REMAKING POEMS:

COMBINING TRANSLATION AND DIGITAL MEDIA

TO INTEREST HIGH SCHOOL STUDENTS IN POETRY ANALYSIS

by

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For my students

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The University of Texas at Dallas, 2017

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In American high schools, the practice of poetry analysis as a study of language art has declined. Outworn methods have contributed to the trend away from close interactions with the text, to the unfortunate end that millennial high school students neither understand nor enjoy poetry. Digital technology coupled with principles of translation offers a dynamic interpretive model that has the potential to engage high school students in constructive experiences with the high art. Until now, most applications of new technology to literature have served archival or big data purposes. This project proposes that the scientific as well as creative use of the computer also can enhance the reading of a single poem by an individual or small group. Exposing the deficiencies of current pedagogy and considering the promise of emerging non-traditional approaches, it argues for change. The impact of new media on culture and language justifies the digitization of a poem as a linguistic artifact and redefines close reading in digital terms. However, to simply generate data leaves readers unsatisfied. Translation bridges the gap between the scientific and humanistic environments as it allows not only for the microscopic observation of a poem's

technical components but also for the means of associative, collaborative, and inventive thinking about the poem. In digital experiments with Arthur Rimbaud's "Vowels," the project traces associations among the poem's aural, visual, verbal, spatial, and chronological agents. To synthesize and visualize the data, it utilizes electronic mechanisms to create new associations in the reconstruction of the poem in verbal and multimedia translations. This remaking of the poem powerfully and respectfully connects the reader to the original text. The systematic introduction of this method into the study of poetry in high school could, in pleasant and personally meaningful ways, restore to students their literary heritage. The proposal is not without its challenges as resources to experiment with curriculum upgrades are limited and resistance to change is strong. Nevertheless, *Remaking Poems* contends that developing digital methodologies, though intriguing, is, more importantly, essential to this generation's obligation to share the soul of its culture with the next.

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INTRODUCTION

A wizened Hawaiian guide once told me that the islanders' ancestors ascribed a mystical quality to words, believing that they contained the life energy of those who issued them. Words were sacred, untouchable. Something akin to that reverence exists today as the keepers of the humanities mummify literary works in dutiful respect and enshrine them on dusty shelves. Paradoxically, the "keepers" of language have virtually killed its artistic forms for the millennial generation. The funerary rituals, combined with the burgeoning attention to STEM subjects, has contributed to a decline of interest in imaginative literature and particularly in poetry. At a time when other disciplines are exploring digital pathways to new knowledge, teachers and critics of literature have made few adjustments toward technological methodologies that could breathe new life into poetry's fading presence in American life, especially in its high schools.

If high school English teachers were to consider digital methods to help their students experience poetry, those methods would have to be more than electronic systems for collecting, storing, and managing data. They would have to be more than mere transcriptions of traditional methods to a digital format. Rather, they would pursue avenues by which the computer is redefining culture, its transmission, and its interpretation. They would promote associative, collaborative, and inventive thinking. They would be accessible and aesthetic. They would require an understanding of language as a technical object; an interactive mechanism to break a poem's language into components and to work with it outside of linear frameworks; a creative platform to construct an evolving translation of the poem's essence. In this dissertation, I explore such methods ranging from simple exercises teachers can construct themselves to more

complex experiments that will require intensive programming, digital housing, and institutional support to effect widespread curricular change.

The activities conceptualized in *Remaking Poems* revolutionize the study of poetry by freeing it from the domain of dogmatic teachers and critics and by placing it in the hands of high school readers who become cocreators with the poets. The accompanying DVD (Appendix C.3) demonstrates some of the experiments, and the paper justifies and explains the project in five chapters:

Chapter One, "An Argument for Change," establishes the need for a digital approach to poetry analysis by exposing the outmoded scope and methods of current pedagogy in secondary schools; by analyzing the strengths and weaknesses of early and current efforts to apply digital technology to poetry analysis; and by exploring innovative methodologies that lend themselves to digital applications in the high school curriculum.

Chapter Two, "An Argument for Digital Methods," justifies the digitization of a poem as an artifact of language and redefines close reading in digital terms.

Chapter Three, "An Argument for Translation," advocates translation as a model for humanistic data visualization and for developing an interpretive perspective by associative, collaborative, and inventive thinking about a poem.

Chapter Four, "Digital Analyses of Rimbaud's 'Vowels,'" destructs the poem in digital experiments and constructs a verbal translation and a "PoemSquare," a ninety-second multimedia translation of the poem that creatively represents a synthesis of the poem's images, movement, sounds, and symbols.

Chapter Five, "*Remaking Poems*: Upgrading the Curriculum," considers the possibilities, processes, and challenges of employing digital means to make poetry analysis more relevant and effective for high school students.

With *Remaking Poems*, the goal is not to preserve the sanctity of the poem but rather to produce dynamic readings of it. It is not to tediously excavate the poem's sacred secret but to revel in its heartbeat – and its other messy yet remarkable systems – both with empathy and with understanding. Thence comes enjoyment and enlightenment.

CHAPTER 1

AN ARGUMENT FOR CHANGE

Ask a group of high school students to call out their favorite poets, and silence dampens the atmosphere. Mention the upcoming poetry unit, and waves of groans erupt. Many of today's students find poetry intimidating or boring, or both. Only a dramatic change from the stagnant methodologies of the past will invigorate the study of poetry in high schools. The goal of this project is twofold. It is to suggest innovative directions for the revitalization of poetry analysis by merging digital technology with the practices of translation. More importantly, it is to engage individual students in the process of their own education – to give them the means to explore a poem from the inside, to tap its energy, to find connections between the text, the world, themselves, finally to return to the original poem with which they will have created a relationship. Then they will find in their poetry meaningful connections to the human experience and to their own culture.

In an April 10, 2013, roundtable discussion at The University of Texas at Dallas, poet Campbell McGrath said that other nations still revere their poets. "In Ireland," he said, "Seamus Heaney has the name recognition of a Bill Gates or a Steven Spielberg" (McGrath). Not so in the United States, where the study of poetry in high schools has been relegated to the seldom-reached last unit in the textbook or to a nonessential filler between the end of standardized tests and the last day of school. Many teachers fill the time with a Poetry Café. They roll down a library cart filled with books of poetry. The students browse the books and pick a poem they like. The classroom becomes a coffee house with dim lights and refreshments. The students read their selections to the class, and everyone snaps approval at the end of each reading. The

activity could make an interesting introduction to poetry, but does little to inspire understanding of how the poem comes to have its effects. To some degree, poetry's diminished reputation in US schools is part of a larger societal trend in devaluating the humanities. As specified in the *Common Core State Standards for English Language Arts and Literacy*, the trend is to focus increasingly on academic language, informational texts, and literary nonfiction more than imaginative literature (Common Core). However, in large measure, the declining position of poetry in the English language arts curriculum can be traced to methodologies that separated it from the practical life of the student. Accordingly, the strongest hope for reconnecting poetry to high school curricula and, through it, to the mainstream of American culture lies in developing a pedagogy that unites contemporary theory with methods that young adults find relevant. For millennial and post-millennial students – many of whom cannot read an analog clock – those methods must be digital.

The disconnection between poetry and the average citizen in the United States began with the methods of the New Critics, who exerted an immeasurable influence in the discipline over five decades. In *Cultural Capital,* John Guillory sees the methods of New Criticism as having "revalued literature as the cultural capital of the university" (Guillory 172) rather than of the masses. The hegemony that New Critics had established by the 1950s began with T. S. Eliot's revaluation of the canon to embody, first, his perception of Christian dogma and, second, his belief that literature should be difficult. Couched in a refashioned tradition and a certain spirituality, New Critics installed themselves in "the university, a place exterior to mass civilization itself, a place in which 'orthodoxy' was expressed in the form of literature" (140). From this place of authority, they labeled their version of tradition as orthodoxy and through

their extensive criticism ensured that respectable poetry conformed to the "right tradition" (152). The "right tradition" defined the canon as the difficult poems of the metaphysical and the modern poets and close reading as the method of choice for identifying the nuclear meaning that lay within each poem. Promoting those values, New Criticism's 1938 textbook, *Understanding Poetry*, became widely used in secondary schools as well as universities (168).

Cleanth Brooks and Robert Penn Warren, teachers at Louisiana State University, wrote *Understanding Poetry* to address the problem that the majority of students in their classes had no idea how to read a literary text (Hickman 197). The textbook would become, as Alan Golding demonstrates by recounting a long list of praises sung by critics across the generations, "one of the most influential college textbooks" (Golding 103) of the twentieth century. It went through four editions over the course of the four decades between 1938 and 1978 and became the model for textbooks by numerous other publishers (109).

In addition to teaching students how to analyze poetry and to write critically about it, the purpose of the book was to teach teachers how to facilitate those processes in their classrooms. Unlike previous textbooks that supplied a short historical and biographical introduction to the selections, *Understanding Poetry* featured essays on applied aesthetics, editorial analyses, critical analysis questions, close reading exercises, and a glossary of literary terms (196). Mark Jancovich writes that the phenomenal influence that the Brooks and Warren textbook exerted was due to the fact that it was published when there was "no coherent practice for the teaching of literature as literature" and that it presented pedagogical activities that defined a system within which literary studies still operate (Jancovich 87).

Thus, as the standards and systems of the New Critics achieved universal acceptance, the language of poetry and its analysis, with its emphasis on difficulty, distanced itself from the language of the masses. Two languages coexisted in the society, the Standard English of the common man and the literary language of the educated. The method of close reading, which enamored teachers of literature by giving them a substantial approach to teaching poetry, was, like the modern and metaphysical poets that the New Critics promoted, difficult. Soon the effects of New Criticism would be all too evident. As Jed Rasula notes, "Readers had been replaced by annotators, not by accident but by design" (195). The impersonal, time-consuming methods of close reading for the purpose of finding a central truth, as well as the complexity of the poetry, had driven away the popular audience.

New Criticism methods persist today in the Advanced Placement (AP) English Literature course endorsed by the College Board that impacts more than a million high school students each year, not counting the millions more in pre-AP courses. The Advanced Placement program, initially known as "The Kenyon Plan," had its origin in 1955 at Kenyon College, where John Crowe Ransom served as professor, founder and editor of *Kenyon Review*, and developer of New Criticism from 1937 to 1959 (Historical). Constructed by the college president and faculty members, the program was designed to provide a way for students to earn college credit for advanced work that they do in high school. Since its inception, the AP Literature and Composition test has heavily favored the New Criticism canon and methods. For example, on the 2012 test, students were asked to read "Thou Blind Man's Mark" by Sir Philip Sydney and then to "Write a well-developed essay in which you analyze how poetic devices help to convey the speaker's complex attitude toward desire" (AP). In her published comments on the essay

results, the Chief Reader stated, "The mean score was 3.98 out of a possible 9 points. This is the lowest mean score on the poetry question in the past eight years, and it reflects a continuing trend in which students have more difficulty with analyzing poetry than they do with prose or the open question. In fact, a number of students did not answer this question at all, perhaps because the poem was challenging" (Student). The observation is concerning, not just for the surprise that the Chief Reader seems to register that many students did not attempt the essay, but also for the downward trend of success on poetry questions. Although the issues of poetry appreciation and analysis are too complex to attribute to a single cause, a reasonable case has been made by Guillory that the rigor of the New Criticism canon and methods has the effect of diminishing return. Even more concerning is that the same criteria that underlie the AP program in literature apply in the new Common Core State Standards (CCSS) that forty-five states have adopted. A 2011 report of the College Board indicates that their members actively participated in forming the CCSS and that "there is a high concentration of alignment between the Common Core State Standards for English Language Arts and AP English Literature" (Common 7). With these standards, the institutional influence of New Criticism is expanding into general education classes. Whereas English teachers might welcome the higher standards for composition and reading comprehension, those who have confronted the blank stares or abject terror on the faces of students tasked with the close reading of difficult poetry must face the reality that this development does not bode well for their students or for the future of poetry in this country.

However, the decline of appreciation for poetry did not come solely at the hands of the New Critics. The trend toward pluralism in the last three decades of the twentieth century yielded a variety of approaches that abandoned the intrinsic focus of the New Critics.

Alternatively, extrinsic methods focus on the text as a creation of the reader – as in Post-structuralism and Psychoanalysis – or as a cultural product – as in Marxism, New Historicism, and interests clustered around sexual and ethnic identities. However, although these schools of thought have in common a resistance to New Criticism's methods, the discontinuities between them diminished their capacity to effect significant change in the common practice of teaching poetry in schools. In their 2009 study "The Other Tradition: Populist Perspectives on Teaching Poetry," Mark Faust and Mark Dressman observe that despite the rise of populist approaches, conflicting philosophical and political agendas among them have precluded "any widespread effect on school curricula in which the teaching of poetry continues to become increasingly standardized" (Dressman and Faust). Furthermore, the competition between the factions has eroded public and scholarly confidence in pluralism as a reliable or meaningful basis for establishing educational standards. As Marjorie Perloff laments, with these open-ended methodologies, the study of poetry became so subjective that it "dispensed with poetics altogether" (Perloff 13), and English departments "found themselves in the odd position of teaching anything but literature" (13). Between the tedious New Criticism methods that alienate students from poetry and the diverse methods that lead students to focus more on sociopolitical than linguistic phenomena, the only wonder is that any scholarly appreciation of poetry survives in high school curricula. What, then, is to be done? How can teachers assist students to an informed subjectivity that does the work of close reading in a way that energizes rather than enervates, that takes into consideration the impact of biographical and cultural contexts, and that invites readers into the ongoing process of co-creating the poem? For despite its anachronisms, New Criticism's valuing of the complex and beautiful intricacies of language should inform any

meaningful revision of literary analysis practices. And some emerging schools, such as Feminism, have brought innovations to pedagogy that may bring life and relevance to the study of poetry. Feminist thinkers have expanded the understanding of how people know to include experience and emotion. They value knowledge as a social process and affirm both individual identities and communal connections. In the true spirit of community, the learning environment offers a forum for intense yet respectful conflict. Feminists favor the decentered classroom in which instructors, as co-learners with the students, share power so that young people can see themselves as "holders of knowledge" (Vanderbilt). Developing a system that blends the strengths of old and new with contemporary media may begin to forge new relationships between youthful readers and poetry.

Charles Bernstein's light-hearted yet insightful short essay on reading "The Difficult Poem" discusses the importance of relationship. Counseling the frustrated reader, Bernstein says, "The difficulty you are having with the poem may suggest that there is a problem not with you the reader or with the poem but with the relation between you and the poem (Bernstein, "Difficult" 150). Readers who reject a difficult poem outright, believing it to be abnormal or themselves to be stupid, will never build a relationship with the poem or come to appreciate it. Appreciation grows through intimate connection. The pressing question becomes how to bring the poem and its reader together in an enjoyable, reflective, and self-expressive process. Digital technology supports new pedagogy that values that kind of interactivity. George Landow says that "hypertext creates an almost embarrassingly literal embodiment of [contemporary literary and semiological theory]" (Delany and Landow 6). The computer and the functionality of

hypertext offer multiple possibilities for the development of innovative ways to make the study of poetry relevant to twenty-first-century students.

Digital programming allows students instant access to collaborative and intertextual resources that facilitate a non-threatening, decentered approach to understanding poetry. Decentering – moving away from the assumptions that a central truth lies at the core of each poem and that the teacher is the revealer of the poem's wisdom – can transform a classroom dynamic from a centripetal spiral toward a closed center to a centrifugal spiral that opens to the outside world. Lynn Keller describes the difference between the two environments in the poetry classroom. Her discussion focuses on the appropriateness of the centrifugal particularly for readings of difficult new poetry. It is true, however, that most students below the graduate level feel challenged by other types of poetry as well. John Donne or John Cage – all poetry is gibberish to them. Therefore, the environment that Keller suggests for new poetry can equally apply to the study of poetry in general. The centripetal classroom of former tradition adopts the atmosphere of the confessional, where the poem is a sacred object that all students experience individually and then share their private insights (Keller 31). In sharp contrast, the centrifugal classroom "involves a dispersion of consciousness and of significance" (31). The process begins with a noisy reliance on collaborative rather than individual experience. Students pool their resources, and their collective experience exceeds the sum of their individual parts. In the centrifugal classroom, the teacher resists the temptation to direct students toward a "right" interpretation, but rather allows them to become "writerly" readers in the vein of Roland Barthes. Authority is displaced from the voice at the front of the room to the voices of students working their way through the text (33). The final trait of the centrifugal classroom relates to its

treatment of language, not simply in its denotative or connotative senses, or in its typography, but also in its relation to the words around it and its use in social contexts beyond the poem (34). The associative and collaborative nature of the centrifugal classroom finds its fulfillment in digital methodology.

Digital technology can facilitate other innovative teaching methods. Subjectivity figures prominently in the textual studies of Robert Scholes. By textual studies, Scholes means writing, which should, in his opinion, form the core of a revised curriculum. Teachers should decide first what kinds of texts they want their students to produce and then decide what literature can serve as good examples of those kinds of texts (Scholes 99). In terms of text selection, Scholes favors poems or other forms of writing that express poetic qualities because metaphors form the essence of language as it functions in all of its various persuasive or expository forms (110). "We extend knowledge by thinking of the unknown in terms of the known," he says, and "the study of figures will take us deep into the workings of textual power and pleasure" (111). Scholes' theory rests on Barthes' concepts of readers as producers of text rather than consumers and of all texts being inherently intertextual. Intertextuality is central to his curriculum plan. One of his writing exercises is to have students "play irreverently with the texts of others" (105). Most importantly, Scholes wants his students to develop a sense of self and of that self in relation to society. Drawing on theories of linguistics and psychoanalysis, he confronts students with the question of what it means to say "I" (106).

Digital studies allow students to recreate the totality of a poem or, said differently, to create a multiplicity of interesting approaches that attract them to the poem. Students may get to know parts of the poem – including the process of its creation – intimately without feeling that

they have to "get" the overall meaning, a feeling that automatically forces them into the false polarity of coming to a right or wrong conclusion. By the end of such activities, however, students may find that the poem becomes knowable. To familiarize students with parts of a poem, Jena Osman uses a variety of found poetry activities she generalizes as "gumshoe poetry," so named because students become detectives in search of a poem within a text. That text might be a poem, a page from a book, a collection of case records in a law library, or a house full of artifacts that represent the essence of a family. So, for example, when Osman begins a study of "The Wasteland," she has students create a poem in which each line relates to a different item in their homes (Osman 239). The exercise helps students realize that there are many types of text and that they take on different meanings when they are reconstructed in different contexts. Having found the poem in the minutiae of their lives reveals something about the relation between form and content that they will encounter in "The Wasteland" (239). Gumshoe poetry "encourages an investigation into language where the reader and/or writer (as detective) discovers new logics beneath the surface, and thus creates a renewed picture of the textual and consequently nontextual world" (240). Osman cites several well-known examples of found poem strategies such as the "grille cipher" of Steve McCaffery and Jed Rasula and Charles Reznikoff's *Testimony: The United States,* where he found poetry among the annals of late nineteenth- and early twentieth-century law reports. Reznikoff searched the dry, technical reports to identify language that conveyed emotion and then wove that language into a powerful series of short poems. The value of this model as a reading exercise for poetry is that it helps students think of words as units that take on or contribute to varieties of meaning as they are reconfigured in different arrangements. They learn that language is more than a tool for

expressing themselves. It is also "a means to investigate how expressing happens" (249). Digital records and procedures vastly expand the field of knowledge for students looking for poetry in unusual places and by non-traditional means. Having found/created such a poem cannot help but affect the way students relate to poems in the future.

