scaffolding role

that is never a complete reproduction or translation of thought (Pinker, 2007, 77-83). For

Luhmann, communication cannot be "preprogrammed" by thought. Communication depends

on situation and previous communications; communication requires "self-reference" (1986,

174). Viewing communication as the constituting elements of, and not the products of, an

organization has serious ramifications for the process theory of professional communication.

Some may even find these ramifications alarming: if communication is not produced by language, is it possible to teach the process of professional communication/composition? Perhaps not. But I contend that an understanding of autopoiesis opens a number of other, richer, pedagogical possibilities which move away from composition process towards (or back to) a pedagogy based on rhetorical argumentation, figuration, and information design that aligns with the enframing nature of technology that serves as medium for organization constituting communication. Such a view of communication opens the door to new pedagogical structures, structures that move away from lecture/workshop constructions towards networked simulation "games" that embrace the contingent nature of communication. Chapter four develops such a pedagogical structure in detail.

In addition to being self-organizing systems of communication, organizations are also operationally closed; the operations of an organization are what distinguish it from its environment (Luhmann, 2013, 63). Without operational closure the organization does not exist. Operational closure allows the internal components or structures (processes and procedures as communication) that interact to create and maintain the organization to evolve in a recursive fashion; processes and procedures can change, be discarded, and invented new without altering the substance of the organization (Magalhaes and Anchez 6). The processes and procedures that form the operating components of the organization are, in substance, forms of communication. Every request for a meeting, presentation of new product features, legal brief, and scientific report is part of the substance of the organizing components of the organization.

Systems construct their own reality through the self-organizing autopoietitc activities

described above. Reality is not a representation of an existing external world, but a

construction created by operational closure of the system. In other words, in creating and

maintaining its own existence, a system creates its environment. For example, an

organization, as social system creates its own existence everyday through its activities; the

products or services it produces, the communications created by its member human systems;

and its structural coupling with other systems (such as the functional economic system) bring

the organization into existence and in doing so create its environment of other systems

(customers, stakeholders, employees and so on). Autopoietic theory follows the enactive

model of cognition that mediates between modular information-processing views of the mind

and connectionist views of globally distributed states in the mind. Francisco Varela, who

developed this approach with Evan Thompson and Eleanor Rosch, describes enactive

cognition as negotiating the "middle path between the Scylla of cognition as the recovery of

a pregiven outer world (realism) and the Charybdis of cognition as the projection of a

pregiven inner world (idealism)" (172). The term *enactive* refers to the perceptually guided

action of the perceiver in her own local situation.   The term *enactive* refers to the

perceptually guided action of the perceiver in her own local situation. For example, in terms

of a person viewing a rose, a cognitivist (realist) would find sensory input being computed by

the brain/mind to represent the rose as it objectively exists in the world (see Newell &

Simon, 1976). An idealist would follow a methodological solipsism that finds the

representation formed in the brain/mind of the viewer has nothing to do with the rose in the

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objective world. The rose in the world and the rose in the mind cannot be connected; one is a

plant and the other a mental state. An enactive approach entails a meeting of perceptual

stimuli and a history of structural coupling, in other words the rose in the world is

represented in the mind through the intersection of perception and context.   It is the

embodied engagement of the perceiver with the material world, and not the internal or

external representation of a preexisting world that drives cognition. Cognition is the

coupling of the world with human systems of perception; perception and the world are

interdependent. The enactive cognition created by operational closure is key to

understanding that communication is the coupling medium between mental systems, and by

default social systems as organizations, and not a direct connection of one mind to another.

   Niklas Luhmann names the linking of system to system and system to environment

"structural coupling". Organizations as communication systems are structurally coupled to

mental systems of consciousness that in turn are structurally coupled to biological systems

(Moeller, 2006, 18). Moeller defines structural coupling as "a state in which two systems

shape the environment of the other in such a way that both depend on the other for

continuing their autopoiesis and increasing their structural complexity" (2006, 19).

According to Luhmann, mental systems structurally couple via language:

> One cannot imagine that a consciousness could have evolved
>
> without communication. Similarly, one cannot imagine that
>
> there would be meaningful communication without
>
> consciousness. There must have been a kind of coordination,

that, because it relates to different forms of autopoiesis, lead,

on the one hand, to an increase of complexity within the realm

of possible mental contents and, on the other hand, within the

realm of social communication. It seems to me that this

mechanism of coupling is language. (Quoted in Moeller, 2006,

19; Moeller's translation).

The coupling of language and consciousness is not a coupling of one mind to the other; one mental system heuristically distills its own thought into language while the other interprets perceived sounds or marks to form meaning in an effort to ward off hermeneutic despair. Kenneth Burke had a similar insight when he found terminology to be a "*reflection* of reality, [and] by its very nature a *selection* of reality; and to this extent a *deflection* of reality" (1966, 45). Burke's reflection, selection, and deflection of reality bundled together represent enaction.

Social systems theory—with autopoietic operationally closed mental systems serving as the environment for autopoietic operationally closed social systems of communication—presents a challenge to technogenetic rhetoric of professional communication; human beings as mental systems formulate communicative acts and objects that do not mirror thought. Just as the narrator in Theodore Dreiser's Sister Carrie says of language, "how true it is that words are but vague shadows of the volumes we mean" (5), Luhmann finds that language as "...structural coupling, excludes a lot in order to include very little..." (2013, 87). Human beings perceive communications that are but vague shadows of the speaker's thought by

formulating thoughts that in turn can never be directly relayed in a return communication creating an endless, or at least as long as the communication continues, chain of self-referential communications. Similar to Derrida's notion of a word dragging a chain of signifiers behind it, language faces an unending contingency. To add to the uncertainty, this coupling via language runs along a very narrow plane; only certain specific sounds serve as aural language and very specific marks serve as written language. Communication is contingent in terms of understanding; the meaning intended by a speaker or writer is contingent on the mental hermeneutics of the listener/reader. Luhmann's version of speech act theory attempts to account for contingency by including "understanding" in a triad with "information" and "utterance" (2013, 215). The elements of the triad can be defined individually, but in practice they operate as a unity. Information is the content of the utterance and as such is a selection of thought while understanding or misunderstanding is the outcome of the linguistic structural coupling. Teaching the art of converting thought into information and then formulating an utterance that creates understanding through the poiesis of technology is the pedagogical challenge. The autopoietic operationally closed system perspective of individuals and organizations where communication is not a direct transmission and is contingent on heuristics of closed mental and social systems presents an even greater challenge in an omnipresent environment of attention-splintering and memory-blunting digital media. This challenge, however, is also liberating. Developing new pedagogical strategies based on networked simulation mirror the contingent nature of communication while reopening avenues of instruction obstructed by technology. The

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lecture is not suited to teaching professional communication that is contingent and distorted by technology and the technological unconscious; the connection between theory and practice is difficult to express in a lecture context. Creating a context that aligns theory and practice in a networked simulation game creates far more effective teaching moments. The next section explores the space of organizations.

2.4 The Space of Organizations

Social systems, autopoiesis, operational closure, and structural coupling provide a theoretical basis for the space of professional communication. Communication, as the product of the network of a system, opens spaces that fill with recursive formations of information, utterances and (mis)understandings. These spaces form, expand, entrench, or disappear. Sidney Dobrin in his book Postcomposition, seeks to move the study of writing (utterances in Luhmann's triad) away from a subject-centred pedagogy towards a focus on writing itself. He employs the metaphor "occupation" to describe how writing forms and occupies space. For Dobrin, writing "saturates" the "cultural, historical, and political space it occupies" (56). Writing alters space, but also limits what can be written in terms of content; a personal message written by a lawyer to her husband does not occupy the space of a firm functioning in the legal social system. It is in the conflation of content and space that Dobrin sees as the root of a focus on the subject in composition studies:

> Content is subject matter, the matter of the subject, denoting
>
> both power of the subject over the matter/the content and the

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makeup of the subject. The matter of the subject, the subject's

matter, is that which composes the subject, and too often in

composition studies, writing is understood in this way, as

matter of subjects, as materials or substances of subjects (57).

Dobrin makes the case in <u>Postcomposition</u> for writing as an object separate and distinct

from the subject. Without ever directly referring to Luhamnn and social systems theory, he

establishes much the same argument that writing/communication manifests outside of the

individual. Language that forms in the mental system of the individual is not thought itself,

just as language as sound or marks on a screen/page is not a direct conduit to the thought of

the speaker/writer. Language becomes communication that serves a social

system/organization's mode of autopoietic reproduction. The essence and space of a social

system is produced through communication.

An organization is the formation and deformation of these spaces by professional

communication. For example, what is a law firm? Is it the three floors in the office tower on

Bay Street? Or is the firm the individual lawyers that occupy the offices on those floors?

Let's say there are two hundred lawyers in the firm. Common sense says that this group of

people practicing law together is the firm. The key words in that definition, however, are

"practicing" and "together." Without either one, the two hundred people are simply lawyers.

The lawyers are participating in, what Luhmann defines as the functional social system of the

law, as well as the economic social system, but what makes them a firm is the

communication that must take place in order to "practice" law "together". The firm is the ongoing formation of communicative space in the form of written briefs, spoken arguments, meetings, presentations, customer bills, and hallway hellos. The quality of the firm is the quality of its communication and here the dilemma for teachers of professional communication becomes clear; information is uttered and understood or misunderstood in a space and manner that is completely outside the direct control of the utterer and the uttered-to. None of this is really new information to the student of rhetoric; rhetoric exists, as I.A. Richards believed, to "be a study of misunderstanding and its remedy" (1965, 3). Whether one employs the metaphor of scaffolding or structural coupling, rhetoric is the art or method of forming intricate but accessible scaffolds or seamless and easy fitting couplings. The metaphors of scaffold and coupling are insufficient, however, to describe the interpersonal effects of communication as the substance of systems and formulator of understanding within the enframing essence of technology. The more suitable pair of terms is Burke's "identification" and "consubstantiality". Identification is a better term than the biological "structural coupling" for the motivated linking of mental systems achieved through communication. Identification presupposes action; a missing element in Luhmann's theory, while consubstantial describes the formation of a system's mode of autopoietic reproduction and structural coupling of separate systems. Before describing the incorporation of these terms further, we need to discuss Jürgen Habermas' theory of communicative action to bridge the problem of motivation in Luhmann's general systems theory.

2.5 Communicative Agency and Social Systems Theory

Jürgen Habermas and Niklas Luhmann debated the constitution of society throughout the 1970's, 80's and 90's. Luhmann, as discussed above, views society as a collection of mental, biological, and social systems constituted by consciousness, life, and communication respectively. The individual subject resides outside of society itself; subjects as operationally closed mental systems serve as the environment for social systems of communication. Systems theory focuses on the communicative events that form society (Moeller, 2006, 6). Habermas, on the other hand, views society as constituted by the actions of its subject members. Individual subjects establish social relations through communicative actions. Communication is front and centre of both models of society; for Luhmann, communication drives human action, while Habermas believes human action drives communication. For Habermas, it is "through this *communicative practice* [subjects] assure themselves at the same time of their common life-relations, of an intersubjectively shared *lifeworld*" (1981, 6). The concept of lifeworld partially aligns with what Luhmann terms "environment," but unlike the notion of environments consisting of other systems, it serves a communicative function; "[the] lifeworld is bounded by the totality of interpretations presupposed by the members as background knowledge" (13). The lifeworld serves as the environment of subjects and consists of commonly held beliefs that enable communication. Luhmann did not disagree with the idea of lifeworld as a space of common ground, but he found a paradox in Habermas' conception; how could lifeworld be both ground (context) and also the horizon (world)? Luhmann reconceived lifeworld into familiar (ground) and unfamiliar (horizon) as

a way of retaining the space of context with the ever-moving future contingencies of the world (Kjaer, 2008, 70). Even though his theory is named "Communicative Action", Habermas (1981) does not equate action with communication, "language is the medium of communication that serves understanding, whereas actors, in coming to an understanding with one another so as to coordinate their actions, pursue their particular aims" (101). In other words, to restate Habermas somewhat reductively, subjects are "motivated" by personal self-interest to *rationally* cooperate with other subjects to form a society. The enlightenment concept of rationality is foundational to Habermas' theory. Individual subjects take action by "[mobilizing] the rationality potential" to form "validity claims" where statements are true or at least rationally proposed through argument, align with the appropriate context, and represent the true intentions of the speaker/writer (99). Individual subjects actively form society through rational, self-serving communicative actions;

> actions regulated by norms, expressive self-presentations, and
>
> also evaluative expressions, supplement constative speech acts
>
> in constituting a communicative practice which, against the
>
> backdrop of a lifeworld, is oriented to achieving, sustaining,
>
> and renewing consensus – and indeed a consensus that rests on
>
> the intersubjective recognition of validity claims (17).

For Habermas, communications, as validity claims, can only continue through the practice of argumentation where "participants thematize contested validity claims" (18). The individual

subject is responsible for the success or failure of the communication. Luhmann places the production of meaning by communication above action. Once the communication is uttered the subject no longer controls the outcome;

> one introduces items of evidence first and sees whether anyone
>
> doubts them. If someone has doubts and good arguments for
>
> these doubts, one must assess what needs to be corrected in
>
> one's own theoretical edifice to take this other view into
>
> account (2013, 168).

In terms of rhetorical motivation, the opposition between action and meaning have important repercussions for cognitive rhetoric of professional communication. The two positions align with the two perspectives on the rhetorical situation. Luhmann, with his reflexive concept of communication, would be in agreement with Lloyd Bitzer who conceived of the rhetorical situation as an objective occurrence that provided three key elements that resulted in a rhetorical discourse: an "exigence", "an imperfection marked by urgency" (1968. 6), an "audience", and "constraints" made up of people, events, and objects that "have the power to constrain decision and action needed to modify the exigence" (8). For Bitzer, the situation is external to the mind and must provide all three elements to the rhetor before a rhetorical discourse can come into effect. In 1980, Bitzer simplified his definition of exigency to "a factual condition plus a relation of some interest", remaining external in nature (28). Habermas' action theory aligns with Richard Vatz's conception of the rhetorical situation

where a dependence on an external communicative event is not required. Vatz argues that exigency is created by the rhetor; the rhetor's choice of language characterizes the situation so that any "real" situation can only be a "translation" (157).   The rhetorical situation from the position of the subject becomes even more complex in a technologically unconscious world.

   Luhmann and Habermas are at once close and far apart in their theories of society; both view communication as foundational, both theorize a distinction between environment/lifeworld and system/subject; and both envision a form of argumentation as critical in communicative acts. The major distinction between the two is the place of the subject; for Luhmann it is defined by the social system and for Habermas it is society. Both theories have weaknesses, at least in terms of applying them to a cognitive rhetoric of professional communication; Habermas's conception of subject-driven action through communication in a lifeworld does not effectively define the space of professional communication in a digital world. While Luhmann's operationally closed, autopoietic social systems provide a workable definition of space, it is weak in describing how subjects as mental systems are motivated to engage in communication. Habermas deemed Luhmann's systems theory as metabiology, based on concepts unrelatable to sociology while Luhmann found Habermas's positioning of the subject as the constituting component of society an outdated humanistic old European viewpoint (Leydesdorff, 2000). Thomas McCarthy, in his essay, "Systems Theory: Complexity and Democracy", finds that if systems theory "is not connected with action theory, [it] becomes empirically questionable, a play of cybernetic

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words that only serves to produce reformulations of problems that it does not really help to resolve" (1991, 123). Fortunately, Kenneth Burke's concepts of "identification" and "consubstantiality", in the locus of human motivation, bridge the constructivist Luhmann and the humanist Habermas. Burke's ideas allow for an autopoietic space for professional communication while retaining the agency of the subject in terms of composition.

Burke's identification implies both action and reflexivity in that the human subject may persuade another to identify with her, or be persuaded by that other to identify with her; one acts and is acted upon. The very notion of identification implies division, as Burke writes; "one need not scrutinize the concept of "identification" very sharply to see, implied in it at every turn, its ironic counterpart: division" (1950, 23). Human beings are divided, operationally closed mental systems; "identification is compensatory to division. If men were not apart from one another, there would be no need for the rhetorician to claim their unity" (22). Burke identifies action in rhetoric, but also alludes to what Luhmann termed "double contingency", the limiting factor in terms of communicative action where a contingency exists in the linguistic scaffolding of thought into language on the part of the sender while a contingency also exists in the scaffolding of language into thought on the part of the receiver (1984, 104). In describing persuasion, Burke (1950) writes: "You persuade a man only insofar as you can talk his language by speech, gesture, tonality, order, image, attitude, idea, identifying your ways with his" (55). There is a double contingency here in terms of selection on the parts of the persuader and persuadee; being divided, neither has access to Burke's list of requirements for identification. Burke deals with the contingency

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problem by identifying the consubstantiality created by the attempt to achieve identification: "A is not identical with his colleague, B. But insofar as their interests are joined, A is *identified* with B. Or he may *identify himself* with B even when their interests are not joined, if he assumes that they are, or is persuaded to believe so" (20). One can become "substantially one" or consubstantial with another through rhetorical communication (21). It is Burke's concept of consubstantiality that bridges the gap between Habermas' communicative action and Luhmann's doubly contingent meaning. Substance, for Burke is a "way of *acting-together*" where subjects "have common sensations, concepts, images, ideas, attitudes that make them consubstantial" (21). The substance of these relations is communication that is at once acted and contingent. Even though these relations have substance, they manifest as substance-less communicative events, not actions taking place in a static lifeworld; communicative events constitute both the organization as system and the lifeworld of context and common knowledge. Relations between human beings are consubstantial, but they exist only in the operationally closed mind, although once expressed, they are the constitutive events of society and by default an organization. Burke helps answer how human agency operates in self-organizing, autopoietic, and operationally closed mental and social systems. Individual human subjects seek identification in order to obtain a sense of consubstantiality that in turn provides, to return to the biological metaphor, a structural coupling with inaccessible mental and social systems.

Burke provides a way of dealing with the problem of doubly contingent communication and agency, but offers limited aid in reconciling the role of technology and attention in

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communication developed through a technogenetic rhetoric. On a cognitive level, communication creates a sense consubstantiality that gestures at agency. I formulate and release an utterance as an act of agency while you receive, interpret and reply, also an act of agency. Hermeneutically accomplishing a sense of understanding leads to consubstantiation that affirms an agency that does not objectively exist. We are, in essence "actors" playing out a reality that is in fact a fiction. A fiction in the sense that we believe that *we* communicate with one another, while in reality it is only communication manifested in sound, sight, and touch that is capable of communicating. I cannot will your understanding. While perhaps not his intention, Burke provides a theory for our fictional feeling of agency in communication. Burke could not, however, have foreseen the role technology would come to play in twenty-first century communication. How does social media, web 2.0, or videoconferencing affect consubstantiality? Is the fiction of agency more or less visible? Michel Callon (1986), Bruno Latour (1987), and John Law's (1994), actor-network theory provides a perspective from which to begin to join technology, cognition, and rhetoric.

Actor-network theory (ANT) is notoriously difficult to define and for my purposes a comprehensive review of the theory is not required. There are, however, some key facets of the theory that help bridge the gap between consubstantiality and the technological unconscious. The term "actor" does not refer to a human communicative agent in the Habermasian sense. Actors include all social and mental systems, as well as the objects or things that participate in networks of activities. ANT treats human and non-human equally because "without the non-human, the humans would not stand a chance" (Latour, 2004, 91;

quoted in Fenwick and Edwards, 2010, 3). ANT investigates all points of engagement between human beings and technology. Latour (1987) uses the term "translation" to refer to the change that occurs in both human being and technological object when the two engage. A presenter on Skype or Go-To Meeting is fundamentally different than a presenter on a landline conference call or even a face-to-face meeting. We accept technology as an actor in a network when we attribute agency through personification. Skype is software, but when deployed it is more. It resides in the technological unconscious as a part of the whole that is communication. Skype *acts* as if it has agency; human beings and technology structurally couple and as the "personificationalist" cognition of the human mind couples with the object, Skype is "felt" to act. We launch the program and follow its direction without consciously acknowledging its intrinsic inertia. Skype without us is a string of zeros and ones on a piece of silicon, but we treat Skype as a "black box", something that has internal qualities too complex to consider while having an external relationship that allows for objectification (Latour 1987). The *presenter on Skype* is a translation of the individual and the technology; one is nothing, if not different without the other. According to Gunther Teubner (2007), personifying technology is a strategy for coping with uncertainty. Treating technology as a black box allows for a doubly contingent relationship. One does not know what is going on inside the technology, but understands the translation of technology and themselves. Personification of technology is most apparent through interactions with software agents. For example, Amazon, in the manner of a sales clerk, suggests books and tells you what others who purchased a certain book have also purchased. It is easier to personify the

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software agent, which is done unconsciously and manifested in not considering the fact we are communicating with computer code, than it is to reconcile the fact we are passing personal information to a machine.

ANT offers an entry point into interactions of systems, technology and human beings that reveals consubstantiality between communicators formed through technogenetic rhetoric that engages cognitive attributes and mechanisms of communication production and reception. A detailed engagement with ANT is found in chapter three.

2.6 Summary

A networked world is neither good nor bad, but a reality all teachers of professional communication must take into account. We live with a technological unconscious that covertly extends our cognitive abilities while seducing us with speed, accessibility, and quantity. We believe we are communicating more effectively because we are communicating more. But as Luhmann points out, operationally closed human systems cannot truly communicate; one cannot know the contents of another's mind, in fact we cannot know the content of our own mind until we move thought into language; only communication communicates. Communications are signals attended to, or not attended to by our greater attention system. I argue that a technogenetic rhetoric that engages technology, discursive, and visuospatial rhetoric with cognitive mechanisms such as attention is required to teach professional communication in such an environment. Also, how, as a professional communicator does one have agency in such an environment and how do we

teach communicative action? The answer to this question, I have argued, is found in the work of in his conceptions of identification and consubstantiality.   Finally, Actor-network theory provides a bridge between technology and human and social systems. The next chapter presents the rhetorical basis for a technogenetic rhetorical pedagogy of professional communication.
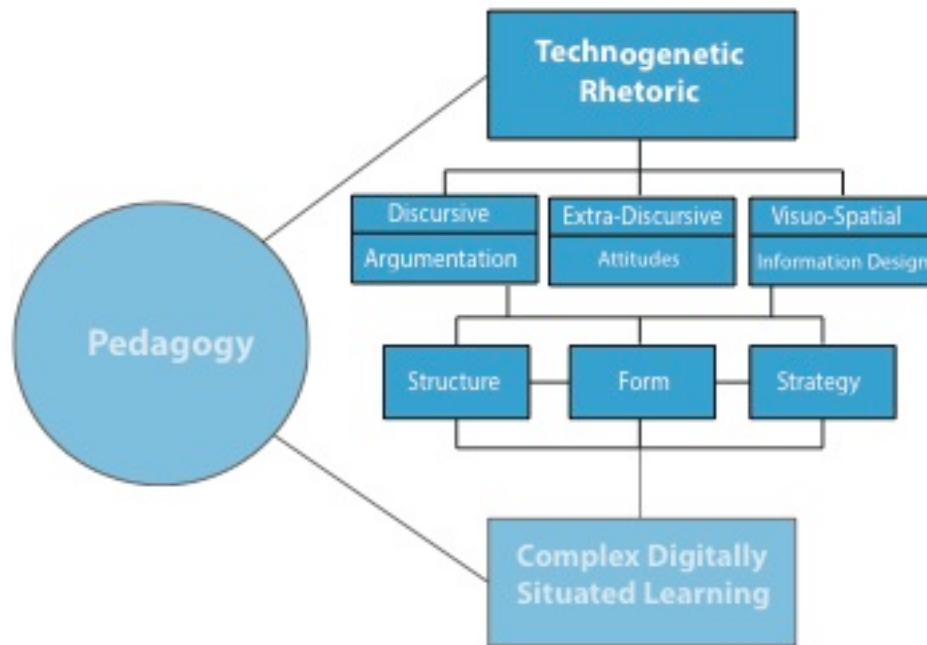
Chapter 3

The Discursive, Extra-Discursive, and Visuospatial Basis of

Technogenetic Rhetoric

The foundation of professional communication pedagogy consists of a cognitive and social

approach to discursive, extra-discursive, and visuospatial rhetoric. Discursive rhetoric is the

composition we all understand as teachers—the words, spoken and written, of communication. *Extra-discursive* refers to aspects of techno-cognitive rhetoric that exist outside of discourse and visuospatial rhetoric.[5] Visuospaitial rhetoric encompasses the non-linguistic, unspoken and unwritten conventions and appeals of visual communication. Discursive rhetoric, for my pedagogy, consists of argumentation and figuration as the primary drivers of identification based on evidence and logic. Visuospatial rhetoric serves as a primary driver of emotion, and attention. Discursive rhetoric entails meaning on a content level—words, spoken or written—but also on a formal level including figuration, genre, and format. Visuospatial rhetoric is not only limited to aspects such as typeface, colour design, tone, but also the use of tables, charts and graphs. Both discursive and visuospatial rhetoric involve the formation of mental images and appeals to various cognitive mechanisms. Extra-discursive rhetoric attempts to get at the effects technology on genres and formats. What I suggest in this chapter is not new; argumentation and figuration pre-date rhetoric as a field of study, and scholars have been studying the rhetorical effects of images for centuries. What I will suggest is a deployment geared to the multitasking, hyper-flow of information environment of twenty-first century organizations. Both discursive and visuospatial rhetoric

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[5] Nick Hardy (2011) uses this term for Foucault's description of the effects of power that are neither discursive nor ontological, effects that remain outside of language and objects of power. My use is both more general (not tied to issues of power) and more local (to the domain of rhetoric).

are applied to a triadic model of structure, form, and strategy. Structure serves as a scaffold for elements of form and strategy. Structure includes Stephen Toulmin's field-dependent theory of micro-argument as strategy for engaging dense fields of communication in a multi-tasking environment. Theories of figuration and figural logic will also be discussed as form and strategy for the engagement of attention and the reduction of attention blindness. Aspects of ethos, kairos, tone, leadership, trust, and especially affect are examined as extra-discursive, and finally, a theory of visuospatial rhetoric will be introduced that brings elements of technology, design, and sensory engagement to the production and reception of professional communication. All rhetorical theories are investigated in their relation to cognition, with a special emphasis on attention.

My conception of techno-cognitive rhetoric differs from the cognitive process work done by Linda Flower and John Hayes. Rather than focus on the processes writers engage in the production of a text, I engage the cognitive psychology scholarship of Dan Sperber and Hugo Mercier (2011) on argumentative reasoning to focus on the engagement of cognitive attributes, technology, and communication in an attempt to answer the technogenetic and ontological questions posed in the previous chapter As teachers of professional communication, we need to help our students align rhetorical strategies with cognitive mechanisms for argument, appeal to cognitive affinities such as association, repetition, and symmetry through form (figuration), and put conscious effort into the formation and reception of mental and visual images. In section 3.1 on discursive argumentation, I follow a review of argumentation in light of the Luhmann and Habermas debate on communicative

agency with a discussion of Sperber and Mercier's (2011) work on argumentative reasoning. I conclude the section with a review of Stephen Toulmin's model of argumentative logic as the structural basis on my pedagogy.   In section 3.2 on form, I explore the cognitive and argumentative aspects of rhetorical figuration and figural logic focusing primarily on the work of Kenneth Burke, Richard Gregg, Randy Allen Harris, and Jeanne Fahnestock. In section 3.3, I discuss the strategic argumentation strategies of Chaim Perelman and Lucie Olbrechts-Tyteca, as well as the argumentation schemes of Douglas Walton. Section 3.4 details the extra-discursive and visuospatial elements of technogenetic rhetoric.

3.1 Discursive Argumentation

   In Rhetoric of Motives, Kenneth Burke wrote that "wherever there is persuasion, there is rhetoric. And wherever there is 'meaning' there is persuasion" (172). Every professional communication is rhetorical in the sense that it contains meaning that influences an audience. Some professional communications are overtly rhetorical: a proposal for a new program, a statement that a proposed strategy will be ineffective, and so on. Other communications are not so obviously rhetorical—a meeting request, for instance, or an 'objective' marketing report, even a forwarded or cc-ed email. But rhetoric, the moves of influence, is just below the surface. Every communication is an argument on some level. When one gives an opinion on the skills of a coworker or relays information on the coworker's personal life to another person, the speaker is being rhetorical; the speaker is making an argument. Professional communication textbooks tend to separate rhetoric and argument from routine messages and research reports. I claim that even a routine message is rhetorical and, by

default, an argument. When a professional makes a meeting request, it always carries reasons (minimally, an implicit 'I want your presence in room x at time y'); when she composes a marketing report, she is making an argument based on the appeal of her expertise; when she ccs a person on an email, she is claiming that this person adds value to the communication. In order for such a broad application of rhetoric and argumentation to be accepted, I take as a given that arguments are not solely the result of conscious planning. For instance, genres argue; the scientific article format (IMRAD – introduction, methods, results, and discussion) argues inductively while parables argue analogically. Ideologies argue below the conscious level as they hail the subject. Digital media such as YouTube videos argue through a kind of "witnessing". Many arguments are consciously formulated, but thought originates in the unconscious; communication is the incomplete and imperfect product of the movement of unconscious thought to conscious language. The strategic dimensions of the meeting request genre are not often considered, but more times than not, they are interpreted by the recipient as an argument. The receiver consciously or unconsciously evaluates the stated or implied reasons, or in the absence of reasons, the credibility and character of the sender; is the sender reliable, do they habitually call useless meetings? Many unintended discursive and extra-discursive evaluations of logos, pathos, and ethos occur with every communication. In order to develop pedagogy that accommodates the evaluation of all professional communications, I will begin with a discussion of the philosophy and types of argumentation followed by an examination of the cognitive elements and effects and finally concluding with a description of an argumentation theory that incorporates the structure offered by Stephen Toulmin with

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the substance of Perelman and Olbrechts-Tyteca's new rhetoric to serve as a foundation for my professional communication pedagogy.

Before discussing the philosophy of argumentation, it is important to revisit the constitution of the organization. In the previous chapter, I presented the debate between Niklas Luhmann and Jürgen Habermas over the constitution of society. In terms of pedagogical application, I follow Luhmann's conception of the organization as complex, autopoietic operationally closed system, where communication is the constitutive element. Habermas contends that organizations are made up of subjects rationally cooperating in communicative action towards common goals. The technological unconscious, where communication technologies have proliferated to such an extent that the processes they provide have dropped below conscious awareness while remaining part of our everyday cognitive activities, has made Habermas' theory untenable. Technologically driven complexity has demonstrated Luhmann's conception to be more applicable for the teaching of professional communication. Individuals formulate communication that, once uttered, is the technological substrate subject to double contingency; contingency exists at the point of formulation, the movement of thought into language, and also at the point of reception, where language is interpreted into thought. Individuals as mental systems, subject to doubly contingent communication, are not what make an organization an organization; communication is. It is not communication *per se*, of course that makes an organization; all sorts of systems implicate communication. But the genres and structures and flow-paths of communication are what make an organization an organization, and what makes a particular

kind of organization (government, NGO, manufacturing plant, service industry) the particular kind of organization it is.

It is possible for an individual to control communication to the extent that Habermas' rational communicative action is probable. In some manner we do manage to achieve common goals despite the impossibility of direct communication with each other and as I suggest above, we do so through what Burke describes as identification that leads to consubstantiality, a sharing of substance where we are apart, but also together. Identification and consubstantiality are accomplished through communication as rhetoric where we craft language distilled from thought using strategies of argument and form. Burkean Identification is the missing bridge between Luhmann and Habermas in their conception of society, because it reduces double contingency. Rhetoric effects the movement of thought into language and language into thought by providing catalysts to cognitive attributes and affinities such as the affinity for repetition engaged in this sentence (*thought into language and language into thought*). Rhetoric as argumentation and form (form is also an element of argumentation as will be discussed below) creates identification across double contingency.

Despite disagreeing with a system model of the organization, Jürgen Habermas (1984) agrees that argumentation is the key to rational communicative action where individuals rely on "validity claims" that allow for consensus through rational argument. Gesturing at Wenzel's taxonomy of argumentation (1978), Habermas identifies three types of argumentation theory: "process" where the form of the argument takes precedence; "procedure" where the interaction between participants is the defining factor; and finally,

what Habermas defines as "producing cogent arguments" which translates to product, the transformation of opinion into knowledge (25). For Habermas, rhetoric is concerned with process, dialectic with procedure, and logic with product:

> The fundamental intuition connected with argumentation can best be characterized from the process perspective, by the intention of convincing a *universal audience* and gaining general assent for an utterance; from the procedural perspective, by the intention of ending a dispute about hypothetical validity claims with a *rationally motivated agreement*; and from the product perspective by the intention of grounding or *redeeming* a validity claim with arguments (26).