Rethinking the resources of interpretation, as Jerome McGann says in *Radiant Textuality*, opens new dimensions for connecting with a poem (McGann 109). He quotes Emily Dickinson's musing discovered on a prose fragment, "Did you ever read one of her Poems backward, because the plunge from the front overturned you? I sometimes (often have, many times) have – a Something overtakes the Mind" (106). Essentially Dickinson has articulated a postmodern deformative strategy for encountering a poem – not necessarily the meaning, but the poem. Reading backward is a system for disordering the text in a way that produces unpredictable results (116) by reorienting the relation of the reader to the text. It is a means of seeing the poem through fresh eyes and finding in the "syntax of backwardness" that the poem, its original idea and its variations on that idea, exists outside of time and space. Other deformative practices that McGann explores are reordering (the placement of the text on the page), isolating (reconstituting the poem according to various combinations of word functions such as all words other than nouns and verbs), and altering (separating phonemes for the words in which they originally appear) (175-177). In essence, deformation is experimentation with the components of the poem at the elemental level to see what a reconstitution might reveal about the poem's unique essence.

Inquisitiveness, playfulness, openness – these are the enticements that invite young adults to befriend poetry. Charles Bernstein values all of them. His "Creative Wreading" selectively

integrates theoretical principles from New Criticism, poststructuralism, and postmodernism to produce an engaging environment for immersing students in poetry. The hallmark of his program is his commitment "to bringing into play the performance of poetry" (Bernstein 274). Performance entails a threefold approach that includes live poetry reading by students and guest poets, creative wreading (reading through writing) activities, and the poem profiler. Bernstein believes that traditional live readings allow students to conceive of the poem not just as an expression of meaning but also as a social construct. The aural experience of the poem provides an introduction to the material text. To engage the text by reading, Bernstein has a stable of more than sixty interactive activities ranging from homolinguistic translation to imitations to rearrangements such as those conceptualized by McGann, all designed to "investigate the recombinant structure of a poem…and to allow for a more intuitive, even visceral, contact with the materials of the poem" (276). For the last component, Bernstein has created the Poem Profiler, a tool he unabashedly recognizes as "an extension of some aspects of New Criticism" (277). Using it sparingly so as not to make it routine, but sufficiently to provide students with a vocabulary for literary criticism, Bernstein has students rate a poem on detailed items within the categories of diction and style, content, mood and tone, structural design, devices, meter, visual shape or form, sound, and point of view (279-281). In the last section, which Bernstein describes as the most "non – New Critical" feature of the profiler, students rate the poem's sociohistorical contexts. The wreading workshop gives students an opportunity to practice intuitive thinking and to overcome their fear of poetry or of the fear of failing to read a poem "correctly."

It is this kind of sensitivity to the student that should drive the reformation of pedagogy in the study of poetry. Michael Joyce notes that because technology has made the world new,

pedagogy must also become new. Poet Charles Olson has said that it is increasingly awkward to call ourselves teachers (Joyce 117). The word does not mean what it used to mean. That is not a death knell but an opportunity. Teachers of the new order are learning managers and co-learners with students. Some will have difficulty with this transition. However, Joyce counsels, "We need to see ourselves at depth and engaged: within the historical scene, not confronting it, authoring the text of our future, projecting and not projected upon…In constructive hypertexts, we are able to see our thought in movement" (126). The digital age opens to innovation, and by its very nature, poetry lends itself to experiments with the new technology. If poetry is to become important to twenty-first-century students, teachers must provide digital resources and methods for their students to experience the poetry of their own era and to translate the poetry of the past into the language of their own sensibilities.

Some pioneers have already begun the journey in search of digital applications to contemporize the study of poetry. The first generation of digital projects related to poetry served as databases for special interests such as the life and work of a specific poet, as with Walt Whitman at www.whitman.org, or poetry in a particular era, as with the Victorian age at www.victorianweb.org. In the second generation, open-access programs such as voyeurtools.org, taporware.mcmaster.ca, wordle.com and lextutor.ca/concordancers/text_concord/ host computational exercises that generate textual data regarding word frequency, unique words, word trends, and words in context. *PoemViewer*, a collaborative project between Oxford University and the University of Utah, enables users of the digital tool simultaneously to view phonetic units and attributes, phonetic features, phonetic relations, word units and attributes, word sentiment, and semantic relations. The site allows users to paste a poem into a

window and upload it to create a visualization that the user can filter to focus on one feature or overlay several. *Myopia*, a visualization tool that is the outcome of research at Miami University in Oxford, Ohio, explores the digital possibilities for representing meter, tropology, syntax, and sound. Currently, its target audience is scholarly; it requires knowledge of code in order to analyze a new poem and is not readily available to the public. Although these projects have produced groundbreaking outcomes, they represent a level of sophistication not easily accessible to high school students. On the other hand, *Poetiks*, a project hosted by Bath Spa University, offers an uncomplicated scansion and annotation program that allows users to upload a poem and scan it for stress patterns. Users can also make tagged notes on items related to imagery and sound (Poetiks). However, the site's simplicity is also its weakness, and it lacks the mechanism for making connections between the features of rhythm, sound, and imagery. The same is true for the University of Virginia's interactive learning program, *for better for verse,* which is designed to help students understand meter (For Better). Less available is scholarly research into digital text manipulation as a means of exploring the nuances of language in a poem. Two websites with useful exercises are textmechanics.com and languageisavirus.com. The first has links to more than fifty text manipulation exercises that range from counting, to reversing text, to inserting text. Likewise, languageisavirus.com, the creative writing site generated by poet Lake Rain Vajra (Lake Lou), provides text manipulation "games" generated by the poet to cure writer's block and inspire creativity. She has programmed fourteen exercises such as "Cut-Up Machine," "Visual Poetry," "Reverse Poem," "Sentence Tree," and "Text Weaver," all deformation activities much like those promoted by McGann and Bernstein. Interesting sites and accessible to high school students, "textmechanics" and "languageisavirus" nevertheless are

limited in scope and do not help students form an interpretive perspective of the target poem. Several open source websites support collaborative digital annotation: Digress.it, a project funded by a JISC grant and used by a number of universities as an online discussion board; Annotation Studio, a product of MIT's HyperStudio project; and Genius, a private user-friendly site that, like Annotation Studio, allows users to upload multimedia artifacts that explicate the poem's various contexts. Again, these notable ventures represent innovative efforts to apply digital technology to poetry analysis, yet because of their unidirectional approach function primarily as data collectors.

A third generation of digital analysis must emerge if technology is to make a meaningful contribution to the study of poetry and to its resurrected role in society. Successful digital humanities programs must bridge the gap between information gathering and interpretation. Johanna Drucker, the Breslauer Professor of Bibliographical Studies at UCLA, observes that as humanities researchers have adopted the technological hardware of so-called empirical scientists, they have tried to adapt terminologies and devices – the software – as well (Drucker, "Humanities"). The problem is that those modes of representation do not allow for the ambiguity and uncertainty that commonly attend the humanistic understanding of knowledge as interpretation. The traditional graphic representations of the sciences do not logically transfer to the interpretive analysis demanded in humanistic studies. Drucker suggests that developers of humanities computer programs create nonstandard visualizations that reflect the concept that "the apprehension of the phenomena of the physical, social, cultural world is through constructed and constitutive acts, not mechanistic or naturalistic realist representations of pre-existing or self-evident information." Until humanists working with computers reconnect with their core

principles and stretch their imaginations to fully explore the possibilities digital technology has to offer, poetry analysis programs, while temporarily intriguing, will disappoint. The "so what?" will remain unanswered.

Because of the cultural transformation wrought by the computer, the time has come to develop software programs that allow high school students to reflect critically on a poem (McGann 18). As outlined by Dr. Rainer Schulte and Dr. Frank Dufour in their 2012 seminar "Translations in the Digital Age," the capabilities of electronic applications exceed data management. Most important is the translation of a poem from a static artifact of the past to a dynamic actualization in the present. Digital technology brings a poem to life. It frees the text from the confines of the printed page and confronts the reader with multimedia and multidimensional representations of the poem that bring it into lifelike experience. Living things move and grow. They are changed by others and in turn change others. This exchange provides the key to enjoyment and understanding. Digital experiments such as those outlined in this project will allow students to visualize and experience the poem's verbal or musical movement that previously could only be described. Transcending time and space, they will provide non-sequential avenues for approaching the semantic, hyper-semantic, and non-semantic constitution of the poem and for performing analytical operations on its elements. The product of that analysis will supply the raw material for remaking – translating – a poem into the student's own creation. In short, it will bridge the gap between data gathering and interpretation.

CHAPTER 2

AN ARGUMENT FOR DIGITAL METHODS

In his book, *Teaching Digital Natives*, Marc Prensky observes that students are changing, primarily due to their experiences with technology. He claims this transformation calls for a revolution in educational practices. "Telling and testing" does not work anymore as increasingly independent students expect more self-directed and creative instruction (xv). The good news, Prensky says, is that the same digital presence that changed them can also satisfy their educational needs. However, implementing new methods means more than downloading the most recent apps. It requires deeper investigations into the technical dimensions of language and how the hypertext of the digital environment can enhance a student's interactions with the language arts.

The evolution of language justifies – even demands – the evolution of poetry analysis. This chapter lays the philosophical foundation for such a shift. It opens with an explanation of the relevance of Michel Foucault's discussion of the metamorphosis of language into a scientific object. Secondly, a review of Gilbert Simondon's definition of the nature and function of technical objects shows how hypertext manifests technical features. Following is a study of hypertext and Barthes' Text in relation to each other. Closing thoughts address the potential of hypertextual modes of writing and reading to effect positive change in individuals and culture and particularly in the rejuvenation of interest and enjoyment in the study of poetry.

In 1966 Michel Foucault made the startling claim in *The Order of Things* that "before the end of the eighteenth century, man did not exist" (308). By that, he meant that in what he calls the pre-Classical and Classical epistemes, language in its closed system of representation

precluded thought about the science of humankind. It was only when language became fragmented and detached from strict representation that it emerged as an object of science and a method that would free people to explore human nature and the complex interrelationships of the knowledge of the world in which they live. Foucault says that this new creature "has grown old so quickly that it has been only too easy to imagine that [it] had been waiting for thousands of years in the darkness for that moment of illumination in which [it] would finally be known" (308). Although Foucault does not attribute this epistemic shift to the rise of technology – he does not deal with causality in the book – the philosophers and semioticians of his day wrote from within the same cultural milieu that fostered the development and expansion of digital technology. Their radical perspectives on language encountered the possibilities of the new writing space that the computer offered, each force informing and shaping the other to create what has come to be known as *hypertext* (Bolter 209).

In the epistemic shift that Foucault identifies as happening at the outset of the nineteenth century, language no longer represented the static collection of all knowledge. Rather, it became a means of applying general principles of understanding to specific, objective domains (Foucault 296). Whereas in the Classical age, the function of language was to establish and organize the scope of knowledge, in the Modern age the function became "to destroy syntax, to shatter tyrannical modes of speech, to turn words around in order to perceive all that is being said through them and despite them" (298). Nevertheless, language remains a human function, clearly energized and orchestrated by humans (290) and giving voice to them and to the environment in which they live. It becomes both a reflection and an agent of change. Language systematizes itself and adapts to its own interior elements by linguistic means that establish "the

constants according to which [its elements] can be combined and the table of their possible modifications" (288). In this newfound power, language, rather than being subject to history, now determines history (287). No longer limited to the single function of discourse about existing knowledge (282), language enters culture as a complex creative agent (235). For now, although some elements of language retain representational value, others contain no meaning at all except as they come into temporary relationships with other elements (283). The fragmented elements – words, inflections, sounds, roots – "can be combined in different ways, but with each of the units preserving its autonomy, and thus the possibility of breaking with the transitory link it has just established with another unit inside a sentence or proposition" (283). The revolutionary openness of language renders possibilities for invention that did not exist before, not simply within its own internal network but also within the external network of human sciences. Modern language allows the sciences to interlock and interpret each other, their individual frontiers becoming "blurred, intermediary and composite disciplines [multiplying] endlessly" (358) and even losing their singular missions altogether. Language, then, becomes an activity rather than a memory (290), and literature, detaching itself from traditional values and genres, becomes an emanation of language that has no necessary purpose beyond its own existence (300).

In the closing line of his preface to *The Order of Things*, Foucault, after having discussed the early nineteenth-century shift from the Classical to the Modern episteme, says that the soil of Western culture is shifting again (xxiv). He does not elaborate on that impression, choosing instead to devote the book to the differences between classical and modern thought. It is not without reason, though, to believe that a similar cataclysmic jump in human development was

underway at the very time he wrote – that in the quarter century between Hiroshima (coincidentally occurring in 1945, the same year of Vannevar Bush's prophetic article calling forth the Memex) and the first moon landing in 1969, mankind took a giant leap into a "Technological" episteme. Symbolized by the remediation of language from print to screen, digital technology has radically changed humankind's way of knowing, the perception of self, the relationship to nature and to others, and the means of interaction. This transformation, though exciting, also breeds anxiety, as Gilbert Simondon indicates in his analysis of the technical object.

Simondon recognizes that humans exist in a paradoxical relationship with technology. On the one hand, they welcome its benefits, but on the other, they fear that it will displace or even conquer them ("Mode" 11). That same uneasiness rooted in a sense of loss of control has, as language has become a technical object, attended the introduction of the new breed of language that is called hypertext. Hypertext is unbounded by previous conventions of language that define order and meaning. It makes some people, especially language purists, nervous. They wring their hands, wonder what has become of language, and cast suspicious eyes on society's turn to a technology that not only allows but encourages and facilitates experimentation. But Simondon argues that the distrust of technology is groundless, and that if people can only come to understand the true nature of the technical object, they will eagerly embrace the more meaningful role that technology frees humans to perform. "Recognition of the modes of existence of technical objects," he writes, "must be the result of philosophic consideration; what philosophy has to achieve in this respect is analogous to what the abolition

of slavery achieved in affirming the worth of the individual human being" (“Mode” 11). Technology frees humans from the mundane to explore more fully what it means to be human.

Rather than the risky, even dangerous, unknown that some people foresee in technology, Simondon views technical objects as open and indeterminate "mediators between man and nature,” (“Mode” 11) which conversely, need the human as their perpetual inventor, coordinator, and interpreter (“Mode” 13). Interpreting the complexity of the technical object in its relationship to man, to cultural values, and to other technical objects requires an interdisciplinary approach and a program of formal education (“Mode” 14). Far more than a simple device, the technical object represents the zenith of an evolutionary process. It does displace man, not as an outmoded worker but as a clerk who has been promoted to upper management. A product of information and organization, the technical object “resembles life and cooperates with life in its opposition to disorder and to the leveling out of all things that tend to deprive the world of its powers of change” (“Mode” 16). So the technical object is always becoming as it converges with and adapts to itself along a thread of continuity that runs from its inception to its most current manifestation, exercising the power to mold the needs of its creators and to influence the civilization that engendered it (“Mode” 22).

Paradoxically, the technical object advances toward specialization by synergy. It performs multiple functions, and its function as one is supported by a linked group of functions that ultimately can exceed the original design plan (“Mode” 30). For example, consider the battery, which had its modern genesis in the early nineteenth century. As a technical object, it exists as one. Its existential function is to generate energy that will power other objects, but it accomplishes this function by completing others: by storing chemicals that react with each other

to produce electricity, by providing a system that brings the chemicals into contact with each other, and by mechanically transferring the energy to the object needing power. The synergy of the battery's internal operations enables it to perform its specialized task, but, also required to complete the task, is the external receiving object. As scientists continued to experiment with the battery throughout the nineteenth century, it became an instrumental and integral part of developing telegraph, telephone, and radio communications. Batteries powered the first vacuum tubes that gave rise to the entire electronics industry. Now they exist in many styles providing power to a multitude of devices, and, even now, experiments are underway to explore the potential of batteries to improve the function of solar energy panels. So, the technical object evolves naturally and generates its own family or environment that perpetuates its existence, a survival through individuation and collectivization (49). It is this "associated milieu" that mediates between the technical and the natural elements within which the technical object operates in the present and will operate in the future. The present is conditioned by the future, which makes possible the function of the new technical object as it is "acted out by systems of the creative imagination" (50). Simondon sees imaginative thought and the dynamism of technical objects as analogous, and believes that the creative energy for both comes out of interactions with a dynamic background as opposed to separate forms (51). It is from this relationship between the individual and the collective that Simondon draws his first postulate of the "technical mentality," which is that "the subsets are relatively detachable from the whole of which they are a part" (Simondon, "Technical"). Technical objects comprise working parts that are at the same time individual elements and part of the whole. It is in this network that the technical mentality finds its realization. In this network "the distance between the inventor, the

constructor, and the operator is reduced: the three types converge towards the image of the technician" ("Technical"). Because of the synergetic interrelationship of parts and the whole, the second postulate is that "if one wants to understand a being completely, one must study it by considering it in its entelechy, and not in its inactivity or its static state" ("Technical"). The technical object fulfills its potential only when it is active and open, lending itself to "being continued, completed, perfected, extended" ("Technical"). In this regard, Simondon sees the technical mentality as being particularly relevant to the Fine Arts. He gives the example that, in architecture, designing a building with an open technical mentality would yield a structure that could expand not only without losing its functionality or beauty but also by becoming a new creation perhaps unforeseen by the original designers ("Technical") even though the potential for that evolution existed in their initial blueprints. The same can be said of language. A word is a technical object in that it has a function, that of expression. That function is enabled by other individually significant entities within the word such as sounds, letters, syllables, prefixes, root words, suffixes, and occasionally symbols like the apostrophe of possession or various accent marks. The internal synergy of the word, or a set of words, produces an expression, but that expression is complete only as the receiver perceives it. By natural process the word takes on meaning in light of the unspoken and often ambiguous intent behind the expression, the context of the expression, and the receiver's prior experience. Therefore, the construction of meaning necessarily will be an expansion on the original expression. The former conception of language function as strict representation no longer applies. Each internal and external juncture affords multiple opportunities for interpretation. Hypertext manifests that multiplicity.

Hypertext is the assemblage of electronically linked information units that can be configured in variable ways by either the generator (author) or visitor (reader) to create unique meanings in repeated or changing associations. The concept originated with Vannevar Bush in his 1945 *Atlantic Monthly* article, "As We May Think," in which he proposed the "Memex," an electronic device that could store large amounts of data. The device would supplement memory and in its means of information storage and retrieval would simulate the network-like operation of the brain. In the 1960s, two electronics pioneers working on different projects brought Bush's vision into physical existence. Theodor Nelson coined the term "hypertext" early in the decade in his work with intertextuality in the project Xanadu (Joyce 22). He used the word to describe "non-sequential writing – text that branches and allows choices to the reader" (Nelson). At the Science Research Institute in 1968, Douglas Engelhart culminated his efforts to develop oNLineSystem, a fully operational hypertext prototype. The development of hypertext since the sixties has evolved from a convergence of thought deriving not only from scientific research but also from cognitive, literary, pedagogical, and sociological theories as well as design principles from the visual arts (Joyce 22). In discussing this interdisciplinary phenomenon unheralded in human history, Michael Joyce claims that the advent of hypertext signals "a momentous cultural shift" (22) that transcends a mere change in available or preferred media. Rather, it indicates a "shift in the way humans think" (22). Although the shift can justifiably be called "momentous," perhaps hypertext does not so much represent a change in the way humans think as it does an opportunity to, for the first time, free humans from the constraints of culturally programmed logical patterns and to allow the form and function of human productivity to flow from a technology that works in harmony with mental processes instead of in opposition to them. In his

1971 article "From Work to Text," Roland Barthes explores this new relationship with language and how it impacts a reader's approach to written expressions.