Habermas finds each perspective incomplete; "At no single one of these analytical levels can the very idea intrinsic to argumentative speech be adequately developed" (26). Rhetoric as process is concerned only with the efficacy of an argument regardless of validity; dialectic as procedure transforms validity into acceptability (Tindale 1999, 5); the products of formal logic are not applicable to the majority of everyday arguments, as they do not account for context and circumstance. While I do not believe that Habermas' conception of an organization holds in a world with an ever-expanding technological unconscious, I do agree with Habermas' views on argumentation. He contends that

it turns out that in the attempt to analyze the corresponding

basic concepts in the theory of argumentation – such as 'the

assent of a universal audience' or 'the attainment of a rationally

motivated agreement' or 'the discursive redemption of a

validity claim' - the separation of the three analytical levels

cannot be maintained (26).

Argumentation involves the process of form, the interaction of procedure, and the logic of

product. Chirstopher Tindale (1999) proposes that a rhetorical model of argumentation

provides the most comprehensive theory. Tindale describes attempts to synthesize process,

procedure, and product, focusing on pragma-dialectics (van Eemeren and Grootendorst 1984,

1992) where process and product are combined. Pragma-dialectics is rooted in the work of

John Searle and J. L. Austin on speech act theory and views arguments as a series of speech

acts defined by dispute where a proposition is expressed by a speaker and subsequent doubt

is expressed by a listener. The theory turns the speech acts of arguments into products

identified as speech acts while also defining a series of rules (that is, procedures) for speech

interactions involving disputes and arguments (Tindale 45). Douglas Walton (1989) also

offers a synthesis of procedure (dialectical) and product theories in his conception of

dialectical argumentation where "at least ten types of argumentative dialogue" are identified.

Pragma-dialectic theories provide a number of analytical advantages outside of the scope of

my development of pedagogy; pragma-dialectics presents a persuasion dialogue where both

parties attempt to present a thesis. Both are trying to persuade. Such a scenario does occur

often in a professional setting, but the implicature basis of the theory highlights the advantage of a rhetorical approach to argumentation. Mutually acceptable rules are required for pragma-dialectics that are subject to inter-subjective acceptability (62). In other words, dialectical and product theories separate or synthesized as pragma-dialectics require an unattainable connection of minds. They violate the rule of double contingency. A rhetorical theory, on the other hand, does not require conversational implicatures and are not subject to mutually agreed upon acceptability. In addition to dealing with audience, context, and situation, a rhetorical theory of argumentation assumes procedure and dialectic; it is, after all, the counterpart to dialectic. Rhetoric redeems validity claims through what Perelman and Olbrechts-Tyteca termed *quasi-logical arguments*. Rhetoric reduces contingency by providing form and strategy that form affinities for cognitive pathways to identification. Rhetoric is therefore ideally suited to professional communication pedagogy where the work of Perelman and Olbrechts-Tyteca needs to be combined with developments in systematic informal logic that include Stephen Toulmin's structural model and Walton's presumptive reasoning.

In order to develop a technogenetic pedagogy of professional communication, Perelman and Olbrechts-Tyteca's concept of audience and strategy for establishing grounds needs to be revisited in relation to Toulmin's field dependency theory and model of micro-argument and Walton's schemes of presumptive reasoning. However, before moving into philosophical and rhetorical discussions of argumentation, an analysis of research from cognitive

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psychology on the nature of reasoning and argumentation will help provide a cognitive ground.

In their 2011 paper "Why do Humans reason? Arguments for an Argumentative Theory", Dan Sperber and Hugo Mercier develop a hypothesis that links reasoning and argumentation. Sperber and Mercier find reasoning to be best understood as a function of human communication, and argumentation produces communication that is more reliable in terms of epistemic development. Sperber and Mercier support Habermas' claim for the preeminence of argumentation in reasoned communicative action. The difference between the two approaches is in the relationship between reasoning and argument; for Habermas, argumentation is the manner in which we use language to express reasoning (in other words, reasoning is a mental activity separate from and prior to communication); for Sperber and Mercier, reasoning is manifested in argumentation enabling communication to take place. "We want," they say,

> to explore the idea that the emergence of reasoning is best
> understood within the framework of the evolution of human
> communication. Reasoning enables people to exchange
> arguments that, on the whole, make communication more
> reliable and hence more advantageous. The main function of
> reasoning is *argumentation* (60).

Sperber and Mercier's theory is based on the *dual process* model of thought where thinking operates in two cognitive systems; System 1 on an unconscious level and System 2 on a conscious level (Evans 2007; Johnson-Laird 2006; Kahneman 2003). Sperber and Mercier offer their own version of the dual process model that contends, "…that the arguments used in reasoning are the output of a mechanism of intuitive inference" (58). Inference, as a cognitive mechanism, serves to "augment and correct information available to the cognitive system" (58). Inference mechanisms are distributed between a number of different cognitive domains and are unconsciously engaged; "People may be aware of having reached a certain conclusion – be aware, that is, of the output of an inferential process – but we claim that they are never aware of the process itself" (58). Intuitive beliefs form and move into consciousness as "reflective beliefs" where reasons are examined. This is what Sperber and Mercier define as "reasoning proper". They provide an example from rhetoric where we might look to the reason for accepting a belief to the ethos of the source (in their example, a professor). Reasoning proper is defined by a conclusion arrived at through the examination of reasons, or in other words, argumentation. As opposed to Habermas' conception of argumentation as the communicative method of deploying reason, Sperber and Mercier find reason to *be* communication as argumentation:

> The mental action of working out a convincing argument, the
> public action of verbally producing this argument so that others
> will be convinced by it, and the mental action of evaluating and
> accepting the conclusion of an argument produced by others

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correspond to what is commonly and traditionally meant by

reasoning (59).

Taking the model one step further, communication, whether mental or social, is essentially a form of reasoning as argumentation. There are speech acts that do not serve as argumentation--asking the time, commenting on the weather and so on--but all of the communication we deem professional in nature, from requesting a meeting as discussed above, to a marketing plan, is in essence argument.

Sperber and Mercier's model takes into account Habermas' foundational concept of validity claims with their theory of "epistemic vigilance"; the cognitive mechanisms of "trust calibration" (with their correspondence to theories of ethos) and "coherence checking" (with their correspondence to logos), developed in early childhood, serve to gauge the truth and validity of arguments (60). We are wired to evaluate arguments as a function of reasoning. These mechanisms are self-evident in the case of a dialogic exchange where the argument is overt, but are less engaged when communication is asynchronous and one-way (prototypically, in writing). In experiments, reasoning based on written information improves when the subject is made aware that the writing is meant to be an argument (Evans et al 1993). In some respects this work explains why the modality of text in print is so high while supporting Sperber and Mercier's claim that reasoning is in essence argumentation; reasoning improves when argumentation skills are engaged. Further experimentation in cognitive psychology (Perkins 1985; Kuhn 1991) has demonstrated that people are in fact naturally good at argumentation. Experimenters provided subjects a premise such as "Would

restoring the military draft significantly increase America's ability to influence world

events?" Results were initially poor in terms of quality of reasoning; more explanatory than

reasons or evidence based), but as participants were provided more information and became

more knowledgeable on the issue, arguments based on evidence were formed and reasoning

scores improved. When subjects were educated in argumentation strategies, scores improved

even further. The conclusion of the studies is that people are cognitively predisposed to be

strong arguers as reasoning improved as subjects were able to knowledgably create premises

and strategies such as analogy, exemplification, and so on. Research has also demonstrated

that groups that engage in argumentative debate are more adept at solving problems. Even

seemingly contradictory concepts such as the "confirmation bias" defined in Sperber and

Mercier as the "seeking or interpreting of evidence in ways that are partial to existing beliefs,

expectations, or a hypothesis in hand" (63), support the relationship between reason and

argument.[6] Cognitive bias is thought to be a result of a deficiency in cognitive resources,

specifically working memory (Johnson-Laird 2006). Sperber and Mercier, however, find the

explanation difficult to reconcile with the fact people do not lack the cognitive resources to

dispute the claims of others. Cognitive bias comes into effect in group reasoning settings;

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[6] In his *Elements of Rhetoric* (1841), Richard Whately presents a theoretical precursor to the notion of confirmation bias in his use of the terms "presumption" and "burden of proof" as a "preoccupation of the ground, as implies that it must stand good till some sufficient reason adduced against it…"(120). Presumptions, as confirmation bias, reverse the force of argument.

reasons and evidence are tested by members of the group by engaging confirmation biases that help to sort out good reasons from bad. Confirmation bias plays an important role in evaluating the arguments of others and not solely in the production of our own beliefs.

In the open-peer comment section of Sperber and Mercier's paper, the authors receive support for their theory from the majority of reviewers. Darcia Narvez, however, comments that

> the authors describe reasoning as a process more akin to rhetoric, completely leaving out practical reasoning. They claim that human reasoning evolved to competitively persuade others of one's viewpoint rather than for making the best decision (84).

Narvez means this as a bad thing, of course. Rhetoric is still viewed by some cognitive scientists, along with many other scholars, as irrational and decorative, not as a link between language and cognitive mechanisms, affinities, and attributes. Sperber and Mercier present the case that reasoning, as argumentation, is rhetorical. Argumentation as product and/or process is rhetoric in action and the primary formulator of practical reason. What should I do? What do I believe? Argumentation is rhetorical; it is the primary manner of identification that forms consubstantiality between divided human beings as mental systems in an environment of society as communication. Sperber and Mercier along with other proponents of their argumentative theory of reasoning, support my claim that rhetoric is an

inherently cognitive aspect of communication, or more succinctly, more than dressed up language or strategies of language deployment. Rhetoric as argumentative strategy, figuration, and grammar plays a key role in communication that should be studied from a cognitive perspective. In terms of professional communication pedagogy, rhetoric, as argumentation, figuration, and grammar deployed as speech, text, and visual media, serves as foundational content.

The triad of *structure, form* and *strategy* anchor the argumentation theory taught in technogenetic pedagogy. In Figure 3, the triad is placed in relationship to discursive, extra-discursive, and visuospatial rhetoric. The structure, form, and strategy triad serve as the foundation of technogenetic rhetoric and complex digitally situated learning (to be discussed in chapter 4).
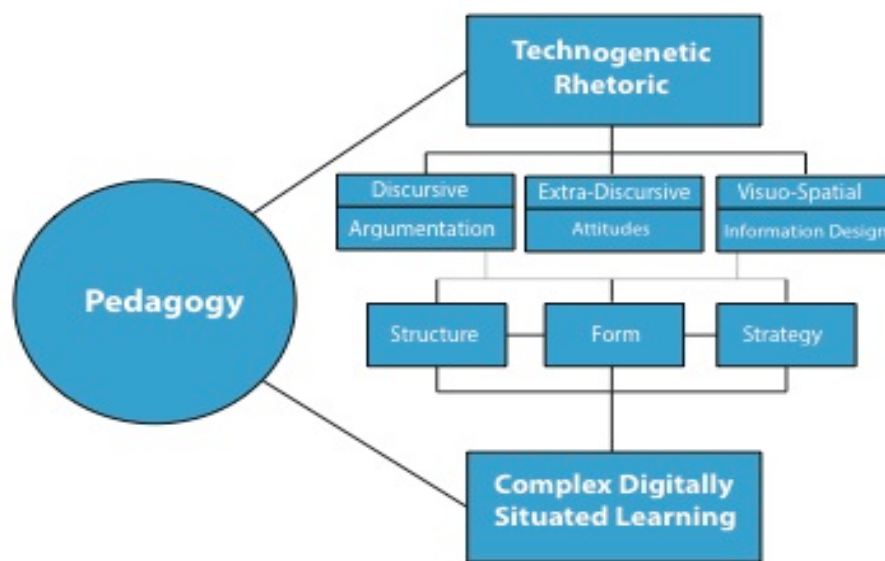
Figure 3: Structure, Form, Strategy of Technogenetic Rhetoric

To use an architectural analogy, structure is the inside of a building, the foundation, walls, transoms and so on. Form, on the other hand, is the outside of a building, the public facing aspects. Strategy maps onto the decisions made by the architect in designing the building. These three elements can be analyzed as separate domains, but cannot be separated in practice. Structure cannot exist without form, nor form without structure, and neither come into existence without strategy. All three elements are rhetorical in nature, forming degrees of identification and consubstantiality in their effectiveness. Rhetorical elements such as

audience analysis, purpose determination, appeals, and commonplaces (loci) are examined in light of structure, form and strategy. My aim is to move theory into a praxis that provides students with an understanding of the pragmatic effects of argumentation along with skill in the execution of technique. My argumentation praxis is based on the cognitive effects of the structures, forms and strategies deployed with an eye to the relationship between cognition and technology. The following section introduces praxis of argumentation for professional communication pedagogy.

3.1.1 The praxis of argumentation for professional communication pedagogy

The first part of the triad I will discuss is that of structure. The structure of an argument includes the basic elements of its construction, but also serves as a heuristic for production and analysis. Argumentation structure provides a discursive space for the invention of form and strategy. And to be clear, structure, form, and strategy are not material entities that can stand on their own. All three are required in the formation of an argument and elements of each overlap and serve as the foundation for the others; there is structure in form, form in strategy, and structure cannot exist without both form and strategy. As teachers, we abstract the three elements for the sake of pedagogy, but it is vital that students understand the triad has a relationship similar to Saussure's signified and signifier as two sides of a piece of paper.

In his 1958 classic text, The Uses of Argument, Stephen Toulmin describes arguments as having an anatomy and a physiology. The gross anatomy of an argument is the completed

text or speech with the parts and paragraphs serving as organs. Toulmin is interested in the deeper physiological aspects of argument; what he defines as "micro-arguments" (87). Micro-arguments occur, mostly unnoticed, in everyday professional communication. They are embedded in the conversations, meeting requests, presentations, and correspondences that occur during the average twenty-four hour workday. What Toulmin provides is a structure for micro-arguments that aids in the production and evaluation of arguments. I believe Toulmin's structure of micro-arguments serves a similar purpose as Heidegger's concept of enframing does for our relationship with technology. Just as enframing divulges an essence of technology that serves to define our mode of being in extended cognition, Toulmin's model provides a basis through which we can understand our capacity for argumentative reasoning. Claims are derived through either or both System 1 and System 2 reasoning while warrants are the products of argumentative reasoning based on grounds (data). Using Toulmin's example argument, a person may access grounds (data) through intuitive inference, move the grounds into language as a mental or oral statement; "Harry was born in Bermuda"; engage System 2 reasoning to evaluate the grounds and make the claim "Harry is a British subject"; and by evaluating the grounds and claim, determine the warrant that "a man born in Bermuda will be a British subject" (92). The model provides a structure through which we can track conscious and, what Daniel Dennett refers to as sub-personal aspects of

argumentative reasoning. In terms of praxis, the model allows for a glimpse into the

cognitive processes we engage in forming knowledge though argumentative reasoning[7]. I

offer a reinterpretation of Toulmin's model in terms of his concepts of field-invariance, the

aspects of argument that apply to all arguments, and field-dependence, the belief that the

backing of an argument may only be evaluated by the field in which it is applied. I am also

offering a broader space for the element of claim that is grounded in Burke's conception of

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[7] Toulmin's model has been used extensively in composition textbooks and pedagogy. Karen

Lunsford's 2002 article in Written Communication "Contextualizing Toulmin's Model in the

Writing Classroom: A Case Study" offers a detailed and comprehensive analysis of

applications of the model. Although Toulmin's model has received its share of criticism,

Lunsford finds specific critiques to be "moot" as the teachers in her case study reinterpreted

the model many times over as they applied it to various pedagogical goals (160). Joseph

Bizup (2009) finds the "history of the Toulmin model in composition studies [to be] largely a

story of alterations and hybridizations" (15). The model has been cited extensively in a

number of divergent fields (Bizup 2009). In fact, Toulmin's model is also being used in

artificial intelligence as a tool in the development of algorithm based knowledge

representation and reasoning (see Potter 2008).

persuasion as identification. Before presenting these reinterpretations, a brief description of the Toulmin model with examples from professional communication is called for.

As I briefly sketched out above, Toulmin's model of micro-argument involves the cognitive processing of intuitive inference into language that serves as *Grounds* (originally called *data* by Toulmin, I maintain the reference to data in parenthesis as the term is used in other applications such as artificial intelligence research). *Grounds (data)* serve as the basis for a *claim*. *Grounds (data)* are the idea, the flash of intuitive inspiration, while the *claim* is the expression of the idea through speech, text, or multimedia. There is a third element that connects *grounds (data)* and *claim*, termed the *warrant*. Toulmin describes the *warrant* as the answer to the question, "How did you get there?" If the interlocutor were to have asked, "What have you got to go on?" *grounds (data)* might have sufficed as a response, but in the first instance a *warrant* is required. A *warrant* provides a basis for the linking of *grounds (data)* to a *claim* (90). Imagine Glenda, a fictional marketing manager for an adventure-based vacation agency, reads a series of reports on the demographics of her customers. Later in the day, she comes across an article on a local radio station describing the listener base as belonging to the same demographic. Using System 1 and System 2 reasoning mechanisms, she intuits a relationship forming *grounds (data)*. She decides to express a *claim* in a meeting request via email to her vice-president and team (see Figure 4):

```
To: [list]

c.c. [admin list]

Subject: Meeting request: Radio advertising

Ms. Smith and team,

I believe we should designate a significant section of our budget to a radio advertising campaign on Adrenaline FM
106.7.  The latest adventure travel demographic report published by Gartner presents a customer profile that matches the
listener of Adrenaline FM.

The Adrenaline listener is predominantly male, age 25-34, earns over $70K annually, and participates in a number of
outdoor sports.  Our primary client demographic aligns in gender, age, and income almost exactly.

I have not worked out the customer acquisition cost associated with a radio campaign, but will do so before we meet.

I am setting up a meeting for Tuesday, September 23 @ 2:pm in the Leader's Room and via conference call 1466934.
Please send notification of attendance.

Thanks,

Glenda Rickards
Senior Marketing Manager
```

Figure 4: Routine Email as Argument

Glenda's memo makes a *claim* that her agency should advertise on radio with Adrenaline FM

based on the *grounds (data)* that the radio station listener aligns demographically with their

clients. The *warrant* is not directly stated in the text. Glenda uses an Aristotelian enthymeme

where she states the two premises of *grounds (data)* and *claim* while leaving out the

conclusion; *the radio station listener will be receptive to our product offering*. In this

particular professional setting, there are more claims being made beyond the radio-

advertising claim; there is a claim that Glenda is capable of calling such a meeting. The

rhetorical appeal of ethos frames a claim of credibility in terms of ideas and inspirations. If

Glenda is prone to making claims based on weak grounds that do not support a suitable warrant, her meeting request may be ignored. In essence, Glenda, by sending the email, is making a claim that she has the ethos to call a meeting based on the grounds (data) that she habitually has good ideas based on strong evidence analysis with a warrant that her idea is a good one. Another claim based on ethos is made by Glenda in her use of research. She is claiming that Gartner and the source for the radio station demographics are able to support their claims and grounds. Glenda's email is a micro-argument before she receives any feedback or debate. Also, by putting her title after her name, Glenda is making an ethotic micro-argument. Other elements of argumentation include the salutation of "Ms. Smith and team" rather than "Dear Ms. Smith and team" or "Mary, Bill, and Alice". The salutation makes a demand on attention rather than a request. Finally, the action is placed at the end of the communication after the reasons have been laid out demonstrating an appeal to the rationality of her audience (more on argument strategy later in this chapter). The Toulmin model provides a heuristic for engaging the attention system of the communications student in a deep and important analysis of a seemingly simple communication.

There are three more elements to Toulmin's model: *backing, qualifier*, and *rebuttal*. Backing involves field-dependent evidence that further support the warrant. In our example, Glenda provides specific demographic language that aligns with her grounds (data); gender, age, and income level. The backing she provides does not directly back the grounds, they serve to expand rather than back. The field-dependent language does, however, back the claim that Gartner and the radio station demographic supplier have the right to make their

claim. If Glenda had been able to provide evidence that other adventure-travel firms acquired more customers via radio advertising, she would have provided backing directly to her grounds (data), claim, and warrant. A rebuttal consists of statements that, if true, would make the claim invalid. In our example, Glenda brings up a rebuttal based on customer acquisition cost. The rebuttal informs the reader that she has thought through potential reasons that her claim would have to be set aside. Rebuttals also provide backing to claims of ethos; the fact that Glenda states a potential reason for the invalidity of her claim strengthens her claim that she should be heard on her idea or grounds. Qualifiers refer to the modal strength of the claim and grounds. Toulmin provides two modal distinctions; force and criteria. Force refers to the "practical implications" of the modal term. In our example, Glenda uses the strong modal term "believe" which in practical terms, represents her high level of commitment to the claim. Criteria refer to the context of the modal; Toulmin explains criteria to refer to

> [the] reference to which we decide in any context that the use
> of a particular modal term is appropriate. We are entitled to
> say that some possibility has to be ruled out only if we can
> produce grounds or reasons to justify this claim, and under the
> term 'criteria' can be included many sorts of things…[for
> example] something can be mathematically impossible (28-29).

Force modals are in essence field-invariant while the criteria of modals are most often field-dependent. The modal in our example does not have criteria; had Glenda made the statement that the campaign would be economically impossible if the customer acquisition cost proves to be too high, she would have employed a modal based on a criteria. Qualifiers play an important role in the overall force of the claim and grounds (data).

The areas of Toulmin's model I repurpose for professional communication pedagogy are the concepts of field-invariant and field-dependent. Toulmin believes the microstructures of everyday arguments are field-invariant; every argument contains a claim, warrant, and grounds. Backing, qualifiers, and rebuttals, on the other hand are field-dependent; what constitutes modal criteria, backing, and rebuttal depend upon the intrinsic nature of the field. Toulmin's concept of field has been interpreted in a number of ways, but primarily as subject matter, sociological entities, and discourse communities (Bermejo-Luque 2006). For the purposes of professional communication pedagogy, I combine aspects of these various conceptions to define a field as a communication system. With Luhmann's social system theory in mind, a field is a system/organization constituted by communication; the environment of a field consists of biological systems (life) and mental systems (consciousness). Bermejo-Luque (2006) offers a similar definition of fields as "subject matter, intellectual disciplines, or, in general, systems of propositions" (81). She proposes that fields serve two rhetorical roles in argumentation; as a determiner of truth value; a field, as a system of propositions determines modality; and a field serves as a heuristic for the evaluation of arguments by providing the appropriate context (82-3). I agree that a field

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constituted by communication serves as a system of propositions that help determine the truth-value and efficacy of arguments, but I also believe the environment in which a field as a system resides plays a crucial rhetorical role in argumentation. An environment consisting of biological and mental systems—otherwise known as human beings—serves as audience for the communication that constitutes a field. Fields, as sub-species of social systems, serve to coalesce organizations, human beings, and functional systems into cohesive entities. An example relevant to professional communications would be the field of retail clothing that would include organizations (as systems of communication) such as The Gap, American Apparel, Bluenotes, Harry Rosen, and so on; the professionals employed by these organizations (as mental systems); all within the economic functional social system. The field is composed of all of the communication conducted by the member systems from the individual emails to trade magazines. This description is getting very close to that of speech and discourse communities. Speech and discourse communities, based on agreed-upon lexical, stylistic, and topical conventions, are primarily voluntary cooperative entities (Borg 2003). Discourse and speech communities would map onto industry organizations such as Retail Association of Canada, and be contained within the field. Fields are communication systems made up of discourse communities with the environment for both consisting of mental (human) and social (organization) systems.

Perceiving fields as a function of systemic interaction brings rhetoric into Toulmin's model. Individuals as mental systems both populate and serve as the environment for communication based fields, in other words as audience. Field-invariant audiences map onto

Perelman and Olbrechts-Tyteca's (1969) conception of the "universal audience," defined as "a universality and unanimity imagined by the speaker" (31).

The universal audience is not a collection of "real" people; it is a mental construction based on the field in which the argument is taking place. The field-dependent audience is the collection of "real" people receiving and judging the argument. When a professional writes and designs a presentation arguing for a specific marketing direction for a given product, she conceives an audience that is at once field-invariant and field-dependent. It is not a case of two groups; the audience is at once field-invariant as a conception of the writer/speaker and field-dependent as real people sitting in the room and universally field-invariant. I am not arguing that the universal audience is exclusively field-invariant while a particular audience is exclusively field-dependent; a universal audience exists within each field. For example, the audience for a legal argument is at once field-invariant, as the mentally conceived universal audience of the lawyer, and field-dependent, responding to the specific forensic appeals of the field (and sub-field, such as civil, corporate, or criminal law), both of which are represented for the speaker/writer in the particular audience listening or reading the argument. The field-invariant universal audience I am referring to consists of mental systems as defined by their cognitive mechanisms and affinities. Randy Allen Harris (2008) conceived of the universal audience in terms of the cognitive similarities shared by human beings. Universally, we all cognitively respond to certain structures of language use such as argumentation and figuration in a similar fashion. I discuss the relationship of rhetoric and cognition in detail in subsequent sections. The field invariant/dependent division is a result

of the operationally closed nature of mental systems. As the professional moves from thought to language, no degree of structural coupling or identification has occurred; the audience is only a mental construction, a universal audience of the field and the speaker aligns writing/speech with her intuited conception of their desires. Once communication takes place, engaging the organization as system, the speaker is able to interact with a field-dependent particular audience. This is not to say that the professional does not use the knowledge of the particular audience in designing her argument, but only imagined, universal aspects can be accessed. There is no way for the professional to have particular field-dependent knowledge until communication is engaged (communication that could be linguistic, the form of questions and comments, as well as kinesthetic, as body language and eye contact). It is important to define field-invariant and dependence further. A field-dependent audience consists of real people while a field-invariant consists of intuitively inferred imaginary people. The field-invariant audience remains a sub-set of all potentially inferred people, in other words, in professional communication, the marketing presenter in our example intuitively infers members of concentric systemic fields – as members of the functional economic system, marketing specialists, retail specialists, and members of the particular segment of the organization. The field-invariant audience can judge the claim, grounds, and warrant in terms of logical coherence and organization. The field-dependent audience consists of the real people who belong to same sub-set of fields as the field-invariant universal audience, with the ability to not only judge the claim, grounds, and warrant, but also challenge the aspects of backing, rebuttal, and qualifiers with specific and

relevant knowledge. The key delineator is the ability to challenge. A field-invariant

universal audience as mental construct cannot challenge as it is defined by unconscious

cognitive mechanisms and affinities such as argumentative reasoning and conceptual

blending (more on these below). A field-dependent universal audience as mental construct,

on the other hand, can challenge through the use of the figure prolepsis by the rhetor. To

accomplish this challenge, the rhetor imagines a challenge to her argument and brings it

forward in order to demonstrate its weakness. So the universal audience is both field-

invariant in terms of cognition, and field-dependent in terms of strategy.[8]

Toulmin's conception of field gestures back to Aristotle's common and special topics.

Just as *field* metaphorically invokes space, *Topos* designates the metaphorical place a speaker

can go to find her argument. Common topics such as *definition* and *analogy* are universal in

nature in that they apply to all fields. The definition of an argument may be invoked in any

argument, while the figure analogy may be applied to any argument of comparison. Special

topics apply only to the field in question. Constitutionality arguments apply to the particular

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[8] This conception of field-dependence and invariance stretches Toulmin's definition. By incorporating Perelman and Olbrechts-Tyteca's conception of universal and particular audiences, a field becomes a rhetorical domain where the multiple arguments of ethos presented in the radio advertising argument presented above are discernable. Incorporating the notion of audience to the Toulmin field does not alter the core of his argument that certain elements of argumentation are field-invariant and apply to all communicating human beings while only experts within specific fields are capable of judging the application of backing, qualifiers, and rebuttals to specific warrants.

fields of law and politics. All common topics appeal to logic and reasoning and are therefore

also appeal to the universal cognitive audience described above.

Bringing audience into the model also allows for the inclusion of rhetorical situations. In

conceiving a field-invariant universal audience, the professional must place them in a

situation. Whether the situation presents itself through communication (Bitzer's objective

exigence in systemic terms) or is inferred through System 1 reasoning into System 2

argumentation by the professional(s) (as Vatz would argue) is moot. Without a situation an

audience is not imagined/assembled and an argument is not formulated. Rhetorical situation

in light of field invariance and dependence brings us back to attention and technology.

Communication technology has extended our cognitive ability. Andy Clark and David

Chalmers in their 1998 essay "The Extended Mind" theorize a relationship between

technologies and the mind where:

> the human organism is linked with an external entity in a two-
>
> way interaction, creating a *coupled system* that can be seen as a
>
> cognitive system in its own right. All the components in the
>
> system play an active causal role, and they jointly govern
>
> behavior in the same sort of way that cognition usually does. If
>
> we remove the external component the system's behavioral
>
> competence will drop, just as it would if we removed part of its
>
> brain. Our thesis is that this sort of coupled process counts

equally well as a cognitive process, whether or not it is wholly

in the head (222).

When a professional accesses a database of contact information or marketing information, for

instance, or when a software program helps to organize thought into language and images,

cognition is extended. They use what they have defined as the "parity principle" to serve as a

gauge:

If, as we confront some task, a part of the world functions as a

process, which, *were it done in the head*, we would have no

hesitation in recognizing as part of the cognitive process, then

that part of the world *is* (so we claim) part of the cognitive

process (222).

Cognition has always been extended to some extent from ancient man using a stick to outline

a hunting plan of attack in the sand to Richard Feynman's often quoted statement to a

biographer that his notes were not a record of his thinking, they *were* his thinking; in other

words, the paper was an integral part of his cognitive activity (Clark 2011 xxv). Computer

software of all kinds has become an active part of our cognitive activity; to a professional,

the loss of a BlackBerry is not unlike a stroke: they lose both some of their memory and a

significant part of their ability to communicate, and they need a kind of cognitive-techno

therapy to regain what they've lost. Argumentative reasoning is a function of extended

cognition in professional communication settings. The ability to infer an idea, reason it into

language, and communicate it to others, is as much a product of the extended cognitive

relationship with the BlackBerry as it is purely mental activity. Taking Clark's conception of

extended cognition even further are the extensions provided by socio-cognitive *technologies*

such as figuration. Figures allow an extension of one mind into another, as all language

does, but in a manner that extends the ability to store and recall the information in question.

They provide a distributed cognition among social affiliates, who seed one another's minds

with information and heuristics and cues for further sharing and retrieval. For example, a

metaphor, as will be discussed below, forms a conceptual blend of mental spaces in the

receivers mind that is more easily stored and recalled from memory. The effect of metaphor

and other figures is not the key aspect of extended cognition; figures serve as technology in a

similar way to the database or the search engine except the retrieval is not outside but inside

of the mind. That is why, for instance, so many mnemonics and proverbs are figured. They

have a linguistic configuration that 'docks' easily in the minds of group members.

   The other side of this relationship of mind and technology is its effect on the greater

attention system. As discussed above, the selection system is engaged on a constant basis

sending System 1 reasoning and argumentative System 2 reasoning into overdrive. James

Crosswhite (2011) correctly asserts that Toulmin's model lacks a method of invention:

"There are no exigencies, no rhetorical situation. Further, there are no procedures for

generating arguments" (2562). The model itself is not meant as heuristic for invention; it

assumes invention. Toulmin, coming from a philosophical and logic perspective, develops a

model that is analytic, allowing for the recognition of the structural components of

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argumentation. The inclusion of audience and situation into the theoretical foundation of field invariance and dependence, however, improves the model's ability to aid invention. Technologically extended cognition and a highly engaged selection system of attention lead to argumentative reasoning. Arguments are developed with field-invariant universal and field-dependent particular audiences in mind. The notion of audience serves to bridge the gap between argumentative reasoning and the engagement of Toulmin's model. Returning to Glenda, our marketing manager, technologically extended cognition led to the engagement of Glenda's attention system and her ability to reason argumentatively. It is her conception of the field-invariant universal and field-dependent audience that led her to construct her email argument and it is the same factors that either support or detract from the arguments of ethos described above. Glenda details her claim, grounds, and warrant by intuitively inferring the knowledge and skills of a universal audience of marketing professionals and structures her backing, rebuttals, and qualifiers to appeal to the particular audience. Glenda's cognition is extended via the technology of email in the sense that the string of responses maintains the original message and serves as a memory aid. When Glenda writes, "I have not worked out the customer acquisition cost associated with a radio campaign, but will do so before we meet", she is creating a technologically extended memory. Field-invariant aspects of audience establish the ethos of her ability to make the claim while field-dependent aspects create the ethos for her backing. The reader uses the same invariant and dependent elements to interpret her argument. The reader's cognition is also technologically extended by the email in the sense of external memory. The element of audience makes the Toulmin model a

useful heuristic for teaching, developing, and interpreting the structure of arguments. Crosswhite's (2011) call for a richer pathway to invention does have merit if we remove the elements of technology, attention, argumentative reasoning, and audience from the model. Without these precursors and catalysts, the model is much less applicable to professional communication pedagogy. Jeanne Fahnestock and Marie Secor (1996) have argued that the Toulmin model is far less effective as a heuristic of invention than is classical rhetoric. Classical rhetoric reformulated as "new rhetoric" by Perelman and Olbrechts-Tyteca, Walton's argumentation schemes of presumptive reasoning, and figurative language provides form and strategy to the structure provided by Toulmin. James Crosswhite (2011) views the form as the recognizable aspect that identifies an argument as he states,

> every argument requires a speaker and audience, operating
>
> within the bounds that define argumentation, drawing on a
>
> shared world, shaping starting points into discourse, and then
>
> moving toward a claim in a way that has an identifiable form
>
> associated with an argumentative technique. The form is not
>
> the only persuasive in the system, but it is the most prominent
>
> part of the model" (2656).