Writing before the availability and proliferation of the personal computer that would begin in the eighties – Barthes acknowledges that significant changes, driven by needs in society and informed by confrontations among various fields such as "linguistics, anthropology, Marxism, and psychoanalysis," (73) had been taking place in language and literature for several years. Furthermore, due to the nature of effective interdisciplinary activity, that process had been challenging and sometimes violent as it required not simply the interaction of disciplines but the dissembling of them in order to create a "new language" and a "new object" that Barthes calls, the *Text* (74). Set in opposition to the "work," which, with a few notable exceptions, had been tradition's product throughout the centuries, the innovations in composition that Barthes suggests require a reassessment of the identity of and relationship between writer, reader, and critic. The Text, in its processes and defining relationships, manifests the conceptual vocabulary of the technical object of the Modern episteme and supplies that of the hyptertext of the Technological. Barthes reduces his observations on the Text to seven descriptive rather than prescriptive propositions over the subjects of: "method, genre, the sign, the plural, filiation, reading, and pleasure" (74). Each proposition – distilled to a single statement in the following analysis – is a variation on openness, the defining feature of the Simondon's technical object, Foucault's language, Barthes' Text, and hypertext.

Method

Proposition 1: "The constitutive movement of the Text is a traversal: it can cut across a work, several works" (75). The essence of the difference between the work and the Text is not

of chronology or physicality but of methodology. Whereas a work sits on a shelf, the Text exists only in language, constantly defining and redefining itself according to its own set of rules. The method in the Text relies on three principles: that it is actively experienced, that it maintains multilinearity of discourse, and that it corresponds with other texts. Hypertext completely supports the method of the Text. As Jay David Bolter explains in *Writing Spaces*, both the Anglo-Saxon and the Latin etymology of "read" imply an activity, the first as giving counsel or interpreting and the second as gathering or collecting and, in a figurative sense, going on a journey (100). The image is of the reader giving voice to the Text and "gathering up signs while moving over the writing surface," (100) a particularly apt description of the hypertext experience where the reader encounters a variety of open choices on the reading path. Those choices might be intratextual or intertextual. Although some print texts feature nonlinear design, the medium itself limits the choices and makes accessing the options a cumbersome process. For example, Bolter describes the complications of reading James Joyce' *Ulysses*, a book described by Michael Gorden as a novel but also "a 'symbolistic' poem, a pattern of allusions to previous literary and cultural texts" (143). Joyce' available technology did not match his vision for the novel, and what are supposed to be its interchangeable parts is buried in a profusion of paper pages, leaving the reader frustrated and confused. One can only imagine the different experience of a digital *Ulysses* where its literary heritage, so painstakingly interspersed among the lines of plot and character development, could be apprehended by the reader. Hypertext would resolve the issue. It facilitates the nonlinear presentation. Comprising nodes of information units and the electronic links between them (Delany 34), the hypertext document makes a wide variety of

rich textual arrangements available, not only to the writer but also to the reader at the touch of a finger.

In his essay on hypertext pedagogy, "Siren Shapes," Michael Joyce explains that hypertext tools adapt well to basic cognitive skills, enfranchising learners as they transform texts to meet their personal needs (Joyce 40). Joyce identifies two types of hypertext applications to learning: exploratory and constructive. The exploratory experience uses hypertext as a delivery system in which students understand the elements of a target subject, track their progress through the elements, and view and evaluate several different visual representations of the subject. In constructive hypertext programs, students become reader-writers as they map the information themselves. Reading becomes an activity of creating, changing, and recovering previous encounters, thus manifesting Barthes' Text (41-42). John Slatin, former English professor at The University of Texas at Austin, recognized the value of hypertext in helping students to experience a poem as Text, to "discover and explicate the poem's relatedness, both to other poems and to other cultural phenomena" (Slatin 125) and to include students in "the ongoing conversation by which poetry constitutes itself" (126). Reading the works of ten poets and exploring supplemental works from other fields of art, the students first followed links structured by Slatin and then later branched out into free exploration, annotation, and construction of their own links, thus becoming "active producers, and not merely consumers" of the Text (133).

Genre

Proposition 2: "What constitutes the Text…is its subversive force with regard to old classifications" (Barthes 75). The Text defies classification in part because its intertexuality often is not limited to objects in the same genre. Barthes points to Georges Bataille, whom he

considers to be a writer of Text. Because of the layers that constitute his work, it is impossible to determine whether he is "a novelist, a poet, an essayist, an economist, a philosopher, [or] a mystic" (75). Hypertext layers its resources in this way to the degree that it has become a genre in itself, or even a set of genres, which "already have structures and conventions and generate expectations among their authors and readers" (Bolter 41). In addition, hypertext refashions traditional forms, (122) as in the case of interactive fiction and digital poetry in which the reader not only makes choices to construct meaning but also intervenes in the writing as a collaborator with the original author. Barthes says that the Text is always pushing the limits of genre to the edge of rationality (Barthes 75), and such is the case with hypertext. In his poetry hypercourse, Slatin, however, observes that some students suffered from what has been termed *cognitive overhead*, a disorientation that comes from the inability to assimilate all of the data one encounters in the hypertext environment (Slatin 131). Response to this issue has followed two tracks. One is the original strategy that Mark Bernstein offered of providing "breadcrumbs" for readers in the form of markers or directional links, but, more recently, he and other researchers have "begun to look at how 'hypertexts can and do exploit disorientation' and to mark distinctive contours…of hypertext writing" (Joyce 27). As a genre, hypertext goes just beyond the limits of common acceptance or approval. Like the Text, it is "always paradoxical," (Barthes 75) open in its form, and thereby demands the active engagement of the reader in constructive participation.

The Sign

Proposition 3: "The Text is approached and experienced in relation to the sign" (Barthes 75). In contrast to the work, which operates in a closed system that ends with the signified, the Text's focus is on the signifier. The work is comfort food for the mind. Sometimes the signified

is apparent and sometimes hidden, but ultimately the reader understands that the work contains an identifiable theme at its core, that even opaque words represent a fundamental cultural reality that the reader can discover through persistence, or, as Billy Collins writes, by "[torturing] a confession out of it (Collins). The Text, however, ends in infinity. The goal of reading a Text is different from that of reading a work. The objective is not to ferret out an author's purpose, but to play with the elements of the Text in ways that will lead to variation rather than consolidation. By design, the signified remains out of reach. The progress through the Text is not measured in depth of understanding but in "the liberation of symbolic energy" (Barthes 76) that leads not to a central meaning but to a constellation of sparkling illuminations. This emphasis on the sign also characterizes hypertext, an unsurprising fact, Bolter explains, in that the computer and semiotic theory both developed within the same cultural milieu, and in that "all kinds of electronic writing and reading by computer are exercises in applied semiotics" (176). The sign is a function rather than an absolute, and signification is an activity. Umberto Eco notes that in the new understanding of language, the sign "dissolves itself into a highly complex network of changing relationships" (Eco 48). The signs in a text interrelate "as points in a space whose coordinates are determined by the intersection of many codes (48). Thais Morgan observes that this intertextuality magnifies the effect of the emphasis on sign "[freeing] the literary text from psychological, sociological, and historical determinisms, opening it up to an apparently infinite play of relationships" (1-2). Hypertext uniquely offers the space for the networking of signs and for making and remaking meaning in the continual revolution of changing associations.

The Plural

Proposition 4: "The Text achieves plurality of meaning, an irreducible plurality" (Barthes 76). To follow Simondon's logic of the technical object, the autonomous element of the sign, which does have meaning it itself, becomes, in relationship to other signs, an object or ultimately an ensemble which is also autonomous. The many are one. The plurality of the Text is stereographic, the components and the system being the multiplicity of texts that the Text – as well as the writer and the reader – have internalized. In crossing the Text, the reader experiences the totality of the effect created by the sometimes conscious, sometimes subconscious, blending of the multisensory aspects of the present experience. In similar fashion, hypertext assimilates and blurs the boundaries between texts, ending separation and opening a dialogue (Delany 13). Walter Ong observes that this dialogue has fostered "an age of 'secondary orality' that 'has striking resemblances to the old [oral, preliterate culture] in its participatory mystique, [and] its fostering of a communal sense" (Ong 136). In featuring connectedness over separateness, the hypertext reinforces and supports the interdependence of texts as technology allows them not simply to refer to one another, but also to touch or to penetrate each other (Bolter 178). Barthes says that the plurality of the Text carries profound implications for the activity of reading.

Filiation

Proposition 5: "The Text's metaphor is that of the network" (Barthes 78). The impact on reading begins with the challenge to the author's privileged position. The work is identified with the author as its father and owner. In addition to the legal protections afforded by copyright law, an expectation prevails that the work itself is inviolable, fixed and bound by the manuscript and by the authorial intent that developed it as an organism. In contrast, Barthes displaces the

author, whose only legitimate continuing relationship to the Text is either as a shadow in a character or speaker in the Text, or as guest who returns to experience it. He sees the text expanding by combination and systematization within the intertextual environment and by collaborative contributions by individual readers (78). The concept of group authorship has found resistance in the standards of both print and electronic technologies in the humanities, although much of the work within the culture is a product of collaboration. Hypertext, however, "changes our sense of authorship, authorial property, and creativity" (Delany 16) by de-emphasizing the perception of the work as an isolated or separate entity. The shift, Morgan says, turns attention from "author/work/tradition" to "text/discourse/culture" (Morgan 1-2). Bolter observes that the network is becoming the dominant organizational pattern of society – a reflection of its technology – and that "people are beginning to function as elements in a hypertextual network of affiliations" (Bolter 204). Nevertheless, some patterns resist change, particularly in the deference given to the author. In a hypertext lesson offered by James Catano at Brown University, students enjoyed exploring intertextual resources but were reluctant to "violate any collection of materials, any 'text,'" (Catano 272) because they had a sense that it would be wrong to tamper with the author's work. Catano helped students overcome their discomfort by having them create found poems from a group of sonnets and also by showing them manuscript versions of Yeats' "Sailing to Byzantium." Seeing the poem in its working form reduced the distance in the students' minds between "the fallible reader and the accomplished poet" (272) and freed them to move beyond the constraints of the closed system of study that reveres the author and the author's intent.

Reading

Proposition 6: "The Text asks the reader for an active collaboration" (Barthes 80). In his displacement of the author, Barthes removes the reader from the role of a consumer to the role of a participant who engages in "play, task, production, and activity" (80). This transferal of roles represents an attempt to link reading and writing in the signifying process. The Text "plays" in that it challenges the reader to experience it. It exists within certain confines, but its boundaries are highly flexible, responding to the active involvement of the reader. The reader "plays" as in a game, and the nature of the game depends on the reader. The reader also "plays" as in a musical sense, becoming "the co-author of a score which he completes rather than interprets" (80). Barthes' view of the reader-author resonates with the Eco's analysis that open works "are characterized by the invitation to make the work together with the author" (Eco 21). The relativity of the "multi-polarity" of authorship offers infinite possibilities for ways of looking at the Text. In hypertext applications, the facility for decentering or recentering the Text to the reader's perspective has Barthes' Text in view. Nicole Yankelovich points out that in the interactive systems of hypertext, "the boundary between author and reader should largely disappear" (Yankelovich, Meyrowitz, van Dam). Nina Parish, in her study on the digital experiments of contemporary French poets, describes a digital reading experience:

> [Sophie] Calle's words move and pulsate as the reader-viewer makes contact with them via the mouse, floating, growing, shrinking, surging, varying in possibilities from page to page, accompanied by a ticking clock, by a few bars of eerie music, or by silence…The reader-viewer is able to interact with the text, actively participating in the unfolding of events from that day, sometimes uncovering the words with the mouse in the same way a private detective would uncover clues when shadowing in an investigation, which of course validates, intensifies even, Calle's themes and indeed her entire creative process (Parish 52-53).

Barthes' belief is that such active reading will cure the boredom of consumers who do not understand how to approach the modern Text.

Pleasure

Proposition 7: "The Text…is linked to enjoyment, to pleasure without separation" (Barthes 80). For all of the reasons associated with the cultural limitations imposed on the work, the reader always remains separate from it, and that separation reduces the pleasure of reading. While a certain degree of pleasure attends the consumption of a work, the *jouissance*, the blissful consummation of active reading erupts in the reader's playful union with the Text. The act occurs in a "social utopia…where no one language has a hold over any other, [where] all languages circulate freely" (80). In the same way, hypertext offers a potentially "anti-hierarchical and democratic" (Delany 29) experience. Writers and reader-writers enjoy a shared multisensory, interactive environment where "users can contribute links and new blocks to the metatext, which thus becomes an open-ended structure of knowledge that readers continuously extend and re-organize" (33).

Hypertext manifests the essential features of Barthes' Text, but in at least three ways it corrects or redefines it. When discussing the value of the Text's plurality, Barthes speaks of the nature of intertextuality, that "every text is an intertext of another text" (Barthes 80). That much corresponds to hypertext principles. But Barthes goes on to warn that "to search for the 'sources of' and 'influences upon' a work is to satisfy the myth of filiation" (80). His opinion is that the quotations from other texts should remain "anonymous and irrecoverable" (80). Bolter, however, explicitly challenges Barthes on the issue. Not only is it possible in digital technology to map a fairly accurate picture of the genetic code of a text, but to do so would be a valuable

cultural project. It would afford writers and reader-writers more opportunities to make connections and to transmit their contributions to future reader-writers. This activity would be consistent with humanistic tradition, but it would also use computer technology to "refashion the idea of tradition itself" (Bolter 179).

Similarly, the second issue is one of filiation. Barthes' negation of the author except as a shadow flitting through the story line or as a guest reader seems absolute. The reader interacts with the Text only. Hypertext offers a more respectful view. The writer who originates the Text collaborates with the reader-writer. In this way, hypertext more closely reflects the views of Eco that while the open work offers the reader-writer the opportunity to intervene in the work, the original author does set certain parameters, and he still recognizes his work as his own (Eco 19). In proof of the author's formative role, Eco gives the example that while a musical composition played by the same artist on different occasions will not be the same, his performances will never be radically different, "to be seen as the actualization of a series of consequences whose premises are firmly rooted in the original data provided by the author" (19). Although it is true that the hypertext author relinquishes a large measure of control in the completion/performance of his original creation, he still functions as a craftsman in the options he builds into the program. Parish addresses the balance between craft and chance operations in interactive, electronic literature. Although the author allows for "unsuspected combinations – be they semantic, visual, or acoustic – [to] emerge from the various possible combinations," those so-called chance operations are determined by the author's "choice[s] and constraints" (59). So, hypertext, while decentering the traditional role of the author, does not announce his death as Barthes does. In fact, in hypertext pedagogy, Jane Yellowlees Douglas has observed that readers of both

interactive fictions and exploratory hypertexts naturally make choices based on their perception of the author's intentions. Reflecting on Douglas' findings, Joyce speaks of the "apparent and awkward resurrection of authorial intention as a 'subject' of literary texts in which the author and reader share a transforming interrelationship" that is "visible, active, and personal" (Joyce 45-46). It is not necessary for the author to disappear for a reader-writer to fully experience the Text.

Finally, Barthes' Text does not address the possibility of electronic media as a writing space. Although digital technology existed at the time he wrote "From Work to Text," it was rudimentary and not so widely available that one could imagine the movable page of the hypermedia environment. Nevertheless, it does seem that his analysis of the Text should allow for its physical representation on the page as one dimension of its openness. Certainly, there had been experimental print texts, such as the poems of Stéphane Mallarmé with "Un Coup de Dés" and of Octavio Paz with "Blanco," that played with typology and space as holding meaning. Bolter confirms that the computer is not necessary for topographic writing, writing that requires a graphic representation, and that hypertext, a form of topographic writing, is "both a visual and a verbal description…not the writing of a place, but rather writing of or with places, spatially realized topics" (Bolter 22). Perhaps it was Barthes' desire to distinguish the Text from the concrete work that prevented him from including a visual element among his propositions. Hypertext, with its visual array, expands on Barthes' view of the Text. Even so, Barthes' influence in the nature of hypertext was profound as evidenced by the fact that virtually every serious writer in the field – somewhat ironically – credits Barthes' theories as foundational.

A distinctive vocabulary threads its way back from hypertext to Barthes to Foucault to Simondon. Mediator, interdisciplinary, evolutionary, change, culture, individual, collective, multiplicity, discontinuity, network, activity…open. It is the vocabulary of humans searching for their identity and their place in a world that functions quite differently than it has through the previous millennia of human existence. In his conclusion to *Writing Spaces*, Bolter explores how attitudes are changing not just in but because of the digital environment. Instead of a simply a mechanism for thought, writing is becoming an expression of a postmodern identity that in its fragmentation is dynamic rather than static, flexible rather than circumscribed, contingent rather than separate, and material rather than spiritual. The mind is a "network of signs," a text in itself (191) rather than a product of text. Bolter says that electronic hypertext has the potential to remediate the mind (197), constructing "the self as a social agent rather than as a reasoning machine" (198). The self is redefined from "one" to "one that exists in connection to the *other*."

The perspective of the self/text-in-relationship that underpins hypertext technology coincides with Barthes' postulate that Text is network. The World Wide Web and social media provide the means for people with shared interests to form communities that assemble and disperse as needs arise and change (205-207). Hypertext has put language into their hands. As Barthes concludes his essay, he says that “Text is that social space that leaves no language safe or untouched, that allows no enunciative subject to hold the position of judge, teacher, analyst, confessor, or decoder. The theory of the Text can coincide only with writing” (Barthes 81). By this, Barthes means that a Text requires the creative engagement of its reader. It cannot be evaluated by the static principles of any science or ideology. Rather, it can be evaluated –

interpreted – only by a practice whereby the reader ceases to be a consumer of literature and instead becomes a producer who discovers and appreciates the plurality of the text (*S/Z* 4).

The challenge in developing digital methods to engage high school students in poetry analysis is to set aside preconceptions of a poem as comprising a closed relationship between speaker and message. Rather, it must be perceived as a continuing expression, an ongoing act of poetry that invites reader-writers to collaborate in the construction of myriads of meanings. The approach must access the several entities of the poem from interdisciplinary perspectives, facilitating an essentially social approach that values and encourages individual contributions to a new creation with each reading.