Form is the next element in the triad of structure, form, and strategy that underpins technogenetic pedagogy. Cognitive psychology has investigated argumentation as a

cognitive function of reasoning; investigations of the cognitive aspects of form have been a combined effort of cognitive psychology and rhetorical studies.

3.2 Figuration and Figural Logic

Many of the definitions of rhetoric written over the past 2400 years or so have hinted at the cognitive nature of rhetorical form. One of the most cognitively focused definitions comes from Friedrich Nietzsche who wrote "that what is called *rhetorical*, as a means of conscious art, had been active as a means of unconscious art in language and its development, indeed that *the rhetorical is a further development, guided by the clear light of the understanding, of the artistic means which are already found in language*" [1989, 21].   Language for Nietzsche *is* rhetoric, understood as tropes and schemes—some fresh, some forgotten—that populate every syllable of expression. Nietzsche believed all words to be figures that serve as image forming signs or *opinions* of the real that in and of themselves do not provide access to reality [23]. All language is metaphor – when human beings devise a word a series of metaphors are involved; first, a metaphor involving the transfer of a visual nerve impulse into an image and second, a metaphor transferring image to sound and a series of letters [1990, 82]. For Nietzsche, the schemes and tropes of rhetoric are, to borrow a phrase from extended cognition theory [discussed below], *scaffolding* for language; or, what is much the same thing in this view, the scaffolding of cognition.

In his 1890 publication *English Composition and Rhetoric* (2010), Alexander Bain provides a further associationist treatment of figures of speech (Chien & Harris 2011).

Figures of speech, for Bain, are "deviations" made for "the sake of greater effect;" nothing new there, but he goes on to link figures to what he defines as "the powers of understanding" [135]. Bain finds a connection between rhetorical use of language and the structure of human thought in three categories: discrimination, similarity, and retentiveness [135-36]. Discrimination refers to the affinity humans cognitively have to contrast and relate. Bain believes we are mentally predisposed to change and that figures such as *antithesis* and *contrast* linguistically reflect this affinity [135]. Similarity refers to the cognitive affinity of agreement; on either a conscious or unconscious cognitive level we are attracted to similarity. The figures that promote similarity include metaphor and allegory [135]; we might add personification, reification, topification, anthropomorphism, and a whole catalogue of" X-is-similar-Y" figures. Retentiveness refers to the mental ability to retain words, images, and impressions on the basis of empirical association, because we experience them together or in close succession; in what would later be called episodic memory. Bain links the figure metonymy to retentiveness, as it is empirical association based on the memory of hearing the words, or seeing the images, in connection with each other, that allows for metonymical expressions such as "the throne" for a sovereign.

Both Bain and Nietzsche view figurative language as scaffolding for mental activity where the form of language structures thought. Nietzsche takes an extreme view where all language is metaphorical and thus rhetorical by default. (This view does not imply that rhetoric is not a conscious and planned form of language. I read Nietzsche as finding rhetoric to be both an unconscious and a conscious activity in alignment with Sperber and Mercier.) Bain views

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rhetorical figures more as a conscious communicative choice (again, Bain does not directly state figures work only on a conscious level, but the implication of his work is a one of communicative choice in meaning making). Bain and Nietzsche have differing scholarly mandates; Nietzsche is explaining the reciprocal effects of language on thought, thought on language, while Bain is recommending strategies of communication and writing based on the structure of thought. Both, however, develop hypotheses that the form of language does more than decorate meaning; rhetorical figures of speech are effective because they align with both mental activity, in the case of Nietzsche, and mental affinities such as a heightened attraction to things that change or are similar as opposed to static or unrelated elements, in the case of Bain.

Rhetorical form engages cognitive affinities for contrast that develop formal assent. Cognitive scientist and philosopher Andy Clark describes language in general as "[a] form of mind-transforming cognitive scaffolding: a persisting, though never stationary, symbolic edifice" (2011, 44). Rhetoric provides the form to the structure or scaffolding of thought. As discussed above argumentative reasoning is a product of sub-personal intuitive inference engaged with working memory. Form is the manifestation of this cognitive mechanism. Just as in the case of a building, the scaffolding as structure remains hidden from the viewer. The beams, girders, transoms, wall frames that support the structure reside beneath the outer aspects of form such as brick work, moldings, and so on. Structure and form are indivisible. You cannot have one without the other. Form adds to structure and structure allows for form. The same applies to communication where form is what attracts or hails the audience.

Kenneth Burke conception of what he terms "formal assent" provides the definitive

description of the relationship between form and structure. Burke state that

> we know that many purely formal patterns can readily awaken
>
> an attitude of collaborative expectancy in us. For instance,
>
> imagine a passage built about a set of oppositions ["*we* do *this*,
>
> but *they* on the other hand do *that*; *we* stay *here*, but they go
>
> there; *we* look up, but *they* look *down*," etc.]. Once you grasp
>
> the trend of the form, it invites participation regardless of the
>
> subject matter. Formally, you will find yourself swinging along
>
> with the succession of anti-thesis, even though you may not
>
> agree with the proposition that is being presented in this form.
>
> Or it may even be an opponents proposition which you resent–
>
> yet for the duration of the statement itself you might "help him
>
> out" to the extent of yielding to the formal development,
>
> surrendering to its symmetry as such. Of course, the more
>
> violent your original resistance to the proposition, the weaker
>
> will be your degree of "surrender" by "collaborating" with the
>
> form. But in cases where a decision is still to be reached, a
>
> yielding to the form prepares for assent to the matter identified
>
> with it. Thus, you are drawn to the form, not in your capacity
>
> as a partisan, but because of some "universal" appeal in it. And

this attitude of assent may then be transferred to the matter

which happens to be associated with the form (1950, 58).

The "'universal' appeal" promoting the acceptance of content Burke refers to is the effect of rhetorical forms on the structure of our thinking. We are unconsciously attracted to the design of the content. Just as Nietzsche and Bain see a connection between rhetoric and thought, Burke also sees the result; rhetorical figures grease the cognitive skids of what he terms *identification*. Figurative language creates a connection between speaker (writer) and listener (reader) that supersedes content creating a degree of assent to meaning. Burke alludes to the *natural function* of rhetoric in his oft-quoted definition: "For rhetoric as such is not rooted in any past condition of human society. It is rooted in an essential function of language itself, a function that is wholly realistic, and continually born anew; the use of language as a symbolic means of inducing cooperation in beings that by nature respond to symbols" (43). Rhetoric is not mere "flattery" or "cookery" as Plato suggests to Gorgias, able to divert truth through a superficial aesthetic of language, though it might certainly be deployed to those ends by some people some of the time, or even by entire industries. Rhetoric is not solely a construction; it is a natural dimension of language resulting from our predisposition to form and cooperative action. I am not denying rhetoric is a proactive mental activity that is consciously and strategically deployed, but as Nietzsche, Bain, and Burke suggest, the power of rhetoric lies in the conscious, and more importantly unconscious cognitive attraction of rhetorical form. Staying with Clark's scaffolding analogy, Burke's formal assent suggests that the scaffold constructed by rhetoric and figurative language is

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preexisting in a way that other linguistic constructs are not; the scaffold of antithesis exemplified by Burke is already in place waiting to semantically connect form and meaning. That is not to say that separate cognitive scaffolds exist for literal and figurative language— as Nietzsche points out, all language is figurative—but it may be that the elements of figurative language that evoke cognitive affinities such as Bain's discrimination, similarity, and retentiveness, produce more accessible linguistic scaffolds.

Richard Gregg, in his neglected 1984 book, *Symbolic Inducement and Knowing: A Study in the Foundations of Rhetoric*, investigates the relationship between symbols and cognitive function through what he terms (borrowing from Burke), "principles of symbolic inducement" which "refers to those symbolic principles and functions which lead or invite us on to action and which begin in the workings of the mind-brain" (19). While Gregg extensively utilizes Burke's theories of symbolic action, he does not refer directly to Burke's theory of formal assent. However, by aligning specific cognitive principles with the processing of symbols he nods to formal assent as he demonstrates how rhetorical language leads to the inducement of meaning. While I take issue with Gregg's narrowly *cognitivist* model, there is much in his work that can be repurposed to apply to an *enactive* and *extended* conception of cognition. Gregg views cognition as a closed-loop system in which the mind-brain manipulates symbols received from an external world through mental faculties of "choice", "intention", and "induction" in order to produce action (133). The mind-brain is sealed off from the world and perceptually acquired symbols serve as inputs that are processed to produce cognitive activity. As described in the previous chapter, I hold to an

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enactive and extended model of cognition that mediates between symbolic information-processing views of the mind and connectionist views of globally distributed states in the mind. The term *enactive* refers to the perceptually guided action of the perceiver in her own local situation. It is the embodiment of the perceiver and not the internal or external representation of a preexisting world that drives cognition. Cognition is the coupling of the world with human systems of perception; perception and the world are interdependent. Enactive cognition is extended when external objects in the world (such as a string around a finger, notebook, abacus, smartphone, tablet computer, augmented glasses, etc.) become an integral part of the human system of perception, memory, and attention. Gregg finds the world to be "representable" to the mind-brain through symbols while an enactive and extended view finds the world as "presentable" through embodied perceptual action. This crucial difference brings into question Gregg's conception of "inducement" as an either conscious or unconscious choice between alternatives. If, however, we take Gregg's foundational processes of cognition and repurpose them to fit an enactive and extended model, his matching of cognitive principles and symbolic interaction extends the work of Burke, Bain, and Nietzsche to align with the subsequent chapters on Digital media and composition.

Gregg uses the terms "choice" and "intention" as foundational principles of a closed-loop cognitive system. If we shift to a concept of "intentionality" that follows a Husserlian definition where linguistic symbols are formed through mind and world interaction it is possible to apply Gregg's work to a cognitive scaffolding model of language. Gregg

identifies six key cognitive principles that lead to symbolic inducement: "edging or bounding, rhythm, association, classification, abstraction, and hierarchic ordering" (134).

- *Edging* or *bounding* refers to the perceptual capacity to create borders where none exist (exemplified by Gregg through an examination of visual perception) allowing for the ordering of symbols so that perception is continuous and theoretically making possible the formation of complex thought patterns such as ideology (134-35). In an enactive sense, this principle results from the symbol being brought forth through phenomenological intentionality rather than a closed-loop representation, but the relationship between cognitive activity and thought holds true. A cognitive scaffold is created by language in an enactive fashion that orders phenomenologically formed symbols. In an extended conceptualization, digital media could participate in the edging and bounding through attention shaping genres such as twitter. In fact, the very appliances through which we get digital media have bounded screens, which contain and frame.

- *Rhythm* refers to the one of the chief pattern affinities of the mind-brain. Gregg finds "perceptual *models* are constantly compared with relevant portions of our larger cognitive *maps* of *reality*" (135). In an enactive sense, we *form* reality, but the affinity holds true (as current neurophysiological research has proven, discussed below).

- *Association* refers to the cognitive affinity for repeated neuronal firings making cognitive maps stable and accessible (135). Figures such as metaphor, analogy, synecdoche, and metonymy all engage association. We associate one mental space to another based on referred thoughts. In other words, thinking analogically or combinatorically requires associating one concept to another.

- *Classification* refers to the cognitive affinity for alternatives (similar to Bain's conception of discrimination). "We not only perceive *this* phenomenon rather than *that* phenomenon, but we choose to see the phenomenon in *this* particular way rather than *that* particular way" (135).

- *Abstraction* refers to the mind-brain's ability to abstract from its environment. Classification is continual abstraction to achieve an ordering of thought (50). Although Gregg does not refer to figuration directly, abstraction is closely associated with interpretation of figurative language (discussed below).

- *Hierarchy* refers to the mind-brain's ability to determine "meanings composed of subordinate and superordinate structures of meanings" (50), a dimension of thought that synecdoche relies upon.

Despite the cognitive conception of cognition as a closed-loop system with a representational and processing bias, Gregg's outline of cognitive principles or affinities provide a basis for the relationship between cognition and rhetorical language. If we conceive of the processes acting on symbols created through an enactive coupling of the mind and its environment,

figurative language serves to engage thought on a phenomenological level and thus on an epistemological level. Doing so supports, in a cognitive sense, amalgamates Nietzsche's conception of persuasive ideological thought-formation; Bain's conscious crafting of persuasion; and Burke's theory of rhetoric as reciprocally persuasive identification that leverages formal assent. Figures of placement, repetition, similarity, contrast, and association align with Gregg's six foundational cognitive principles.

In her essay, "Rhetoric in the Age of Cognitive Science," (2005) Jeanne Fahnestock summarizes a number of studies performed in neuroscience and cognitive psychology that provide some evidence that the insights of Nietzsche, Bain, Burke, and Gregg have experimental validity. Fahnestock cites a study by Robert Zatorre et al investigating the neural elements of speech in terms of loudness, pitch, duration, and cognitive origin where subjects were asked to identify separate syllables, pairs of syllables, and pitch differences while undergoing a PET scan. Zatorre concludes, "our results, taken together, support a model whereby auditory information undergoes discreet processing stages, each of which depends on separate neural subsystems" (Zatorre et al, 848). Fahnestock (2005) believes the study provides an initial foundation for a cognitive exploration of rhetorical stylistics in that it demonstrates "the manipulable parameters of a language" (166). Before a cognitive basis of rhetorical language can be established, it is important that a baseline of linguistic (in this case aural) differentiation can be detected in brain activity. Studies such as Zatorre's do not prove the insights of our rhetoricians, but without a detectable variation in how aural language is cognized such insights can never move from theoretical to demonstrable.

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Fahnestock also cites studies on the hemispheric differences in brain activity in terms of "tone". While the majority of language processing is done in the left hemisphere, studies by Borod, Bloom, and Santschi-Haywood (1998) have revealed the right hemisphere's role in the appreciation of tone, for instance the ability to detect the inflection of a statement: "He has a PhD?" versus "*he* has a PhD?". While Fahnestock (2005) agrees that understanding where in the brain events occur is hardly useful for rhetoricians, "[t]he fact that prosodic construal has a separate location in the brain suggests that this dimension of an utterance can be manipulated separately" (167). And if the construal of prosody can be manipulated separately based on differentiated neural function, perhaps other aspects more relevant to rhetorical language are also manipulable. Other neuroscientists, such as Helmut Schnelle, have investigated neural comprehension of rhyme. Schnelle finds that when two words rhyme,

> [t]he brain organizes the phonotactic structure of the words it
> hears, one after the other. It may even be that the brain repeats
> several times the word sequence it hears. Obviously in each
> case a distributed phonotactic category pattern is temporarily
> synchronized by a number of phonotactic categories. Two
> synchronized patterns become short-term active one after the
> other. If the repeated activation of the two words is direct, the
> following happens: The onset parts register quickly from one
> into the other whereas the rhyme parts remain the same in

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phonetic repetition. The brain signals a direct rhythm! Thus

the experience of a rhyme is automatic and absolutely simple.

The example shows that synchronized prosody pattern

comparison may have influence in feeling experience (Schnelle

2010, 209).

Schnelle's work aligns with Burke's theory of formal assent and with the work of Gregg in

cognitive affinities and symbolic inducement. There is a temporal difference in

interpretation when words rhyme. The figures of assonance and consonance naturally apply,

as syllable repetitions necessarily rhyme. Other figures also induce synchronized patterns.

For example, in Burke's epitome of formal assent, "*we* do *this*, but *they* on the other hand do

that; *we* stay *here*, but they go there; *we* look up, but *they* look *down*" contains a number of

figures that induce temporally short-term active patterns such as epanaphora – repetition of a

word at the beginning of successive phrases, epistrophe – repetition of a word at the end of

successive phrases, ploche – the "synchronized rhythmic repetitions of words" (Harris,

2013b 3), and isocolon – parallel phrases of the same length (*we do this* …but *they do that*;

we look up … but *they look down*).

  Fahnestock (2005) offers the strongest support for Burke's theory of formal assent in her

discussion of the neuroscientific research being done in the area of what she describes as

"residual orality" (170). A study by Mark Dubin (2002) found some areas of the brain

believed to specific to language production were activated during reading comprehension:

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"An initial explanation of this finding was that silent, covert subvocalization was occurring as part of comprehension. That is, in trying to understand the words being heard, the person was rehearsing the speaking of those words without being aware of doing so" (51). Dubin's results demonstrate two important points: that reading rhetorical figures may have a similar effect as hearing them; and secondly as Fahnestock (2005) describes,

> [t]he research suggests that as someone listens to or reads a phrase or sentence, some part of the brain is also, in parallel, activated as though it were simultaneously constructing that phrase or sentence. If the relevant segment is constructed according to a pattern with which the language user is already familiar, perhaps because it is established by a figure of repetition in the text, it will be more easily constructed as it is construed (171).

Residual orality, demonstrated by Dubin's work, aligns with both Burke and Gregg and provides experimental evidence of formal assent. Cognitive affinities such as repetition in the form of neurological rhythm are also supported by parallel brain functions in terms of meaning making and figurative language.

3.2.1 Interpretation of rhetorical figures

Up to this point my focus has been primarily on rhetorical figures as linguistic constructions in the form of schemes where formal features such as repetition align with

foundations of cognition. It is important for a professional communication pedagogy to not only look at the cognitive effect of rhetorical figures, but also how such linguistic constructions are interpreted. Section 3.2.1, presents a model of figure interpretation that focuses on tropes such as metaphor, metonymy, and irony. There are a number of theories on how figurative language is interpreted that develop cognitive viewpoints beyond the standard pragmatic and direct access views including; *graded salience theory* which promotes context over "literal" meaning, *underspecification theory* where words are analyzed for figurative use based on a comparison with the most common "literal" usage, and *relevance theory* which finds figurative language to be interpreted based on context and optimal relevance (Gibbs & Colston, 2012). While these theories based on context and semantic differences have merit, the two theories that I will explore in detail are conceptual blending theory and embodied simulation theory. An understanding of the cognitive mechanisms involved in the interpretation of figures is an important element of teaching their deployment.

Conceptual blending is based on Gilles Fauconnier's mental space theory. Conceptual Blending is a theory that evolved out of ancient theories of space such as the already discussed topos, but also spatial organization theories such as Cicero's memory-as-a-house, mnemonic. According to Fauconnier, "Mental spaces are partial structures that proliferate when we think and talk allowing a fine-grained partitioning of our discourse and knowledge structures" (1997 11). Mental spaces contain the elements of discourse that can be mapped onto one another. For example, in the simple sentence "Martha is John's wife" a base mental

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space that contains "John" and "Martha" is created in the mind of the receiver alongside a

mental space that contains the roles of husband and wife. The receiver maps "husband" to

"John" and "wife" to "Martha" from the role space to the base space of discourse elements.

As phenomena in the brain, mental spaces are "sets of activated neuronal assemblies, and the

(mapping) lines between elements correspond to coactivation-bindings of a certain kind"

(Fauconnier and Turner 40). Mental spaces are partial in nature and are structured by frames

of "long-term schematic knowledge" (40). In our simple example, the frame of marriage is

employed. Frames developed out of work in frame semantics, developed by Charles

Fillmore to represent encyclopedic meaning, and artificial intelligence frames, developed by

Marvin Minsky as a data structure model. A frame contains *slots* for relevant *fillers* of data.

The data model of frames allows for individual differences in frames, as different minds will

utilize different slots and fillers (Coulson 19). With its utilization of frames, conceptual

blending theory applies to tropes such as irony (conflicting frames) and metonymy (frame-

internal elements representing one another), as well as metaphor (the blending of 'similar,' or

predicated-as-similar frames) (see Gibbs & Colston 2012, 109-13). This aspect of the

conceptual blending model is extremely important for digital composition pedagogy and will

be discussed in detail in chapter five.

  The conceptual blending model consists of four main elements: inputs, cross-space

mappings, generic space, and a blended space. An input is a mental space that contains

discourse elements. Cross-space mappings are the connections between discourse elements

in the input mental spaces. A generic space is a mental space that contains what each input

space has in common. Finally, the blended space contains certain elements from each input

space to create a new and *emergent structure* (41). According to Fauconnier and Turner, the

emergent structure is the key element in the conceptual model. Three cognitive processes

construct and conceive the blend: "First *composition* of the elements from the inputs makes

relations available in the blend that do not exist in the separate inputs [...] Second, *completion*

brings additional structure to the blend [... and third,] the running of the blend is called

elaboration" (43-4). *Composition* refers to the utilization of discourse elements located in

the inputs to create discourse elements that do not occur in either input mental space.

Completion also refers to the access of background knowledge frames, "pattern completion is

the most basic kind of recruitment: we see some parts of a familiar frame of meaning and

much more of a frame is recruited silently but effectively to the blend" (48). For example, a

conceptual blending interpretation of the metaphor "love is a rose" involves composing

mental spaces for both "love" and "rose" and a generic space that contains salient features of

each; love is a relationship between humans, an investment in emotions etc.; a rose is

beautiful, has thorns (so, is dangerous to pick), etc. A third mental state is completed that

contains elements of the rose and love, perhaps, beauty, thorns, emotional investment.

Finally, as Figure 4 details below, the blend is elaborated to create an interpretation of the

metaphor; while love is beautiful, it is also dangerous.

Generic Space
Love is an emotion
A Rose is a plant/flower

Love
Pleasant feeling
Powerful
Relationship
Investment

Rose
Aesthetically pleasing
Thorns
Short-lived
Picked carefully

Love is a Rose
Beautiful and Dangerous
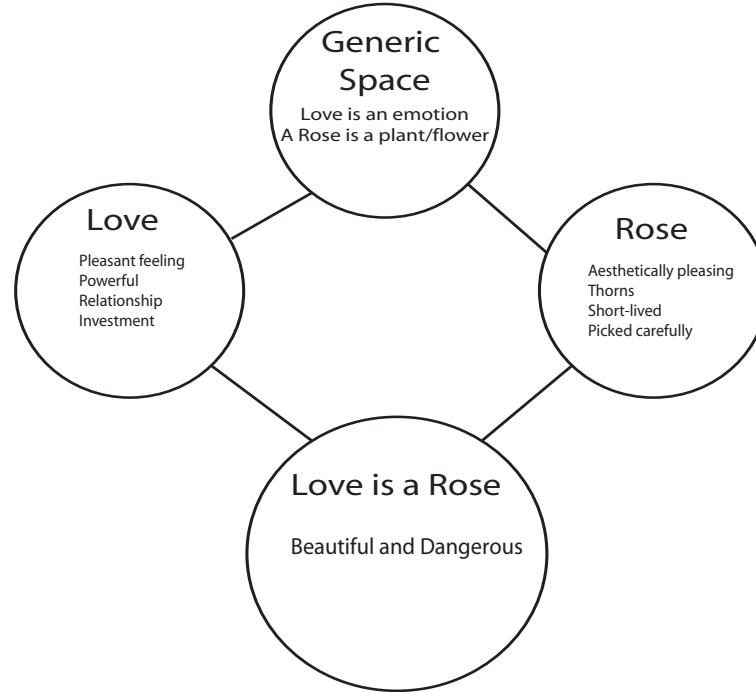
Figure 5: Conceptual Blend of "Love is a Rose" Metaphor

Elaborations, or the content that fills the mental spaces may vary from person to person, but the integration of mental states is the same. Conceptual blending theory develops a model of mental activity engaged in interpreting figurative language that requires a theory of embodiment to be fully understood in terms of enactive and extended cognition.

Embodied simulation theory views the interpretation of figurative language as a part of the overall process of embodied cognition where "just as properly seeing a cup sitting on a table requires us to imagine different bodily actions we may perform on that object, so too with language do we imagine ourselves engaging in actions relevant to the words spoken or read.

Simulation processes, under this view, are not purely mental or neural, but involve and effect many full-bodied sensations" (114). Embodied simulation theory aligns with the research summarized by Fahnestock on covert subvocalization where a residual orality is formed while reading.

Gibbs and Colston present a number of examples of embodied simulation determined through experimental research (see Gibbs 2006) where subjects reacted to the metaphor "tear apart the argument". Subjects "exhibit significant embodied qualities of the actions referred to by these phrases (e.g., people conceive of the "argument" as a physical object that when torn apart no longer persists)" (116). Embodied simulation and conceptual blending are fully compatible, and can be seen as different parts of the same dynamic process; embodied neural constructs form when we engage a figure that serves as part of the mental blend of composition spaces. For example, in our "love is a rose" metaphor, embodied simulation occurs when the elaboration space is created. On one level we interpret the blend as "love is wonderful but risky" based on the composition of the spaces "rose" and "love" while also simulating the pricking feeling we encounter when picking a beautiful, but thorny rose. It is not a linear but a dynamic process with embodied simulation occurring in the mental activity of blending. Embodied simulation may provide input to the frame and generic space of conceptual blending process. Linguist Benjamin Bergan supports this notion when he states that

> [i]n an embodied approach to language, the experiences an
> individual has had in the world are viewed as vital to the

architecture of their cognitive faculties and their behavior. It

seems that internal simulation, based on previous action and

perception in the world, is essential to understanding literal and

figurative language processing (279).

Embodied simulation also points to other areas of interest for the deployment of

arguments. Embodied simulation is a key factor in the engagement of mirror neurons that

serve as a neurological key to our ability to empathize. Embodied simulation is also an

important factor in professional communication in its relationship with deep and hyper

attention. Perhaps the figurative embodied simulation provided during video and digital

games plays a role in extended hyper attention where the user is engaging neurons and

mental activities that simulate and thus stimulate feelings of movement and action.

Figures undoubtedly play a role in the cognitive attributes and mechanisms of

argumentative reasoning and communication. Research in cognitive psychology supports

Kenneth Burke's argument that form plays a far greater role in the formation of identification

than previously believed. Figures are not ornamental language, added to the true nature of

argument. New research into "figural logic" by Jeanne Fahnestock and Randy Allen Harris

expands the role played by figures in argumentation. Neither Fahnestock nor Harris argue

that figures do not have aesthetic or affective properties, but "in the best arguments, their

aesthetic, emotional, and rational effects align into a vector of persuasive force" (Harris,

2013a, 576). It is easier to see how tropes like metaphor create what Harris (paraphrasing

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Burke) defines as a "distilled linguistic correlate of perspective" (576). Of Burke's four

master tropes, metaphor superimposes one position on another ("love is a rose"); synecdoche

uses part for the whole as logic of example ("the ranch employs forty hands"); metonymy

associates concepts and objects by referring to a related name ("I am reading Aristotle"); and

finally, irony where an affirmative response to one frame infers a negative response to

another ("*nice hat!"* when the speaker means the hat is ugly) (576-577). These tropes, and

many others, serve as serve as epitomes of arguments. Fahnestock (1999) observes that the

view of figures as epitomes of argument is a "recapturing of an older view"; Aristotle did not

refer to figures in The Rhetoric as aesthetic devices for the primary purpose of establishing

an affective response; rather, "certain [figurative] devices are compelling because they map

function onto form or perfectly epitomize certain patterns of thought or argument" (26).

Both Fahnestock and Harris extend the epitomizing nature of figures beyond the heavily

analyzed tropes to the neglected schemes[9]. Fahnestock, in her book Rhetorical Figures in

Science, presents the argument epitomizing nature of schemes such as antimetabole,

antithesis, ploche, polyptoton, incrementum, and gradatio. In one example, she highlights the

figure gradatio in an argument for the preservation of wolves as the arguer details the

progressive effects caused by the wolf killing an elk, whose carcass serves as fertilizer for

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[9] Harris also adds new types to the taxonomy of figures with chroma, an unexpected change in intention, and rhetorical move, tactical constructions outside of purely linguistic domains (2013a: 572-575)

plants that are in turn eaten by an animal which is in turn eaten by another and so on up the food chain. The figure of gradatio *is the argument* (109). Harris (2013a) describes the figures, including antimetabole, in the predicate calculus of pioneering geneticist Gregor Mendal. Harris provides a succinct description of figural logic:

> I want to be as clear as possible that I am not claiming Mendel had a rhetorical manual at his elbow, looking for the appropriate figure to decorate his text or epitomize his argument. The claim is much deeper than that. Reasoning depends on principles and processes that also underlie thought and language more generally and that have obvious manifestations in "style." These principles include identity, similarity, contrast, and symmetry; processes include repetition, substitution, expansion, reduction, and inversion. The figural presence in Mendel's formula is not such as to heighten its aesthetic salience. Rather, that figural presence heightens the formula's functional salience, by compressing the reasoning into a distinctive harmony of patterns. (2013a 585)

These principles and processes that underlie thought are the mechanisms that move intuitive inference from System 1 sub-personal reasoning to System 2 argumentative reasoning; in other words, from thought to language. These mechanisms manifest the attributes of style (including identity, similarity, contrast, and symmetry). All language would move through this process, even literal, or as Harris renames it, to signal a minimum of scheme-shifts as well ("literal" only evokes a paucity of trope-shifts), "bland" language. Bland language "exhibits a lack of design or innovation, recycling routine diction and routine arrangement

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for routine purposes" (575, 598n3); but this lack of innovation or design does not mean it is not produced using the same mechanisms as Harris finds: "Bland language is the effective, specialized residue of language that was developed, using all the resources of figuration, for various daily communicative routines (social routines, professional routines, religious routines). But the bland / figural distinction is one of degree, with some semiotic acts asymptotically approaching degree-zero figuration (degree-complete blandness), or conversely degree-zero blandness (degree-complete figuration), but no living, breathing semiotic act ever actually achieving either degree" (575). There is an unconscious tendency to use figures to form arguments, but, more importantly for professional communication pedagogy, figures can be actively deployed to enhance the form of the structure (claim). As I stated above, every professional communication is an argument even those written in supposedly bland language. Educating professional communicators in figural logic provides an extra dimension to what seems to be routine communication. I am not suggesting that professionals keep a database of figures on their bookmark bar (but maybe I am), but understanding the argumentative power of figural logic is vital in a professional world where the technological unconscious has made getting and sustaining attention a challenging endeavor. One does not have to look very far for examples of figural logic in seemingly everyday professional communications; the figure polyptoton plays an important role in the establishment of criteria in marketing. The word market has undergone a number of ployptotonic neologisms including "marketize", "marketization", and "go-to-market" that serve to argue for the importance of the marketing activity. The subject lines of emails that

contain a scheme stand more of a chance of being read than those written in bland language.

One can imagine our example email from Glenda with a subject line: "Significant Section of

Budget for Broadcast Advertising", as opposed to "Broadcast Advertising" moving into the

sub-personal level of reasoning as it connects stylistic assonance with cognitive affinities for

repetition. Only communication communicates and once the subject line is brought from

System 1 to System 2 reasoning, it is on its own, at the mercy of the hermeneutic capacities

of a reader receiving one hundred and fifty emails a day. The professional communication

simulation game will provide ongoing feedback and advice on the use of figures in

argumentation. Future versions will use natural language processing software to identify

figures such as epanaphora (see…). The current version will suggest figures selected based

on the problem presented. For example, if the student is charged with producing a marketing

proposal, figures such as antithesis, gradatio, and ploche will be suggested. Further details

on implementation are discussed in chapter four.

3.3 Discursive Strategy

The third part of the triad is strategy. Strategy entails making conscious decisions as to the

manner in which reasons formulated through argumentative reasoning are deployed, what

Perelman and Olbrechts-Tyteca name *techniques of argumentation*. Strategy requires form

and is executed within an argumentation structure of claim, grounds, and warrant. Figural

logic is in itself, strategic; using gradatio as the epitome of series reasoning to explain an

ecosystem is a strategic decision. Strategy also involves, however, the reasons and goals for

the deployment of the form. The first aim of a rhetorical strategy of argumentation is that of

what Perelman and Olbrechts-Tyteca term "presence". Making an idea or concept present involves accessing the selection system of the greater attention system of an audience and engaging the sustaining and controlling mechanisms. Hailing as audience, whether one or one thousand other operationally closed mental systems, is challenging in technologically crowded communication spaces. Figural logic, as discussed in the subject-line example above, is one strategy, but generally a second layer of strategy is required. Reasons and purpose come into play at the moment of utterance (spoken or written); how do I structure my reasons to make them present to the selection system of this audience? What will increase my chances of having my communication understood as closely to what I intend as possible? Perelman and Olbrechts-Tyteca recognized the dilemma of double contingency long before Luhmann developed his theory:

> If one finds that a properly developed syllogism, which was
> accepted by the hearer, does not necessarily induce him to act
> in accordance with the conclusions, it is because the premises,
> which were isolated during the demonstration, might have
> encountered obstacles once they entered the mental circuit of
> the person they were supposed to persuade (118).

The producer of an argument has a choice not only in what reasons to put forward, but also in the strategic manner or technique they are presented. As Perelman and Olbrechts-Tyteca put

it: "Questions of form and questions of substance are intermingled in order to achieve presence" (120).

While, in addition to argumentation, professional communication does involve demonstration, I will discuss demonstration and its relation to strategy in the following section on visuospatial rhetoric and design. I realize there is a discursive element to demonstration, but visuospatial rhetoric is required in order to demonstrate. The strategic methods I will focus on in my discussion of discursive rhetoric are Perelman and Olbrechts-Tyteca's formulation of quasi-logical, reality-based, reality-structuring, and concept-dissociating argumentative techniques, as well as Douglas Walton's argumentation schemes of presumptive reasoning.

3.3.1 Perelman and Olbrechts-Tyteca's Project

The mandate of Perelman and Olbrechts-Tyteca's scholarly project is to develop a rhetorical theory of argumentation that moves beyond pure demonstration to the contingent world of human relations. Their techniques are reformulations of established topoi and an amalgamation of classical sources like Aristotle, Cicero, Quintilian, and Augustine, with contemporary European philosophy. Each technique, however, is dissected and analyzed to a far greater degree than any of their classical precursors. What follows is a necessarily brief overview of the four main species of argumentative reason. There is a significant degree of overlap between figural logic and strategic techniques of Perelman and Olbrechts-Tyteca that will become apparent.

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The first argument technique is quasi-logical arguments. These techniques are similar to demonstration in that they present grounds and backing as having the essence of mathematical reasoning. An example is an "argument of reciprocity" where two distinct entities or situations are treated as symmetrical. Perelman and Olbrechts-Tyteca provide an example from Quintilian, "what is honourable to learn is also honourable to teach" (221). "Learn" and "teach" are symmetrical activities in that they both involve a 'movement' of information, but in the opposite directions; they have a conceptual or semantic symmetry. In Quintilian's example, they are connected by the value of "honour". The example is also a case of figural logic with the figures of ploche and isocolon attracting our cognitive affinities for (respectively) repetition and parallelism. The strategic nature of the technique and figural logic is the presentation of two entities as having a conceptually symmetrical nature. One could have said, "learning is good, but so is teaching", but the phrase lacks the authority that symmetry provides.

An example from everyday professional communication would be, "if it is bad for the company, it is bad for you", a whole/part construction framed by epanaphora and enforced by isocolon. To invoke the parallelism created by epanaphora and isocolon is a strategic decision that provides a quasi-logical foundation. To invoke argument of reciprocity and the figural logic of epanaphora and isocolon is to create a mathematical essence to the statement. Other quasi-logical arguments include transitivity, where a relationship between two pairs of entities implies a relationship between all four, and division of the whole into its parts, where breaking an entity into its constitutive elements distributes superordinate qualities among

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subordinate components. The technique is best engaged using figural logic as Perelman and Olbrechts-Tyteca find that "these forms of argumentation can give rise to rhetorical figures" (236). They give the example of "amplification" used by Vico in describing the destruction of a city by listing the destroyed districts. Synecdoche also plays a prominent role in this form of argumentation. There are other quasi-logical argument techniques that will be used in the simulation game. The implementation of these techniques is discussed in chapter five

   "Arguments based on the structure of reality" is a technique of establishing a relationship between what has been previously accepted and what one is proposing (261). Academic arguments, including the one in this dissertation, are based on the acceptance of a view of what Perelman and Olbrechts-Tyteca term "reality" as we cite previous theorists as a basis for our claims. In this dissertation I have claimed that the reality of the organization is structurating communication, based on the systems theory work of Niklas Luhmann. Luhmann is accepted by many sociologists and other scholars as having a viable theory of society. The strength of his social systems theory is my basis for reality. Other examples based on the structure of reality include sequential relations, or cause and effect; one has to believe in the reality of the cause to move to its responsibility for a stated effect.

   The three argument techniques which underlie the most deployed strategic forms in business communication are pragmatic arguments, which "[permit] the evaluation of an act or an event in terms of its favorable or unfavorable consequences" (266); arguments of ends and means, where favorable ends overshadow the means to achieve them; and the argument of waste, where actions already taken would have been in vain and have serious

consequences. Arguments made for increased profit are often presented using one of these strategies. For example, an argument put forward by the Canadian Association of Petroleum Producers on their website is couched in the pragmatic and end-to-means argument strategy. The opening sentence, "Canada's oil sands industry will provide a secure source of energy, reduce its impact on the environment and provide economic benefits to society while developing this globally significant resource" (2012, par 1) wedges the means between two ends making the pragmatic benefit of available energy and economic benefits superior to the means of production. The superior establishment of the ends also implies an argument of waste; *if we don not act now, we waste this valuable resource*. The simulation game will educate the student in the production of arguments based on the structure of reality, but also in their interpretation.

Arguments that establish the structure reality are not limited to strategic business communication. Communication that appears to be purely informational can also use argument by example, illustration, and modeling. Figure 6 reproduces the Siri page from the iPad user manual. The apple user manual establishes a new reality where we are able to have a dialogue with our tablet computer. The text illustrates a world where our tablet serves as a personal assistant. The manual creates a reality where we talk to our device rather than communicating through touch. The user manual uses the figure of *personification* to focus the argument. Siri, a software program that uses the hardware available in the iPad, is treated as a person, someone you can talk to, ask questions and get answers. The argument that

structures reality through illustration and personification is made to enhance Burkean

identification between hardware/software and user.

Siri

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What is Siri?

Siri is the intelligent personal assistant that helps you get things done just by talking. Siri understands natural speech, so you don't have to learn specific commands or remember keywords. You can ask things in different ways. For example, you can say "Set the alarm for 6:30 a.m." or "Wake me at 6:30 in the morning." Either way, Siri gets it.

> *WARNING:* For important information about avoiding distraction while driving, see Important safety information on page 125.

Siri lets you write and send a message, schedule a meeting, place a FaceTime call, get directions, set a reminder, search the web, and much more—simply by talking naturally. Siri asks a question if it needs clarification or more information. Siri also uses information from your contacts, music library, calendars, reminders, and so forth to know what you're talking about.

Siri works seamlessly with most of the built-in apps on iPad, and uses Search and Location Services when needed. You can also ask Siri to open an app for you.

There's so much you can say to Siri—here are some more examples, for starters:

- FaceTime Joe
- Set the timer for 30 minutes
- Directions to the nearest Apple Store
- Is it going to rain tomorrow?
- Post to Facebook
- Tweet

Note: Siri is available on iPad 3rd generation or later, and requires Internet access. Siri may not be available in all languages or in all areas, and features may vary by area. Cellular data charges may apply.

Figure 6: Technical Description of Siri

Another prominent argument involving the establishment of reality is that of analogy. Much scholarly work has been done on analogy (Holyoak & Thagard 1995, Duit 2006, Thagard 1992). Holyoak and Thagard (1995) define "analogic thinking" as understanding one situation in terms of another where the elements of the situations contain and engage cognitive affinities for similarity and structure within a recognized purpose (5-6). Analogies are theoretically interpreted through the conceptual blending of mental spaces and embodied simulation (see 3.2.1). Analogies are powerful versions of argument that engage more fully the cognitive mechanisms involved in conceptual blending such as similarity and association. Analogies also frequently engage our cognitive affinity for narrative. Mark Turner designates "parable" as the "root of the human mind" (1996, 2) where narratives are analogically placed in relation to each other to produce meaning (5). For example, a business analyst attempting to explain the current problems encountered by Research in Motion could argue by example and point to Apple's rise from irrelevance in the late nineties to the most valuable company in the world by 2012 or he could use the same evidence in the form of an analogy by telling Apple's story and letting the receiver do the cognitive work of creating the structure, drawing similarities and associations, and finally establishing the purpose of the message.

The last argumentative strategic technique used in my professional communication pedagogy is the dissociation of concepts. Perelman and Olbrechts-Tyteca define the technique as establishing opposition to connections made between situations and concepts

purported to be interdependent (411). Dissociation is the strategy of objection, the ability to invent counterarguments.

For example, if a manager sitting listening and reading the claims made by the proponents of a new tablet computer being designed by her organization, is unsatisfied with the connections being made between a competitor's situation and their own, she would form grounds to disassociate the example. The manager would disassociate the appearance of an example from the reality. Argument techniques that support a reality such as a pragmatic look at cause and effect; the manager could point out that the competitor's product was successful, not solely because it creates a new category of tablet computer, but due to the ecosystem that supports it. The appearance/reality pair is the most effective argumentative technique out a number of philosophical pairings including ends/means and relative/absolute (416-20). The ability to disassociate the synthesis of concepts and situations is a vital skill for professionals, especially managers and will be an integral element of my pedagogy.

3.3.2 Walton's Argument Schemes

Perelman and Olbrechts-Tytecca provide what David Hitchcock (2010) calls a "bottom-up approach" (159) to argument generation. While offering a rich and dynamic set of generalized argumentative schemes, the inventional strategies of the new rhetoric are less interested in the response of particular audiences. Perelman and Olbrechts-Tyteca's strategies account for a universal audience, but make no claims on the effects of their schemes on a contextually situated audience. The presumptive reasoning schemes of

Douglas Walton offer an adjunct to the New Rhetoric that accounts for audience or interlocutor response. While many of Walton's schemes overlap with schemes developed by Perelman and Olbrechts-Tyteca, Walton presents a strategic method ideal for an online technogenetic environment. While a detailed description and discussion of Walton's extensive work on argumentation schemes is beyond the scope of this dissertation, two key elements in his work are critical to the objective of improved feedback in an online setting. Presumptive reasoning entails the deployment of an argumentation scheme with one defeasible premise presupposed (Walton 2009). For example, a manager could make the proposition, "I have not heard back from Susan on the budget, so I am going to go ahead and issue the purchase orders". The manager is making an argument using Walton's "argument from sign" (loc. 1504) where the sign in question is a lack of response from Susan. The sign is being used to argue that the manager is cleared to move ahead with a proposed budget. The missing premise, in an Aristotelian enthymematic sense, is the proposition that a non-response from Susan indicates an affirmative response. The manager presupposes that basis of the sign is an implicature agreed to by her audience. The premise is, however, defeasible. Walton provides a series of "critical questions" aimed at demonstrating the defeasibility of the scheme—such as, "is there any other event that could reliably account for Susan's non-response?"—thereby countering the unstated premise (loc 1505). While presumptive reasoning is similar to Perelman and Olbrechts-Tyteca's quasi-logical schemes, it differs in its attention to response. Walton has developed over sixty argument schemes, ranging from "argument by example" to "argument by analogy" (Walton, Reed & Macagno 2008), that

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serve as presumptive reasoning. What is important to the Professional Communication Simulation game and technogenetic pedagogy are these specific identifiable schemes, as well as the concept of critical questions. Walton's schemes are utilized in natural language processing and artificial intelligence projects in argumentation (discussed in detail in chapter six) and are ideal for the annotation engine of the simulation game. The schemes are more easily annotated and the critical questions present a feedback opportunity that occurs in real time. For example, if a student deploys the scheme "argument from expert opinion", they are able to annotate the sentences representing the stated premises. The artificial intelligence of the simulation game is then able to ask the critical questions, such as, "is there a possible bias on the part of the expert" that create a real argumentative dialogue. Walton's schemes add to Perelman and Olbrechts-Tyteca's work on general argumentative invention to create a complete argumentation pedagogy for technogenetic rhetoric.

3.4 Extra-Discursive Rhetoric

The truth of the statement, "every professional communication is an argument," requires an acceptance of the notion of extra-discursive rhetoric. As I discussed above, a simple meeting request carries an argument that goes beyond the overtly stated claim and grounds, the ethos of the sender, the receiver's perspective on the importance of the issue at hand, and the quality of the discursive rhetoric, the writing. Extra-discursive elements of the argument are also vital. Joddy Murray (2006) defines some of the elements that I am designating extra-discursive as "non-discursive", which she describes as including "the many other ways

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humans use symbols to create meaning – methods wholly outside the realm of traditional word-based discursive text." She adds that

> [w]ith this distinction in symbolization, then, comes a distinction in rhetoric; non-discursive rhetoric is the study of how these symbol systems persuade, evoke consensus, become epistemological, and organize or employ intended results in human behavior (12).

Murray includes film, dance, gesture, and vocal elements in her view of the non-discursive rhetorical realm. I believe the Foucauldian term *extra-discursive,* is more appropriate for professional communication, as the effects often overlap with discursive and visuospatial rhetoric. Extra-discursive symbolization focuses on two rhetorical appeals that play an important role in professional communications: ethos and pathos. While ethos and pathos are at times dealt with directly in discourse through explanations of skills, experience, and word choice, logos dominates the strategies discussed above. Figurative language is often used to evoke emotion, but figural logic implies the use of figures to establish logical arguments. The appeals of ethos and pathos, or credibility and emotion, are dealt with in a cursory fashion in most professional communication texts. Both are dealt with as discursive rhetoric. "How do you establish credibility in your text?" they ask. "What words evoke emotion in the reader?" Both ethos (I will use *ethos* to stand in for the combination of credibility and character) and emotion (I will use *emotion* rather that *pathos* to avoid confusion when discussing research from cognitive science, psychology, and neurology) are primarily appealed to through extra-discursive symbols; the manner in which you carry your

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body, the tone of your voice, the appropriateness of gestures, clothing, and timing (kairos) are vital signals of ethos. The use of visual images, movement, volume, as well as all of the aspects of ethos listed above, extra-discursively appeal to emotion. Ethos is appealed to in every professional communication while emotion is appealed to in varying degrees that fall along a continuum ranging from intense – as found in advertising – to subtle praotes, the subdued calmness displayed in many technical communications (see Aristotle, 130) The three appeals; logos, ethos, and emotion are entwined and interdependent. I am suggesting a conscious effort to teach extra-discursive symbolization as part of professional communication pedagogy beyond aspects of tone, body language, and visual rhetoric. Just as cognitive science and psychology are finding a cognitive role for discursive rhetoric in our ability to communicate and reason, extra-discursive rhetoric as purveyor of ethos and emotion serves a vital cognitive role as well.

While ethos is accepted as a crucial element in effective professional communication, emotion often gets a bad rap. In the heat of an argument, one often hears, "don't get emotional"; emotions in a professional argument are often viewed as an aspect of weakness. The discursive strategies discussed above are based on quasi-logic, structuring and the structure of reality; there is little discussion of emotion. As Murray writes, however,

> Recent work done by neuroscientists suggests … that
>
> consciousness is 'the feeling of what happens,' so for our field
>
> [rhetoric] to attempt to continue to view affect as distinct from

reason simply becomes nonsensical; reason is part of our

consciousness, and, therefore, reason must be affective (85).

The "feeling of what happens" references a concept developed by neuroscientist Antonio Damasio in his book of the same name (1999). Damasio refers to the role of emotions in consciousness where a state of emotion can be unconsciously engaged causing a state of feeling to be unconsciously represented, and when a state of emotion comes into contact with a represented feeling, a state of feeling becomes conscious (37). Feelings are based on reasoning in light of emotions, making emotions an important dimension for reasoning. Earlier I discussed the evaluative nature of arguments. We evaluate our own reasoning (System 1 evolving into argumentative System 2 reasoning), and we evaluate the reasoning of others, all in the presence of conscious feelings or unconscious intuitions. To ignore the affective nature of professional communication seems a remnant of the positivist frame of Taylorism. In reality, emotions are present in the reception of every communication albeit on a continuum ranging from practically dormant to highly engaged. Judgments of ethos are essentially based on emotions. Ethos is a feeling. Ethos is a belief and the poster child for emotionally based reasoning. Returning to my meeting request example, when one receives the request and reads the discursive argument, she does so in a state of emotion that given the right circumstances could become represented as a feeling. The state of emotion may have to do with the timing of the meeting, the location, the importance of the subject matter, or possibly with the ethos of the sender. As I discussed above, if the sender has a reputation for calling pointless meetings, or lacks the authority to take a leadership role on the subject, the

emotional state of the reader may become represented as a feeling of anger, disgust, amusement, and so on. Emotions and feelings shape the argumentative System 2 reasoning; should I respond in the affirmative or negative; should I reply to all or just the sender? Most of the argumentative elements that shape these questions are extra-discursive; the status, authority, and credibility of the sender are judgments made from long-term memory and are based on images of the sender made by the receiver.

3.4.1 A Review of the foundations and images

Before discussing the term "image", it is important to revisit the foundation of my conception of professional communication pedagogy and technogenetic rhetoric. Organizations, as social systems are constituted by communication. Members of the organization, as mental systems, are capable of producing communication, but incapable of communicating; only communication communicates. When we form communication through intuitive inference and argumentative reasoning, we are attempting to identify with others, forming a consubstantial relationship where we share substantive understanding. In order to develop identification, we have at our disposal rhetoric, a way of configuring language into tropes, schemes, and strategies that find affinity with the cognitive attributes and mechanisms (repetition, similarity, association, symmetry, and so on) of other mental systems. We do our best to reason out our unconscious intuition into language and to organize that language into patterns and arrangements that stand the best chance of achieving identification and consubstantiation through understanding. To sum up, we have covered how we arrange language into figures and strategies of discourse that appeal to the cognitive

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affinities and argumentative reasoning capabilities of an audience, both universal and

particular. The question remains; how are such cognitive affinities, mechanisms, and

reasoning functions accessed and how are they defined. In order to begin to answer such

questions, the concept of "image" must be defined.

The term "image" in professional communications has generally stood for two things: the

ethos projected by a person or product, for example BlackBerry's brand image; and image as

a picture, a visual presentation of something. The definition of image that I employ could

encompass both senses, but I will use the word image to mean "mental image", a mental

construct that fills Fauconnier's mental spaces. I use Antonio Damasio's (1999) conception

of image as multi-sensory; an image can be constructed by sound, touch, taste, smell, as well

as by vision. According to Damasio,

> The business of making images never stops while we are
>
> awake and it even continues during part of our sleep, when we
>
> dream. One might argue that images are the currency of our
>
> minds. The words I am using to bring these ideas to you are
>
> first formed, however briefly and sketchily, as auditory, visual,
>
> or somatosensory images of phonemes and morphemes, before
>
> I implement them on the page in their written version.
>
> Likewise, those written words now printed before your eyes are
>
> first processed by you as verbal images before they promote
>
> the activation of yet other images, this time non-verbal, with

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which the 'concepts' that correspond to my words can be

displayed mentally…Even the feelings that make up the

backdrop of each mental instant are images, in the sense

articulated above, somatosensory images, that is, which mostly

signal aspects of the body state (319).

Images may be representations, mental constructs of the contents of memory, such as

remembering a face (320). These representations are not facsimiles or *reproductions* of the

world; they are rather, the product of enactive *engagements* with the world. Images are

neural constructs of interactions between our bodies and other systems. Returning to

Luhmann's application of Varela and Maturana's theory of autopoiesis, mental images are

what form when we structurally couple with other systems. As operationally closed mental

systems, human beings enactively construct neural patterns that form mental images.

Emotions play a key role in the formation of images. In fact emotion is involved in the

formation of every image; "emotions shade everything we know and understand. Without a

slight emotional shade to the image of an object, we can not ultimately connect the image

with its value, or meaning, or level of familiarity we have with it" (Murray 2006 100).

Damasio (1999) theorizes a constant hum of emotions that he terms "background feelings"

(286). As discussed above, we are constantly in an emotional state that ranges from low to

high in terms of engagement; we are not always happy or sad; afraid or angry. Damasio

suggests we function most often in a state of background feelings that arise from background

emotions and consist of states such as "fatigue, energy, excitement, and relaxation. We may

or may not be consciously aware of our background feelings depending upon their degree of intensity and they can be a result of psychological or physiological stimuli. Murray summarizes why we need to teach the engagement of emotions in composition:

1. Reason and affectivity are not in opposition; even rational states such as intellectual interest or concentration are constituted by emotion

2. Every image carries an emotional charge or affective component

3. Background feelings run all the time creating a "mood" or baseline context for emotions

4. Emotional behavior is neither rational or irrational; emotionality does not indicate emotional value; one can experience a valueless emotion (not liking insects and so on)

5. Affectivity and images are central to reasoning (104-05)

From a professional communications perspective, the question becomes how do we account or engage emotions and background feelings. While engaging affect through discursive rhetoric of word choice and figuration is inevitable, extra-discursive rhetoric also engages emotions, perhaps to greater effect. The ability to enactively engage more senses with sound, smell, touch, taste, as well as sight provides more opportunity to connect with background feelings and emotions. Emotion is omnipresent to System 1 and System 2 argumentative reasoning and plays a critical role in the engagement and maintenance of the greater attention system. Background states such as "energetic" or "relaxed" affect the degree to which the selection system is motivated to attend to objects or situations (Lang & Davis 2006). Let's

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look at an example from professional communications where a CEO is speaking to all members of an organization at the company's annual meeting. The extra-discursive mental image of ethos held by the receiver of communication for a sender may engage a background state of energy, and maybe even the full emotional state of excitement. Emotion directs and focuses attention, and researchers Renee Thompson et al (2011) have found that when attention is directed not only at a signal, but also at the emotion itself, the subject switches attention between signal and a desire to control the level of affect. This engagement of the switching mechanism of the selection system points to a movement between mental images of the signal and that of the receiver's emotional state. Using Fauconnier and Turner's theory of conceptual blending, one could diagram the integration of mental space images of ethos, message, and emotional self-awareness into a blended mental space of identification and consubstantiality, as in Figure 7..

Grounding
Listening to a CEO
Present the "state of the company"
at the annual general meeting

Ethos
Non-discursive rhetoric
of reputation - vocal qualities
bearing - appearance

Argument
Discursive rhetoric
presented by the CEO

Emotional State
An emotional state is only a mental space
if the mind is aware of the state - the mind
recognizes and objectifies the emotion -
on this case excitement and pride

Identification
&
Consubstantiation

Figure 7: Conceptual Blend of Extra-Discursive Qualities in a CEO Speech

The extra-discursive rhetorical qualities of leadership, trust, expertise, and so on, blend with

a mental space of personal affective reflection consisting of pride and accomplishment, and

the message content of a successful year for the company into a mental space where the

accomplishments of operationally closed human systems are consubstantial. Focusing on the

extra-discursive rhetorical formation of mental images is as important as our attention to

discursive rhetoric.

So far, my focus on extra-discursive rhetoric has been on unwritten and unspoken formation of mental images. Images of ethos, engagement of emotion and attention are, for the most part, rhetorically evoked through extra-discursive factors; the tone, pace, and volume of a speaker engages emotion and attention; the gestures and bearing of a speaker form mental images of ethos. The purpose of our communication is the creation of a mental image in the mind of the receiver that matches as closely as possible to the image in our own mind. Extra-discursive factors help frame content as information increasing the likelihood of understanding and identification. By framing, I mean the extra-discursive expresses context that limits interpretation of communication. For example, the extra-discursively expressed credibility of a writer or speaker evoked through vocal tone, intonation, volume, gestures, and so on, in the case of speech; ink density, paper size and texture, and so on in the case of print. Extra-discursive elements combine with information retrieved in long-term memory to establish the frame of ethos. Extra-discursive elements can frame arguments in rhetorical appeals of ethos and affect by appealing not only sight and sound, but to all senses. In professional communications, however, there are opportunities to engage the senses of touch, such as the tactile feel of a report, the appropriate firmness of a handshake, or the raised letters on a business card. There may be fewer opportunities to engage smell and taste except perhaps in marketing based communications, but the smell of a presentation room and the taste of the food offered at lunch are extra-discursive elements of rhetorical appeal. The methodology of extra-discursive rhetoric that will accompany the structure, form, and strategy of discursive rhetoric is visuospatial rhetoric manifested as *design*.

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3.5 Visuospatial Rhetoric and Design

Both discursive and extra-discursive rhetoric are designed. There are elements of visual language in both. The concept of visual language is difficult to define; many scholars provide many definitions. The best explanation is provided by University of California at San Diego psychologist Neil Cohn. Human beings have only three ways to communicate the products of our minds, he notes: the production of sounds, moving our body in gesture including touch, and by producing visual images   Cohn theorizes that "when any of these conceptual channels takes on a structured sequence governed by an underlying rule system (a grammar), it becomes a language" (1). Sounds become spoken languages, gestures become sign languages, and sequential images become visual language (1). Cohn presents comics as the archetypal example of a visual language, but I believe the structured sequence of images can also be applied to any visual image used to extend and enhance a narrative or argument. Just as a word or phrase is structured spoken language, a single image may be structured in a way that makes it visual language. Cohn's definition does not directly account for writing, but if one sticks to his definition, writing is a visual language. All three modes Cohn defines are motivated to produce understanding in another human being. All three involve meaning; the difference is the medium. In terms of professional communication, the language of argumentative reasoning produces information using all three modes, sometimes all at once as in a spoken presentation where voice transmits communication as sound, body language and physical movement as gesture, and digital images projected on a screen as visual language. The structure, form, and strategy play a role in both the discursive and extra-

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discursive elements of all three languages. This means that design plays a role in all three.

The vocal delivery of the information is designed in the sense that the uses of inflection,

volume, pace, and tone are consciously considered and planned for; a speaker may speed up

at certain points in the presentation to engage attention and emotion. There is a design

element to the reasoning offered in the argument itself in the deployments of figures and

strategy, as well as in the organization of the structure itself, the placement of the claim,

grounds, and backing. There is a design element to the gestural language including

conscious decisions such as when to move out from behind a podium and approach the

audience or moving one's arms in a gesture of gathering when speaking of community and so

on. And there is absolutely a design element in all visuospatial aspects of the presentation

from typeface for the text, the presenter's clothing, the lighting of the room, the placement of

cameras for online transmission and recording of video, the graphical presentation of data, to

the choice of images for the slides. At times design choices such as these are out of the

presenter's control; the typeface options are chosen by the Microsoft or Apple; the lighting a

decision of the interior designer of the room. Design becomes the driver of the elements of

purpose, audience analysis, and decisions of scope that are part of current professional

communication pedagogy. Design links purpose, audience, and scope to the praxis of

structure, form, and strategy of discursive and extra-discursive rhetoric.

   While the design of discursive rhetoric is entirely proactive and established in

consciousness, some elements of extra-discursive rhetoric cannot be proactively designed,

such as the positive ethos of successful projects. However, most can be; the extra-discursive

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elements of speech are selected, organized, arranged, and delivered within a conscious design. The extra-discursive elements of written communication from choice of typeface to medium are most definitely designed. Visuospatial rhetoric and information design provide the concepts and methodologies for professional communication pedagogy. Visual rhetoric, as defined by Marguerite Helmers and Charles Hill (2008), investigates "the relationship between visual images and persuasion" (76). Visual rhetoric is an emerging field struggling with identity issues:

> some people seem to think of visual elements only in relation to expressing quantitative relationships in charts and graphs. Other scholars concentrate solely on the ubiquity of visual elements on the Internet. Much of the more culturally oriented work is based in art history and art theory, giving the impression that, when we speaking of "visuals" and "images", we mean artistic artifacts exclusively (98).

The concept of visuospatial rhetoric that I employ in technic-cognitive rhetoric moves beyond the visual image to the intersection of visual and space created by technology. Visuospatial references aspects of communication related to the increase in visual elements of communication brought about by digital media. Information design, on the other hand is focused on meaning. Information Design researcher, Erik Reel, defines information design as

transform[ing] data into clear, meaningful, easily accessed

information. It originally derived its techniques from graphic

design, cognitive psychology, human factors research, and

industrial design; and continues to draw from these and any

other field that provides insight into how humans assimilate

and understand information and the media through which it is

conveyed (1).

Professional communication pedagogy requires a rhetorical theory of design that incorporates

the salient aspects of visuospatial rhetoric into the practical mandate of information design

allowing the triad of structure, form, and strategy to be applied to visual language. The

approach to information design I will employ is based on the work of Charles Kostelnick and

Michael Hassett, as well as that of Edward Tufte. Kostelnick and Hassett develop a theory of

visual language based on conventions created by discourse communities. They find

ubiquitous conventional practices to exist in all forms of professional communication and

argue that the

principles that structure these disparate forms can best be

discovered by defining how users collectively shape and

normalize them within group – some large and some small,

some well defined and others loosely knit (2003, 5).

They present a convincing case for the analysis of convention: conventions encourage invention as they are in a constant state of flux; conventions exist in all forms of design; conventions operate in social contexts; and conventions are essentially rhetorical (5-6). Using a theory of discourse community conventions fits well with a social systems and field conception of communication and professional organizations. Discourse communities that serve as the environment for the constituting communication inhabit Toulmin's field conceived as communication systems. Conventions are the structuring elements of information design. While Kostelnick and Hassett do not delve into pedagogy, conventions can be used both heuristically and hermeneutically. The student will uncover the conventions of a field in order to challenge or conform to them. The work of Edward Tufte provides the tools for the creation of great design. Everything from the use of data-ink, colour, and layering, to the escape of flatland is prominent in the pedagogy of Ametros..

3.6 Summary

All professional communication is rhetorical, an argument addressed to an audience to be evaluated. The most routine communication carries a rhetorical weight in discursive, extra-discursive, and visuospatial forms. To summarize the rhetorical basis of a techno-cognitive rhetorical professional communication pedagogy, let's return to our fictional marketing manager Glenda. Glenda has been tasked with producing and presenting a market analysis of a new geographic region for her organization's product. After completing the necessary research, Glenda will develop discursive and extra-discursive rhetoric aimed at creating the highest degree of identification between herself and her audience. Glenda will analyze the

data to create a claim based on grounds to support her warrant. She will structure her case as

an argument aimed at persuading her audience of the merits of her analysis. Glenda

establishes the basic structural elements of her argument, for example a claim "we should

launch our product in country X", based on grounds such as "the data demonstrates

alignment between our new market criteria and the demographic profile of the citizens of the

country", establishing a warrant that "the company will sell more product by entering the

market of country X". As they stand, the claim and grounds of the argument, even with

backing, qualifiers, and rebuttals, are insufficiently weak in terms of persuasive capability.

Glenda moves to the elements of form and strategy. She may decide to follow a strategy

based on the current structure of her firm's reality; for example, "if we do not move into the

market, out competitors will; the lost opportunity cost of not selling in the market justifies the

immediate investment". Glenda will develop her backing based on the strategy to build a

strong case for her claim and grounds. She will use qualifiers such as "potential" and "high-

probability" that align with the language of her industry's field. She will work from larger

scale strategies to strategies of figuration and figural logic that will at once help support the

quasi-logical arguments based on projections, while appealing to the audience's cognitive

affinities for elements such as repetition. Figural strategies take place at the micro level, the

sentence and paragraph and add another layer of strategic argument to her case. For

example, she may employ the figure gradatio to demonstrate the increased organizational

financial benefits with each step of opening a new market and Glenda may use the figure of

epanaphora to appeal to cognitive affinities; "We will establish profitable retail partners; we

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will establish profitable regional sales teams; and we will establish a profitable overall market in country X".

On an extra-discursive and visuospatial level, the same structure, form, and strategy apply to the formation of mental and visual images. The organization of Glenda's argument, the thoroughness of her research, and the effectiveness of her strategies will develop her ethotic appeal. The audience creates a mental image of the credibility of Glenda. She will use visuospatial design to increase her ethos; the design of her documents, presentations, along with her charts, tables, and figures all affect the audience in terms of both attention and emotional.