CHAPTER 3

AN ARGUMENT FOR TRANSLATION

A digital approach to poetry analysis can bring to life Barthes' view of the "Text" and the writerly reader. It can provide the creative dimension to learning that high school students value. However, although digitization can generate new understandings by accessing the multiple fields within a poem, it also can diminish the poetic effect and inhibit understanding when data collection becomes an end unto itself. Two issues must attend even the most sophisticated digital analysis: first, how to synthesize the data to gain insights into the associations between the varied operations of the poem, and, second, how to visualize that synthesis in a manner that enhances the experience of the poem. These issues represent the greatest challenge of digital analysis programs. In his "State of the Digital Humanities," Alan Liu cites three general shortcomings of current work in the digital humanities that can apply specifically to computer-assisted literary analysis. One is the failure to integrate the benefits of both close and distant reading practices into a single program. Secondly, both the abandonment of interest in traditional forms and the lack of inquiry into new forms that could evolve in digital environments have created a formless void that precludes substantive conclusions about gathered information. Most significantly to this chapter, Liu cites "the near-total imaginative poverty of the field in crafting an aesthetics of data" (27). He argues that the inaccessible and often incomprehensible visualization of data patterns in existing analysis software programs subordinates communication and renders the programs largely ineffective in forging emotional or intellectual connections with the poem. Liu calls for a new paradigm of interpretation with a new vocabulary that replaces "interpret" with more dynamic verbs such as "deform, model, and play…perform, adapt, parody,

[and] translate (27)". The relevance of translation to the digital analysis of poetry anchors the approach to synthesis and visualization in *Remaking Poems.* As underscored by Rainer Schulte and Frank Dufour, translation, which enables communication, begins by approaching a text first through a personal point of view and continues by creating connections between the text and those who engage it. Movement characterizes the process, a carrying across of experience from one place or system to another as if over a bridge. Both movement and associative thinking lend themselves to digital treatment with its networked connections and frequent realignment of those connections. Furthermore, digital representations can be multimedia and non-sequential, thereby expanding the opportunities for audience interaction and creative input to craft the most comprehensive translation possible (Dufour, Schulte).

The scope of this chapter is to justify translation as an effective means of synthesizing and visualizing data. It opens with a brief survey and evaluation of visualization products of pioneer software programs. Secondly, it establishes humanistic principles that should undergird a more effective approach to visualization than the previous empirical styles of representation. Finally, it proposes translation as a means for high school students to utilize digital methods to express their unique understandings of a poem based on their playful interactions with it.

The number of existing projects related to the digital analysis of poetry is surprising both in how many and how few there are. For all poetry's loss of standing in the academy and for all the purists who vehemently resist subjecting the holiness of poetry to the computer's scalpel, a respectable field of scholars is toying with ways that new technologies might enhance the reading of poetry. Heretofore, the majority of that work has focused on the analysis of large corpora. However, some of those same programs are turning their lenses toward the analysis of a

single poem. Yet none have produced a particularly satisfying improvement in the visceral experience of a poem.

Perhaps the problem lies in a limited understanding of synthesis as a process in text analysis. Stéfan Sinclair, one of the principle collaborators in the text analysis program, *Voyant*, describes text analysis as a two-stage process: "Analysis, in which the computer breaks apart the text into basic units like words; and Synthesis, in which the computer counts these units, manipulates them and reassembles a new text (Sinclair 243). If the goal is simply to generate and organize information about a poem's technical components, then Sinclair's definition of synthesis will suffice, but if the goal of computer assisted analysis is to enhance a user's experience of the poem, then the user must participate in synthesizing the information in a meaningful way. Essentially, *Voyant* is an electronic concordance that visualizes information about the frequency, repetition, and contexts of words. Designed primarily for text analysis of large corpora, certain tools that the program offers can apply to a single text, whether poetry or prose. The multiple tools in *Voyant* provide interesting, colorful representations in three categories: words, words over time, and linked words. Nevertheless, however fascinating the visualizations might be, when it comes to analysis of a single poem, they offer variations of only one aspect of the poem: word frequency. Sinclair admits that *Voyant* does not "pretend to answer questions," but neither does it provide the mechanism for users to ask and answer questions for themselves given the discoveries the analysis has yielded. The computational aspect of the process has its merit, but high school students of poetry will likely leave the analysis confused about its relevance, and devotees disappointed with the feeling that more has been lost than gained in the exercise.

Such was the emotional fatigue that overtook Rebecca Sutton Koeser at the 2012 Digital Humanities Conference in Hamburg. Koeser, an Emory University software engineer who also holds a PhD in English Literature, reflects that the one-dimensional aspect of the poetry analysis programs presented at the conference troubled her. Although she sees the value of isolating specific features of a poem for close study, she wonders how much of a poem an analysis program can ignore and still address the essentials that "make a text a poem" (Koeser). Particularly critical of *Myopia*, she observes that the purpose of the data manipulation is not apparent and that, in addition to lacking aesthetic appeal, the homogeneous visualizations do not adequately represent the unique poem. Using Python, Panda 3D, and Graphical User Interface to create the program, developers of *Myopia* sought to fuse the visualization of the dimensions of sound, meter, syntax, and tropes. To allow for the various dimensions each poem undergoes, multiple Text Encoding Initiative (TEI) encodings are layered in the visualization at the user's discretion. Katherine Coles, the University of Utah English professor and poet who is working with the Oxford University Digging Into Data project that produced another text analysis program called *PoemViewer*, notes that the constraints of *Myopia's* encoding system, which originally was developed for other uses, results in visualizations that diffuse poetic energy and fail to reveal complex dynamic relationships (Coles). *Myopia's* use of shape and color becomes confusing when patterns are overlaid and hold little aesthetic appeal that adequately conveys a human interaction with the poem.

Coles is equally critical of the early visualizations of her own team's project, *Poemviewer*. Although the Oxford University and University of Utah collaborators desired to create a program for revealing the multidimensionality of poetry, Coles confesses that the tools

at that time were "not yet useful aids to close readings" (Coles 447). In *Poemviewer,* graphs identify sounds by the International Phonetic Alphabet, indicate sound production by the sound's position in the mouth, and designate repetitions of sound by connecting colored lines. Despite the team's desire to "enhance [readers'] engagement with language as experience," Coles realizes that something is yet missing (445). In a conference presentation of *Poemviewer*, she observed that current digital humanities projects require close readers "to change our priorities and downgrade our needs and desires to fit the data model rather than creating something that helps us to pursue the thing that matters to us most" (Coles). That "thing that matters most" is an enhanced personal experience with the poem.

To provide that digitally enhanced experience for high school students will require not the abandonment of previous work but a shift in focus (1) from understanding the poem as an ontological collection of information to viewing it as a social expression that both embodies and inspires communication, (2) from tracing associations by empirical analyses to presenting data/capta in more subjective humanistic visualizations, (3) from tracing associations as an end goal to creating multidimensional associations in aesthetically pleasing translations generated by human and machine interactions.

To a fault, the tendency of twentieth-century criticism from New Criticism to Post-structuralism to de-emphasize the communication function of poetry has shaped the development of digital humanities projects in poetry analysis (Liu 17). The literary theory has been that the poem exists as an autonomous entity, and it supplies all necessary information about itself. Therefore, a close reading of the nuances of the text produces sufficient and legitimate commentary about it. This guiding principle for understanding poetry has contributed to the flat,

static aspect of current digital analysis programs, awkward in the way of trying to fit a square peg into a round hole. For by nature, digital process dynamically configures the multiple and shifting relationships between equally dynamic units of information. Poems share that energy, according to University of Utah's Julie Lien, who sees poems as "living and relational. Their components move and interact not only with each other but with us as readers, and these relationships occur both in space and in and through time" (Lien). An effective poetry analysis program will explore not only the interactions between the sounds, images, movement, symbols, and syntax that comprise a poem, but also the communications between poet, readers, texts present and past, and other social events past and present. Using the concept of social network to comprehend a poem introduces analytical approaches compatible with sociology and communication theory as well as the social-network technologies of the internet. Literary scholars such as Frank Moretti and Andrew Piper are using social network theory to develop interactive models of novels (Liu). Piper suggests that the digital mapping of a literary work helps readers to see it as a "socially embedded, circulatory process" rather than as a "static, timeless, and ultimately isolatable object." Examining a poem through its topology by mapping out its relational structures affords different perspectives into the work and its authorship.

In that case, the principles of social network theory might offer fresh perspectives for poetry analysis. In his introduction to Actor-Network Theory (ANT), Bruno Latour explains that a network is not a thing but a concept that traces the formation of short-lived and surprising relays of associations which can be shuffled and reshuffled. Those formations, which are perceived only by their movement, can be generated by human or nonhuman participants. They are mediators whose "input is never a good predictor of their output" because "mediators

transform, translate, distort, and modify the meaning of the elements they are supposed to carry" (Latour 30). Rather than arbitrarily packaging meaning in convenient and pre-set categories, the sociologist of associations deploys uncertainties, allowing the task of making sense of the social to be left to the mediators themselves and not the analysts, allowing the mediators to "unfold their own differing cosmos, no matter how counter-intuitive they appear" (20). Fearlessly acknowledging uncertainty allows multiplicity of meaning to come into view, not as multiple points of view of a single reality, but as the natural state of a "thing that has been allowed to be deployed as multiple and thus allowed to be grasped through different viewpoints, before being possibly unified in some later stage depending on the abilities of the collective to unify them" (164). Then can begin the process of stabilization, the recording or visualization of all observable associations. In due time, the mediator reassembles the experience of the social in a composition or translation that not only constructs meaning from the observations of associations but also comfortably allows for the unknown, the unconnected, the "stuff" in between the links. Latour says that actor-network theory is more accurately called the "sociology of translation" and defines translation as "a relation that does not transport causality but induces two mediators into coexisting" (144). The transient coexistence expressed as translation is an apt metaphor for the relationship between a poem and its reader in a digital environment.

The model works because reading is an act of translation, and translation is an act of communication that creates a balance between twin entities that are at the same time strongly similar yet unique. The reader/translator/mediator begins an encounter with a poem by first divesting herself/himself/itself of all preconceptions or assumptions of what individual words and phrases definitively mean. Resisting the temptation to draw conclusions too soon, the

mediator unleashes and explores the multiple connotations associated with words and phrases. This act is seen by some as doing damage to the poem, but, in reality, it simply frees the elements of the poem from the constraints of the fixed page in order to closely examine the unique properties in the semantic and cultural environment of each element and of each element in relationship to other elements. For example, a mediator investigating the color "red" in William Carlos Williams' one-sentence poem, "The Red Wheelbarrow," might explore the multiple associations with the color. The color can hardly be dismissed as incidental as the emphasis is on not just a wheelbarrow, but on a *red* wheelbarrow. Red is a primary color. It is associated with iron-clad tradition and painful infection, with Valentine hearts and blinding rage, with life-giving blood and disaster's carnage. Of course, in the poem's linear reading, "red" connects to "wheelbarrow," but by virtue of being in the poem's word set, it also connects to white – perhaps as in the red and white of Red Cross relief or of the Swiss Army knife's handy functions. Or "red" might connect to white and the implied "blue" of water, in which case it might represent the red-white-and-blue work ethic of the American dream. These possibilities do not even dip into the etymological and philological roots that imbue the color with nuances of meaning. Or to the influence of the word's phonemic units. Or to the repetitions or progressive modifications of the word within the text. Or to the various connections to other literary works or cultural events. Or to figurative or syntactical combinations. Or to the physical arrangement of the words and the white space between them. Or to the unique manipulations a poet exercises on a specific word or phrase. Or to the personal history that shapes a reader's perception of a word. Each aspect generates transformations in the others. The process of deploying uncertainties – of deforming a poem – does not capriciously or disrespectfully dismantle the

poem's integrity but rather makes visible inherent qualities that otherwise might remain unseen. Just as the scientist's microscope reveals the frenetic interactions of atomic and subatomic particles that comprise what appear to the naked eye as solid objects, so digital experiments on a poem can unveil invisible realms that undergird and bubble within it. This uncertain journey into the multifaceted sociology of the poem can be unsettling because it challenges beliefs and initially confuses more than illuminates. It opens the mind to more possibilities of interpretation than can be imagined or seemingly than can be managed. However, this opening cultivates a richer experience with the poem,

In Latour's actor-network theory, the formation of associations renders the social visible. A network is not a physical construction but "a trace left behind by some moving agent." Tracing those fleeting associations stabilizes them momentarily, and mediators meticulously record their observations to begin to make meaning. Likewise, the essence of a poem emerges in the apprehension of its fluid intratextual, intertextual, and extratextual relationships. Digital applications provide a natural medium for detecting and visualizing a poem's associations. However, despite the best intentions of their creators, previous poetry analysis programs have approached poems as static objects composed of isolated elements. Therefore, it will be helpful to establish some foundational principles for designing preliminary visualizations that will provide effective transitions toward a plausible translation.

The goal of the transitional visualizations is to trace associations to assist a mediator in developing an interpretive perspective. One problem with previous poetry analysis programs is the issue of how to consolidate the multiple elements into a single graphic representation that demonstrates the interactions between the elements. The tendency has been simply to layer the

individual graphs over each other. To do so reduces or eliminates user input or experimentation with the observed relationships because they must be coded to blend with the integrated graph. Because of these constraints, the integrated graph only shows the existence of multiple layers rather than the influence they have on each other. It negates the goal of tracing associations. Furthermore, the visually convoluted integrated graph becomes virtually meaningless. At this stage, the process, which should allow for collaboration, modification, and self-reflection, is more important than the product. Using transitional visualizations as work papers on isolated elements to be integrated subsequently into a multimedia translation allows for the messy process of investigation as well as the ultimate goal of an enhanced experience with the poem.

Facts are interpretive. As Latour points out, the etymology of the term "fact" indicates that a fact is something constructed rather than an absolute truth. Latour prefers the phrase "matter of concern" rather than "matter of fact." As agencies, facts should be taken not as objects but as "gatherings" (156-157). Johanna Drucker argues a similar position in her "Humanities Approaches to Graphical Display." She suggests the term "capta" instead of "data" to distinguish the difference between information that is taken and information that is given. The idea is that rather than what *is*, facts are what is *perceived* to be. Therefore, they should be understood as relative, dependent on the observer, incomplete, and riddled with variables (29). Visualizations, she says, should reflect humanistic principles instead of the empiricist's traditional treatment of facts. Instead of the equal units, bounded bars, and straight lines of the empiricists' graphs of "certainties," humanistic graphs must be adapted to account for the ambiguous, the uncertain, the implied, and the unconnected. They also must account for subjective perceptions of time and space. The empiricist views time as "continuous, uni-

directional, and homogenous" but the humanist understands time as "discontinuous, multi-directional, and variable" (33). Similarly, in contrast to the empiricist's delineated area that can be measured in discreet units, space can be subject to distortion by emotional variables. What appears distant might feel insufferably close. The nearby loved one might seem remote. Like time, space might expand, contract, fold in, or break. Humanistic graphs will attempt to reflect those perceptions.

Keep the original poem in view. The translator always returns to the original text. Even when the tracing of relationships can take the mediator far afield, the original text is always the departure point and the destination. Translation is the most intimate form of close reading. It is, as Schulte observes, "an extremely intense process that requires constant interaction with the details of a text, a total involvement with the text, and a re-creation of the text (Schulte, *Geography* 190). Visualizations must trace "associations from one word to the next without stepping outside the parameters of the text" (190). Keeping the original text visually upfront during the process of mapping associations will reinforce the integrity of the translation.

Documentation is essential. Transitional visualizations provide an opportunity for students to tinker with the text in search of unexpected associations. Jentery Sayers asserts that documentation is central to the success of tinker-centric pedagogy. The collaborative activities are less about mastery than they are about trial and error experimentation in order to gain confidence about the process of discovery (Clark). Students log their findings and record answers to questions about how their perceptions change with each experiment (Sayers 285). Latour suggests keeping four notebooks: one to document the transformation a mediator undergoes during the inquiry; one to document the chronology and to categorize the information;

one to record ad libitum thoughts; one to register the effects on the object of the inquiry (190). Regardless of which form the documentation takes, it is an essential component for sharing and synthesizing gathered information. An effective narrative – one that describes rather than explains – prepares the mediator for the final stage: composition.

Having deployed the uncertainties and having traced their networks of relationships, in Latour's composition phase, the mediator then reassembles the social. In the process of re-composing the collective, Latour warns, it is important to remember that a network does not represent a larger context within which a social connection rests. Rather, a network is the representation of the social connection. To interpret a social event in terms of context rather than specific interactions is to make jumps into levels of abstraction that can distort conclusions about the collective. The composition is a translation, a model that applies nicely to the construction of meaning in the process of poetry analysis. To every degree possible, the visualization must remain connected to the specific situation of the text. The translator should avoid the trap of choosing more abstract than concrete terms, more neutral than highly connotative words (Schulte 31). The task now becomes not to *trace* associations but to *create* corresponding associations between the poem and a hypermedia translation of it. Schulte claims that the reconstruction process, the process of "bringing the parts back together in a new environment is…challenging and rewarding" (10). He sees translation as reassembling "blocks of analysis" into an "integrated system of human and artistic perception" (10). Adding the constructive translational dimension to the destructive computational focus of previous programs provides the elusive enhanced experience with a poem that has disappointed humanists in their digital forays into poetry analysis.

Translation comes in different forms, as Roman Jakobson discusses in his essay, "On Linguistic Aspects of Translation." "Intralingual" translation interprets words by using other words in the same language, as distinguished from "interlingual" translation that recreates the text in another language. Jakobson also allows for "intersemiotic" translation that utilizes nonverbal sign systems to communicate the source message (144). The "intersemiotic" translation particularly suits poetry analysis because it allows for the simultaneous display of the interactions between sound, image, movement, and symbols. The digital environment with its easy access to various databases and multiple functions offers a creative platform to stage a dynamic an aesthetically pleasing "intersemiotic" translation that will provide for high school students a high interest level means of engagement with a poem. The digital translation might comprise aspects of a traditional narrative, but it might, in contrast, resemble the new medium that is impressing itself on human culture. Noting the expansion of "nonlinear, ubiquitous" information that the computer unveils, Victoria Vesna states that "because of technological advances, we are…progressively and collectively experiencing a new way of being, and it is not orchestrated from the center by a single authority" (Vesna 3). The "new way of being," Lev Manovich postulates, is that society's reliance on the computer has restructured the world into two objects: database and algorithm. A database is an electronic collection of information organized for easy access and retrieval. An algorithm enables users to perform functions on the collection. The altered world order fashioned by these symbiotic objects has established database as a cultural form, and an interactive relationship with its users that differs radically from that of reader to book or audience to movie. It is only natural for art and aesthetics to

develop around the new form (39-40). "Database," Manovich says, "becomes the center of the creative process in the computer age."

Translating a poem into new media forms animates Barthes' writerly reader. The mediator can choose to apply different interfaces to the same text to produce multiple versions, each version having the potential to illuminate fresh perspectives on ambiguous segments and to drive the meaning-maker back to the text with renewed vision. As Tanya Clements proposes, the goal is not to arrive at the definitive truth of a text but rather to develop "plausibly sound interpretations" that recursively inform and influence each other. As a visualization of a poem's synchronous elements, the translation complements Bill Seaman's view of recombinant poetics. His interest is in "how media elements from the mixed semiotic milieus of text, image (both still and time-based), and sound/music can be explored in [various] forms of media environments through engaging forms of interactivity" (Seaman 424). Key terms Seaman emphasizes in characterizing new media art forms are exploration, engagement, participant, and media-construction. The freedom and energy of this approach to literary expression can shape a pedagogy that will invigorate the study of poetry for millennial and post-millennial high school students.

CHAPTER 4

DIGITAL ANALYSES OF RIMBAUD'S "VOWELS"

A poem is a dynamic experience composed of interactions between sounds and images, both of which are crafted from the artful manipulation of words, space, and time. Digital technology affords new methods of close listening and close looking to explore the poem's aural, visual, verbal, spatial, and chronological agents. It also provides dramatic means to express various interpretive perspectives of the poem. The purpose of this chapter is to explain two sets of digital analysis activities and to apply them to Arthur Rimbaud's 1871 sonnet, "Voyelles" (Rimbaud 139). The first set of activities comprises eleven experiments that allow students – the mediators – to trace associations in the poem, generating information about the interactions of its various elements. The discussion of each experiment will include an explanation of its purpose and philosophical context, a description of its procedures, and a representative sample of its results. The second set of activities details mechanisms for students to create meaningful associations from their results in the production of a multimedia and a verbal translation of the poem.