The next chapter presents the execution of techno-cognitive rhetorical pedagogy capable of instilling the strategic and theoretical tools that allow students communicate in a professional world of hyper attention in the grasp of the technological unconscious.
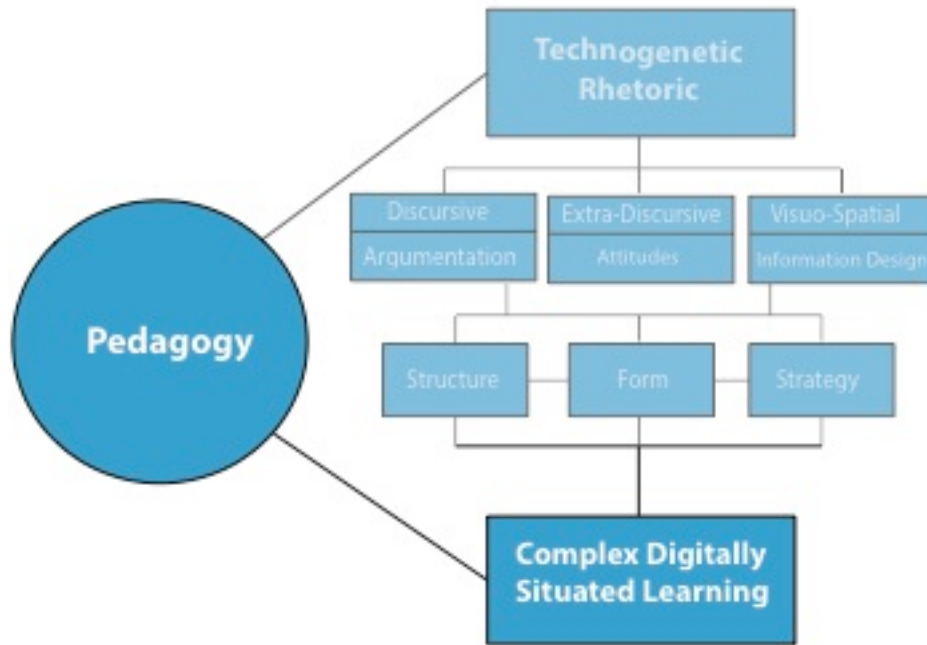
Chapter 4

Pedagogical Foundation of Technogenetic Rhetoric

As discussed in chapter 3, the rhetorical basis of professional communication pedagogy is at once discursive, extra-discursive, and visuospatial. Professional communication involves composition of textual discourse, composition and delivery of oral discourse, as well as visual discourse in the form of infographics. It also involves extra-discursive appeals to ethos and affect through credibility gained or lost in the historical context of previous

accomplishments, the design of information, and deployment of visual images. In the previous chapter I looked at the structures, forms, and strategies available to technogenetic rhetoric; namely, argumentation, figurative language, figural logic, and information design delivered and received in the context of the sender and receiver's cognitive mechanisms and affinities. Viewing human beings and organizations as operationally closed autopoietic systems enframed by technology where only *communication communicates*, calls for a cognitive approach to rhetoric and composition in a professional setting. An individual develops beliefs, ideas, and methodologies from intuitive inference that are subjected to argumentative reasoning before being expressed as discursive, extra-discursive, and visuospatial language. Once the communication is formed it is at the mercy of the interpretive abilities of the receiver who follows the same process in reverse by moving language into argumentative reasoning and subjecting her interpretation to intuitive inference. Cognitive rhetoric is developing out of work done in cognitive science, psychology and rhetorical studies on argumentation and reasoning, cognitive effects of figuration, figural language and logic, as well as mental images, and affect. Cognitive psychologists Sperber and Mercier have conducted extensive research into the argumentative nature of reasoning. Scholars Jeanne Fahnestock and Randy Allen Harris have followed up Kenneth Burke's intuition that form leads to assent in the reception of a message to develop theories of figuration and cognitive affinities, and figural logic; theories that are supported by experimental work in cognitive psychology on the effects of cognitive affinities for repetition, assonance, and so on in the enhanced reception of language (see Zatorre, 1992).

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George Lakoff, Raymond Gibbs, Gilles Fauconnier, and Mark Turner have conducted extensive research into the epistemic nature of figurative language. For the purposes of professional communication pedagogy, I propose placing the multidisciplinary scholarship of cognitive rhetoric in the context of digital media technologies in contact with the cognitivist theories of Jean Piaget and Lev Vygotsky. My conception of technogenetic rhetoric is focused upon elements of production and reception of communication consciously and unconsciously embedded in technology rather than solely the cognitive processes of composition as metacognition.

A technogenetic rhetoric, emerging in a multidisciplinary fashion, investigates what is going on beneath the theory of composition as metacognition developed by Linda Flower and John Hayes in 1981. Originally named "cognitive rhetoric", Flower and Hayes developed a process model consisting of cognitive systems of *planning*, *translating*, and *reviewing* (372-74). *Planning* involves generating ideas and constructing internal representations from long-term memory. *Translating* is the process of "putting ideas into visible language" (373). *Reviewing* involves cognitive processes of evaluation and revision. These three process sub-systems (sub-system as each process involves other processes) operate with the guidance of a *monitor* that determines when to move from one process to another. Technogenetic rhetoric investigates the underlying cognitive mechanisms that generate these activities. Sperber and Mercier's work on System 1 and System 2 reasoning as intuitive inference and argumentative reasoning describes the mechanisms involved in planning, translation, and reviewing (see also…). The work on figuration and argument done by Fahnestock and Harris move beyond

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Flower and Hayes to develop theories on why figures appeal to our mind/brain and how figures induce identification through quasi-logic while Lakoff, Gibbs, Fauconnier, and Turner present theories of epistemic reception for figurative and rhetorical language.

Technogenetic rhetoric is ideally suited to the development of professional communication pedagogy from a perspective of social systems theory. Understanding the mental processes and mechanisms involved in receiving communication increases the likelihood of successful communication. For example, recognizing that figures such as antimetabole appeal to our cognitive affinity for repetition increases the likelihood of establishing identification and consubstantiation with one's audience. Understanding the argumentative nature of our reasoning mechanisms in combination with the ability to structure and strategize an argument increases the likelihood of establishing identification inducing understanding. Producing and receiving identification inducing communication, however, is not a cognitive activity occurring in a vacuum, argumentative reasoning, conceptual blending, and the deployment of figurative language occurs simultaneously to the enactive cognition of context. Context is the manifestation of communication as identification; context is the non-material and material substance serving a consubstantiating purpose. In other words, context is the shared objects, discourse, and visuospatial mental images produced by communication. Consubstantiation, formed through identification is knowledge formed through both cognitive mechanisms of reason in the presence of catalytic mental images of shared and situated context. Context, that in a complex system of organizations, is more often than not, *digitally* situated. Mental images of digitally situated context are shared based on commonly held properties and

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situation. For example, two marketing managers discussing a new project share contextual mental images of high level product strategy, the language that describes the marketing activities (neologisms such as CPA – cost per acquisition), the individuals that form their teams, and so on. This shared context is situated in Toulmin's fields and the conventions of discourse communities and these fields and discourse communities take on new elements of meaning if they are digitally situated. For example, the same meeting taking place via Skype call consciously or unconsciously adds another dimension to the context; consciously if the presenters are managing the visuospatial dimensions of the call such as angle of the camera, lighting, and so on; unconsciously if the technology is affecting extra-discursive elements of ethos by such factors as vocal pitch and tone. If it is to be used in the development of professional communication pedagogy, technogenetic rhetoric requires a theory of context and knowledge that is shared and digitally situated.

Chapter 4 develops a complex, digitally situated pedagogical basis for technogenetic rhetoric. Section 4.1 describes technogenetic pedagogy in relation to the cognitive composition work of Linda Flower and John Hayes. Section 4.2 defines shared and situated knowledge in terms of the constructivist pedagogy of Piaget and Vygotsky as a prelude to the introduction of a digital simulation game that aligns learning and experience. Section 4.3 further develops technogenetic pedagogy by introducing Gee's theory of semiotic domain as a strategy to deal with the complications of organizational space created by Luhmann's system theory. Section 4.4 reviews selected examples of current professional communication pedagogy in comparison to technogenetic pedagogy. Section 4.5 calls primarily on the work

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of Byron Hawk to establish a post-process pedagogy capable of dealing with the conception of audience as assemblage of technological and human systems. Finally, section 4.6 repurposes the work of Margaret Syverson on composition and complex systems, as well as actor-network theory to develop two analytical methods focused on the dimensions and attributes of communicative assemblages. These methods serve as the pedagogical underpinnings of the professional communication simulation game.

4.1 Technogenetic Composition Theory

Linda Flower, in her 1989 paper "Cognition, Context, and Theory Building" recognizes the need for a cognitive theory of writing to be integrated with a theory of context. Flower presents a theory where cognition and context construct one another:

> Let me propose three principles that inform this more
> complicated interaction and suggest that both cognition and
> context may in a sense construct one another. One principle is
> that cultural and social context can provide direct cues to
> cognition. The second is that that context is also and always
> mediated by the cognition of the individual writer. And the
> third is that the bounded purposes that emerge from this
> process are highly constrained but at the same time meaningful,
> rhetorical acts (287).

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Flower describes in her first two principles what in essence is an enactive and situated theory of context and cognition. The individual mental system enactively engages the world to form a reality that exists in immediate consciousness, but also in working and long-term memory. For example, a professional composing the business case for a proposed marketing program will enactively engage visual, auditory, and kinesthetic perception to produce the text using a computer (the document could include text, visual images, sound), move from System 1 intuitive inference to System 2 argumentative reasoning while calling on relevant data stored in long-term memory to situate the information. The document is transmitted and detached from the composer. The hermeneutic treatment of the message by the receiver is a combination of perception, digital literacy and existing knowledge that combine to form new knowledge. Flower's third principle relates to the management of Luhmann's double contingency, the individual choices of contextual knowledge are contingent just as the interpretation of the message is at the mercy of the contextual knowledge the receiver brings to the table. Flower is pointing to the effect of rhetoric on choice:

> When we look closely at how writers construct these bounded
> purposes we do not see a single statement of purpose, but a
> web of purpose—a complex network of goals, plans,
> intentions, and ideas (Flower, "Construction"). The creation of
> this web is a richly interactive social and cognitive event;
> however, the way in which people manage or mediate the

constraints upon them may depend on whether they recognize

the significance of their own choices within this web (292)**.**

The goals, plans, and intentions Flower refers to, align with conscious choice of structure, form, and strategy in producing professional communication. The choices made with the intention of enhancing identification and consubstantiation are based on rhetorical choices that bring the operationally closed mind/system of the composer closer in substance to the operationally closed mind/system of the audience. As Flower adds, however, the execution of these choices is an "interactive social and cognitive event", and if I take social to refer to context, a technogenetic rhetoric suitable for professional communication pedagogy must account for shared and situated knowledge.

4.2 Shared and Situated Knowledge

The next issue a technogenetic rhetoric must address is the origin of shared and situated knowledge. The discussion above clearly demonstrates, from the perspective of social systems theory, the constructivist nature of knowledge formation through identification forming discursive, extra-discursive, and visuospatial rhetoric. In epistemological terms, technogenetic rhetoric and social systems theory hold to the social constructivism of Richard Rorty. Rorty (2009) argues against a "foundation" for knowledge; knowledge does not exist out in the world ready to be visually perceived or represented. Rorty would like to do away with epistemology altogether as a vacuous pursuit of something that does not exist. Rorty calls for a "hermeneutics" that is not a discipline, but an "expression of hope that the cultural

space of epistemology will not be filled" (315). Hermeneutics, for Rorty, serves as a reference to the constructed nature of knowledge.

The work of Jean Piaget (2000) offers a cognitivist theory of knowledge that aligns with social systems theory and technogenetic rhetoric. Piaget develops a theory of stages in which a child develops cognitive structures called schemata through accommodation and adaptation: (1) sensorimotor, (2) pre-operation, (3) concrete operational, and (4) formal operational. Grounding knowledge develops as concept patterns termed schemata. For example, the schemata for *living thing* will evolve through the stages from "all things that move are alive" in the pre-operation stage to sophisticated definitions based on biology in the formal operational stage. Individuals construct knowledge through cognitive adaptation and accommodation where schemas are experienced and internalized. The individual mind/brain adapts to the requirements of her environment by adapting existing schemas formed through rhetoric. For example, the child in the pre-operation stage believes a car to be alive because it moves and takes on food in the form of gasoline. As the child enters the concrete operational stage, she adjusts her schema to remove automobiles from the schema of what makes a thing alive. New information such as the concept of a "driver" and "gasoline is not a food" causes the adaptation. Discursive rhetoric as language and visuospatial rhetoric as the actions of a driver play a vital role in the child's ability to accommodate schemata. Such information can be deemed rhetorical in cases where other individual mental systems are structurally coupling with the child as mental system through discursive, extra-discursive, and visuospatial communication. There is a persuasive element of identification at work in

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accommodation; the child wants to identify with the adult world and the adult world wants the child to identify with it. Piaget offers a constructivist epistemological theory that aligns with Luhmann's autopoietic and operationally closed social and mental systems. Social systems are constituted by communication that serves to develop cognitive mechanisms and schemata in human beings from birth to adulthood. Although Piaget believed the mental system of the individual to be the primary space of adaptation and accommodation, he did offer what I take to be an explanation of autopoietic structural coupling as rhetorical identification in 1967 when he wrote:

> In the realm of knowledge, it seems obvious that individual
>
> operations of the intelligence and operations making for
>
> exchanges in cognitive cooperation are one and the same thing,
>
> the "general coordination of actions" to which we have
>
> continually referred being an interindividual as well as an
>
> intraindividual coordination because such "actions" can be
>
> collective as well as executed by individuals. (360)

The "operations of the intelligence" and "cognitive cooperation" Piaget refers to correspond closely to the systems of argumentative reason and formal assent studied and theorized by Sperber and Mercier, and Kenneth Burke. Knowledge is constructed by the individual mental system in an environment of communication as social system. Context as shared and situated knowledge is at once the defining manifestation of the social system and

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the product of individual mental operations. These operations, including intuitive inference, argumentative reasoning, conceptual metaphor and blending, and figural logic, strive for identification with either one's self as thought or with others as communication. Technogenetic rhetoric offers a theory of discursive, extra-discursive, and visuospatial communication as the way in which autopoietic, operationally closed human mental systems cooperate and function in social systems of communication. Discursive rhetoric of argumentation and figuration align with cognitive mechanisms of reasoning, as well as cognitive affinities for various mental functions such as repetition and symmetry. Technogenetic rhetoric moves beyond pedagogy of current-traditional methodologies of process towards pedagogy that accounts for technological cognitive extension towards the development of strategies that provide students with insights into the problems of communication in a professional world dominated by a technological unconscious where cognitive systems of attention and memory are unconsciously extended and altered by networked technology. The next section of this chapter presents a teaching methodology aimed at providing a strategy for communicating in a world of technological unconscious, but also a strategy for reaching technologically unconscious students.

   Foundational to a technogenetic rhetoric is the work of Russian psychologist Lev Vygotsky. Vygotsky is focused on the transformation of interpersonal thinking into intrapersonal communication. While Piaget establishes a relationship between the operations of intelligence and social cognition, a gap developed between educators and psychologists on the mechanism of transfer. In his forward to the 2012 edition of Vygotsky's classic <u>Thought</u>

and Language (1986), Alex Kozulin describes the disconnect: "the popularity of Piaget's theory only reinforced the conviction that children should first reach an appropriate level of conceptual reasoning (evaluated by psychologists) in order to be ready for the corresponding level of instruction (provided by educators)" (xi). Vygotsky placed a far greater emphasis on the socio-cultural effects on learning (Kennedy). He conceived the "Zone of Proximal Development" (ZPD) which measures the difference between a learner's mental age level and the age level she can solve problems with assistance (Vygotsky, 198); Kozulin describes the ZPD as "a psychological 'space' where students' experientially rich spontaneous concepts meet the teacher's systemically organized academic concepts" (xviii). Vygotsky performed experiments in which children of equal mental age were given problems beyond their stage of cognitive development. One child was given assistance in the form of leading questions or the first step of a solution while the other was left on their own. The child offered assistance was able to solve problems beyond their mental age level (198). A thorough discussion of the Zone of Proximal Development (ZPD) is beyond the scope of this dissertation, but the notion that cognitive ability increases with social contact supports and expands Piaget's theory of social cognitive cooperation.

Vygotsky identified a clash between the spontaneous concepts held by a child and the academic concepts taught by the educator. Kozulin provides a concise description of the conflict:

> Vygotsky outlined several aspects of this problem. Firstly, he
> indicated that there is a significant difference, even a conflict,

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between spontaneous concepts that we acquire in our everyday

experience and that might be adequate for daily life (e.g., "the

sun rises in the morning") and the corresponding academic

concepts essential for scientific and technological reasoning

("what appears as a sun rise is the result of the rotation of the

earth around its axis"). Secondly, he alerted educators to the

fact that children do not come to the classroom as a tabula rasa

but bring with them their preexistent everyday concepts.

Thirdly, Vygotsky asserted that acquisition of academic

concepts would not happen without deliberate instructional

activity. Such activity should be carried out in the student's

ZPD (xviii)

The goal of education is to align instruction with experience; to align identification and

consubstantiation between operationally closed mental systems. The learner requires context

in order to internalize instruction. Identification is not only dependent upon rhetoric as a

cognitive catalyst, social relations as situated and embodied knowledge (context) is required.

Vygotsky's work on situated learning influenced theories of pedagogical simulation that

serve as the basis for simulation game delivery of technogenetic pedagogy presented in the

next chapter.

   Vygotsky and his successors believed thought to be a product of socio-historical factors

and not solely the result of mental activities (Moll & Greenberg, 319). Human

consciousness, for Vygotsky, is a result of interaction between mind and objective reality not dissimilar to enactive cognition. Although his social theory of cognition appears at first blush to be a version of realism, Vygotsky does not claim a pre-given outer world. Objective reality rather, is a precondition of cognition, and we must have an objective world with which to interact (Bakhurst, 67). Some have questioned the clash between Vygotsky's realism and constructivism (Edwards, 100), but it is this combination of perceived outer world cognitively constructed into thought, an intuitive inference of enactive cognition, that will serve as a foundation for professional communication pedagogy. Vygotsky and Piaget provide a pedagogical platform for bridging the teleological gap between rhetoric as cognitive catalyst and the identification it engenders between human beings. Piaget offers a cognitive explanation for learning as identification between operationally closed mental systems while Vygotsky presents a theory of social cognition that aligns with enaction, situated, and embodied knowledge. Both the interpersonal pedagogical work of Piaget and the intrapersonal work of Vygotsky play an important role in the development of my professional communication simulation game. The role interpersonal and intrapersonal learning activities serve in simulation games are discussed in Chapter five but before entering into such a discussion there are two areas that must be covered; discursive, extra-discursive, and visuospatial rhetoric need to be placed in a context suitable for pedagogical development and the issue of pedagogical space needs to be addressed.

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4.3 Pedagogical Space

The structure, forms, and strategies of discursive, extra-discursive, and visuospatial rhetoric that make up technogenetic rhetoric are most pedagogically effective in the context of an online simulation game for professional communication. Before I can begin to argue the merits of simulation and game design in a Vygotskian context, however, the concept of pedagogical space needs to be clarified and established. I began by describing the space of an organization as the communication exchanged by its members. Organizations are systems constituted by communication in an environment of member mental systems as human beings. Organizations and their member/environment mental systems also form a space of communication that serves as a field in terms of technogenetic rhetoric. Toulmin's concept of the field determines what can and cannot be symbolically expressed by its inhabitants and is the primary determinant of what may be symbolically used to back a claim and grounds. A field is a discourse community that creates and follows conventions, but a field is also a *communication system* of conventions that serves as environment for organizations and their members. What is needed is a method of defining a field based on the conventions of technogenetic rhetoric that is suitable for pedagogy of professional communication in a technology driven world. Toulmin's concept of field as a description of space is appropriate for my discussion thus far; the space of organizations formed by communication bounded in fields of convention and community. Functioning, however, as an operationally closed mental system striving for identification with other equally closed mental systems in a world made increasingly complex by technology and the technological unconscious it induces,

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requires a more precise definition of the field as *semiotic domain*. James Paul Gee (2003) calls for an expansion of literacy from primarily text based to one that accounts for the multimodal nature of technological communication (14). Semiotic domains encapsulate both discursive (print) and non-discursive (visual and mental images) literacies. Gee believes that

> We need…to think first in terms of what I call *semiotic*
>
> *domains* and only then get to literacy in the more traditional
>
> terms of print literacy. "Semiotic" here is just a fancy way of
>
> saying we want to talk about all sorts of different things that
>
> can take on meaning, such as images, sounds, gestures,
>
> movements, graphs, diagrams, equations, objects, even people
>
> like babies, midwives, and mothers, not just words. All of
>
> these things are signs (symbols, representations, whatever term
>
> you want to use) that "stand for" (take on) different meanings
>
> in different situations, contexts, practices, cultures, and
>
> historical periods (17-18).

Gee's semiotic domains provide a description of the overlapping spaces of social and mental spaces by including all of the discursive and non-discursive rhetoric of identification produced by mental systems that constitute social systems. Semiotic domains contain the conventions and communities of Toulmin's fields of argument in discursive, extra-discursive, and visuospatial terms. In other words, Toulmin's fields are biased towards discursive

language, *what can and cannot be said with field specific language and knowledge*. Semiotic

domains open the field to visuospatial elements of visual image, design, gesture, and so on

that communicate on an emotional level. Pedagogy of professional communication takes

place in semiotic domains of specialization such as marketing, finance, law, and computer

software, but also in semiotic domains of learning such as collaboration, simulation, and

game theory. The technological inclusiveness of semiotic domains adds a level of

complexity to their pedagogical application. For example, the semiotic domain of the

marketing presentation presents a complex mixture of literacies to be mastered. Print literacy

is obviously required, the reading and writing of the presentation text in cognitively

rhetorical structures, forms, and strategies; visual literacy is also required, the selection,

creation, and deployment of visual images using various software applications; kinesthetic

literacy is engaged, the execution of gesture and movement as structure, form, and strategy,

in addition to the ability to "read" audience gestures and body language; auditory and vocal

literacy is equally important, the management of vocal tone, volume, and pace, in addition to

the ability "read" the sounds emanating from the audience, such as the tone of a question or a

sigh. Finally the semiotic domain of the technology engaged interacts with all literacies.

These semiotic domains—textual, visual, kinesthetic, and vocal/auditory—require different

rhetorical structures, forms, and strategies that are made more complex by technology;

reading body language and gesture during a Skype or videoconference call; aligning visual

image and text; and managing vocal tone and volume on a podcast are but a few of the

complex literacy challenges. There is the semiotic domain of the organization/system that

within itself, several other semiotic domains exist such as the marketplace, the discipline of marketing, as well as marketing the specific product or service. The complex nature of the semiotic domains problematizes pedagogy. The traditional banking model of education where an expert *deposits* knowledge into the mental account of the student is all but impossible in this context. The odds of aligning instruction and student held experience are quite high. The following section discusses complexity theory in terms of composition while developing a matrix from which to build a pedagogical tool capable of accounting for complex semiotic domains.

4.4 Current Pedagogy of Professional Communication

The goal of my project is the development of a practical pedagogy of professional communication that is grounded in theories of cognitive rhetoric and constructivist teaching strategy. In order to differentiate the post-process pedagogy I am developing from current process oriented practical strategies, I will briefly outline some examples of current professional communication pedagogy. This content takes the form of textbooks. The textbooks I have surveyed focus on business and technical communication. The six textbooks I have selected to survey represent a valid cross-section of the standard texts in use in post-secondary institutions. The textbooks are written for first or second year students in either a business administration or information-processing program at a university or college. The six texts are:

- How to Write for the World of Work (WW), seventh edition, Donald H. Cunningham, Elizabeth O. Smith, and Thomas E. Pearsall

- Communicating for Results (CR), second edition, Carolyn Meyer

- Business Communication Now (BN), Canadian Edition, Isobel M. Findley

- Business Communication: Building Critical Skills (BB), fourth edition, Kitty O. Locker, Stephen Kyo Kaczmarek, and Kathryn Braun

- Technical Communication (TC), fourth Canadian edition, John M. Lannon and Don Klepp

- Strategies for Technical Communication in the Workplace (STC), second edition, Laura J. Gurak and John M. Lannon

All six texts organize content around specific document types, such as emails, memos, research reports, business letters, resumes, and user manuals. The texts divide business communication into persuasive and non-persuasive messages. CR, BB, and BN further divide business communication into positive (routine) and negative messages. WW offers a wider range of genres that include instructions and mechanism descriptions. All four cover visual and oral presentations with WW providing the most comprehensive coverage of visual communication. The TC and STC technical communication textbooks break down the elements of technical documents (such as user manuals) into component parts that include definitions, instructions, and processes.   All six textbooks take a practical process oriented approach to producing business and technical communications.

The six texts provide an excellent description and discussion of key instrumental aspects of business and technical communication. They all cover the nuts and bolts of producing documents in the proper format, strategies for routine, negative, and persuasive messages, and communicating across cultures in an ethical manner. All six present strategies and processes for audience and scope analysis, as well as provide sections on grammar and word choice. Attention, as a cognitive function, does not appear in the index of any of the text, nor does argumentation or figuration. WW does cover scientific argument and details induction and deduction, while all four cover the three Aristotelian appeals (logic, emotion, and credibility) in detail. The content in the textbooks surveyed is comprehensive and a valuable addition to professional communication pedagogy. What I am suggesting would add another layer to the content provided on specific document and communication types. The cognitive rhetoric developed in my dissertation is aimed at providing a framework that takes instrumental and practical content with a focus on effectiveness in the face of systems based organizations, the technological unconscious, and complexity. Rather than focus on routine, negative, persuasive messages, empathetic audience analysis, and structured appeals, a pedagogy rooted in cognitive rhetoric seeks out communication strategies of argumentation, figuration, visual, and mental images that increase mutual understanding as identification and consubstantiality. The missing key to effectiveness in these textbooks is precisely what my approach supplies, an alignment of communication with cognitive affinities and mechanisms. An online simulation game provides a medium that allows students to experience the complexity and double contingency of communication. Before presenting the case for a

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game as pedagogical tool, I need to return to Gee's conception of semiotic domain and how it relates to communication processes and content.

The problem, as I see it, with professional communication textbooks and standard lecture-based pedagogy is in what Gee calls the "content view". The semiotic domain of professional communication is not, as Gee puts it, "a set of facts and principles, [i]t is rather primarily a lived and historically changing set of distinctive social practices" (2003, 21). In other words, teaching the principles of audience analysis, the process of prewriting, or the structure of an email, as a set of facts and procedures that will lead to a positive communicative outcome is incomplete. Exercises, such as cases that ask the student to write a positive or negative message based on a set of circumstances graded on rubrics that are focused on purpose, audience, and scope (see Appendix A) do not account sufficiently for the complex issues of attention, technology, reception of the message, and so on. Such a passive approach to the semiotic domain of professional communication does not provide the experience of communicating in a doubly contingent setting. The writing process becomes a step-by-step series of check boxes rather than the interaction of operationally closed mental systems. Writing only for the teacher limits the ability to develop and engage the cognitive rhetoric necessary in today's technologically unconscious and complex environment. The next section describes the basis for a post-process pedagogy of professional communication.

4.5 Establishing a Post-process Technogenetic Pedagogy

A number of composition scholars have taken on writing process pedagogy (Kent, 1993; Sanchez, 2005; Dobrin,Rice & Vastola, 2011; Hawk, 2011). In his 2011 essay "Reassembling Post-process: Toward a Posthuman Theory of Public Rhetoric", Byron Hawk summarizes the assumptions of a post-process theory of writing: "writing is public, writing is interpretive, and writing is situated" (75). *Public* refers to the exchange of communication between writer and audience; *interpretive* refers to the double contingency of communication where operationally closed mental systems can hermeneutically engage with only communication and not the mind of the other; and *situated* refers to the individual context in which each communicative event takes place. Writing is also public, interpretive, and situated for Thomas Kent (1999) who takes writing process theory to task for avoiding the "hermeneutic guesswork" involved in all communication. For Kent, teaching process is impossible as the only way to reveal process is to look back at each individual situation (5). Writers, for Kent, need to make educated guesses as to what will be effective communication based on experience. The more writers investigate what works in certain situations, the better communicators they will be. Communication is dialogic. Individuals produce, receive, and interpret language in what Hawk calls a "hermeneutic circle" (76). Kent's view of process is not dissimilar to a complex social systems view of communication where only communication communicates and understanding is doubly contingent. Kent's view also supports technogenetic rhetoric's call for attention to the way rhetorical symbols interact with cognitive affinities and mechanisms; if human beings are incapable of directly accessing the

mind of another and are subject to the double contingency of communication, understanding

the affinities between cognitive mechanisms and aspects of discursive and non-discursive

language is indispensible. Kent's post-process theory is language centred and does not

account for engagements with non-discursive rhetoric of technology. Communication, for

Kent, is between human beings and he has little to say on the posthumanist reality formed by

technology and the technological unconscious.

   Byron Hawk (2011) calls for a rearranging of Kent's theory. Rather than have writers

analyze audiences, conceive of strategies, and then engage with situations, Hawk calls for a

reversal where situations call forth communication through enactive and embodied

interpretation of a world that creates a public.[10] The goal of his conception of post-process is

to

> Build a new constellation of concepts that can reground post-
>
> process in a posthuman model of netwrks to ultimately argue
>
> that the subject of writing is the network that inscribes the
>
> subject as the subject scribes the network (75)

Hawk redefines post-process theory as follows:

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[10] Hawk weaves together Deleuze and Guttari's (1987) theory of assemblages, Heidegger's (1962) theory of interpretation, and Latour's (2005) conception of the public, to develop a post-process theory that is grounded in context and situation.

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- *Situatedness* demarcates an assemblage or territory in relation to the chaotic world around it and sets the conditions of possibility for the manifold assignments it gathers

- *Interpretation* organizes the internal assemblage once it is distinguished from its milieu and participates in the coproduction of the world the situation gathers: and

- *Public* expression opens the assemblage back to the outside world in order to make new connections with it possible, continually enacting the process through the invention of new rhetorics (91)

Situatedness, interpretation, and public are presented as the interaction of assemblages of humans, non-humans, and objects that express worlds rather than communication. In other words, composition is the result of situated assemblages produced through interpretation and not recursive hermeneutic guesswork. For Hawk,

> Humans don't just test their theories on other humans: they connect these theories to complex situations to express worlds. Such an approach isn't based on concious debate about effective guesses, but on embodied enactions with a complex, evolving world that includes innumerable objects at various levels of scale. This is a posthuman image of the world that includes humans but decenters them in relational models of assemblage and expression (77).

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Hawk uses assemblages instead of Kent's conception of audience as the ground for his version of post-process theory as assemblages make reference to more than just people. Objects of technology also participate in the assemblage.

In terms of professional communication, the concept of assemblage expands the actors involved. While a model of organization as operationally closed social system is required in the development of a pedagogy based on cognitive rhetoric, there is a likelihood that the theory will fall into what DeLanda (2006) defines as an "organismic metaphor" where the removal of one part of a system (an organ) causes it to lose its identity (8). For example, removing the liver from the biological system in which it participates changes its makeup. By focusing on rhetoric's cognitive affect on mental processes of production and reception of communication within complex networks of mental and social systems it is possible to focus on the micro, individual-to-individual viewpoint that the macro viewpoint of system interaction is ignored. Thinking in terms of assemblages allows for the dissection of communicative events from the overall interaction of systems without losing the vitality of the individually situated communicative event. In other words, we are able to pull as assemblage such as a presentation out of the overall functioning of the system for both composition and analysis. I interpret Deleuze and Guttari's assemblage as a contextually and technologically situated audience within a semiotic domain(s). Using assemblage rather than Kent's concept of public (audience) allows for inclusion of technology and technologically unconscious cognition. Audience, as assemblage grounds the technological and socio-spatial dimensions of professional communication by fusing technology and context. For example,

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participants in a videoconference are situated in context, a common semiotic domain, but are also situated in technology and in the case of a videoconference the contextual and technological situations are indistinguishable and inseparable. Thinking in terms of assemblage instead of audience moves professional communication away from the purely dialogic. Of course, each participant in the videoconference is both a producer and receiver of communication, but so is the technology. The hardware and software of the videoconference assemblage has an effect on the discursive and non-discursive rhetoric of the communication network. An assemblage consists of technologically situated individuals who serve as universal cognitive audience (as discussed in the previous chapter), as well as a field variant and invariant particular audience. An assemblage as field-dependent, field-invariant, universal, and particular reside within a semiotic domain.

In Hawk's theory, interpretation is no longer trial and error executed through retrospection; communication is not exchanged, but coproduced. The public is not an audience to be analyzed, but a creation of discursive and non-discursive rhetoric. In other words, assemblages form and disband as communication systems. Hawk's conception of interpretation grounds the *psychological* and *temporal* dimensions of the professional communication matrix. A speaker imagines the cognitive universal audience of a semiotic domain in the formulation of her argument by taking into account field-invariant aspects of values and beliefs that universally appeal to all members of a semiotic domain, as well as field-dependent aspects of values and beliefs specific to the members of an organization within a semiotic domain. For example, an audience of software engineers is universal in

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terms of cognitive mechanisms and affinities; universal in terms of knowledge, values, and beliefs attributable to software engineers while also particular in knowledge, values, and beliefs attributable to members of ABC Software Inc. The assemblage, in this case, consists of the particular audience and their contextual and technological situation. The particular audience is created and constructed by communication in the same way an organization is constituted by communication. The assemblage is made public at the moment of such communication. Post-process theory, in Hawk's conception, aligns with social systems theory, complexity and emergence and provides a foundation for technogenetic rhetoric.

   The concept of assemblage is better suited to professional communication than the traditional concept of audience as a particular person or group of people. Thinking about audiences as universal members of a semiotic domain defined by a design grammar replaces audience analysis as it is promoted by process theory. The concept of assemblage adds another dimension to analyzing a particular audience. It is not enough in a world constrained by the technological unconscious to restrict audience analysis to the receiver's hierarchical position within the organization, their attitudes, interests, experiences, knowledge level, expectations, and likely response. Audience as assemblage includes this information, but adds technological situation to the mix. Technological situation, in traditional prewriting analysis is accounted for as medium, separate from audience. An assemblage folds one into the other; technology determines an assemblage just as an assemblage determines technology. An assemblage is, what Gee defines as an "affinity group", the citizens of a semiotic domain, situated in both the world and semiotic domain (31). The audience in a

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face-to-face presentation is not the same audience in a Skype or videoconference presentation even if the individual human beings are the same. The structural couplings of mental systems are different in each case and, as a result, the pathways to identification and consubstantiation are significantly altered. Both situations involve actors that include human beings and technology. In the Skype presentation, the actors include presenter, viewers, computers, monitors, operating systems, Skype software, cameras, microphones, and perhaps multimedia software such as PowerPoint. These actors form an assemblage or network consisting of human and non-human agents that Bruno Latour refers to as an *actants* (84). Assemblages as networks form complex systems of communication that are engaged by technogenetic rhetoric. The next section develops a theory of complex systems into a pedagogical model for professional communication.

4.6 Complex Systems and Networks

Melanie Mitchell defines a complex system as: " a system in which large networks of components with no central control and simple rules of operation give rise to collective behavior, sophisticated information processing, and adaptation via learning or evolution"; she also provides an alternative definition that incorporates emergence where the actions of a system produce something different from the individual components: "a system that exhibits nontrivial emergent and self-organizing behaviors" (2009, 13). Mark C. Taylor provides a more detailed definition that breaks down the vital emergent qualities of a complex system:

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Complex systems display spontaneous self-organization, which

complicates interiority and exteriority in such a way that the

line that is supposed to separate them becomes undecidable.

The structures resulting from spontaneous self-organization

emerge from but are not necessarily reducible to the

interactivity of the components or elements in the system.

Inasmuch as self-organizing structures emerge spontaneously,

complex systems are neither fixed nor static but develop or

evolve. Such evolution presupposes that complex systems are

both open and adaptive. Emergence occurs in a narrow

possibility space lying between conditions that are too ordered

and too disordered. This boundary or margin is "the edge of

chaos" which is always far from equilibrium (2001, 142-43).

Complex systems theory applies to both adaptive (systems that evolve and learn) and non-adaptive (weather) complex systems. Complexity theory does not completely align with Luhmann's social systems theory; social systems of communication and mental systems of consciousness are operationally closed rather than open and can only couple to other systems through communication. In social systems theory, emergence through complexity is a result of the double contingency of communication where neither sender nor receiver is capable of controlling communicative outcome. Understanding is contingent on the translation of thought into language by the sender and language into thought by the receiver. This

contingency creates emergent outcomes through complex interactions. Complexity intensifies instrumentally through technology that ontologically, in Heidegger's sense of enframing, situates the rhetorical formation of communicative action on the part of the sender, as well as on the part of the receiver into semiotic domains. Ecology of communicative action is formed where learning and evolution are achieved via the vital emergence of identification and consubstantiality between human and social systems. The primary mode of this communicative action is rhetoric.

Social/organizational and mental systems interact to form complex semiotic domains. As semiotic domains require an extension of literacies (reading and writing), new metaphors of composition have developed. Although the ecology model has primarily been directed at writing, I will take composition to include all activities of communication production. The metaphor of ecology provides a way of viewing technology-saturated communication as multimodal. Margaret Syverson, in her book The Wealth of Reality: An Ecology of Composition, develops a theory of writing as complex ecology. Syverson finds writing to be

> complex system[s] of self-organizing, adaptive, and dynamic
>
> interactions [that are] actually situated in an ecology, a larger
>
> system that includes environmental structures, such as pens,
>
> paper, computers, books, telephones, fax machines...as well as
>
> other complex systems operating at various levels of scale,
>
> such as families, global economies, publishing systems...and
>
> language itself (5).

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Syverson brings the technics of communication to bear on complex systems theory; social systems such as professional organizations that are constituted by communication are populated by human beings who, as mental systems of consciousness, are situated by technology. Technology interrelates complex systems into what Syverson designates an ecology. The goal of her research is to determine whether or not one can understand composition as an ecological system (5). I apply her model to professional communications pedagogy where technology becomes the manifestation of the constitutive communication of an organization. While she is a technological generation behind (pen, paper, and fax machines have for the most part been replaced by word processing applications, email, text messaging, Facebook, Twitter, etc.), Syverson's model of an ecological matrix for describing professional communication remains rich and applicable. Four cognitive attributes (distribution, emergence, enaction, and embodiment) are mapped against five analytical dimensions: physical material, social, psychological, spatial, and temporal.

Distribution refers to the situated nature of cognition; the production of communication in the workplace is never the product of the writer/designer/speaker in isolation. What one writes/speaks is always a continuation of previous discourse and always an opportunity for future discourse. The vast majority of professional communication is achieved through collaboration in both content and production. I add *extended cognition* to Syverson's concept of distributed and situated cognition, for the purposes of technogenetic rhetoric.

Distributed cognition refers to cognition shared by different mental systems in particular situations while *extended cognition* refers to technology that exteriorizes cognitive systems

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such as memory. Cognition is extended from a purely mental activity (or collection of

mental activities) to a technological device. Technology such as the address book application

in a smartphone is an example of such a device, but so is a paper notepad. Extended and

distributed cognition are closely related and the terms are often interchanged. For my

purposes, I will use *distributed* to refer to cognition shared by human beings as mental

systems and, as discussed above, *extended* to refer to technological extension of cognitive

abilities that lead to a technological unconscious.

Syverson's conception of *emergence* in composition aligns with the definition given

above: "emergence refers to the self-organization arising globally in networks of simple

components connected to each other and operating locally" (11). Communication emerges

from words, phrases, sentences, paragraphs, and texts, as well as design, images, and vocal

qualities— a result of the structural coupling through linguistic, visual, and kinesthetic

symbols between mental systems as human beings. Emergence is the result of the

engagement of the cognitive principle.]

As discussed in the previous chapter: edging/bounding, rhythm, association, classification,

abstraction, and hierarchy with discursive, extra-discursive and visuospatial rhetoric.

Emergence may occur as a result of conceptual blending, embodied simulation, and/or

System 1 and System 2 argumentative reasoning.

Enaction refers to Varela, Thompson and Rosch's theory of enactive cognition described

above. Individual mental systems bring forth a world through embodied perceptual

connection to the objective world. Embodied and enacted cognition help explain how mental systems interact in situations constituted by communication. Varela, Thompson and Rosch, in their book The Embodied Mind, offer an enactive explanation of communicative action:

> Yet another way to express this idea would be to say that cognition as embodied action is always about or directed toward something that is missing: on the one hand, there is always the next step for the *system* in its perceptually guided action; and on the other hand, the actions of the system are always directed towards situations that have yet to become actual. Thus cognition as embodied action both poses the problems and specifies those paths that must be treat or laid down for their solution. (205).

In other words, enactive cognition accounts for the recursive nature of communication in social systems. One mental system as sender produces communication while the receiver is simultaneously producing a response. What is missing is the next communication; it is recursively produced by the preceding communication.

Embodiment, for Syverson refers to both the physical activity of composing (pen, paper, keyboard, sitting, standing) and the conceptual structures of the human mind (13). Our physical experiences "ground" our concepts as analogic frame. The HUMAN BODY IS A CONTAINER, SADNESS IS LOW, ANGER IS HOT are a few examples. In terms of

technogenetic rhetoric, embodiment is closely related to technology and extended cognition. We are increasingly technologically embodied where the demarcation between body and technology is difficult to discern. Wearable computing is an example of technological embodiment that affects professional communication, as a technology such as Google Glass (or a similar wearable device) extends and distends cognitive aspects of memory and attention. Technological embodiments such as Google Glass create a tangible version of Burke's terministic screens; Google Glass "selects and deflects" the world in an immediate sense that is beyond the analogical (1966, 45).

To summarize Syverson's four cognitive attributes in terms of pedagogy of professional communication: distributed and extended cognition relate to the interaction of mental systems and situations/technology; emergence refers to the products of mental and social systemic interaction as communication that engage the greater attention system; enaction refers to the perceptual interpretation of communication; and embodiment relates to both the physical and technical situation in the interaction of mental systems based on embodied conceptual structures. I will add the cognitive attribute of *affinity* to Syverson's list. *Affinity* refers to the cognitive attraction we have to specific formations and patterns of language and objects, both discursive and non-discursive. For example, we have an affinity for argumentation where logical and quasi-logical presentations of information appeal to the argumentative nature of System 2 argumentative reasoning mechanisms. We have an affinity for linguistic and object patterns of repetition, symmetry, association, and rhyme. We also

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have an affinity for emotional language and images. *Affinity* is the cognitive attribute most affected by rhetoric and is a primary area of study for technogenetic rhetoric.

Syverson defines the five analytical dimensions of the matrix in relation to writing; physical relates the instruments of writing, pen, paper, computer, desks and so on; the social dimension involves a number of human relationships from collaborations to political movements; the psychological dimension involves cognitive aspects of writing such as those theorized by Linda Flower and John Hayes (1984); the spatial dimension refers to the physical and digital space taken up by writing (books, journals, blogs and so on); and the temporal dimension relates to writing in its "historical trajectory" (Syverson, 18-21). The dimensions as defined by Syverson do not align directly with the theories of social systems, technological unconscious, attention, and extended cognition outlined above. The *technological* dimension refers to the technics of communication that construct an organization; language, speech, writing are foundational while network, text, image, and voice producing software applications provide the medium. *Argument* refers to the structure, form, and strategy invoked in the communication. The attributes of discursive (language), extra-discursive (ethos, kairos, tone), and visuospatial (visual design) are analyzed as separate elements that come together as one argument. Finally, *semiotic domain* refers to the conventions and communities of rhetoric that make up the structure, form, and strategies of communication within fields of argument. Semiotic domains, according to Gee (2003), exhibit a "design grammar" that defines what is acceptable and not acceptable in terms of communication within and about a semiotic domain (30). Understanding the design

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grammar of a semiotic domain in terms of language, use of technological media, and communication format is a crucial factor in successful professional communication. The five dimensions do not align in a parallel existence separate from one another; they overlap on a multidimensional plane.

As an example, how would a typical professional communication event such as a technical briefing on a new product break down in the matrix dimensionally and in terms of cognitive attributes? On the technological dimension, the event would involve presentation software that utilizes text, image, and perhaps sound; collaboration software such as Google Drive, Facebook, and/or Twitter could also have been involved in the production, as well as follow up communication. The meeting room, video-conferencing site, on-line meeting software, microphones, pointers, and online Q&A applications are just a few of the other aspects of the technical dimension. Discursive attributes include the written and spoken language of the argument put forward. Extra-discursive attributes could include the timing of the presentation, the reputation of the presenter, and the tone of the delivery (excited, somber, cajoling, neutral informing, and so on). Visuospatial attributes include the design of the slides, the attire of the presenter, images used, infographics, and so on. Through its design grammar, the semiotic domain determines the rhetorical elements of argument structure, form, and strategy and the conventions of the field. The presenter may decide to structure their claim and grounds on a strategy based on changing an accepted reality using an argument from expertise scheme and figural logic in the form of an analogy. The presenter will follow conventions of language and design in delivering her message. For example,

there may be a conventional order to a presentation of this sort where specifications are defined in the introduction and so on.

Each cognitive attribute is mapped onto the dimensions. Distributed and extended cognition engages technology to the extent of the distribution and extension of mental systems that vary depending on the technological situation; are people viewing the presentation remotely? Is technology allowing an increase in the interaction among participants? What emergent new communicative spaces as ideas and strategies form as a result of the presentation? Does the presentation enactively invoke the appropriate missing elements on the part of the audience? In other words, does the argument invoke sufficient identification? How is the embodied state of the presenter and audience affected by the discursive, extra-discursive, and visuospatial dimensions? What structures, forms, and strategies of technogenetic rhetoric deployed within the conventions of the semiotic domain make the argument effective? These are a few of the units of analysis brought forth by the dimension/attribute matrix. Figure 8 is an example of the dimension/attribute matrix as applied to a routine instant messenger (in this case BlackBerry Messenger) exchange.

Figure 8: Blackberry Messenger Conversation

The exchange occurs between peers preparing a for a major product launch. Thomas is responsible for organizing a customer event, at which he has promoted the CEO Mary as keynote speaker. An analysis using the dimension/attribute matrix is presented in Table 1.

	Technological	*Discursive*	*Extra-Discursive*	*Visuospatial*	*Semiotic Domian*
Distribution & Extension	Short- instant messages – occur in dialogic fashion – recorded dialogue extends memory		**Using BBM instead of email establishes urgency and relationship of communicators**	Hybrid between video chat and text chat	Informal communication medium used for crucial interactions -
Embodiment	Delay between linguistic reasoning and thumbs typing	Thomas's argument from sign is dictated by his location at the event	**The "R" for read notification creates a sense of asynchronous conversation**	Pictures of communicators create visual engagement	Thomas is on the front line of the business while Magdalena appears in the rear
Attention System	**Buzzing of the message notification. "Read" notification causes extended focus**	**The "read" notification belies urgent language**	**Delay in response by Magdalena affects tone of Thomas's proposition – hard tone**	**Cartoon like dialogue box for statements creates informaility Waiting for the "read" notification to appear**	**Organization uses instant messaging to initiate text conversations – notifications are considered confirmations of message**
Enaction	Technologically induced face-to-face conversation – dissonance caused by paradox of atemporal conversation	Presumptive reasoning: Mary is not reliable - and Thomas is responsible for customer	**Delay in Magdalen's response to Thomas's presumptive proposition provides affirmation that is revoked**		A non-response to a proposition sent by BBM is considered acceptance

Table 1: Dimension/Attribute Analysis of BBM Conversation

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The dimension/attribute matrix Table 1 reveals the complexity of communication events as networks. The bolded quadrants represent key relationships in terms of identification and consubstantiality. In this case the key dimension is the psychological. The key cognitive attribute is the attention system (emergence). The "R" or "read" notification is applicable to a number of the cognitive dimensions and rhetorical attributes. The matrix demonstrates how this simple communication is a complex combination of cognition, technology, and rhetoric. The technological medium creates dissonance in the attention system by creating a dialogue-like situation with visual image of the respondent and a notification when the person has read the message. The dialogue is not, however, experienced in the manner of a phone, Skype, or face-to-face communication as the respondent does not have to respond immediately. Only the expectations created in the semiotic domain of the organization regulate response time. The interconnection of attention and technology affect Thomas's argument from sign. The hidden premise is deemed accepted by the response gap, even though a critical interjection of say, "hold on, you know Mary, her schedule is unreliable, but she always shows" or something to that effect. The matrix demonstrates both the strengths and potential pitfalls of one type of digital medium.

The matrix is also a tool of invention especially in the composition of digital media where discursive, extra-discursive, and visuospatial rhetoric play equally important roles. The matrix could be used in both large and small projects, from the design and composition of a blog to a complete application interface. As a pedagogical tool, the matrix is designed to deal with practical as opposed to theoretical content. In other words, the matrix is used

primarily as a composing as opposed to analytical/critical tool and it will be embedded, in a simplified interface as part Ametros. The matrix will provide a series of pre-determined analysis points available in drop down menus that allow the student to construct the assemblage using the dimensions and attributes. As the dimension/attribute matrix's domain is cognitive, it requires the addition of a social methodology capable of dealing with the relationships formed between technology and systems.

One of the limitations of the dimension/attribute matrix is the focus on objects of communication. The matrix offers an effective heuristic for the analysis of communicative events and is an excellent tool for the deployment of technogenetic rhetoric in the form of argumentative reasoning, figuration, and figural logic. The matrix displays the ways in which cognitive attributes, mechanisms, and affinities relate to the dimensions of a communicative event. It aligns with the Vygotskian pedagogical model that attempts to construct an intersection of instruction and experience. The dimension/attribute matrix is an example of third generation activity theory with its focus on cognition and communicative events as objects (see Cole & Engerstrom, 1993). Human beings as represented by the psychological dimension of the matrix are "mediated" by the material objects of the dimensions such as space, technology, and semiotic domain. Activity theory does not differentiate between cognition and social and presents a model that aligns with distributed cognition; "human activity at the individual level is a dialectic among humans and their mediators" (Spinuzzi, 2008, 70). Mediation becomes the activity of the network leading to development or, in other words, the interactions between dimensions and attributes lead to

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communication. The reification of communication produced by the matrix provides an assemblage perspective crucial to technogenetic rhetoric.

The problem encountered involves the reconciliation of communication as object with social systems theory that views communication as the non-material essence of social systems (such as organizations). While it is necessary to pull out the non-material communicative events and treat them as objects in order to take a cognitive perspective (how operationally closed mental systems integrate in systemic environments of communication), treating communication solely as object reduces our ability to examine social cognition and technology relationships formed during the formation of assemblages. For example, using the dimension/attribute matrix, we are able to analyze and/or produce a new product presentation through the intersection of cognitive attributes and dimensions of technology, space, psychology, temporality, and semiotic domains. What the matrix does not offer, however, is a method for examining the relationship between mental and social systems. The matrix allows for the analysis and/or production of communication between individual mental systems, but it does not allow for the examination of the effects on the social system (organization and functional systems) as a whole, in other words, the effect of communication on social cognition.

Actor-network theory (ANT) provides a method for analyzing the formation of networks in terms of assemblages of mental systems and technology where agency is distributed among human and technological actors. ANT moves analysis from the reification of the dimension/attribute matrix to the personification of technology as technogenetic actor in a

realization of Daniel Dennett's intentional stance (17). ANT is a loosely defined theory of the relationships between various human and non-human actors in a network. The theory is most often associated with the work of three science and technology scholars: Bruno Latour (1987), John Law (1992), and Michel Callon (1991). Callon (1991) defines actor-networks as the configuration of

> all groups, actors, and intermediaries [that] describe a network:
> they identify and define other groups, actors, and
> intermediaries, together with the relationships that bring these
> together... the network of intermediaries accepted by an actor
> after negotiation and transformation is in turn transformed *by*
> that actor. It is converted into a scenario, carrying the
> signature of its author, looking for actors ready to play its roles.
> For this reason I speak of *actor-networks*: for an actor is also a
> network (142: also quoted in Spinuzzi, 2008, 84).

The key activity of actor-network theory is identifying and analyzing instances of *translation*. Translation is the term used by proponents of ANT to describe the changes exhibited by actors as they interact. Crawford (2005) defines translations as:

> Transport without deformation, as distinguishable from
> diffusion (transfer without distortion). [Translation] is both a

process and an effect [that] establishes identities and conditions

of interaction, [while] characterizing representations (2).

Translation is a form of transformation (see Spinuzzi, 2008, 88) where actors enter into emergent relationships where the resultant network is more than a sum of the parts. While the attribute/dimension matrix looks at the cognitive relationship between sender and receiver in a communicative event, ANT takes a more comprehensive perspective. The matrix is a micro view while ANT provides a macro view.

Scholars are beginning to apply ANT to technical communication (Potts, 2009; Spinuzzi, 2008). Potts applies ANT to what she terms "social software" in the form of online photo sharing sites developed in response to the London bus bombings of 2005. Spinuzzi applies ANT to the analysis of networks as knowledge producers in telecommunications. Both scholars use ANT to offer a macro-level analysis of communication networks. Applying ANT to our instant messenger example outlined in Table 1, we get an expanded view of the interactions between sender and receivers of the communication. Rather than looking at how the discursive, extra-discursive, and visuospatial arguments cognitively engage the sender and receiver, ANT looks at the formation of the communicative network as a whole. The sender and receiver are in essence translators who engage information and technology to either accept or reject identification. The instant messenger technology in our example is an attempt at the formation of a communication network. The actors include Thomas, Magdalena, the BBM software application, the BlackBerry hardware devices, the mobile network, and the BlackBerry network. Thomas is attempting (in Callon's 1986 and Latour's

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1987 term) to *problematize* the lack of stability in the customer event planning process of the organization. The second stage of translation is interessment, or the interpositional strength of network connections where Thomas attempts to define the identity of the other actors as allies in both recognition of the problem and its suggested solution, in this case only one human actor, Magdalena (Callon, 1986, 208). It is at the interessment stage that non-human actors emerge. In order for interessment to take place, pathways for participation must be provided, in this case, BBM application on a BlackBerry device over the mobile and BlackBerry Networks. The third stage of translation is *enrollment* where sender and receiver engage in expanding the network by participating in Thomas's problematized argument. The software and hardware actors participate by displaying "sent" and "read" notifications that bring the non-human actors actively into the network as they "poke" or "hail" Thomas and Magdalena notifying each that the other has read their message. Both hardware and software actors through notification exacerbate delays in response and create the frustration of an asynchronous conversation where the hearer of a message says "I hear you, but I am not answering". The final stage is *mobilization* where actors, both human and technological become promoters of the network through participation in the form of recruitment (217). The difference between enrollment and mobilization is in the selection of technological actors. During enrollment, viewers decide on the actor they wish to engage with. Thomas may wait patiently for the BBM actor to announce Magdalena's reading of the message or Thomas may recruit more actors, human or technological into the network, perhaps by placing a phone call. Figure 9 presents a diagrammatic view of the partial actor network

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centred on Thomas – there are other relationships between the other actors such as

Magdalena and hardware, BBM and the cell network are not displayed. The thickness of the

lines represents the importance of the relationship between actors. The relationship between

Thomas and BBM is second only to the relationship between Thomas and Magdalena.
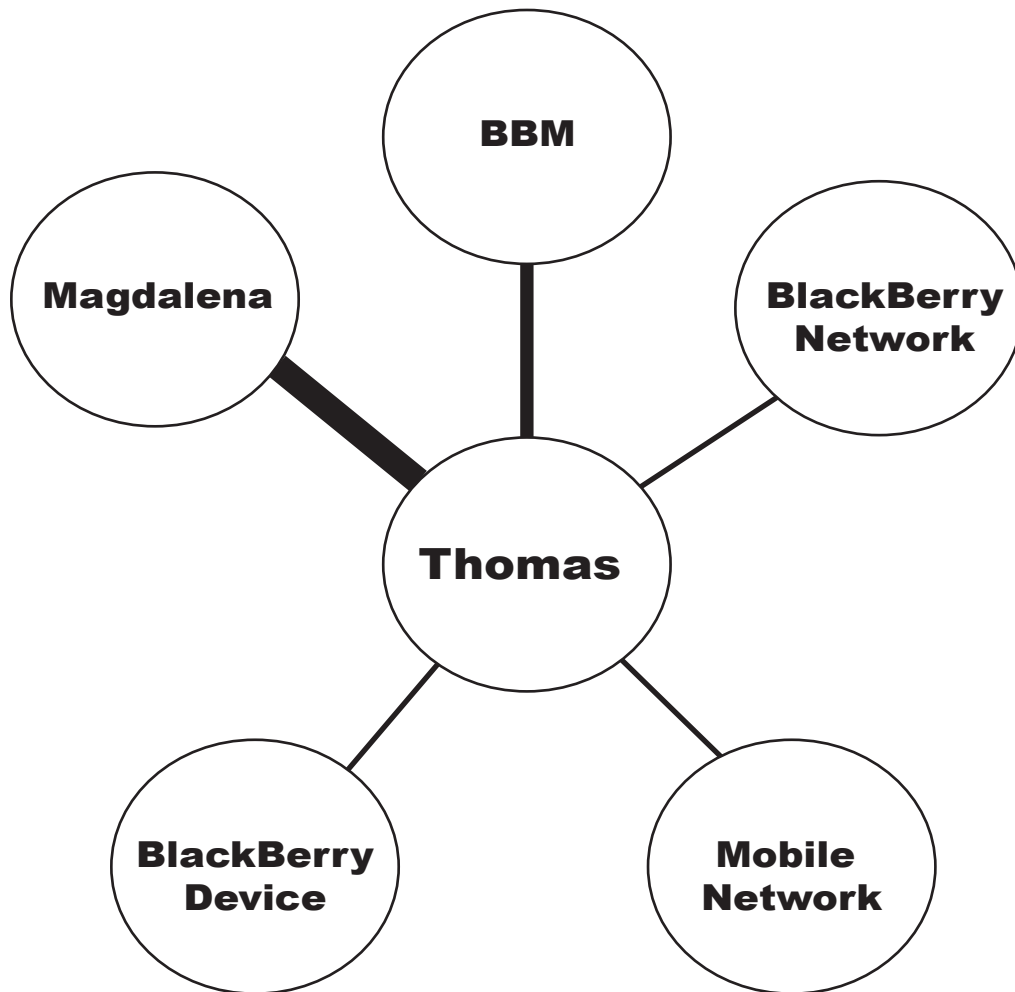
Figure 9: Actor Network Diagram of BBM Conversation

ANT is useful as an analytical tool, as demonstrated by Potts (2009) and Spinuzzi (2008),
but also as a strategic method. In addition to analyzing a cognitive universal and particular

audience, the producer of communication is able to project the network of actors, human and non-, that will be formed. Problematization aides in the determination of argument structure and strategy while interessment, enrollment, and mobilization help develop strategies of engagement and identification. Each stage of an ANT analysis serves to ground strategic choices of cognitive rhetoric in technology. Actor-network theory's treatment of technological artifacts as participant actors in networks of communication links cognitive rhetoric and technology in the act of Heideggerian enframing. Technology distributes and extends cognition that is engaged by rhetoric. Technology such as PowerPoint extends and distributes the speaker's ability to engage the cognitive attributes and mechanisms by allowing the speaker's message to exist as discursive and non-discursive rhetoric simultaneously; the voice of the speaker is accompanied by strategically timed animations of text, and data presented as images. Although design scholar Edward Tuffte (2003) criticizes the way PowerPoint is typically used as a crutch by the presenter rather than platform for the extension and distribution of cognition, PowerPoint remains a technological actor capable of transforming text and speech into Tuffte's conception of "cognitive art" (1990, 9). PowerPoint presentations that undergo a strategic cognitive rhetorical analysis using the attribute/dimension matrix and actor-network theory are capable of forming communication networks of identification and consubstantiation.

4.7 Summary

The goal of my project is to develop a post-process pedagogy based on the intersection of argumentation, figuration, and cognitive attributes The professional communication

pedagogy is based on a foundation of technogenetic rhetoric that moves beyond the pioneering work of Linda Flower and John Hayes on the cognitive processes involved in composition. Technogenetic rhetoric is the product of multidisciplinary research from the fields of rhetoric, cognitive science, and psychology. Rather than taking a process perspective, where rhetoric serves as a composition template, technogenetic rhetoric aligns strategic decisions of language and form with our cognitive affinities for such features as repetition, rhythm, association, and symmetry, as well as our natural propensity to engage argumentative reasoning. Pedagogy must align instruction with experience by situating pedagogical content in contexts that students will deploy professional communication. I take a Vygotskian constructivist perspective that expands the student's zone of proximal development by providing two heuristics. First, the attribute/dimension matrix provides a heuristic for the microanalysis of rhetoric, technology, situation, and cognitive attributes. The matrix focuses on the producer and the cognitive universal and particular audience. Second, the adaptation of actor-network theory provides a macro analysis of the assemblages of human and non-human actors that form communication networks. The challenge faced by teachers of professional communication is how to deploy the heuristics in a manner that engages discursive and non-discursive rhetoric with situated experience. The next chapter introduces the online simulation game as a vehicle for deploying my pedagogy of technogenetic rhetoric.
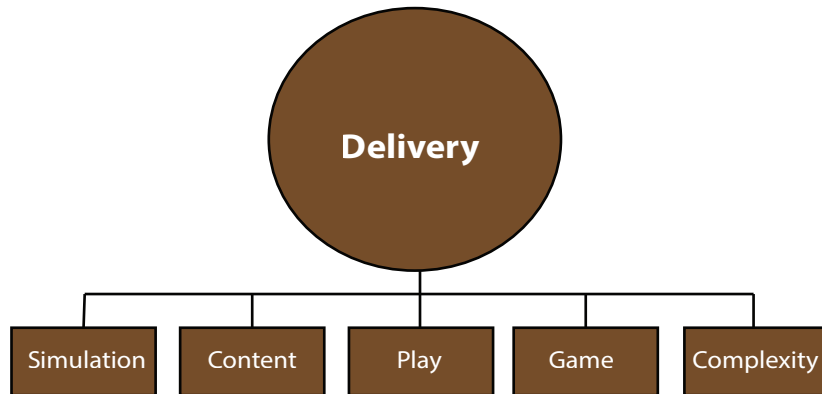
Chapter 5

The Professional Communication Simulation Game

Pedagogy of professional communication based on technogenetic rhetoric requires a medium that integrates instruction and experience. How do we escape what Gee calls the "content trap" where instruction on theoretical underpinnings dominates the curriculum? Traditional and lecture-based delivery inevitably slides into process teaching: first you do this; then you do that. Following a process model, the student is lectured on the *how* of professional communication: how to write a bad news message, how to write a persuasive report, and so on, to be followed by workshops designed to practice through heuristics. The goal of my project, however, is to escape the process model of current-traditional rhetoric and move towards a rhetoric anchored in the engagement of cognitive mechanisms and attributes through technologically enframed discursive, extra-discursive, and visuospatial means. The goal is ultimately the development of communicative skills necessary to be effective in a complex array of systems that are operationally closed off from one another. As I discussed

in chapter one, Luhmann states, only communication communicates, suggesting that the teaching of process in contextual isolation is the least effective pedagogy. Communication production has to be based on elements of reception, or in other words, how does one produce communication that forms identification and consubstantiation with another closed mental system? A medium is required that will immerse the student in the practice of communication in specific situational context. The culmination of my project is the development of such an authentic learning environment in the form of a professional communication online simulation game. The following chapter outlines the pedagogical and technical basis of such a game following the work of James Paul Gee (2003), Schaffer and Resnick (2005), and Ian Bogost (2007) in game based learning. Section 5.1 reviews current research into digital gaming and pedagogy while section 5.2 investigates the relationship between content and learning in a digital world with special emphasis on the work of Sealy and Brown. Sections 5.3 and 5.4 introduce the game world and play of Ametros. The elements of play, games, content, and authentic situated learning are applied to the design of Ametros.

Before describing the elements of Ametros, the meanings of *simulation* and *game* that I deploy need to be discussed. *Simulation* refers to both the role the student takes on, as well as the focus on the results and ramifications of communication practice. The student plays a specific professional role (marketing manager, software engineer, associate in a law firm, and so on) that composes communication and responds to its results. Examples of this type of simulation are discussed in depth in the game mechanics section. *Game* refers to the nature

of the experience of Ametros. There is a play aspect to the experience where the student

strives to accomplish communicative tasks with objectives of achieving objective

measurements of success beyond the letter or numeric grade.

If we think of knowledge in terms of Gee's semiotic domains, where discursive, extra-

discursive, and visuospatial elements of communication serve as signs or representations that

determine the complex translations between human beings and technology, the facile nature

of content and process pedagogy becomes apparent. When all actors, both human and non-

human, are accounted for, complexity makes establishing process extremely difficult.

Ironically, the problem of how to escape process pedagogy involves process as how does one

focus on the communication produced by a networked system without an understanding of

the processes involved? Clearly there is a process to composition, as Flower and Hayes

(1981) have demonstrated but a step-by-step process pedagogy of composition based on

either the practical writing method of purpose-audience-scope or the invention-arrangement-

style-memory-delivery process of classical rhetoric becomes overly simplistic in the face of

the complexity of digital communication media. Both the practical and classical processes

remain valid, but incomplete. A pedagogical method that links instruction, digital media and

experience is required.

In 2005, learning-systems scholars, Schaffer and Resnick developed the theory of a

"thickly authentic" learning environment

where activities are simultaneously aligned with the interests of

the learners, the structure of the domain of knowledge, valued

practices in the world, and the modes of assessment used (para

3).

A thickly authentic learning environment involves aligning instruction with experience

situated in defined contexts of professional activities. While traditional case study based

pedagogy does present authentic problems to be analyzed and solved via traditional

processes; identifying and defining the problem, determining a purpose for the

communication, analyzing primary and secondary audiences, selecting a medium, selecting a

rhetorical strategy, and so on, what is missing is Shaffer's conception of "thick" authenticity,

the immersion in the identities, values and practices of the semiotic domain.   Gee describes a

thickly authentic learning environment when he describes the ideal educational video game

as taking place in

a domain of authentic professionalism [where the game] will

intelligently select the skills and knowledge to be distributed,

build in a related value system as integral to gameplay, and

clearly relate any explicit instructions to specific contexts and

situations (2005, para. 20).

Thick authenticity is difficult to establish in both classroom and online settings. Case

studies serve as a window to the professional semiotic domain where the student is able to

peer into a situation without ever connecting with identities and values, or in other words, students are unable to develop a significant degree of identification and consubstantiation with practitioners in the field. Somehow the student needs to pass through the window opened by the case as a participant in the experience of the situation, an authentic experience rather than as an outside observer performing analysis in a vacuum.