"Vowels" serves well as a mentor text because of the complexities of the poem and its composer. The puzzling poem by the French Symbolist poet, Arthur Rimbaud (1854-1891), pairs vowels and colors in a multisensory expression of rage and ecstasy. Rimbaud particularly intrigues high school students because virtually his entire writing career occurred during his teenage years, most of his important work coming between the ages of sixteen and nineteen. His poetry reflects typical teenage concerns with personal identity, social issues, and universal truth that are intensified by his life circumstances: abandoned at the age of six by his soldier father,

raised by an authoritarian mother, humiliated by poverty, pressured by school officials, plagued by war, exploited sexually by an older role model. Add to this list of profound influences a highly intelligent and sensitive spirit with a brilliant facility for language, and the net effect is a series of explosively inventive poetic expressions of Rimbaud's confusion, rage, rebellion, grief, and, ultimately, resolution.

Although the complexity of "Vowels" derives in part from its blended symbolic and semiotic systems and in part from its paradoxical and synesthetic phrases, the greatest source of its difficulty lies in Rimbaud's intention to challenge conventional language by creating a new language that cannot be catalogued in a dictionary. Rimbaud foresees a "universal language…of the soul, for the soul, encompassing everything, scents, sounds, colors, one thought mounting another" (Rimbaud, "Letter," 36). As a "thief of fire," (36) the visionary poet who creates the new language accepts the moral obligation to enlighten living beings with experience rather than with explanation. The holy thief anticipates the currents of change in his generation and functions not as a scribe who records that change but as a "propagator of progress who renders enormity a norm to be absorbed by everyone" (36). The progressive energy that drives Rimbaud's poetry lends itself to study by high school students equipped and emboldened by digital technology to enjoy poems in radical ways.

The source and significance of Rimbaud's enigmatic colored vowels – "Black A, white E, red I, green U, blue O" – has initiated much scholarly debate. Some biographers trace its contemporaneous origins to Rimbaud's encounters with a color-coded children's book of letters or with a system for learning piano that associated colors with notes. Others see the colors corresponding to Rimbaud's knowledge of apocalyptic literature or his studies in alchemy, a

popular subject among the Symbolist poets. A few critics make less of the colors, explaining them as a tantalizing riddle in the medieval tradition, as an impressionistic backdrop of the poem without any independent significance (Meltzer 344-345), or as the product of Rimbaud's absinthe-induced hallucinations. The poet himself attributes the color scheme to his search for a new kind of poetry: "I invented colors for the vowels…and I boasted of inventing, with rhythms from within me, a kind of poetry that all the senses, sooner or later, would recognize" (Rimbaud 232*)*. Coupling colors with vowels manifests Rimbaud's philosophy that "the Poet makes himself into a seer by a long, involved, and logical derangement of all the senses" (Rimbaud, "Letter," 33). That derangement applies not only to the poet, but also to the readers who would follow him to the "unknown" to enrich their souls regardless of their own bewilderment, or perhaps even because of it. In "Vowels," the seer pledges his determination to unlock the mysteries of language: "Some day I will open your silent pregnancies." From the opening lines, the disorientation continues through the four stanzas of the poem, the first two linked thematically by grotesque images of dark pits of corruption, intimidating figures of oppression or repression, and bloody outbursts of rage with "bloody spittle dribbling from a face/In wild denial or in anger." The two three-line stanzas that close the poem lead the spent speaker into strange places of peace and, ultimately, ecstasy. It will be to the students to interpret the nature and significance of the places of misery and enlightenment as their sense of the poem expands through their interactions with it. Digital experiments with a poem complement Rimbaud's derangement theory as they enable students to deform the components of the poem, trace their influences on each other, and reconstruct them in personally meaningful ways. To seek, to experience, to marvel – sometimes even without understanding – is an approach to poetry that

high school students can enjoy. Digital investigations of "Vowels" invite students on a journey to explore the reaches of the poem and to delight in uncertainty as much as discovery.

Experiments

The student's activities in the digital experiments trace associations that impact perceptions of the text. Deforming the text in various ways allows the mediator to discover connections and possibilities of connections that otherwise might go unnoticed. The conceptual network can form within the poem and can extend to include associations between the poem and other texts, the poem and the mediator, or the poem and one or more past or present cultural contexts. To facilitate open searches, Nazir Cassini's "User Interface Design Principles" offers some useful suggestions for the physical configuration of the experiments. The work space should be as clean as possible. The text of the original poem should always remain in view, and any secondary windows that open should not hide lines of the text. Also, to the degree possible the design should be free of dividers that segment the page. Cassini feels that the open space subliminally encourages freer responses (Nazir). Therefore, as illustrated in Figure 1, the template for most of the experiments in *Remaking Poems* includes the name of the experiment, a few lines of instructions, a "Text" window for the original text, and a wider "Phase" window, which is the creative space where the mediator tinkers with the text. For some experiments, the "Text" window contains one or more command buttons that will generate text in the "Phase" window. Likewise, for some experiments, the "Phase" window may include command buttons or a tool menu for functions required for the experiment.

Fig. 1. Layout of the experiment page in *Remaking Poems*

Mediators document the process for each experiment in an "Actions/Reactions Log," shown in Figure 2. The log contains a series of open-ended seed questions to help mediators begin their observations if they are at a loss as to what to record. The open-ended questions are not comprehensive, and students are not required to answer them. Below the seed questions, mediators record the actions they perform and the phenomena they observe. The log also includes a box in which mediators note their reactions to the experiment, the ways in which the experiment enlightened or changed them. Students save their logs and screenshots of their work in private portfolios in whatever drives their school district provides or authorizes. To demonstrate the application of the digital activities to "Vowels," I will log in as "giraffeguru," complete the activities as students would, and then discuss some representative examples of my results. Three examples of completed logs can be found in Appendix A. Also, the DVD that accompanies this paper contains a live demonstration of some of the experiments.

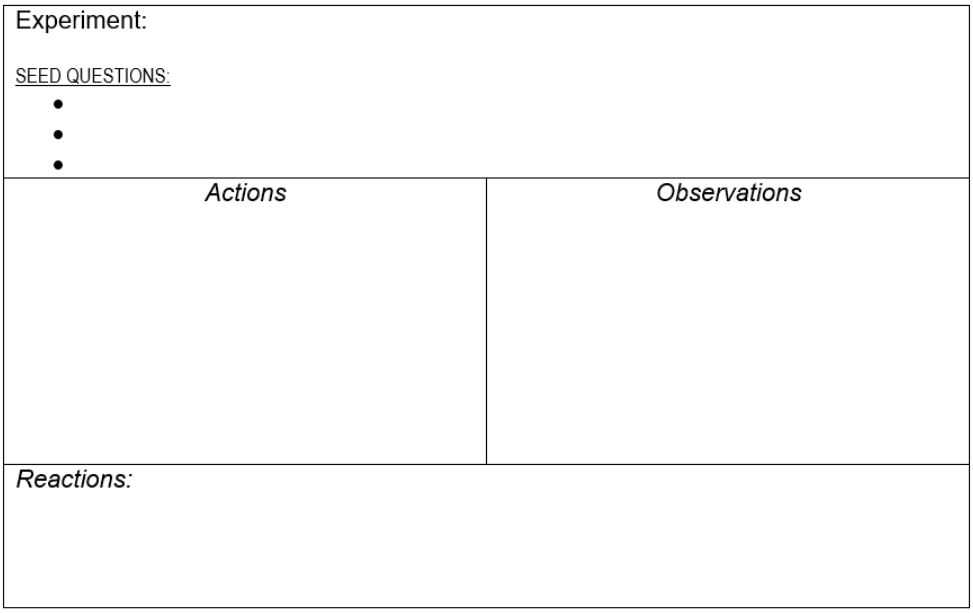


Fig. 2. “Actions/Reactions Log” template

Aural agents

Although patrons of poetry have long understood the centrality of sound, the predominance of the visual in contemporary culture has relegated sound to a supplemental role, especially in downplaying the performance of what historically has been an oral art. In his study on sound, Don Ihde discusses the prevalent visual metaphors that reduce thought and understanding to seeing, such as having “insight” to produce a solution to a problem. The preoccupation with sight, he says, can have the result of precluding the fullness of experience that comes with the inclusion of sound (Ihde 8). As the organs of sight and sound transmit more sensory information to the brain and at a faster rate than the other senses – “forty bits per second for the eyes and thirty bits per second for the ears” with the next closest being the sense of touch at five bits per second (Johnson 4) – logic argues that both sight and sound should receive equal value to adequately represent reality. However, making the shift to a substantial focus on sound

will not be a matter of implementing a few token changes. Ihde believes it will require "a deliberate decentering of a dominant tradition in order to discover what may be missing" (Ihde 13). Reinforcing that view, Adalaide Morris in her book *Sound States* reflects that the increasing computerization of information systems demands the development of "complex, plural, and supple methods of interpretation – methods that register more than one sense" (7). The experiments of *Remaking Poems* intentionally approach the dimensions of sound and sight as being equally significant. So, to complement the visual images of the poem, the aural experiments involve the oral performance, the physics, the biology, the symbols, the rhymes, the rhythms, and the graphic representations of sound, all to awaken mediators to a richer experience of the poem.

Experiment: Sound

Charles Bernstein, in his book on close listening, contends that the life energy of poetry lies latent in poems that are un-sounded. The inefficacious marks on the page wait to be animated by voice. Vocalization takes the poem "off the page, out of the realm of ideas, and into action" (Bernstein, *Close* 7). It takes the language of the poem out of the metaphysical and gives it flesh (21). Speaking the poem aloud also makes listeners of both the speaker and the speaker's audience. Listening begins the process of understanding. In his essay on listening, Barthes claims that "to listen is to adopt an attitude of decoding what is obscure, blurred, or mute, in order to make available to consciousness the 'underside' of meaning'" (Barthes, "Listening" 249). The oral delivery of a poem provides more input by which to perceive and appreciate it. Furthermore, it establishes a collaborative environment around the poem where "I am listening" also means "Listen to me" (246). The discussion raises sound to a previously disregarded level

of significance thereby resulting in the possibility of expanded interpretive perspectives (Bernstein, *Close* 5). In search of these new perspectives, mediators take a virtual field trip to a sound lab hosted by Cornell University. The Cornell Lab of Ornithology makes available to students and educators *Raven Lite,* a free software program for learning about sounds (Bioacoustics). Users receive a free license to download the software onto their computers. Other sources, including several open source publishers, offer free sound analysis software. However, for the high school classroom, where time is limited and students vary in digital proficiency levels, *Raven Lite* serves best for accessibility, reliability, and creativity. Its functions fulfill the purpose of the experiment, which is to allow students not only to benefit from multiple hearings of the poem but also to record, see, and experiment with the sounds of "Vowels."

When a student opens the program, he first plays a sound file of the poem in French and see the sounds as the file plays. Although the class is studying the poem in translation, hearing it in its original language and seeing the visual manifestations of its sounds in the waveform and spectrogram will make a pleasant and intriguing multisensory introduction to the poem. A student may also play a full recording of the poem in English. Before beginning his own experiments, the student reads a brief tutorial, "Terms Associated with Sound" (Appendix B.2). The rudimentary knowledge of waveforms, spectrograms, and terms associated with sound supplied by the tutorial will allow the student to make some basic observations about similarities and differences between consonant and vowel sounds and to draw some conclusions about which ones have the most sonic energy. Returning to *Raven Lite,* he explores the functions of the program by recording vowel and consonant sounds listed in "Common Sounds of English"

(Appendix B.1). The list contains my simplified phonetic alphabet as well as information about where sounds are shaped in the mouth. In addition to introducing the program's functions, the practice session will lead the student to think about how spoken sounds are formed, classified, and described. Some sounds are open, others closed. Some resonate with deep vibrations, others are thin and high pitched. Some stop suddenly, others explosively push air out. Some sounds are so short they are barely perceptible, while others languish in extended tones. Comprehending these distinctions can assist the understanding of how specific sounds can contribute to certain effects in, or emotional responses to, a poem. The sound analysis program displays a waveform and a spectrogram of the recorded sound that enables users to see the sounds and draw conclusions about their characteristics.

After the practice recording, the student begins working with the poem, first to trace associations within the poem, then to record his observations, and finally to describe his reactions – that is, how this activity changed his perceptions. At this point, his task is not to draw conclusions, but simply to objectively view what is happening in the sonic makeup of the poem. As he proceeds through the activity, he enters his findings in the "Actions/Reactions Log." To begin, he records his own reading of the poem, and then plays it back to see the correspondence between the words and the images in the waveform and spectrogram. To work more closely with meaningful segments of the poem, the student/mediator divides the poem into two to eight rhetorical segments. He may choose to divide it by syntactical units, by stanzas, by shifts in tone or focus, or by any other means that makes sense to him. He records each segment, paying close attention during the playback to the correspondence between words and images. For each recording the mediator hides the waveform and views the spectrogram. Experimenting

with zoom and color functions to investigate different effects, he decides which effect best suits the tone of each segment and then saves each segment to a separate file. Once all segments are recorded, the mediator tiles the segments to see them in a single view, all the while continuing to experiment with zoom and color functions. Eventually he will have a visual rendering of the poem's tonal shifts. Figure 3 shows the tiled windows for six segments – the introductory apostrophe to the vowels and one segment for the lines associated with each of the five vowels. Reading from left to right and top to bottom, the six identified segments show the tonal progression of the poem, from the brash apostrophe of the opening segment, to the engulfing black pit, to the white spears dominating the blackness, to the red-hot rage of the speaker, to the emergence of peace, to the final transcendence.

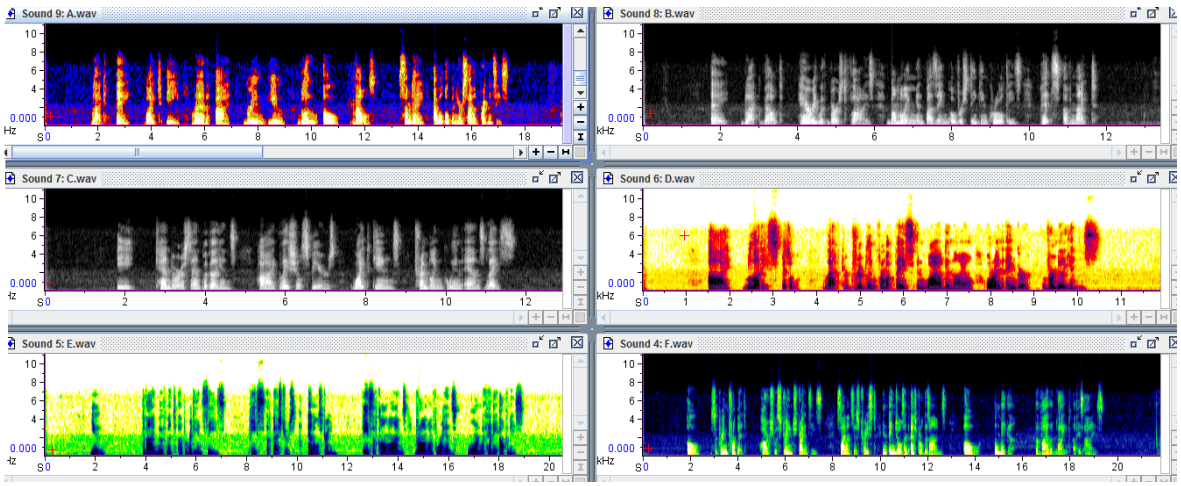


Fig. 3. Spectrograms for recordings of segments in "Vowels" provide a visualization of the sonic and emotional tones of the poem.

During and after the experiment, the mediator records observations in his log. Seed questions for this experiment offer some guidance:

- In the readings of the sounds of English, how do the waveforms reflect open and closed sounds? Which consonants seem to have the most or the least energy?

- In the poem, where does the sound appear to be the most complex? What connections, if any, do you see between the complexity of sound and the corresponding lines of the text? Which words have the highest or lowest sounds? The loudest or softest? The longest or shortest? The fullest or thinnest? What patterns, if any, do you observe? Which words have the most interesting sound signatures? How did you choose your color schemes for the spectrograms?
- What other observations did you make?

My log from the practice session indicates that fricative and nasal sounds seem to generate the most sonic energy. The nature of fricative sounds is probably why the word "face" stands out as one of the more interesting graphs. A short word, two of its three sounds are fricatives. That observation, coupled with the instruction to divide the poem into segments, caused me to look more closely at the word and to notice that, at the end of the seventh line, it marks the center point of the poem. The sonic and emotional force of lines six and seven led me to choose the hot color scheme of reds and yellows. While recording these types of details, the mediator should resist the temptation to draw conclusions too soon, which usually ends in empty frustration. Rather, he should enjoy the experiments and continue to follow the traces that lead him through the poem observing the curiosities along the way. The time for conclusions will come later.

Experiment: Rhythm

Derived from the Greek "rhythmos" and the Latin "rithmus," rhythm relates to predictable and measurable movements in time. As an observable phenomenon that makes itself felt as much as heard, rhythm involves visual, aural, and tactile perceptions – visual in the reading of words of the page, aural in the onomatopoetic nature of language and in the oral performance of the poem, tactile in the sympathetic synchronization of the poem's rhythms with the rhythms of nature that are common and essential to human existence. However, despite poetry's sensory richness, teachers of the art often disregard rhythm or promulgate the tradition

that rhythm synonymizes meter. Their limited scansion systems confuse and frustrate students, failing to address the multiple factors that contribute to the waves, pools, and eddies of the poem. At the end of tedious scansion exercises in which words are unnaturally squeezed into patterns to identify a particular meter, perplexed students look at the teacher and say, "But we don't talk like that." So ends the class discussion on rhythm. Richard Cureton recommends approaches that reject one-dimensional analysis and recognize that "all complex rhythms are inherently hierarchical and interactional" (Cureton 244). Instead of trying to force the search for a poem's rhythm into a metrical glass slipper, *Remaking Poems* responds to Cureton's call for a more flexible, multilevel analysis.

The physical movement of a poem, which is generated by its sonic aspects, comprises the interrelationship of three organizational levels: organic, syntactic, and poetic. Each level intersects with the others in various ways and to varying degrees throughout the poem as individual elements reinforce, complement, or contradict other elements. These intersections give the poem its rhetorical power. At the organic level, naturally unstressed and stressed syllables come together to form words. At a level of greater complexity, the syntactic level, words come together to form rhythm phrases, a term Cureton uses for full-word phrases usually constructed with one stressed syllable and generally from one to several unstressed syllables (Cureton 249). Types of rhythm phrases can be repeated or diversified to create mood. Coded by punctuation, they can also be folded into dependent or independent clauses to delineate a complete thought. Finally, at the poetic level, stress patterns may form metrical units – such as the iamb, anapest, trochee, dactyl, and spondee – that transect words. Traditional meters may underlie the entire poem or may emerge briefly to create certain effects. In addition, lines and

stanzas may transect sentences. An idea initiated in one line may continue in another line or even in another stanza. Breaks – caesuras – may be imposed within or between sentences by commas, dashes, ellipses, or empty space. All these elements in each of the levels factor into the movement of the poem – structured in its linguistic hierarchies yet fluid in its manifestations.

In the rhythm experiment, the mediator traces the intersections of the organic, syntactic, and poetic layers of the poem. The purpose in the experiment is not yet to draw conclusions about meaning, but simply to track the ways in which all the components overlap to forge complex rhythms in the poem. If needed, the mediator may refer to a brief tutorial in "Rhythm" (Appendix B.3.) She then begins the activity by clicking a "Layers" button in the text window that displays in the phase window a copy of the poem that is marked for the rhythmic layers.

In the phase window, seen in the clip in Figure 4, words break into syllables; stressed syllables appear in all capital letters; end punctuation marks appear in red bold-faced type; pause punctuation marks appear in blue bold-faced type; independent clauses appear in yellow highlight; lines that carry thoughts into the next line end with a green arrow; a line of blue equal signs indicates stanzas.

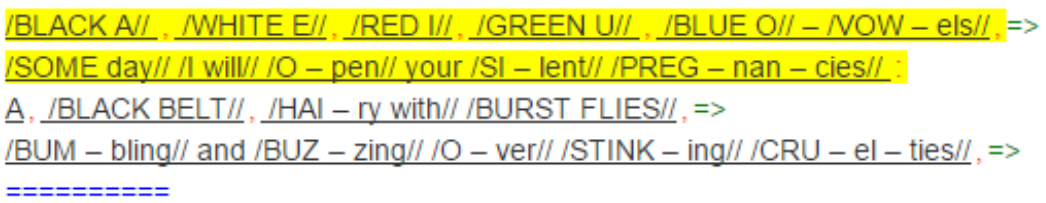


Fig. 4. Phase window display of "Rhythm: Layers"

Relying on the seed questions to the extent needed, the mediator looks for patterns or anomalies, and notes her observations in her log.

- Do any traditional metrical units occur in the poem? If so, where? What effects, if any, does the use of particular metrical units create? Where are the most interesting or effective uses of metrical units? Are there places where the rhythmic flow seems to change? How does the arrangement of stressed and unstressed syllables affect your impressions of the poem's tone?
- How many complete sentences does the poem contain? How do the rhythm phrases relate to the clause(s)? How do the clauses and rhythm phrases contribute to the movement of the poem? Where do the full stops occur? Is there any significance in their positions?
- How do the pauses function? Where do lines carry a thought over to the next line of text? What is the effect of the extension? How do the stanzas relate to each other and to the poem as a whole?
- How does your understanding of the poem's rhythm change the way you read it aloud?

For example, my log notes that the yellow highlighting makes apparent that the fourteen lines of the sonnet comprise one sentence, a two-line independent clause followed by five phrases. The green arrow at the end of the fourth line links the first two stanzas into one unit. The bolded syllables reveal no consistent meter underlying the entire poem, which makes the weighted first syllable of the trochaic feet in the third and seventh lines even more ominous in tone. The bold red exclamation point at the end calls attention to the emotional force of the last line.

After observing the marked text, the mediator rearranges the text into rhythmic phrases as she perceives them. She clicks on the "Cadence" button in the text box to show in the phase box an unmarked prose arrangement of the text without punctuation and capitalization. The mediator arranges the text in ways she could choose to phrase it orally, starting a new line with each pause or stop she would make. She can experiment with various configurations, and she may choose whether to or not to punctuate or capitalize. Experimenting with how changing rhythm alters meaning can shed new light on how the original lines mean. For example, in the phrase, "Peace of pastures animal-strewn, peace of calm lines drawn on foreheads…," adding rhythmic breaks after the two occurrences of "peace" and after the prepositional phrases that follow emphasizes

the word over the full image. "Peace/of pastures animal-strewn/Peace/of calm lines drawn on foreheads…" has a different effect than the first reading. The arrangement will vary among mediators, and they should take some time in small groups to read their versions to each other taking into consideration their new understandings of how rhythm works in the poem.

Experiment: Rhyme

At the mention of poetry, most people initially think of rhyme. Perhaps the association stems from childhood's lullabies and nursery rhymes or from the rhyming phonic pairs that characterize primary reading lessons. Surprisingly, much of the world does not produce rhymed poetry, and rhyme did not emerge as a poetic convention in Western tradition until well into the Middle Ages (Stewart 33-34). Even then, the device has fallen sporadically into disfavor through the centuries from Milton's describing rhyme as a fault that was "the Invention of a barbarous Age to set off wretched matter and lame Meter," (210) to the contemporary fascination with free verse.

However, rhyme continues its close association with poetry on technical and primal levels. In her insightful essay, "Rhyme and Freedom," Susan Stewart discusses rhyme as a universal yet paradoxical phenomenon of language. Rhyme mimics natural rotations in time as both a visual and an aural experience. It may or may not embody semantic content. On the one hand, it can stabilize language, and on the other, can expand it into polyvocal ambiguities. Rhyme can imbue words with greater meaning or strip them of meanings that syntax and context would impose. At once, rhyme is passive and active, instinctive and intentional, retrospective and anticipatory. It distinguishes words from each other, and it links them. Most significantly, it is the giver of pain and pleasure – pain in the confusion of possibilities it engenders and pleasure

in the rhythm and comforting resonance of the familiar (41-43). What then constitutes rhyme? Understanding of the term varies from poet to poet and scholar to scholar. Roman Jakobson extends the traditional definition of rhyme as the "regular recurrence of equivalent phonemes or phonemic groups" to necessarily include "the semantic relationship between rhyming units" (367). In poetry, he says, rhyme functions most demonstrably as the "palpable" intersection of sound and sense (373) either by the concentrated occurrences of a sound, by the isolated presence of a sound in an otherwise rhyming pattern, or by the juxtaposition of contrasting sounds. The phonemes themselves may convey culturally determined meaning that can be magnified by the repetition and relationship that is rhyme. Tina Lowrey and L. J. Shrum, in their essay on brand construction, review empirical evidence that justifies the plausibility of phonetic symbolism. They explain the results of several studies showing that the formation of certain vowel and consonant sounds can be linked to perceptions of space, size, strength, movement, brightness, favorability, and a variety of other qualifiers. The power of sound to shape physical and emotional responses in readers led poets Julie Lein and Katharine Coles, collaborators in the digital sound analysis project, *Poemage,* to identify "all sonic and linguistic devices" as rhyme (McCurdy 441). The project tracks and maps the interactions of up to twenty-one rhyme types to explore the ways that poets play with sound and sound figures over the course of a poem. The broad-based definition generates interesting visualizations of rhyme sets for scholars to appreciate the sonic topology of a poem, but involves more complexity than the average high school student would find manageable. Nevertheless, the underlying principles of *Poemage* offer some useful perspectives for this project, particularly in the idea of demonstrating the relationship between rhyme sets.

The purpose of the "Rhyme" experiment is to explore how repetition of sounds might generate certain effects. It focuses on phonemes – their frequency, their position, their symbolism, and their semantic role in rhyming phonemic groups. Initially, the mediator may want to read a brief tutorial, "Rhyme" (Appendix B.4) To begin the experiment, the mediator selects the "Sounds" or the "Scheme" button in the text window. On the "Sounds" command, a phonetic transcription of the poem appears in black type in the phase window. To the right of the phase window, a narrow text box displays a list of color-coded phonemes that are ranked in order of their frequency. Color treatments are assigned by sound types. For example, open vowels have a bright background fill with black type, mid vowels have a dark background fill with white type, and closed vowels have no background fill, but the letters are darkly colored. The mediator selects a phonetic symbol from the list. Upon selection, all occurrences of that sound in the phonetic transcription will pop in the color of the selected symbol in the list. The color coding allows the mediator to track the locations and frequency of the sound and to note any patterns that might exist within the context of the poem. Clicking again on the same symbol in the list will undo the color in the transcription. At the bottom of the list, a "Color All" button allows mediators to see all phonemes displayed in their designated color treatments, distinguishing each phoneme as part of a rhyme set and apart from other rhyme sets. "Reset" removes all colors from the transcription. In the "Actions/Reactions Log," the seed questions lead the mediator to consider the emotive impact of the accumulation of the same phoneme, the rarity or absence of a phoneme, and the juxtaposition of disparately or similarly formed phonemes.

- Do you observe any accumulations or clusters of specific sounds? If so, do the sounds seem to reinforce or contradict the text? Are there any sounds that stand alone or nearly

alone? Do those sounds create emphasis or are they relatively unimportant? Do you see any sounds placed near similar or contrasting sounds? What effect might these sounds have?

- Are there places where the sound patterns change? In what way? For what reason or to what effect?
- How do the poem's sounds correspond to the words they form? How does the rhyme scheme affect your experience of the poem? Does it contribute to meanings you perceive?
- What other observations do you have on how sound functions in the poem?

In my experiments, as I record in my log, selecting the opening sound of the poem, the voiced plosive consonant, /b/, reveals that in the first two stanzas, the sound appears at an average rate of 1.38 times per line. It does not appear at all in the last six lines. Similarly, the /ng/ sound occurs at an average rate of once per line in the first two stanzas, and disappears in the last two stanzas. The repetition of the two consonant sounds, as depicted in Figure 5, adds force and an unpleasant cast to the shocking images of the first two stanzas. The last two stanzas contain the poem's only instances of the open vowel sounds of /ah/ and /aw/, which contribute to the slower pace and softer tones of the closing lines. A related observation is that in the first two stanzas, /s/, /sh/, and /z/ occur at an average of 2.6 times per line, in contrast to the rate of 4.17 in the last two stanzas. In the sestet, the disgust and rage of the octet subside, and peace rises, a sensation supplemented by the increased use of the softer sounds. Seeing the sounds visually displayed in color allows a mediator to detect sound patterns that might later lead him to conclusions about how the poem yields its effects.

/p/i/t/s/ /uh/v/ /n/I/t/ /E/ /k/e/n/d/or/ /uh/v/ /s/e/n/d/ /e/n/d/ /p/uh/v/i/l/y/uh/n/z/
/h/I/ /g/I/A/sh/uh/l/ /s/p/E/r/z/ /w/I/t/ /k/E/ng/z/ /t/r/e/m/b/I/E/ng/ /k/w/E/n/ /e/n/z/ /I/A/s/
/I/ /b/I/uh/d/E/ /s/p/i/t/I/ /I/a/f/t/ur/ /d/r/i/b/I/E/ng/ /f/r/uh/m/ /A/ /f/A/s/
/i/n/ /w/I/I/d/ /d/E/n/I/y/uh/I/ /or/ /i/n/ /A/ng/g/ur/ /v/ur/m/i/l/y/uh/n/z/

Fig. 5. Phase window display of "Rhyme: Sounds" showing a phonetic transcription with highlights for /b/ and /ng/

In the other half of the experiment, the mediator selects "Scheme" to display the poem and three columns of boxes for identifying the rhyme scheme. One frustration for students trying to determine rhyme scheme is that often exceptions to traditional patterns exist, or pronunciations cause a phoneme or syllable to seem out of place. To unnaturally force a rhyme scheme into a prescribed pattern seems arbitrary and meaningless. Here a mediator can play with different possible rhyme schemes based on his interpretations of the sounds. Clicking in a box brings up a list of letters to choose from in identifying matching end sounds. In my experimentations, shown in Figure 6, I observed at least three ways of looking at rhyme scheme. Most notably, one view reveals that except for lines six and seven, every line ends with the same consonant sound of /z/.

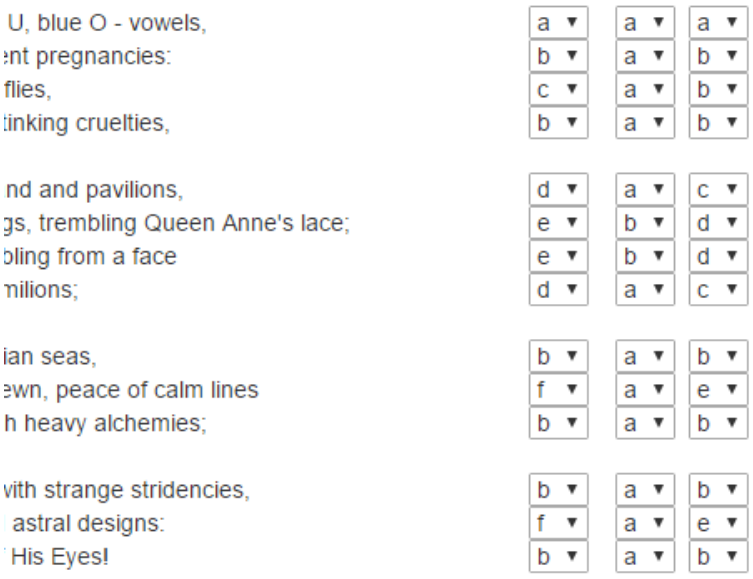


Fig. 6. Phase window display of "Rhyme: Scheme" showing three options for coding rhyme scheme

Seed questions in the "Actions/Reactions Log" lead the mediator to ponder how his perceptions of the rhyme scheme might affect the meaning he creates from the poem. My log records that

none of the observed rhyme schemes follow the rhyming patterns of traditional sonnets, which may contribute to the poem's chaotic, defiant tone. Also, the end sound of /z/ in twelve of the fourteen lines adds such sonic force that the variation in lines six and seven brings into them into sharper focus as the place of breakthrough and change.

The experiments in sound exercise multisensory skills in close listening that open an awareness to the sonic dimension of poetry that often is slighted or ignored in traditional approaches to poetry analysis in high school. Allowing students to play in the poem's sonic fields enables them to more fully appreciate its images.

Visual agents

In poetry, as in film, sound and image complement each other as conveyors of information from which the receiver constructs meaning. They share similarities in their reliance on formal and cultural codes. They can function together in confirmation or opposition; independently of each other; or even by absence when the other is present. They are measurable in similar terms and subject to the same types of manipulations (Johnson). In the view of Ron Burnett, author of *How Images Think*, both sound and image, along with language, form the nexus of human thinking and feeling (9). More than mere representations or "objects of consumption," Burnett claims that "images are the interfaces that structure interaction, people, and the environments they share" (5). Visualization is about human – individual and collective – creativity as viewers construct what they see. Image is a concept that is "an entry point into the depth of the viewer's experience" (13). In his study, *The Domain of Images*, James Elkins acknowledges the connection between images and thought. The dual nature of the image is at the same time to show and to say. It is a "fusion of the intuitive and fragile nonverbal,

nonlinguistic sense of 'picture' and…the determinate readings that insist on pictures' propositional logic" (65). Interestingly, in Elkins' division of images into seven categories, three deal with the pictorial nature of printed words (90). Laura Mandell explores the idea of type as image in her research inspired by Paul Saenger's argument in *The Space Between Words* that people read words as pictures rather than sounds. She reflects that the image of the word might involve "the same cognitive processes as would looking at any image – a photograph or a painting – and from that process comes the meaning of a word – a thought" (Mandell 762). So considering the visual in poetry requires multiple layers of inquiry – not only the typical considerations of sensory words, figurative combinations of words, and cultural codes, but also of type, type treatments, and the arrangement of words on the page. The successful investigation yields what Gaston Bachelard refers to as "an explosion of images" without which, there is no "imaginative action" (7-13). Bachelard extols the literary image as a source of individual vitality and enriched thought. To fully experience the image, he suggests an open approach: "About every image that strikes us, we must ask ourselves: what is the verbal force this image releases within us? How do we pull it loose from the too stable bedrock of our familiar memories?" The reader must "patiently seek, in every word, the desire for otherness, for double meaning, for metaphor." Indeed, as Roland Barthes observes in *The Rhetoric of the Image*, "all images are polysemous…a 'floating chain' of signifieds, the reader able to choose some and ignore others" (156). In the vast array of possible meanings, readers must find an "anchorage" to narrow or direct the options in order to devise a plausible interpretive perspective. The goal of the visual experiments in *Remaking Poems* is to ignite Bachelard's explosion of images and to allow students to make their own sense of the experience.

Experiment: Visual Annotation Blog

Ask most high school students about the purpose of descriptive language in a poem and they will say, "It makes you feel like you are right there." They think the purpose of poetic language is to authentically depict an objective reality. However, poetic language functions in the opposite manner. It inspires new perspectives by making language strange whether semantically or syntactically. In *On Photography*, Susan Sontag says that looking through the camera can be like looking through both ends of a pair of binoculars. The camera makes strange and distant objects seem close and familiar and makes familiar objects seem distant and strange. The camera offers "both the participation and alienation in our own lives and those of others – allowing us to participate while confirming alienation" (131). Tropes operate in much the same way in poetry. Imagery zooms in on sensory details to magnify their effect, even to make visible the invisible. Figurative language zooms out to form paradoxical connections that draw poets and readers of their poems to dizzyingly fresh understandings. Both imagery and figurative language create images that disorient rather than orient and that lead to intensely personal encounters with the poem as well as interactions between the reader, the poet, and other readers.

The purpose of the "Visual Annotation Blog" is to help the mediator expand and explore the images of the poem, to feel comfortable with uncertainty, and ultimately to experience pleasure in the power of language to evoke surprising sensations. To engage the mediator with the poem on a nonliteral level, the experiment employs nonverbal strategies. Rather than write essays or answer lists of questions about what images mean, the mediator takes her phone camera to the people and places of her life to find scenes that reflect her impressions of the poem. She also looks for scenes that contradict those impressions because contrast often brings

clarity. Her task is not to illustrate the lines of the poem, but to take pictures or videos that reflect the personal associations that the poem generates in her. In addition, she searches databases and the internet for interesting visual perspectives that correspond to the concepts that underlie the poem. Another means of expanding the mediator's perceptions of the poem is to ask her to seek images that relate to the poem's title and author as well as the time and place in which the poem was written. Once she has selected her images, the mediator experiments with editing techniques to alter her pictures or videos to more accurately express her insights. She saves all her images to her media file. Throughout this process, she records her activity on her log, which offers seed questions to stimulate her thinking.

- What images do the words create?
- What image startled you the most? What made it so surprising?
- How do the images of the poem connect to each other: compare, contrast, cause, effect, sequence, paradox, describe, combine?
- How do the images change through the course of the poem?
- How do your visuals reflect the images of the poem?
- What treatments did you use to maximize the effects of the images?
- What picture/video did you see on the blog that intrigued you most? Why did it interest you?
- What other observations do you have?

Finally, the mediator collaborates with her peers to visually annotate the poem. She selects what she feels to be some of her strongest pictures or videos and posts them to the "Visual Annotation Blog" where all mediators can contribute and comment. This interaction provides additional possibilities and sensitivities that can help the mediator see the poem through wider eyes.

To run the experiment, a mediator selects a word from the poem in the text window. That action calls up an annotation form in the phase window. The mediator writes the phrase or clause containing the word in the blank provided. She then can upload an image and/or a video,

provide the URL if appropriate, and write a brief reflection on her choice. After she submits the entry to the database, it can be accessed by any mediator who later selects the word and might want to add comments or related images in response to the original post.

The blog allows the mediator to juxtapose images in the text and her personal associations with those images. For example, in the post for "laughter," I situated it in the phrase, "laughter dribbling from a face," and noted that, for me, the image seems to be one of insanity. Figure 7 reveals two different perspectives on the same line.