Shaffer (2005) offers a method of developing thickly authentic learning environments through the engagement of epistemic frames and what he has termed "epistemic games" (para. 10). Shaffer suggests that

> Rather than constructing a curriculum based on the ways of knowing mathematics, science, history, and language arts, we can imagine a system in which students learn to work (and thus to think) as doctors, lawyers, architects, engineers, journalists, and other valued reflective practitioners – not in order to train for these pursuits in the traditional sense of vocational education, but rather because developing those epistemic frames provides students with an opportunity to see the world in a variety of ways that are fundamentally grounded in meaningful activity and well aligned with core skills, habits, and understandings of a postindustrial society (para. 8).

Shaffer's epistemic games are simulations that have students take on the identity of professionals within specific domains. He cites an example, "Madison 2200" where students take on the role of urban planners in a simulation of a street redesign project. The students receive a package from the mayor and city council detailing plans and budgets. Teams are formed and student urban planners work though the process of planning a street and in so doing experienced the way in which urban planners see the world (2005, para. 11-13). Epistemic games are more simulation activities than games per say. However, Shaffer's concepts of thick authenticity, epistemic frames, and epistemic games, buttressed by Gee's focus on the values instilled through simulating the role of professional, provide a foundation from which to develop a simulation game that will allow students to deploy technogenetic rhetorical strategies and heuristics in a setting that meshes instruction, digital media and experience.

Ian Bogust (2005, 2007) provides a way of looking at the work of Gee and Shaffer from a meta-game perspective. While Gee and Shaffer are primarily concerned with situated learning in a context of simulation, Bogost looks at the rhetorical nature of the procedures inherent in educational games. He defines a "procedural rhetoric" where the processes of the game itself produce rhetorically driven action (2007, 28). In Ametros, for example, the processes involved in completing a project, drive the simulation and values based pedagogy as they direct the student's actions. The process of meeting with the Senior Director game character to receive instructions is procedurally rhetorical in the sense that such a meeting (procedure) is required to move forward in the simulation and such a meeting reveals values

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such as punctuality and engaged listening that are important to professional

communication.[11] Bogost also presents a "procedural literacy" where procedures promote

"experimentation with the basic building blocks" (2005, 36) towards a deeper understanding

of complex systems. By their very nature, simulation games promote procedural literacy

through the procedures of simulation. Ametros is designed as a simulation game that

exposes students in the practices and values of professional communicators while engaging a

procedural literacy and rhetoric. The following section outlines current research into digital

games and education.

5.1 Current Research in Digital Games and Education

The term *video game* is most often used by scholars of digital pedagogy. For my purposes

I will use *digital game* to signify technology-based games that include discursive, extra-

discursive, and visuospatial rhetoric, and may be applied in a hybrid or purely online learning

environment. In addition to the work of Gee, Shaffer, and Bogost, scholarship on digital

games and education is wide ranging and extensive. Lamberti and Richards (2012)

investigate the effect digital games have in creating the "democratic classroom" where

"students are encouraged to articulate and to act according to their own goals and have the

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[11] It is important to note that the word "process" at the root of procedural rhetoric is markedly different from the use of "process" in composition theory. Bogost derives process from computer programming and provides a wide definition that includes all interactions driven by the rules or boundaries of a system (2007, 5).

opportunity to refine their social habits and skills as they encounter an ever expanding

network of others" (482). Apperley and Beavis (2011) examine the critical nature of

"gaming literacy" and the treatment of such games as "text" and "action" (134). They

conclude text and action form paratexts that lead to higher levels of multi-modal literacy in

students. Charsky (2010) calls for the designers of serious educational games to pay

attention to the characteristics of successful entertainment games including goals, rules,

challenges, and rewards (177). Shultz-Colby and Colby (2008) examine the difficulties of

implementing game play as pedagogy caused by the work/play dichotomy. They point to the

"theory of emergent gaming" established by researchers of massively multiplayer digital

games such as "World of Warcraft" as an opportunity to bring composition and game

pedagogy into contact (301). Daisley (1994) finds the problem of play and instruction to be

solvable through the empowerment of students in terms of the "rules of the game" (107). By

involving students in the design of play based pedagogy helps improve oral skills in a

democratized classroom where the teacher is not the only voice (118). De Freitas (2006)

looks at perceptions and attitudes of teachers and students to the pedagogical use of games

and simulations. De Freitas finds that research done on leisure games has been "forced" on

pedagogical games and simulations causing a disruption in the acceptance of games as

pedagogical tools. Mason (2013) finds a connection between technical communicators and

gaming communities in terms of "rhetorical uses of technical communication genres" (219).

Through involvement in common genres such as user guidebooks, process descriptions, and

reviews, technical communication should embrace game studies as she states,

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The futures of online gamers and technical communicators are

joined by the overlapping genre ecologies of these two

discourse communities. Already, ''serious gaming'' in areas

such as defense, health care, education, and engineering has

provided an opportunity for technical communication to

increase its influence within fields in which it has traditionally

held sway (233).

Egenfeldt-Nielsen (2011) develops a theory of educational games that reformulates Gee's

concepts of probing and hypothesizing into a four part model of (1) concrete experience, (2)

reflective observation, (3) abstract concepts, and (4) active experimentation that create a

constructivist pedagogy similar to Shaffer's thickly authentic simulations (2005, 189). While

my research review found only Lamberti and Richards (2012) and Apperley and Beavis

(2011) refer to Bogost's procedural rhetoric, all find the procedural nature of games to have a

significant effect on pedagogical value. Although often not cited, Bogost's procedural

rhetoric and literacy are evident in the majority of educational game scholarship reviewed in

this dissertation.

   James Paul Gee (2003, 2005, 2006), David Shaffer (2007, 2005, 2009), and Ian Bogost

(2005, 2007) have produced the most extensive body of research into online/video games,

learning, and literacy. The following section investigates the relationship between content

and learning in educational digital games.

5.2 The Relationship Between Content and Learning

Gee agrees with Shaffer on the situated nature of knowledge and meaning. Semiotic domains align with epistemic frames in terms of establishing the content and design of potential learning environments. Gee defines a process of "reflective practice" provided by digital games as "the probe, hypothesize, reprobe, rethink cycle" (2003, 90). Gee's cycle is a way of learning not readily available in the offline classroom. The virtual world created by the online simulation allows the student to "probe" the environment, exploring available options and actions; the student then forms a "hypothesis" on how best to proceed engaging the challenge offered; equipped with the hypothesis, the student "reprobes" the virtual world looking for results; finally, the student "rethinks" her hypothesis based on feedback from the game environment (90). Students practice Gee's cycle every time they play an entertainment based videogame. Gee argues that all videogames offer a learning environment that is situated, value-laden, and epistemic. Douglas Thomas and John Seely Brown (2007) state the issue succinctly – current pedagogy is based on "learning about" while video and digital games are about "learning to be" (149).

The relationship between learning and content is complex and context dependent. Thomas and Brown argue in <u>A New Culture of Learning</u> (2011) that content has shifted from a question of "what is the information" to "where is the information" as technology has unconsciously extended memory (Loc. 1256). To the student with a smartphone, *remembering* is about the process of launching applications and designing search strings. In other words, "where" is the information? Again, it comes down to attention: what is

important to attend to; what is important to move from short to long-term memory?

Attention shifts to the technological context of media. Information is literally found with the

fingers.   Technological media context frames attention. Thomas and Brown feel that

> reframing knowledge as a *where* question underscores the
>
> increasing importance of context. In a world where context is
>
> always shifting and being rearranged, the stability of the *what*
>
> dimension of knowledge comes into question. Only by
>
> understanding the *where* of a piece of information can we
>
> understand its meaning (2011, loc. 1279).

McLuhan's dictum "the medium is the message" takes on a deeper, darker meaning. The

shifting context Thomas and Brown refer to is rearranged by digital media and digital media

may well be the message in and of itself, but the ramifications of a *where* focus on

information, where technological media context precedes content, places a new evaluation

stress on the individual. A student using Google to search for information on climate change

will be presented with hundreds of thousands of entry points to journal articles, blog articles,

news reports, videos, and podcasts. If she narrowed her search to Facebook, she would find

thousands of profiles. And if she searched #climatechange on Twitter, she would find a long

and vibrant conversation. Gaining expertise on the topic requires more than the ability to call

up information; expertise shifts from a knowledge of accessibility to skill in evaluation where

understanding technological media context predominates. The information on climate

change to which the student has access will range from journal articles in *Nature* presenting

the scientific evidence to the slick video presentations of Alex Jones "uncovering" the

climate change hoax. While this sort of evaluation expertise may seem obvious and common

sense, technological media context, especially the professionally presented blogs and

YouTube channels, muddy the waters of information appraisal. In his book <u>PresentShock:</u>

<u>When Everything Happens Now</u>, NYU media scholar, Douglas Rushkoff presents Gallup

and Pew research that finds that "from 1985 to 2005, the number of Americans unsure about

evolution increased from 7 percent to 21 percent while those questioning global warming

increased from 31% in 1997 to 48% in 2010" (49). Rushkoff finds ideological cable news

and religious programming, posing as news to be at the heart of the shifts in opinion. While

information may have shifted to a question of *where* form one of *what*, the challenges of

students with information at their fingertips have increased rather than decreased.

   While Thomas and Brown do not delve into the ramifications of a shift from *what* to *where*

of information (note – there has always been a where), their pedagogical concept of

"making" offers a direction for the teaching of critical evaluation. The "making" that

Thomas and Brown refer to is the hands-on creation of technological media context:

> When we build, we do more than create content. Thanks to
>
> new technologies, we create context by building within a
>
> particular environment, often providing links or creating
>
> connections and juxtapositions to give meaning to the content.
>
> Learning now, therefore, goes far beyond a simple transfer of

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information and becomes inextricably bound with the context

that is being created. Where one choses to post, where one

links to, or where one is linked from does not just serve as a

locus for finding content. It becomes part of the content itself

(loc. 1316).

"Making" media exposes the student exposed to the message making power of the context.

Creating a blog or a YouTube video opens the student to the meaning making potential of the

medium. Thomas and Brown continue:

Through the process of making, we are also learning how to

craft context so that it carries more of a message, which helps

solve many of the issues of information overload. Thus, as

context begins to play an increasingly important role, it

becomes easier to talk about things like visual arguments;

expanding the notion of literacy to include images, colour, and

sound; and how information is transmitted through new

phenomenon, such as viral distribution (loc. 1316).

Making becomes a critical tool to battle the *where* focus of information. The

dimension/attribute matrix and actor network theory discussed in Section 4.6 provide abstract

tools for critical analysis in terms of cognitive rhetoric of digital media, but they can also be

applied in a practical sense to critically "make" arguments in technological media contexts.

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The *where* of information embedded in technological media context and a pedagogical focus on making bring us back to Schaffer and Gee and their conception of thickly authentic epistemic games. An epistemic simulation game that immerses the student in the technological media context is the platform of my pedagogy of professional communication. Before moving on to a description of the game platform itself, however, the concept of play needs to be addressed.

As soon as one suggests games, even simulation games, as a pedagogical foundation the specter of play arises. Thomas and Brown (2011) find play to be treated as "secondary or incidental" and not a part of "serious" learning (loc. 1347). I have implanted and tested a number of game-like pedagogical experiments in a post-secondary setting and I have found that many, if not most instructors view play as the opposite of serious; and games are the domain of play, therefore a game cannot be a serious pedagogical tool.[12] Most instructors

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[12] While interesting and important, this statement is anecdotal and as such cannot be utilized as a significant source of data. As an example, I designed a teaching module on analogy and argumentation around an analogy contest where student teams competed in the formulation of an analogy for climate change. The analogies were judged by a random selection of students from outside of the class, as well as through a Google survey. The analogies were graded based on a combination of my judgment and outside student responses. While each team received a grade, the winning analogy received a 2.5% bump to their final grade. The contest was part of a simulation where student teams serve as communication consultants specializing in environmental issues. The majority of my peers, while finding the exercise interesting, did not choose to add the simulation game activity to

that I have interacted with have felt games to be an interesting adjunct to serious pedagogy, but only as a peripheral activity. However, I want to make the case that in a world of contextually unconscious technological media, simulation games are a more effective pedagogical tool than readings, lectures, and workshops . Serious pedagogy of the lecture, decontextualized cases and workshops, measured through tests and abstract assignments are less effective in teaching discursive, extra-discursive, and visuospatial rhetoric professional communication. I am not saying there is no place for theoretical explanations or tests of skill, but traditional delivery methods of the lecture monologue and the artificial case study cannot provide the thick authenticity necessary to develop skill in argumentation, figuration, and information design. The stumbling block to games being viewed as a viable alternative to serious pedagogy is the notion of play.

   In his seminal work on play <u>Homo Ludens</u>, Johan Huizinga found play to be an activity apart from culture, a concept found in activities of other species, and a concept very difficult to define as solely a biological, psychological, or social activity. For Huizinga, play is defined by its characteristics:

> Here, then, we have the first main characteristic of play: that it
>
> is free, is in fact freedom. A second characteristic is closely

---

their course modules at our curriculum meeting. Most viewed the activity as fun, but incremental to existing tests and assignments.

connected with this, namely, that play is not "ordinary" or

"real" life. It is rather a stepping out of "real" life into a

temporary sphere of activity with a disposition all of its own

(8).

Huizinga's claims that play is freedom and not of the ordinary are they key reasons

simulation games are the best pedagogical alternative in the teaching of professional

communication. The student is given the freedom of agency in a simulation game. She

locates and evaluates theoretical and skill based information as required in order to complete

the simulation (the details of how this is effected are discussed below). The path through

theory and skill development is less linear and emerges as the student navigates the narratives

of the simulation. Even though all theory is covered in the simulation, the student chooses

their path through the game; freedom of play instills agency. Huizinga also states, however,

that "first and foremost, then, play is a voluntary activity. Play to order is no longer play: it

could at best be but a forcible imitation of it" (7). And while technically this is true of a

game made pedagogy, the diametrical opposition to traditional practices redeems it as play.

The same holds for a simulation game in terms of Huizinga's claim that play steps outside

"real" life; while a simulation does strive to mirror real life seemingly contradicting this

characteristic of play, the real life that is stepping away from is the ordinary life of the

classroom. If we compare a simulation game as pedagogical tool to a first-person shooter

video game in terms of freedom, the real, and agency, the educational game falls short of

Huizinga's mark. The video game, however, is not our point of comparison. The simulation

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game needs to be compared to traditional process based lecture and workshop pedagogy in relation to play. Compared to traditional pedagogy, the simulation game offers more freedom (agency); is apart from what is expected from pedagogy by the student (out of the ordinary); and the choices made by the student appear more voluntary than the completion of a workshop exercise.

A simulation game provides "thick authenticity" to pedagogy while a critical focus on technology and the technological unconscious helps move into a *where* from a *what* perspective in terms of pedagogical content. The digital native student, raised in an era of instant information is able to use the search skills they have honed all of their lives in a fashion guided by the cognitive rhetorical principals of argumentation, figuration, and figural logic they uncover and are exposed to as they move through the narrative of the game. Rather than try to force a *what* perspective of information (content) through lectures and workshops, the simulation allows the student to discover and engage theory in consequential action. Consequential in the sense that actions lead to reactions and responses that measure the degree to which the student has internalized theory. The goal of both traditional and simulation pedagogy is the same: to instill theoretically informed praxis that the student is able to call on in real life situations. I am not arguing that traditional pedagogy is wrong; rather that it is less effective (see discussion in chapter three) in the face of media proliferation and technological unconscious. The agency, out-of-the-ordinary, and attitude of choice offered by the simulation allow for the word *game* and its association with *play* to be

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added without losing pedagogical rigor. The next section provides a breakdown of the structure of a professional communication simulation game.

The professional communication simulation game (Ametros) of my project immerses the student in the practices of the organization as system and is designed for post-secondary institutions. Ametros is designed to be agnostic to genre; the content of the communications can come from any area of professional communication including business, technical, and legal.

Section 5.3 describes the nature and design of Ametros, the simulated environment that immerses the student. Section 5.4 describes the way in which she navigates through and engages that environment.

5.3 Game World

Ametros is framed as a fictional organization. The prototype version of the game takes place in a software firm specializing in online presentation applications. A detailed backstory is embedded in the game that includes product descriptions, markets, competitors, production, research and development, organization charts, and a company history. Students can access archives of blogs, newsletters, and the like, to research this backstory right at the outset of their play, or they can encounter it as they progress through the game, filling gaps for themselves as necessary. The backstory includes how the student is related to the company as a new hire, including a job description that details responsibilities, expectations, and assumed skills, which helps to frame the functionality and gameplay of Ametros.

The online environment includes a 3D animated office where the student, in a first-person perspective, interacts with the characters generated by the artificial intelligence engine, and in the future other students.[13] The student completes tasks using a dashboard like interface that includes links to outside software residing in the cloud of the post-secondary institution (applications could include Skype, PowerPoint, Sync-In, SlideRocket, Prezi, Wordpress, Twitter, and Facebook).

Characters include a Senior Director and a Mentor. The Senior Director provides the student/manager with theoretical content (argumentation theory, strategies, figural logic, dimension/attribute matrix, and so on) in the form of meetings, readings, and forums. The Senior Director fulfills the role off the instructor/professor in a classroom setting, the relationship, however, is professional rather than academic. The Mentor character provides ongoing support for the student/manager in the form of draft reviews, comments, and suggestions. Both the Senior Director and the Mentor contain human and artificial intelligence elements. The Instructor or Teaching Assistant of the course may choose to use the artificial intelligence agent to deliver lecture/meetings and readings while engaging in discussion forums in the role of the Senior Director. In the early version of Ametros, a

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[13] The initial version of Ametros will focus on interactions between Senior Directors, Mentors, and Students in the animated office setting. Student to student contact will take place via message boards and Skype. Subsequent versions of the game will include group VoIP (voice over Internet) discussions in the animated office.

Teaching Assistant plays the Mentor, in terms of reading drafts and offering suggestions as well as providing feedback as performance review/grades. The goal of the Ametros project is the development of an artificial intelligence agent capable of increasing the time a Teaching Assistant has for composition response. The natural language processing and corpus building aspect of Ametros is detailed in section 6.2. The student/manager is not directly informed as to whether the Senior Director or Mentor is played by a human being or an artificial intelligence agent.

The game world of Ametros is designed to immerse the student in a professional setting subject to the interactions of Level 1 and Level 2 technological systems. The student navigates a series of projects utilizing a number of technologies from Skype to Wordpress in an attempt to develop and deliver communication that moves the mission of the organization forward.

5.4 Game Play

The student assumes the role of a Manager in an organization who then proceeds to complete a series of communication challenges. The student has a choice of gender, while other factors such as educational background, ethnicity, interests, and specialties are selected by Ametros in order to assure the student moves through various contexts imbibing (

'learning' in the old model) the most effective theorized praxis.[14] The gameplay objective is to successfully complete all challenges achieving a series of promotions culminating in a position of Director (pedagogical objectives are discussed in Chapter 6). Each week the student attends a meeting or presentation where projects and tasks are discussed and administered. The meetings and presentations include theoretical, as well as situational material. For example:

> The student logs into Ametros through the post-secondary institution's learning management system (LMS). They now have a first person view of a lobby/reception area where an animated receptionist lets the student know the Senior Director is waiting for them in the conference room (he points to the conference door). The student's avatar walks into the conference room and provides an introduction using their keyboard (note on possible voice). The animated characters of the Senior Director and associates welcome the student, alongside avatars of other students in other roles, by providing an orientation to the organization, what business they are in, markets, structure, and so on. The Senior Director then proceeds to contextually describe a communication task that is being assigned to the student. The Senior

---

[14] Future versions of Ametros will incorporate intercultural communication into the project modules by allowing students to designate ethnicity for the purpose of recognizing cultural differences in communication as part of the peer review process. For example, a student will analyze factors of politeness, directness, and so on in other students work. Such a module will require research beyond the scope of version one.

> Director emails the student background material that includes a detailed description
> of the situation, the appropriate communication/argumentation/figural
> logic/information design theory necessary to the task, and detailed instructions on
> how to carry out the assignment. The meeting will have duration of approximately
> ten to fifteen minutes. The student exits the conference room and logs off to read
> the material that has been emailed to their LMS email account.

The student/manager is assigned a mentor as both a human Teaching Assistant (TA), as well as in the form of a character-based artificial intelligence engine (AI). The character of the Mentor (a senior manager of randomized gender and ethnicity) provides the student with clarification of the readings, videos, and other materials that might have been assigned during the meetings; the relevant context of the situation or problem; advice about the projected audience; and so on. The Mentor (AI) delivers the information through a combination of monologue and quasi-dialogue. The student can set up a meeting with the Mentor immediately or at a future time. For example:

> The student sends a meeting request to the Mentor (AI) complete with time and
> subject to be discussed. If the request is vague or incomplete (lack of specified time,
> name of project, and so on) the Mentor (AI) emails back with questions rather than
> acceptance providing repeated learning opportunities in drafting routine messages.
> The Mentor as Teaching Assistant accepts the meeting and provides the place; the
> meeting can take place in the conference room with the animated AI Mentor
> (allowing the Mentor to use slides to augment the discussion) or via text or voice

chat. The Mentor (AI) gives a monologue presentation on theorized practices, the situation, and tips for completing the task, using presentation software. The Mentor (AI) will review the student's draft and proffer context specific questions based on natural language algorithms that detect elements of argumentation (discussed in chapter 6.0)

- "have you considered using an argument based on reality, where you look for aspects that have been previously accepted…?", or

- "have you considered using the figure gradatio to organize your points? Gradatio involves…", or

- "this situation requires a clean design, pay special attention to the leading and the amount of white space. Leading is the…," and so on.

When the student has exhausted the information available through the Mentor, she proceeds to complete the task.

Meeting with the Mentor (AI) before interaction with the Mentor as Teaching Assistant allows for a preliminary level of response that will develop into a version of Nancy Sommers (1982) conception response as engagement with the intended meaning (in this case argument) of the student. As the corpora of student work grows, the Mentor (AI) will provide ever more detailed and student specific critical questions. The Mentor (AI) serves to "sabatoge our student's conviction that the drafts they have written are complete and coherent…forcing [them] back into the chaos" (154). The Mentor (AI) helps deal with what Sommers views as

a "confusion of process and product" by calling out what can only be elements of product (154). The feedback provided by the Mentor (AI) at this stage is incomplete and designed to free the Mentor (TA) time for in-depth response further into the project.

The tasks will range from requesting information, completing a research report, writing a message in a crisis environment, giving bad news, recommendations, proposals, research reports, Tweets, Facebook posts, text chats, Skype chats, as well as PowerPoint, Prezi, or Sliderocket presentations.[15] The tasks will be part of the overall narrative of the simulation. A business communication Ametros could have a marketing focus (such as the launch of a new product), a management focus (issues such as team building), operational, financial, or a crisis situation. For example:

> The student is tasked with recommending a website design firm from three finalists. Using the finalist's websites and information provided by the Senior Director, the student analyzes the three firms in terms of services and design capabilities in relation to the needs of the student's organization and the situation. The student

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[15] Outside software applications will be accessed via an embedded link in the game interface.

drafts a recommendation report that requires the engagement of argumentation, figural logic and design theory (the structure, form, and strategy triad discussed in chapter two). The report is emailed to the Mentor who responds with questions and concerns. The Mentor could send the report back to be revised and/or accept the report with questions. The student then revises the report or answers the questions until the Mentor is satisfied. It is at this stage, the part of the Mentor is played by the real-life Teaching Assistant (the next section details the development of the artificial intelligence engine using corpora building and natural language processing to aid and augment the Teaching Assistant). When the Mentor (TA) deems the report satisfactory, it is sent to the Senior Director (also a TA at this point in the simulation) for grading. Feedback is provided throughout the process. The task is iterative; the student does not compose a report to be evaluated as much as draft a report for a grade as work though drafts that result in a finished product suitable to be evaluated as a communicative object. There are a number of supporting exercises that include annotating argument structure, schemes, and figural logic. The annotations are performed using a point-and-click interface and allow for a host of activities including visualization and dialogue interactions. The annotation engine is described in detail in the next chapter.

The Mentor (TA) responds to what in essence is a second draft through a Skype video or voice conference. The method of response is at the discretion of the Instructor, but could be based on what Richard Haswell (2006, 3) refers to as "discourse activity" where a field

dynamics similar to the use of Actor Network Theory examined in chapter 4.6, integrates

human and technological actors.[16] The Mentor (TA) will conference for five to ten minutes

with each student to discuss the effectiveness of the communication (style and grammar in

text, as well as design elements in image and organization should be addressed only when

effective meaning is established). The live or recorded conference follows Jeff Sommers'

conception of "Response 2.0" where Instructors respond with audio comments. Sommers'

research finds student's feel the feedback is more "personal" as tone and inflection can put

comments into the appropriate context (2013, 25). Ametros will deploy both audio and video

feedback where the TA responds first to the rhetorical and argumentative aspects of the work

followed by engagement with design and style.

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[16] Haswell integrates his discourse activity theory with Paul du Gay's "circuit of culture" as way of explaining the role of response and its complexities. I am appropriating the notion of discourse theory as a way to map response onto the technogentic theories of complex systems and actor networks.

Figure 10 shows the basic progression of one task from student log on to completion.

**Student signs into PCSG through Post-Secondary Instiitution LMS
Student checks messages to either continue with an existing task
or move to next project**

New Project

Project in Progress

**Meeting with Senior Director
Details of project/task(s)
Situation and theory readings**

**Meeting with
Mentor Request**

**Mentor provides guidance
on project/task and
communication theory**

**Student composes/designs
communication object
makes revsions**

**Drafts are exchanged with Mentor who may have
questions or desire revisions**

Student completes final draft

Final draft is submitted to Senior Director for evaluation

**Student receives feedback
possible promotion or performance review
Instructions provided on how to proceed to next project or
schedule a performance review**

Figure 10: Ametros Project Flow Through

Ametros consists of three projects with a total duration of twelve weeks. Each project contains elements of a traditional professional communication curriculum: routine messages, formats, negative information, research, and so on. The elements of curriculum, however, are secondary to the goal of the project, which is to simulate the use of the elements of curriculum in real-world type settings and contexts. Sections 5.4.1 - 5.4.3 present three example projects based on a business-writing version of Ametros. The content of the projects are not discussed in great detail. For example, details of the lectures and presentations provided by the artificial intelligence engine (Mentor AI) are not provided. The content of these presentations is fluid and can be developed by the course developer. It can be assumed that a project with a heavy emphasis on design would involve multimedia presentations on the pedagogical material presented earlier in this dissertation.

5.4.1 Example Project One – New Website Design Partner

The student meets with the Senior Director who provides details on their first project. The organization is in the process of choosing a new website designer/Internet consultant and the student is given the task of researching three finalists, recommending one company, and communicating a rejection to the two remaining firms. Figure 11 displays the four tasks of the project: requesting research (from the artificial intelligence engine of Ametros, playing the role of the research department), drafting a recommendation report, drafting notifications via the company's social media (Twitter, Facebook, and Blog), and finally notifying the

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remaining firms that they were not selected. A number of traditional curriculum areas are covered (writing a routine message, research, persuasive writing, formatting an informal report, writing for social media, and writing negative messages) in a dynamic format where cognitive rhetorical theory is put into practice. The communications produced serve specific purposes other than just functioning as objects to be graded. The communications drive responses that affect the forward motion of the project. For example, if the request for the research documents does not provide sufficient detail (names of the reports, appropriate format, reasons for why they are being requested, clarity about timeline, and so on), Ametros will send back a request for further information until the request is complete. The Mentor is provided drafts of the final three tasks before they go to the Senior Director for approval. The Mentor (TA) responds to the students work as discourse activity providing suggestions and advice that student may use to make improvements. .

Figure 11 displays a sample project for weeks one to three of a Ametros with a marketing focus.

Project 1: New Web Design/Strategy Partner - Weeks 1-3

Task 1 Request Information from Research Team		3 Days
Acceptable: Move to Task 2	Unacceptable: Resubmit Request	
Task 2 Compose and Design a Recommendation Report		7 Days
Acceptable: Move to Task 3	Unacceptable: Revise Report	
Task 3: Compose Twitter/FB/Blog Posts Announcing Web Partner		4 Days
Acceptable: Move to Task 4	Unacceptable: Revise Posts	
Task 4: Inform Unsuccessful Finalists		4 Days
Acceptable: Project Completed	Unacceptable: Revise Notification	

Move to Next Project with Promotion and Salary Increase — Move to Next Project — Performance Review
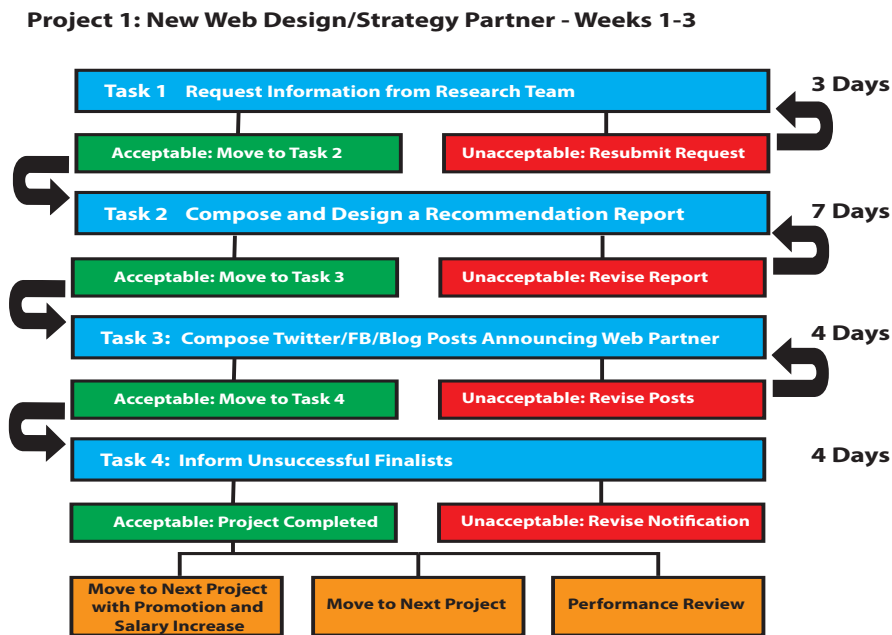
Figure 11: Web Design Partner Project

The Senior Director (TA) must accept a task as complete before the student can continue with the project. Each task has a hard deadline that requires an effective request communication if an extension is required. Finally, the Senior Director provides a project

review (grade) based on a detailed rubric for the overall project that falls into three categories: 75-100 move on to the next project with a promotion and salary increase in the form of two bonus marks; 60-74 move onto the next project without promotion or increase in salary – the student must draft an email to the Senior Director acknowledging areas that require improvement; and finally, 0-59 requires a performance review where the student is required to resubmit revised task documents in order to move onto the next project. The process mimics the business environment in an exaggerated fashion where strong work is rewarded and weaker work requires more work. The goal is not to punish, but to drive home the fact that communication creates effects that result in action or inaction, some positive and some negative. As discussed above, the Mentor/Senior Director functions of the Teaching Assistants are designed to minimize ineffectual communication. Figure 12 presents the promotion and salary levels achievable in Ametros. There are twenty-seven different possible outcomes in terms of achievement: the student may receive a promotion and bonus on one project and not on another.