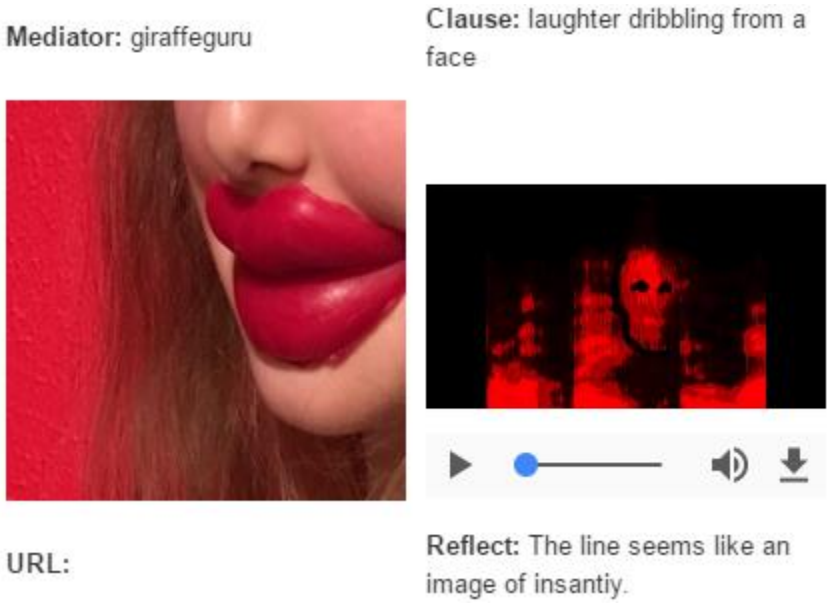


Fig. 7. Phase window display for a "Visual Annotation Blog" entry for "laughter dribbling from a face"

In the sound experiments, I observed that the spectrogram of face seemed skull-like. I snipped it, added eye sockets with the open-source draw program in *GIMP2* and in the same program colorized the spectrogram red because of the association of "laughter" with "bloody spittle." I created a soundtrack of insane laughter with the open-source program, *Audacity*, by recording my own laughter and then slowing the play speed. After combining image and sound, I posted

the short video to the blog. The video is playable in the blog, but it can also be downloaded for use by others. Each post allows for responses from any mediator who signs into the blog.

In addition to annotating the words of the poem, the mediator can post images related to the historical, literary, and biographical contexts of the poem as it is possible to annotate the title, author, and date. For example, my annotation for the title includes an image of the poem written in Rimbaud's hand and a reflection that "Vowels" is a sonnet that is traditional in some ways and nontraditional in others. To annotate the poet's name, I uploaded several pictures that exist of Rimbaud during his writing years. Here I also have posted biographical data connected to other images related to his family and school life. My posts regarding the year of publication relate to the literary and historical contexts of the poem. I added an image of the Fantin-Lateur painting and commented on Rimbaud's relationship to other writers of the Symbolist period. Also, when Rimbaud wrote "Vowels," France was at war with Prussia. I uploaded a few drawings from the era that depict scenes from the front and noted some of the ways that the war affected the young Rimbaud. The multiplicity of perspectives, the diversity of types of data, and the methods of generating it makes the blog a useful tool for exploring the nuances and ambiguities of the text.

Experiment: Canvas

The mind's eye views the images of poetry with the same selectivity by which the organic eye processes optical data. Rather than a purely mechanical operation, developing perspective is a creative act that directly impacts the understanding of and response to what is seen. An individual's unique vantage point requires engagement with the image on a number of levels – internal and external, subjective and objective, conscious and subconscious – that distance the viewers from the image and at the same time connects them to it. Ron Burnett

suggests that the "intersections of creativity, viewing, and critical reflection are fundamental to the very act of engaging with images in all of their forms" (13). The purpose of this experiment is to allow mediators to creatively express and reflect on the images the poem forms in their mind's eye. They select an image from the poem that particularly intrigues them or that they regard as central to the poem's identity and draw a graphic representation of that image on a canvas of the greyed-out text. The picture might be realistic, impressionistic, or symbolic. It could reflect how the image functions in the poem, how it changes in the course of the poem, and/or how the mediator feels about the image as it appears in the poem.

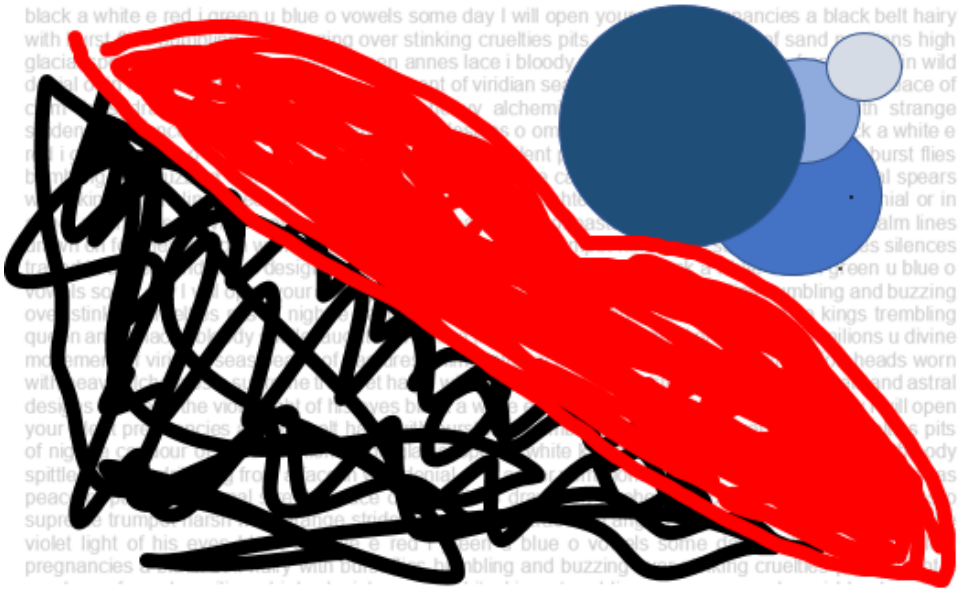


Fig. 8. Phase window display of a drawing in "Canvas"

The mediator reflects on his choices in the log, keeping the seed questions in mind.

- What image did you draw?
- What in your personal experience might have caused you to connect with this image?
- What stylistic choices did you make to convey the tone of the image?
- What other observations do you have?

As noted in my log, my drawing, seen in Figure 8, moves from the lower left corner of the canvas to the upper right. The black scribbles represent the dark pit of chaos – the deep recesses of unspoken ideas and words. It is a place I know well, as I often feel inspired to create or to bring order, but am intimidated by the constraints of my own insecurities. The central position of the giant red lips shows the overcoming of chaos, the breakthrough of verbalization. Emerging is the new creation, figured by rising blue circles. The drawing intentionally omits white and green colors to focus on the beginning and ending states of being and the means to move from turmoil to completion.

Giving students opportunities to investigate the sounds and images that anchor the poem opens new dimensions of the text, but exploring the poet's basic tools of words, space, and time also yields fresh perspectives.

Verbal agents

Between sounds and images exist words. Sounds comprise words, words comprise images. It would be simple to understand, if only words were simple. However, even outside of a poetic context, the concept of "word" defies comprehensive explanation. A definitively human expression, words enable thought and communication by naming objects or concepts and by placing them in logical and emotive discourse through a system that meaningfully manages signs and signifiers (Paz 22). Octavio Paz describes the word as "a bridge by which man tries to traverse the distance that separates him from external reality" (25). Like their creators, words are born, change, and die, and during their finite existence, lead complex lives. They have the qualities of being able to explain and to be exchanged with other words. Within them lies a plurality of meanings that derives from their origins, their evolving use through time, the

personal associations that various groups and individuals attach to them, and the specific contexts that surround them. These latent potentialities can influence the ways in which they contribute to image construction. For this reason, Paz determines that the "return of words to their original nature – that is to their plurality of meanings – is the…first act of the poetic operation" (94). The "WordTrace" experiment helps mediators expose the plurality of words.

Experiment: WordTrace

The "WordTrace" experiment enables a mediator to track a word's meanings through its origins, historical evolution, present connotations, personal associations, and contextual connections. Students can search the word in several online dictionaries. After reviewing the various dimensions of the word, the mediator completes the "WordTrace" form in the phase window.

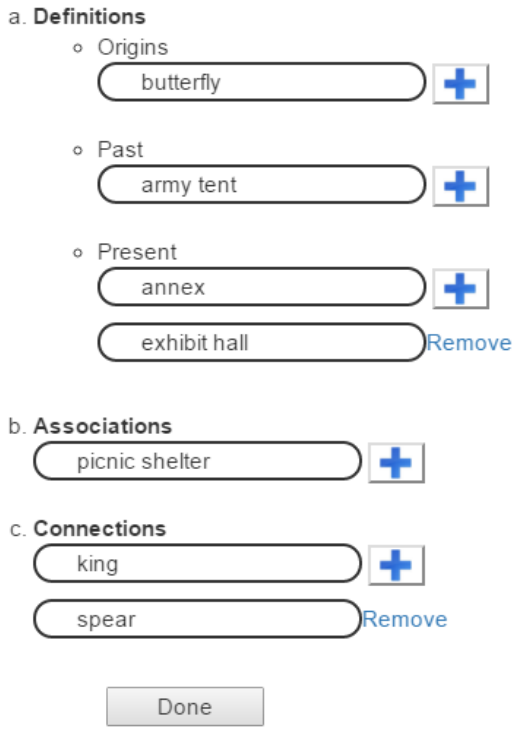


Fig. 9. Phase window display in "WordTrace" of a completed form for "pavilion"

The form, illustrated in Figure 9, has three sections. The mediator enters definitions in Section A. The definitions are divided into three categories: origins, which refers to the word's etymology; past, which refers to the word's changing meanings through time; present, which refers to the word's contemporary use. In Section B, the mediator adds personal associations the word has for her. In Section C, she enters words from the poem that relate to the target word. Clicking on the plus sign will open new entry blanks in any of the form's sections. When the mediator completes the form, she clicks, "Done." To display the "WordTrace," the mediator again selects the word from the poem in the text window. The phase window displays the multiple entries related to the target word. Origins of the word appear in pink, past definitions in gold, and present in red. Blue type indicates personal associations the word has for the mediator, and green type connections that the word has with other words in the poem. The view, pictured below in Figure 10, offers the mediator the opportunity to consider the fuller scope of the word and possibly to gain new insights into the poem's images.

Fig. 10. Phase window display of a "WordTrace" for "pavilions"

In her log, the mediator records new revelations that the seed questions might help her categorize.

- How does the word's history affect your understanding of the poem?
- How do your cultural or personal associations figure in your interpretation?
- What terms or concepts appear more than once in the poem?
- How do those terms or concepts evolve in course of the poem?
- What else do you observe about repetitions in the poem?

For example, in my log, I share that the word "pavilions" evokes memories of weekly childhood picnics at White Rock Lake or of sampling the fares of other countries in the exhibit halls at the State Fair of Texas. In my "WordTrace" of the term, "pavilions," I was surprised to learn that the origin of the word was the Latin, "papilio," meaning "butterfly." The flaps of the ornate tents of Roman military officers, when pulled back to the open position, resembled butterfly wings. As I record the observation in my log, the military connection suggests a possible relationship between "pavilions," "white kings," and "high glacial spears" that influences my understanding of the poem. "WordTrace" unveils the internal layers of meaning that a word carries with it. Similarly, external relationships to other words can also expand the target word's universe.

Experiment: Order

Words are chameleons. They take on different shades depending on their emotional or physical environment. So, another way to tease latent meanings from words and to expose them to fresh views is to alter their arrangement within the context of the poem's word set. That objective is the focus of the three short experiments in "Order." "Reverse" orders the text from last word to first. The effect is to see the words in isolation rather than in phrases, thus bringing to close attention words that might have been overlooked before. A technique of proofreaders, reversing the text intensifies the focus on a specific word by averting the eye's tendency to see

words in groups. For example, in the clip in Figure 11, the reverse order moves “alchemies” to the first word of a stanza, bringing it into greater focus and forcing attention to it.

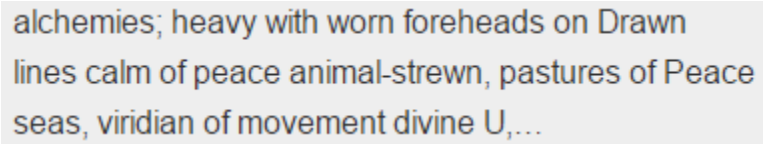


Fig. 11. Phase window display of “Vowels” in reverse

The second experiment, “Randomize,” serves the words in endless computer-generated configurations to see how changing proximities alters tonal character. Interesting combinations observed in Figure 12, juxtapositions such as “High of face anger,” “dribbling candour,” and “hairy sand” startle students in looking closer at the poem’s language.

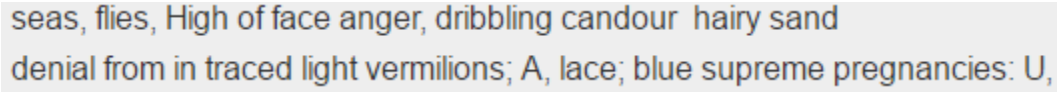


Fig. 12. Phase window display of a randomized view of “Vowels”

Entering “Rearrange” turns the text into a bank of terms from which the mediator creates his own poem. Words are grouped into parts of speech as they function in the poem. Cutting and pasting from the list, the student may choose only words from the poem and in the same form as they appear in the original to create a new poem such as the one in Figure 13. The instructions ask the budding poet to give the new text a title and to compare or contrast it with the target poem.

The seed questions of the log invite mediators to document the enlightening word combinations that they observe.

- Looking at the poem in reverse, which words stand out to you?
- What are some words that changed for you when you saw them in different word combinations?
- In what ways is your poem like or different from the original poem?
- What other observations do you have?

School Day

Black designs
Bloody candor
Harsh laughter
Calm cruelties
Buzzing silences

Bursting foreheads
Trembling

Black and white
Or black and blue
Strange peace
In silent nights
Of denial
And stinking pits –
The supreme spear.

Fig. 13. Phase window display of a poem created by rearranging selected words from "Vowels"

As I scanned the reversed poem, I logged several striking occurrences that had intensifying effects. For example, the reverse causes the poem to open with an exclamation, "Eyes!" The arrangement magnifies the ecstasy of the final phrase. Also, when "pits of night" becomes "night of pits," it deepens the depressive tone. Similarly, "Randomize" offers some intriguing pairings. "Viridian seas" becomes "glacial seas," and "pastures animal-strewn" becomes "pastures astral." In both cases, the association with a different word increases the understanding of the expanse of the sea and the pasture. The first two experiments in "Order," inspired me to rearrange the words into my own poem, "School Day," which turned out to be similar in tone to the first half of Rimbaud's sonnet but lacking the upward turn of his ending. However, as fascinating as word combinations might be, arrangement involves more than word order. In addition to shaping the physical appearance, the creative use of space also shapes its meanings.

Spatial agents

Discovering space in poetry yields surprises and consequences not unlike that of early voyagers who discovered that the world is round. The earth is not a flat surface. It does not have a distinct point of origin or an end from which unsuspecting travelers might drop into oblivion. Rather, the world is a sphere with no beginning or end. Distinctions of north and south, center, east and west arbitrarily impose perspectives that reflect and shape the worldview of the designers of those distinctions. These new understandings of natural order opened the minds of explorers to infinite possibilities in the search for the undiscovered that continuously expanded their perceptions of reality and how to manage it. Similarly, in poetry, space traditionally has been regarded as a finite writing space, the static flat surface on which the letters of the poem live out their prescribed, two-dimensional existence. Now, however, technology has changed space from writing surface to writing. To describe the new role of space in the technological environment, Paz proposes terms such as "active," "animated," "plural," "vast" (258). It consists of the space on which thought is written in a limitless variety of new constructs allowed by the creative tools of digital platforms as well as the open spaces, which also speak. Silence speaks. In his discussion of *The Open Work*, Umberto Eco says that the purpose of blank space is to open the poem to the unfettered response of readers who create sense from the interaction of the text with their personal emotions and experiences. Along with spatial arrangement and typographical choices, the blank spaces contribute to generating "a halo of indefiniteness [that makes] the text pregnant with infinite suggestive possibilities" (8). Paz does not see that indefinite space as primarily allowing for subjective interpretation. He views the blank space as providing an "intersection of different points of view" that create possibilities of interpretation (252). In both

ways, digital methods afford high school students the means to explore the dynamics of poetic space and learn to listen to what the silence says.

Experiment: Space

In this simple experiment, the mediator plays with the effects of space on her understanding of the poem. Cause and effect can best – perhaps only – be observed and measured as they are in operation. For example, in looking at a photo of a boy holding an open, half-full box of candy, an observer might draw any number of conclusions from what appears or does not appear in the photograph. But if an observer comes upon the child with that box of candy, the observer will be able to watch the candy-eating process and determine the effects. If the boy eats one piece of candy, the effect might be that he spits it out or that he wants more candy. If the boy eats two pieces of candy, he might be satisfied or he might want more candy. If the boy eats three pieces of candy, he might be satisfied, he might want more candy, or he might get a stomach ache and wish he had not eaten any candy. Depending on the observed effects, the candy might be perceived as enticing, satisfying, or dangerous. The live action also opens a host of other possible conclusions. In the same way, digital experiments with space activate the poem and allow mediators to observe the effects of the use of space as part of a dynamic process. The mediator positions the cursor to add or delete spaces between letters, words, lines. She also may make changes in capitalization, punctuation, and typography to complement the use of space. Making changes allows her to better assess the effects of space in the original poem. A screenshot cannot reasonably convey the tinkering that occurs in this experiment, nor can a log contain all the options tried. The mediator plays with multiple

possibilities, but records only the few most interesting as they reflect on their results in view of the seed questions.

- How does adding or subtracting distance between neighboring words affect the pace of specific lines or the entire text?
- What do the silences say?
- How do the changes affect your perception of the poem?
- What other observations do you have?

The question that drew my attention in the log had to do with the role of silence, for that is one factor that space supplies. It seems to me that, primarily, the silence reflects the emotion of the reader. It is the place of the greatest ambiguity and the greatest opportunity. So, in the opening lines of my experiment, the spaces are removed: "BlackAwhiteEredIgreenUblueOvowels." Removing the spaces heightens the sense of urgency. Here the speaker makes his pronouncement with virtually no chance for an emotional response from the reader. Toward the middle of the poem in my experiment, punctuation wedges space into the text, opening it to personal interjections: "U,...divine movement of ____viridian seas" and "Peace of c__a__l__m lines." But at the end, the spaces are uninterrupted, allowing the reader to pour her own memories and hopes into the experience of the poem: " O Omega the violet light of His eyes!" Space introduces time into the reading.

Chronological agents

Time misbehaves in poetry. It is not chronological. Various combinations of words and space make it seem to extend or fold in on itself, to swirl in overlapping waves or spurt like a playful fountain. If there were a way to categorize the functions of time, the traditional linear view of past, present, and future might suffice. However, time is indivisible. It exists only in the present, and the present exists for only the tiniest fraction of a second. All else is memory of

events that have transpired or anticipation of events that will transpire. So, it could be said that time possesses actual and virtual aspects. Actual time is the true present, which in its flash of self-awareness contains the virtual – the continuous conceptualizations that represent events held in memory or anticipation. Yet, for its ephemeral nature, time exerts a powerful influence on poetry as it hearkens not only to the urgency of the present but also to the full range of human experiences and aspirations. Tracing the interactions between its actual and virtual aspects can engender unexpected perceptions from which to construct meanings.

Experiment: Chronograph

"Chronograph" provides the mechanism for the mediator to identify and graph the workings of time in the poem. First, he searches for time indicators, such as those listed in Table 1, that alert him to operations of the here and now, memory, or anticipation. Those indicators might appear in the form of literary devices, signal words, or pacing tools such as sounds, space, and punctuation.