PCSG Achievement Levels and Incentives

Associate Project 1		
Complete Project 1 **Mark = 75 - 100**	**Complete Project 1** **Mark = 60 - 74**	Complete Project 1 Mark = 0 - 59
Proceed to Project 2 **as Manager** **Salary Inc. = 2 Bonus Marks**	**Proceed to Project 2** **as Associate**	**Proceed to Project 2** **as Associate** **w/Performance review** **Memo for S.D.**

Project 2

Complete Project 2 **Mark = 75 - 100**	**Complete Project 2** **Mark = 60 - 74**	**Complete Project 2** **Mark = 0 - 59**
Proceed to Project 3 **with promotion to next level** **Salary Inc. = 2 Bonus Marks**	**Proceed to Project 3** **as Previous Rank**	**Proceed to Project 3** **at previous pank** **w/Performance Review** **Memo for S.D.**

Project 3

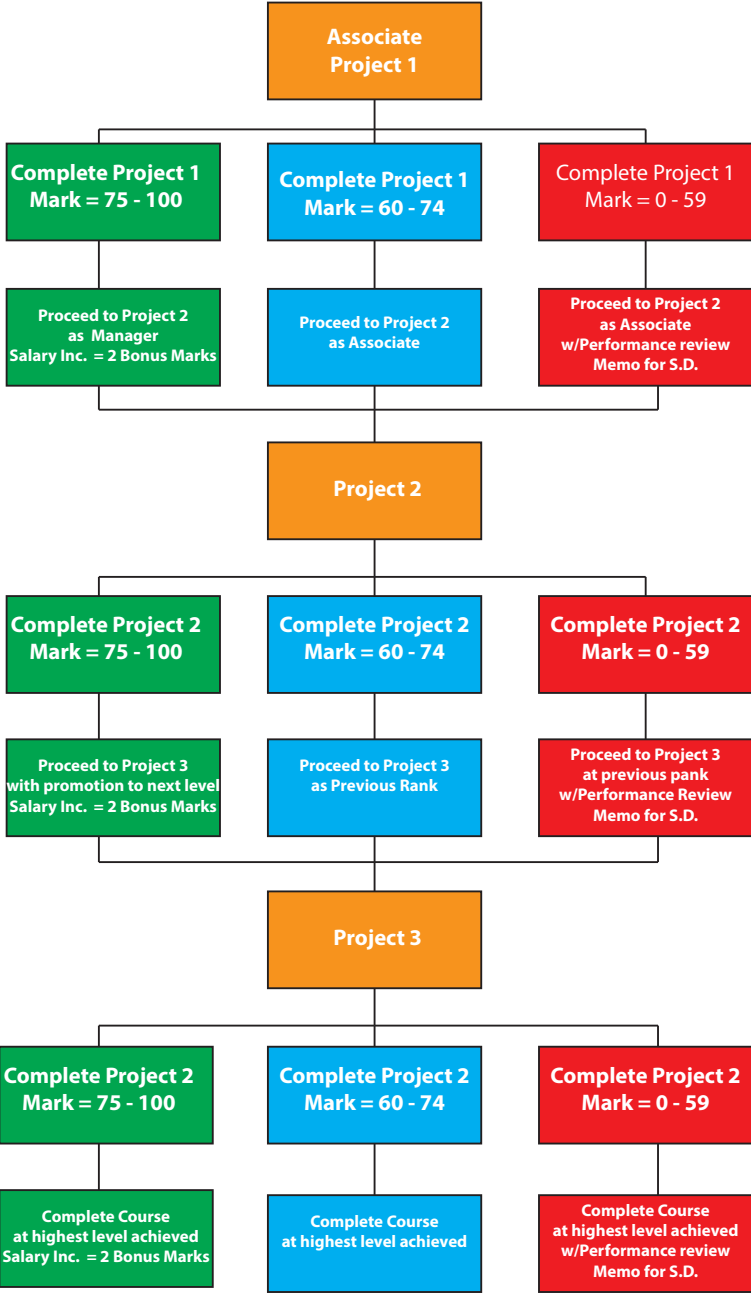| **Complete Project 2** **Mark = 75 - 100**	**Complete Project 2** **Mark = 60 - 74**	**Complete Project 2** **Mark = 0 - 59**
Complete Course **at highest level achieved** **Salary Inc. = 2 Bonus Marks**	**Complete Course** **at highest level achieved**	**Complete Course** **at highest level achieved** **w/Performance review** **Memo for S.D.**

Figure 12: Ametros Achievement Levels and Incentives

5.4.2 Example Project Two – Brand Review

   Project two involves performing four individual tasks in a group setting. The situation is a

Brand Review that is being compiled by the Senior Director. The overall goal of the project

is a comprehensive review of the organization's brand strengths and weaknesses. Teams of

four are created with each member student tasked with converting raw data that includes

numbers and focus group results – for example, converting raw sales figures and a ranked list

of brand qualities into a visual using information design and visuospatial rhetoric. Each

student will also be assigned a geographic market in which they will prepare a review of

competitive offerings. For example, one student in the group may be tasked with the

Canadian and another the United Kingdom market. The parameters of the report such as

number of brands, product offerings, analysis of social media presence, and so on, will be

provided. For task three, group members will meet via Skype to discuss and plan task four,

the composition of a set of presentation slides using the results of task one and two. The

slides will be developed on an online presentation application such as SlideRocket or Prezi.

The Mentor (as artificial intelligence engine and not TA) will provide guidance in the form

of lectures and multimedia presentation on elements of design and visuospatial rhetoric. In

this project, the students peer review each other's work.[17] Rather than have the Mentor (TA)

provide feedback, the students review and authorize the work of the other group members.

Issues such as draft due dates become very important in this project. Once the group has

authorized the tasks, the students move onto the next task or project.


5.4.3 Example Project Three – Formal Proposal

The final example project involves collaboration in both the composition and analysis of a

formal proposal. The students work in the same teams as project two and once again they

work independently on a collaborative project. The purpose of the project is the composition

of a formal proposal detailing the opening of a new geographic market for the organization.

The proposal is broken into functional sections including finance, product planning, human

resources, and marketing. The structure of the proposal is predetermined so that the

functional content does not dominate the project. For example, the human resources section

involves planning the number of employees required, where they will be hired,

qualifications, and so on. The Mentor provides the detail required to complete the section

without previous knowledge of human resources. The content provided by the Mentor is

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[17] There is large stream of excellent scholarship on peer review and writing studies that is beyond the scope of this dissertation including Lee-Ann Kastman Breuch work on virtual peer review (2004)

vetted by functional area experts (preferably from the hosting post-secondary institution).

Hyperlinks are provided to Internet and scholarly resources that allow the student to focus on

composing their section rather than on research (note). The team meets via Skype to discuss

the proposal and delegate sections. The individual students compose their section of the

written proposal, as well as slides accompanied by an audio description. The students meet

to compile the report and the presentation assuring that proper transitions are in place for

both the written proposal and visual/audio presentation.

The project occupies the final four weeks of the course with the proposal and presentation

completed in the first three weeks of the project. The finished products are then transmitted

to another group who will vet the written proposal and presentation, producing a written

critique and response. The situation requires the proposal to be prepared for the Senior

Director, but before any proposal is sent on, it is critiqued and responded to by another team.

Once the proposal critique and response are complete, the composing team will have the

opportunity to make edits before submission to the Senior Director. Completed individual

tasks are uploaded to the Mentor as they are completed; for instance, when the individual

completes their section and slides, they send them to the Mentor, who, as artificial

intelligence, will provide a checklist of key factors. The Senior Director (TA) grades the

final proposals, digital presentations, critiques, and responses. The proposal and presentation

are graded by individual section.
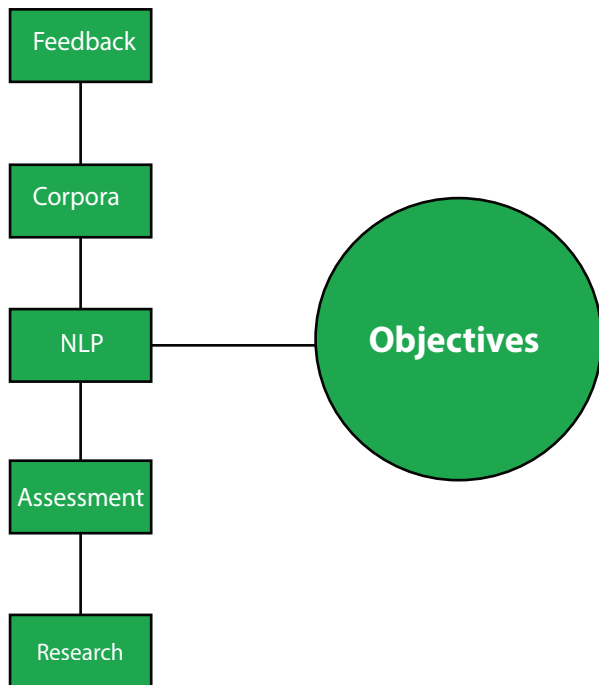
Chapter 6

Objectives and Further

Research

The primary objective of a technogenetic pedagogy of professional communication is the development of teaching methodologies that account for the effects of digital media technologies on cognition and communication in a world of human and organizational closed complex systems.

Chapter one defined the context of technogenetic rhetoric while chapters two through four outline a pedagogy based on argumentation, figural logic, visuospatial rhetoric and information design that attempts to reconcile the conscious and unconscious technological extension of cognition. Technogenetic rhetoric focuses on the interrelationships of language, image, technology, and extra-discursive elements such as ethos, kairos, and tone from a cognitive perspective. Specifically the cognitive affinities and mechanisms we have for language and image as argumentation, figuration, vision, sound, and space. Chapter five describes a delivery mechanism for a technogenetic pedagogy in the form of a simulation game in which students are immersed in the theory and practice of professional communication in a setting of play and exploration. The Professional Communication

Simulation Game (Ametros) has a set of objectives beyond the development of teaching methodologies. Ametros is primarily an online offering, and while it can be deployed in a hybrid classroom/online setting, gameplay is designed for online education. The following chapter outlines a series of Ametros objectives for online pedagogy that focus on feedback (section 6.1), a research program and protocol inherent to the PCGS involving corpora building and natural language processing (section 6.2), assessment (section 6.3), and finally, a brief outline of further research (section 6.4). Technogenetic rhetorical pedagogy for professional communication has four objectives:

1. Develop pedagogy and methodologies suitable for the conscious and unconscious extension of cognition and communication

2. Develop pedagogical and natural language processing protocols that provide feedback superior to classroom-based courses by developing a corpora of professional communication suitable for natural language processing.

3. Develop assessment protocols that align the needs of the institution with the reality of the professional organization.

4. Develop a research protocol and on-going program to study communication immersed in digital media through the construction of corpora and natural language processing applications.

Chapters one through four address the enormity of objective one. This final chapter discusses feedback, assessment, and research program objectives in relation to the

implementation of Ametros and future work. While the theoretical foundation, pedagogical

implications, and structure of Ametros are well defined and are in the process of being

implemented, the path to objectives two, three, and four are far from clear and will constitute

an ongoing research program.

6.1 The Challenge of Online Feedback

Studies such as Bernard et al. (2003) and Zhao et al. (2005) report what most educators

involved in online learning already know: the more engaged the instructor, the higher the

degree of feedback, resulting in a higher degree of student satisfaction. Since its inception,

online education has struggled with the issue of feedback. The strength of online education,

primarily the ability to reach more students through the virtual classroom is often offset by

the limited feedback an instructor is able to provide. If an Instructor is responsible for five

hundred students, and ten Teaching Assistants fifty students each, the level of feedback that

can be offered is limited by time.   Providing detailed feedback on fifty average size (5-6

page) reports requires anywhere from ten to fifteen hours. When weekly workshops, major

projects, and time spent answering posts and emails are added to the mix, the one-hundred

hours allocated to the Teaching Assistant are easily consumed, most often without the

provision of adequate feedback. The online and solitary nature of the pedagogy is most often

the crux of the problem. In a traditional lecture setting, students listen and perhaps join in a

discussion on the content of the course. The instructor assigns assignments based on what

she is capable of grading and offering feedback in a reasonable amount of time, very often

between four and six assignments and tests per term. Class size also determines the number

of assignments and tests; in a class of twenty students, the instructor is able to provide feedback on weekly exercises such as blog posts and reflections, while a class of forty-five makes such a feedback unrealistic or, if attempted, insufficient. The student understands the tradeoff. The availability of the instructor during office hours and after class, in a combination with the setting where the student is one of a visible group, makes acceptance of the level of feedback probable. In an online setting, the student sits alone at their computer viewing a multi-media presentation as lecture, without the opportunity to ask questions or join in a discussion. Emailing questions to a TA or posting to a discussion board is the available means of interaction in most online environments creating a delay that dilutes the effectiveness of feedback. At the same time, the student is asked to produce more content in the form of workshops, assignments, and tests than they would in a traditional setting. Content lectures in an online setting are of a significantly shorter duration than in a face-to-face lecture. Ninety minute lectures/discussions are not feasible online. To offset the smaller content lectures, online courses increase the degree of actual practice performed by the student. On the whole, this is a good thing and one of the strengths of online education. The problem lies in feedback. The student rightfully expects feedback for most, if not all activities they have completed. In a writing and communication course, the feedback issue is critical; automatic marking is not applicable in most cases. Automatically marked quizzes on theory are often implemented, but in communication and writing pedagogy, only feedback on actual practice leads to praxis. Students expect comment and correction on their work and as most online classes are significantly larger than face-to-face tutorials, this is, for the most

part, impossible. A real-world example is found at the University of Waterloo: face-to-face tutorials for the academic writing course (ENGL 109) are capped at twenty-five, while the online business writing course (ENGL 210F) is capped at fifty students.[18]

Ametros attempts to alleviate the feedback issue in online education by expanding the opportunities available to the student to test and analyze the validity and effectiveness of their work. Feedback in Ametros is provided at a number of points in the course beyond the grading of work. Feedback is received from multiple sources that include Instructors, Teaching Assistants, peers, and artificial intelligence agents. The key conduit of feedback is the Mentor character, both artificial intelligence and human being, described in the previous section. The Mentor offers numerous feedback opportunities beyond the grading of assignments. The two primary feedback mechanisms are dialogue and analysis. Dialogue occurs on four levels, two of which function through the Mentor and two through peer interaction. Each Mentor and peer dialogue involves a live stream and interaction with an artificial intelligence agent. Analysis also takes place on four levels: analysis performed by the student on their own work, analysis performed by the student on the work of peers, analysis by the Mentor, and limited analysis by human Instructors and Teaching Assistants. Constant dialogic and analytical opportunities provide a level of feedback superior to that of

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[18] In a review of the comment sections of five online course evaluations for ENGL 210F and found the "lack of feedback" complaint to be second only to "lack of communication with TA/Instructor" in terms of frequency.

both traditional online and face-to-face teaching environments. Before describing the feedback mechanisms, two core ontologies that allow dialogue and analysis to take place via artificial intelligence agents is described. The first, the Argument Interchange Format (AIF), applies to argumentation, while the second is, the Rhetorical Figure Ontology (RhetFig), an ontology still in development. The AIF and Rhetfig provide an intermediate language that will allow the development of web-based feedback applications.

6.1.1 The Argument Interchange Format

The AIF is a joint project of a research community in computational argumentation based out of the Argument Research Group of the University of Dundee. The goal of the project is the development "of a core ontology for expressing argumentative information" (Bex et al. 2013, 953) that allows the many diverse research projects focused on computational argumentation a common intermediary language. It is beyond the scope of this dissertation to provide a detailed technical description of the AIF. There are a number of papers on the AIF and its applications that provide such detail (…). The following describes the AIF and the applications it supports in connection to the pedagogical value afforded Ametros. The AIF is an abstract representation of classes and relations in the elements of argumentation theory represented as an ontology of argumentation classes that is based on graph theory where arguments are represented in *nodes* that are connected by *edges*. The ontology contains two parts, an Upper Ontology that contains the basic, abstract elements that allow for the development of Argument graphs and a Forms Ontology that contains the specific definitions (953). There are two types of nodes in the Upper Ontology, *information*

nodes (I-Nodes) and *scheme nodes* (S-Nodes). I-Nodes hold the information content while S-nodes contain the argumentation scheme (what I have called strategy in this dissertation). Information nodes contain data as propositions and sentences while scheme nodes contain very basic reasoning strategies such as preference, inference, and conflict (953). CA-nodes denote conflict schemes, PA-Nodes denote preference schemes, and RA Nodes denote inference schemes. Edges are represented by lines that define the relationship between nodes, for example CA or inference nodes are a sub-class of schemes. The Forms Ontology contains nodes and edges that allow for specific argument schemes and relationships. The Upper Ontology represents the syntax of the ontology while the Forms Ontology represents the semantics of the AIF (3). Figure 13 represents the ontology as a graph.

Figure 13: AIF Ontology - (Bex, Modgil,Prakken & Reed 2013 955)

The AIF ontology supports particular argument schemes of Perelman and Olbreachts-Tytecca, and Douglas Walton discussed in chapter three. Using AIF, it is possible to create graphs of specific argument schemes that can be displayed visually using another ARG software tool *Araucaria*. Araucaria is able to engage an AIF ontology that has been moved from abstract graph to reified intermediary language (written in OWL) to produce visual models of arguments (see Figure 14).
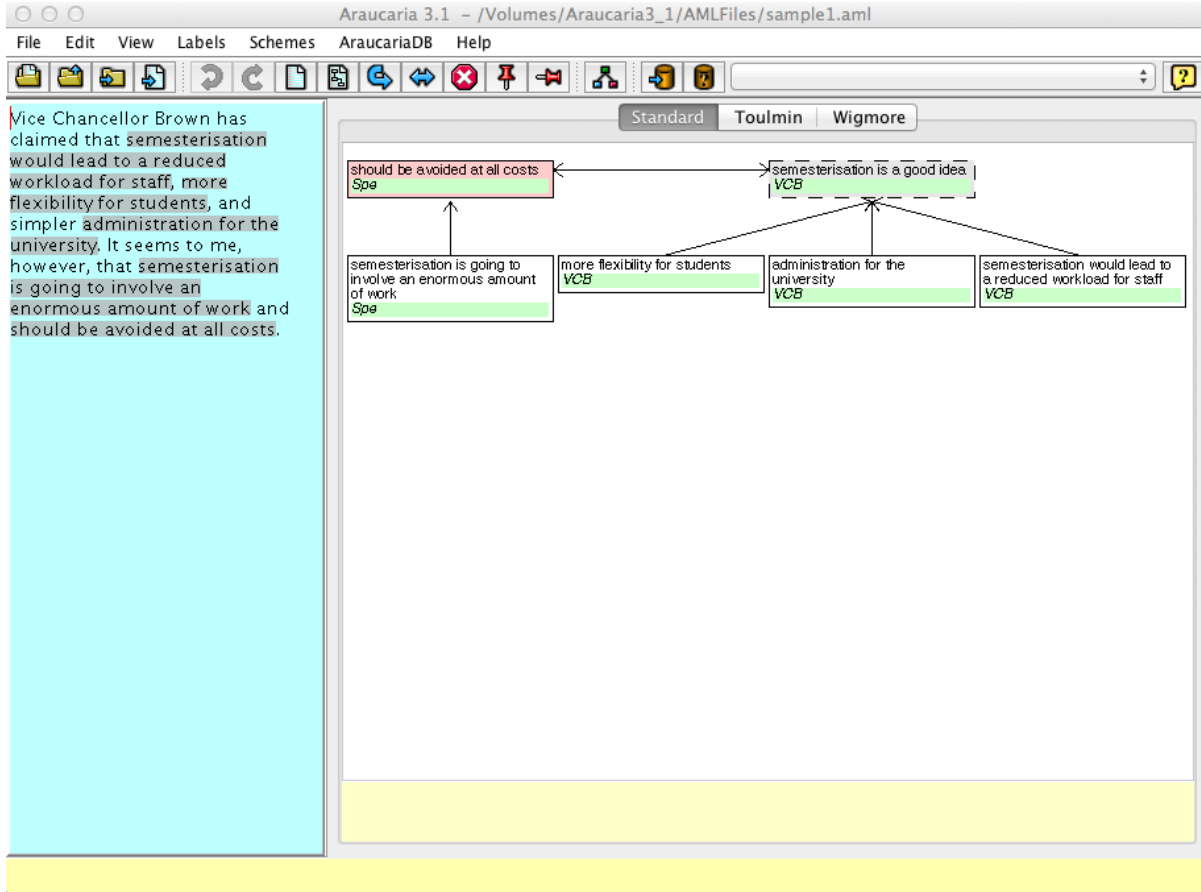
Figure 14: Sample Argument Diagram

Araucaria allows the user to enter the text of an argument, select premises, and determine the argument scheme in use. Figure 15 shows the scheme "argument from a position to know" engaged in the premises displayed in the top two boxes.
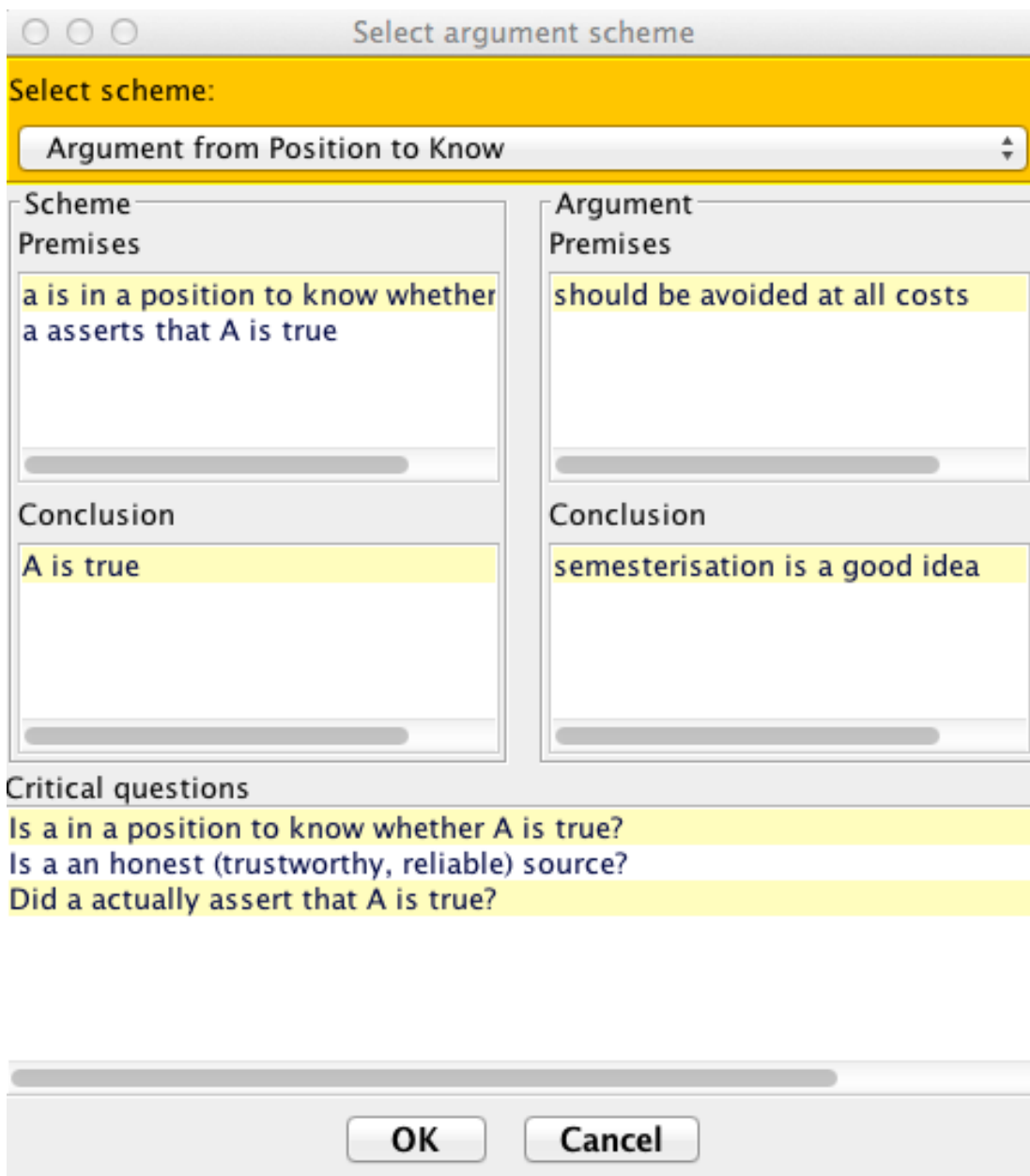
Figure 15: Araucaria Argument Scheme Dialouge Box

A reified AIF ontology also allows for interactive argumentation using applications such as

Arvina (Reed et al. 2011). AIF arguments that are stored in a database are accessible to

Arvina, which allows a student to interact with the claim and ground statements of previous participants. While other students create the statements, the artificial intelligence robot of Arvina calls up the relevant propositions and interacts with the student. At the time of this writing, Arvina is in the prototype stage.

The AIF ontology, along with the applications Araucaria and Arvina provide a second level of feedback on top of traditional marking and review as the student is able to conduct a fine grained visual and dynamic analysis their own arguments, as well as those of other students. For example, the student is able to visually diagram the claims, grounds, and backing of the argument they made in project one, the selection of a web partner. The student is also able to interact and question arguments made by other students in favor of the other companies. The AI Mentor will assign these activities as part of the review and feedback sessions prior to final submission to the Senior Director. The engagement of Ametros and a reified AIF offer a number of other possibilities. I plan to integrate Araucaria and Arvina (when the final version is available) into the interface of Ametros as supplemental activities required to complete each project.[19]

The second ontology Ametros will engage is the Rhetorical Figure Ontology (RhetFig). RhetFig is a project of Randy Allen Harris and is currently in an early stage of development.

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[19] Both applications are products of the Argument Research Group (ARG) at the University of Dundee in Dundee, Scotland. The programs are open source and available for research purposes. I will work with the ARG to integrate the applications into Ametros.

The RhetFig ontology will classify rhetorical figures in a manner similar to the AIF ontology. Schemes, tropes, chroma, and rhetorical strategies will be classified in relation to the cognitive affinities they engage. For example, the scheme antimetabole engages the cognitive affinities of repetition and association. The RhetFig ontology will allow for the development of annotation tools (described below) and applications that will allow students to analyze their own, as well as that of other student's use of figuration as an argumentation methodology.

6.2 Corpus Building

The analytical activities and exercises assigned by the Mentor are based on annotation performed by the student. Ametros will provide an interface that allows the student to annotate their work by highlighting a specific sentence, or clause and then clicking the appropriate button. For example, the student may be tasked with annotating the key sentence that describes their argument scheme.

The student is given a finite selection of argument schemes to employ in any given report or assignment. The student may decide to employ the "argument from expert opinion" scheme in making their recommendation for a web design company (project one detailed above). The student highlights the text, "the Canadian Association of Web Design Companies selected A1 Design as the best e-commerce provider in Canada" and clicks the "argument from expert opinion" selection on the interface. Other aspects such as claim, data, and backing statements will also be annotated. Araucaria allows for the annotation of

argument schemes that could serve as the engine for annotation in Ametros interface. Textual elements of rhetorical figures such as antimetabole, anaphora, isocolon, and ploche will also be annotated for use with the Rhetorical Figure Ontology (RhetFig). Other tropes and chroma such as analogy and gradatio will be annotated. In addition to a standard list, the annotation engine and interface will allow for the addition of whichever argument schemes/elements and rhetorical figures the course instructor deems necessary.

The annotation engine will be designed using a modified version of Araucaria and Argumentation Markup Language (AML) developed by the ARG of the University of Dundee. AML is based on XML (Extensible Markup Language) a widely used text markup language that provides a number of standard tools for development. Basing AML on XML also allows for the use of stylesheets that will allow Ametros to extend the basic markup parameters of AML to elements of figuration and figural logic. AML currently annotates text with basic elements of argumentation including premises and propositions (Reed and Rowe, 2004). Ametros will create an interface that simplifies the annotation of elements to a highlight and click model. One of the primary roles of the Teaching Assistant (a full description of the role is presented below) is the checking and correcting of the annotation. Approximately four texts, written in different technological mediums and formats (recommendation report, blog post, instant messenger dialogue, and presentation transcript) are annotated during a course cycle. The TA (as Mentor) is responsible for checking and correcting the annotation, or sending it back to the student for revision if the elements annotated do not represent an argument scheme or rhetorical figure. At the end of each term,

the course will produce hundreds of annotated arguments. Ametros will upload the annotated arguments to the Araucaria database, as well as a database maintained for use research on figuration and figural logic. As the number of arguments in the corpus increases, the annotation engine will deploy a hidden Markov model algorithm that will train the engine to anticipate the validity of the selection. A hidden Markov model algorithm determines the probability of linguistic tokens in a temporal sequence based on a corpus database (Baum, 1972). In other words, the annotation engine (as Mentor) will suggest corrections or alterations to an annotation. For example if the student clicks the "argument from example" selection for what the engine determines is more likely the scheme "argument from expert opinion", a suggestion to change the annotation is presented in a pop-up text box. If the annotation engine is in agreement with the annotation of the scheme, it will ask Walton's critical questions, creating a mini-dialectical argument aimed at helping the student test their propositions. For example, in the "argument from expert opinion" scheme the annotation engine will ask, "if there is a possibility of bias on the part of the expert in question". The annotation engine, as Mentor, will answer will further suggestions on the issue of bias – how important it is to check or how to, or even whether to defend the proposition if bias does exist and so on.   As the corpus grows, the annotation engine will become adept to the point of replacing the TA in annotation checking, as well as asking Walton's critical questions.

Another possible method of computational analysis is rhetorical structure theory (RST).[20] Moens, Mochales Palau, Boiy, and Reed (2007) developed an analytical method based on RST for the classification of legal arguments that could serve as a method for computational argument analysis in Ametros. The RST based analysis defined th relations between arguments and non-arguments through a series of markers including word couples, text statistics such as sentence and word length, punctuation, key words, and parse features such as certain conjunctions and adverbial combinations (227).

The annotation engine will provide immediate feedback to the student in terms of argument and figural elements. The student will be able to use the annotation engine in combination with Araucaria to create a visual representation of their argument that will help in not only understanding the effectiveness of their case, but also look at how arguments evolve in different digital media settings. The database of arguments will also allow the student to take part in dialogic interaction with the arguments of other students on their own time. Students will be able to use a modified Arvina tool to select recommendations different from their own to present counter claims and backing. The result is a chat-based argument with the real propositions of other students that are controlled and presented by the artificial

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[20] RST has little to do with *rhetoric* per se, the theory attempts to define structure and coherence in a text by analyzing relations between elements defined as nucleus and satellite. For example, the relation "antithesis" has a nucleus of ideas favored by the author and a satellite of ideas disfavored by the author (see Mann & Thompson, 1988).

intelligence engine of the modified Arvin application. These chats will have the appearance of instant messenger interactions that will also be annotated as a dialogic argument in a digital medium. The annotation engine and the applications it serves add a level of feedback not found in online courses.

6.3 Assessment

Next to feedback, assessment is the greatest challenge faced in an online environment. Assessment falls into two categories; automatically marked multiple-choice, fill-in-the-blank, and true-false quizzes, or short and long answer assignments marked by Teaching Assistants. Professional communication does not lend itself to the first category. Assessing using auto-marked quizzes demands a focus on theory and not practice. Content modules in courses that utilize quizzes invariably rely on process and memorization making the deployment of a technogenetic pedagogy all but impossible. The second category generally suffers from inconsistency in grading. Individual Teaching Assistants will always interpret the most detailed rubrics differently. The second most common complaint that I have read on the course evaluations for the professional communications online course offered by the University of Waterloo is inconsistent marking of assignments. Regular Teaching Assistant meetings and discussion can alleviate the problem somewhat, but ultimately consistent grading will be a problem whenever a large body of students is graded on the same material by a large group of Teaching Assistants. Ametros will attempt to alleviate the consistency problem though the various feedback loops available in each project. The feedback applications available through the annotation engine and the interactions with the Mentor

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(whether TA or AI engine) create a situation where multiple drafts of each project are revised

numerous times. Peer analysis in combination with applications such as a modified Arvina

dialectical argument generator and Araucaria argument-mapping tool will create final

products that are of higher quality than one-time submission projects. The engagement of the

Teaching Assistant in the process of revision also makes marking variance less likely. The

most important effect of the feedback loop of revisions, however, is on the attitudes of the

students; the sheer number of times the student engages either the Teaching Assistant or

artificial intelligence engine as Mentor, instills a deep understanding of the marking rubric

involved. For example, as the student annotates their argument elements of propositions and

figuration, answers critical questions on their scheme, is given suggestions for improvement,

and engages the work of other students, she is more apt to be completely aware of the quality

of her work. It is my expectation that the grade average for the course will be generally

higher than a traditional offering with a portfolio (database) of student work in support.

Assessment in Ametros is related to the workload of the course. Personal research on

online courses offered by the University of Waterloo, Conestoga College, and the University

of Phoenix reveal that the average time spent engaged with the course modules (excluding

reading) is forty-five minutes per week. I take the time spent on course modules such as

content lectures and workshops to be the equivalent of time spent in class in an on-campus

setting. The normal weekly in-class time of on-campus course is three hours. In all courses

observed, the amount of reading was relatively consistent at about forty-to-sixty pages

weekly. The discrepancy in student engagement time is more than likely a result of a

concern over attention. It is unlikely a student would sit through a ninety-minute lecture online. Ametros increases the engagement time of students and course drastically through the simulation game model. The student does not click on a content module and listen to the twenty or so minutes of lecture and PowerPoint; she meets with the Mentor character for a theoretical introduction, completes a draft of a communication, annotates, analyzes, and diagrams the draft, Engages the work of other students, constantly interacts with the Mentor through numerous drafts and revisions, and finally submits a final artifact. The goal is to have three hours on online engagement that keeps the student's attention by keeping interaction time to less than twenty minutes per activity and instilling the goal and play orientation of a game.

6.4 Ongoing Research Program

In addition to developing new pedagogical tools based on technogenetic rhetoric, Ametros will provide a corpora of categorized arguments for future research into computer models of argumentation and figuration. The arguments will be categorized according to digital medium and provide an opportunity for researchers to analyze arguments by media type. The corpora will be available to researchers in natural language processing to develop applications in number of different areas

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