Table 1. Cues that time has become a factor

TIME INDICATORS			
Devices – Memory	*Devices – Anticipation*	*Signal Words*	*Pace – Sounds, Space, Punctuation*
Flashback	Flash-forward	Time relationships	Extend/slow
Allusion	Allusion	Hour	Compress/speed
Remembrance	Foreshadow	Season	Pause
Backstory	Cliffhanger	Cause/effect; sequence	Stop
Dream	Dream	Verb tense	Suspend

Having observed and reflected on the time factors in the poem, the mediator then graphs those elements in relationship to one another. The vertical axis of the graph corresponds to the lines of the poem, and the horizontal axis to the time aspect. The student will choose shapes and colors that best represent his understanding of the time functions.

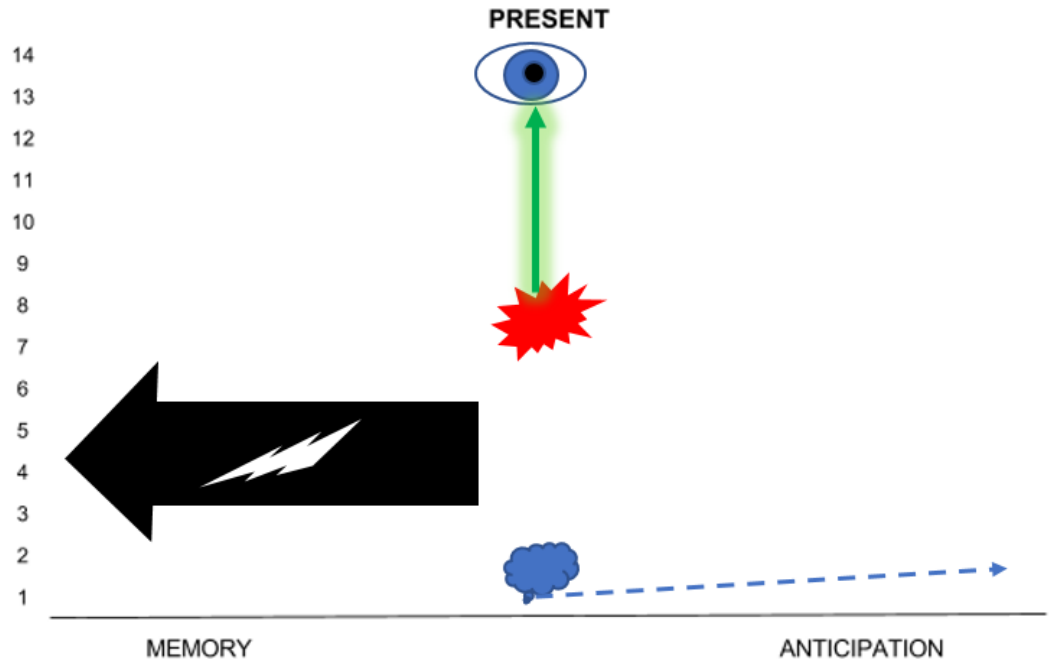


Fig. 14. Phase window display of a humanistic graph of the operations of time in "Vowels"

The seed questions ask students to consider the possibility that the poem does not begin at the beginning or end at the end.

- Is the chronology of the poem linear or non-linear?
- How do present, memory, and anticipation relate to each other in the poem?
- What other observations do you have?

The observations recorded in my log indicate that the poem appears to open in the present with a vision of the future – the day when the speaker will force the vowels to give up their secret. The images in the chronograph in Figure 14 correspond to the colors of the vowels in the poem. The grim images of black and white seem to hearken to past events that have the power to stop the vision from coming to pass. Lines six and seven return to the present when the speaker explodes in red-hot rage, finally breaking the hold of the past and moving toward peace and freedom, depicted respectively in green and blue. My chronograph reflects the perspective that the timeline of the poem is not a line. The timeline is a moment in the present that contains the

memories of the past and the dreams of the future. Or maybe not. One purpose of the chronograph is to help students feel comfortable with uncertainty and with the reality of multiple existences that inhabit the poem. Mediators do not have to fill in all the spaces.

Translations

Whereas the experiments set the poem in motion to open its components to investigation, the translations provide mediators the opportunity to synthesize and visualize their discoveries in emotionally satisfying, humanistic presentations. Their creations complete the communication initiated by the poet. Unlike the concrete communication that transfers information and requires a literal understanding of the sender's message, the poetic communication features ambiguities that stimulate thinking and confront the receiver with choices. The poet thinks, and then encodes that thought in sounds and images crafted within a specific framework of words, time, and space. Readers decode the poet's expression, and then – in an act of translation – encode it within the framework of their own experiences and skills. They remake the poem. Making sense of poetry follows the process that underlies all communication, reading, and translation. Although that process allows for individual differentiation, ultimately all the products will bear the genetic markers of the original poem. Eco indicates that the artist circumscribes certain premises and possibilities and invites interpreters/translators to collaborate in the completion of his work within the field he has established. The artist – in this case, the poet – "does not know the fashion in which his work will be concluded, but he is aware that once completed the work in question will still be his own" (Eco 19). Yet, despite the connecting cord between the parent and all its offspring, each translation brings new life to the original poem and with it an enhanced experience for the translator. With digital media, students call on their experimental interactions

with “Vowels” to create both a verbal and a multi-media translation of the poem. The closeness to the poem that they have developed during the experiments allows them to inventively yet authentically represent its style, its progression, and even its ambiguities. Rather than produce word-for-word equivalencies, they recreate the overall impression the poem had on them.

Multi-media Translation

The “PoemSquare” is a ninety-second multimedia translation of the poem that the mediator constructs from files she has created or borrowed. To begin the process, she first reflects on her prior experiments and draws conclusions about what and how the poem means. She considers the following questions:

1. What interests, skills, or experiences of yours might bring an interesting interpretive perspective to your translation? For example, can you dance the poem, paint it, play it on a musical instrument? How would you convert those innovative expressions of the poem into a digital format? What electronic devices might you use to do that? Or what media files that you have located might you use in your translation?
2. What phases or movements does the original poem seem to go through? How will your translation reflect those phases?
3. What associations do the poem’s images have? Will the stills and/or videos you choose for your translation depict the verbal images literally? Figuratively? Impressionistically? Or will you use different styles in combination? How will your selection and treatment of graphic elements reflect the essence of the poem?
4. What words or concepts change over the course of the original poem? How will you account for those changes in your translation?
5. If you were only going to incorporate a few words from the original text into your translation, what words would you choose? Or will you use other words? Or will you use no words at all? How would you use font, size, and color so that the visual appearance of the words helps to communicate your perception of the poem? What impact do specific sound features have on the poem?
6. How does sound contribute to your understanding of the poem? How will your observations on sound affect your choice of music or other sounds? Will the sounds you choose highlight your images by matching them or by contradicting them? Will you use sounds to emphasize the transitions in the poem?
7. Who will be your audience? How will your knowledge of your audience affect your translation?
8. Essentially, what is this poem about for you?

The PoemSquare, seen in Figure 15, comprises nine tiles that the mediator can configure in any way she chooses. Tiles can be deleted or loaded with one of four types of media files: text, sound (wav, mp3), still image (jpeg, png, gif), moving image (mov, mp4). Each tile can play for up to ten seconds.

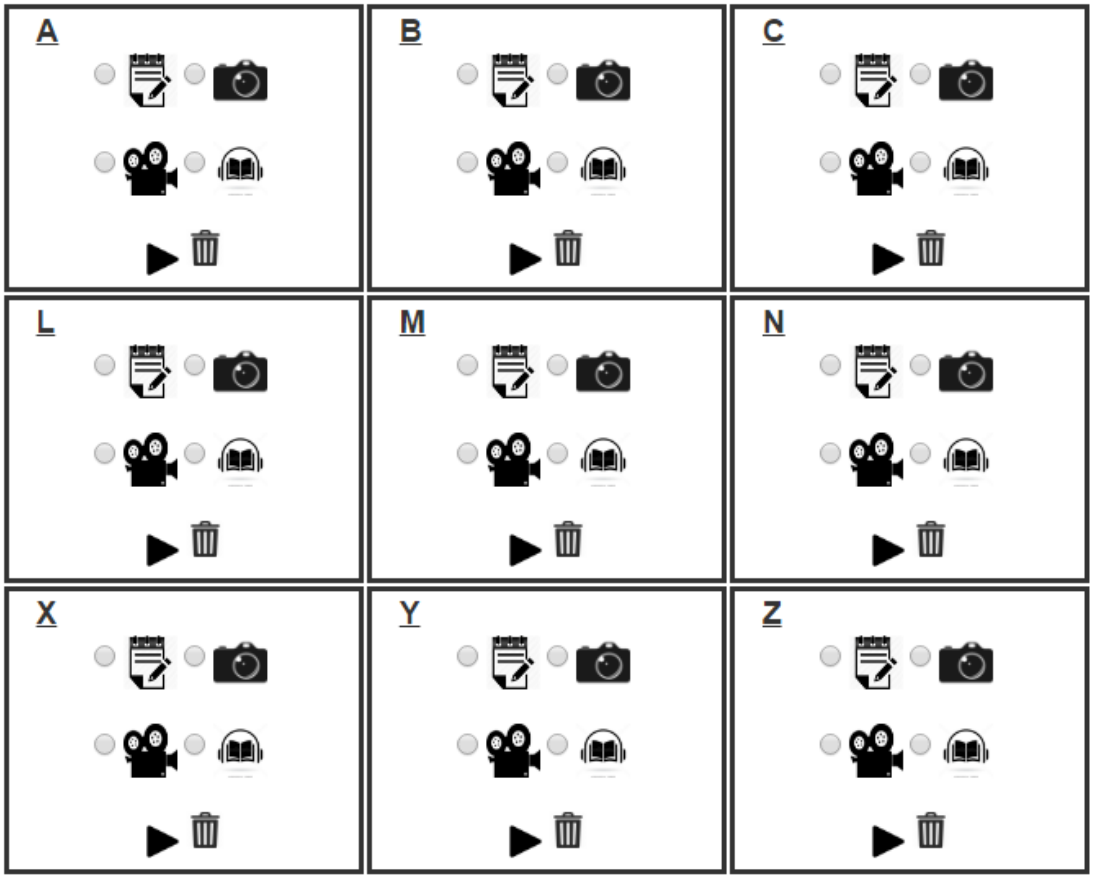


Fig. 15. "PoemSquare"

The completed "PoemSquare" has three play options: manual, slideshow, and sparkle, shown in Figure 16. The manual mode allows a viewer to select tiles to play in any order. The slideshow mode plays the tiles in the order the mediator prescribes. In a collaboration between man and machine, the sparkle mode plays the tiles randomly in computer-generated sequences to produce surprising effects.

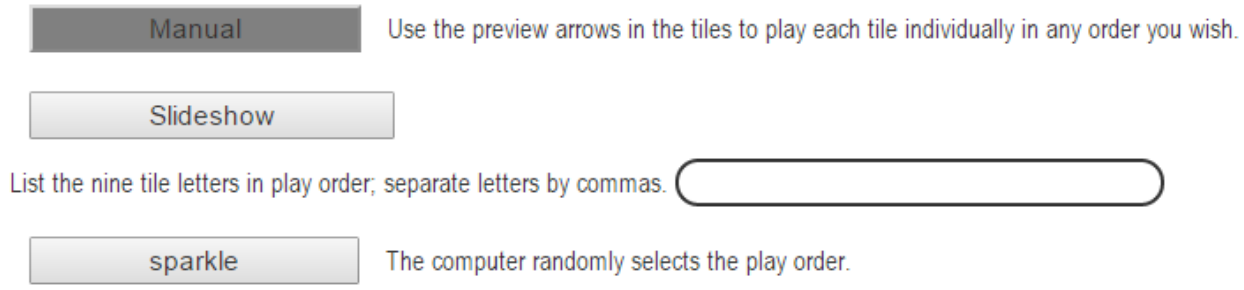


Fig. 16. "PoemSquare" play modes

The mediator documents her interpretive perspective and creative choices in the log. As I explain in my log (Table 2), my PoemSquare adopts a framework of the struggle to verbalize painful memories as a necessary step to finding personal peace.

Table 2. A completed "PoemSquare Explanation"

Interpretive perspective: In this PoemSquare, I view the poem from the perspective of post-traumatic stress; one possible theme seems to be that memories too hard to share become a torturous source of decay that leads to insanity until their victim forces them to confess and set him free; although any past traumatic experience could apply, I chose the context of war memories; the poem was written during the Franco-Prussian war, which intruded into Rimbaud's life; the father who abandoned him was a soldier; war imagery appears in several lines of the poem; during the same time period as the writing of "Vowels" Rimbaud wrote several poems about the nasty causes and effects of war Structure: The structure of the PoemSqure moves for the most part from bottom to top and from left to right to reflect the upward progression of the poem; the tiles are arranged to feature the contrasts between Alpha/Omega, black/white, red/green, silence (in beginning)/silence (at end), pits/heavens

CHOICES	EXPLANATIONS
TILE A	
• Still image: Alpha	• Rimbaud altered the traditional alphabetical order of the vowels. Since the last line of the poem opens with "O…Omega," – the end – it is reasonable to regard "A" as the beginning; the Alpha/Omega merism of my translation includes all the vowels in between
• Still images: Rimbaud with title in French; reversed Rimbaud in blue tones with title in English	• Of the few images of Rimbaud that exist, I chose the Fantin-Latour painting because it was created within a year of the writing of "Vowels," and because it reveals the youth and pensive nature of the poet. I wrote the title of the poem in its original French. Then I reversed the image and added the

• Opening measures of alphabet song	title in English to show the aspect of translation and to reflect the poem's motif of turning things inside out. • The translation opens with a few measures from the children's alphabet song because of its focus on letters and because some biographers associate Rimbaud's use of vowels and colors with a childhood piano lesson that matched notes (A-G) with colors.
TILE L • Descending order • Black screen • No sound	• To open the translation, I chose a descending order rather than left to right because the first images take place in the pit • The first word of the poem is "black." • That the vowels are silent is the problem, so the translation begins as the poem does – in silence
TILE X • Still image: blurred; eyes of soldier • Sound: speak	• The protagonist – the stoic soldier – suffers in silence the memories of what he has seen and done in war. I cropped the photo to focus on his eyes and blurred the image slightly as if to peer into the memories that haunt his soul • The apostrophe of the opening lines pledges to make the vowels give up their secrets. I recorded the word speak, repeated it to reinforce the command, and added a reverberation as a lead-in to the past
TILE Y • Video: black; silhouetted bombers in sky; bombs dropping; bombs hitting ground; mother and child in bombed home • Sound of buzzing insects under all images	• I set the translation in the context of modern warfare. I created a ten-second montage of a bombing mission in the Middle-East. The bombers swarm the sky like a black belt; the bombs burst from the plane and pepper the ground like stinging insects; the mother and child – usually a symbol of hope and innocence – are left in rags and utter devastation. As this image is the black alpha image, I edited three of the four video strips into black and white; I left the bomb strike in color to show the force of the hit. • The poem emphasizes the sounds of corruption – like stinging flies over a stinking corpse hastening its decay. The soundtrack for the montage is the

	recorded sound of wasps in a swamp. It magnifies the effect by allowing the mind to supply the sounds of bombs and screams and associating with the image the natural fear and disgust of swarms of stinging scavengers
TILE Z • Still images: white on black; Washington seats of power alternated with helmet on boots on battlefield • Sound: military drum cadence	• In contrast to the black of the preceding images of victimization, the poem moves into images cast in white. The diction of the opening two lines of the second stanza suggest the cold, arbitrary seats of authority where decisions of war are made by powermongers who never suffer the effects of their edicts. Translators of the original French poem differ on the meaning of "candeurs des vapeurs." The phrase could indicate steam rising from the starkness of a cold scene. Or it could suggest the harsh reality of smoke rising from the battlefield. "Pavilions" are tents that are military headquarters on the battlefield. "High glacial spears," and "White kings" reinforce the military interpretation. Even "trembling Queen Anne's lace" could be viewed as the power brokers trembling with greed and bloodlust. So, I translated these lines with images of US seats of power: White House, Capitol Building, Supreme Court, Washington Monument. I edited the images to make the white more stark and garish. I also alternated these images with the classic symbol for loss of a soldier's life on the battlefield – a helmet resting on the butt of a soldier's rifle that is stuck into the ground. I reversed the image to associate the deadly effects with the white that is the color of the remote and insensitive decision makers whose pristine hands never see the color of blood • For the soundtrack, I used the military drum cadence for its associations with mechanically following commands
TILE M • Ascending order • Center tile • Still image: colorized red spectrogram of the word "face"	• The ascending order signifies the beginning of healing. • Associated with the color of red, the "I" vowel is the center of the vowel list. It centers on the protagonist – the soldier who, left alone with his own actions and memories, finally expresses them in an outburst of insane rage. • To visualize insanity and rage, I used the spectrogram of the word, "face." It, too, is at the center point of the poem – the last word of the

• Sound: trochaic demonic laugh	seventh line – and for me had the most dynamic sound signature in the spectrograms of the poem. It contains the shape of a hellish skull in a field of electronic static. I colorized it red and added three black strokes to define the left side and to add eye sockets. • The trochaic rhythm of this line with its stress on the first syllable adds a ponderous tone. I used the meter to create an ominous laugh. I slowed the speed to lower the pitch and make it more bizarre.
TILE N • Still images: colorized green and pixelated soldier in field; green hillside of military cemetery with bone-white headstones • Sound: digital sounds	• Expressing the anger takes the soldier to a place of peace. Green is associated with new life, which ironically is found in death. It is the "Peace drawn in calm lines" on worn foreheads. The rage has ended, the edge of pain is gone. But the weight of memory still imposes itself. I chose an image of a soldier standing alone in a field. I colorized it green and pixelated it to indicate the translation from one dimension to another – the rolling hills of the cemetery hillside where the soldier's comrades wait. • The sounds of an electronic arcade game signify the change.
TILE B • Ascending order • Text only: Renaissance • No sound	• The poem opens in black pits; it ends in the heavens. The tile order ascends to the upper level. • Set free to come to life again
TILE C • Video: nebula • Sound: strident trumpets • Still image: soldier crying	• The poem opens in black pits; it ends in the heavens; in the unfamiliar country. I am using a Hubble image of a distant nebula to represent this place of "angels and astral designs." The nebula resembles an immense blue eye of understanding and acceptance. • The trumpet's call has many associations. It sounds the battle cry, it calls to order, it pronounces victory. In my translation, it does all. I created the sound of the trumpet on a synthesizer and amplified it in *Audacity*. • Here the soldier finds release. I chose an image of the soldier finally able to grieve.

• Still image: Omega • Sound: "shhhhh"	• Here the trumpet supremely proclaims the end of struggle. It is the Omega. Signifying the "O" vowel, I used the image of the Greek symbol for "Omega." • The last stanza contains many fricative consonants such as "s," "sh," and "z." They have a softening effect compatible with the "silences." I end the translation with my recording of "shhhhh." The silence at the beginning was the forced silence of repressed emotion. The silence at the end is the silence of peace.

The experience concludes with each mediator showing a personal PoemSquare to the class and participating in a discussion that recognizes and celebrates the differences in each presentation. By the nature of poetry, many plausible views exist, and each unique perspective will enrich the understanding of all. One mediator even might waiver between multiple interpretive possibilities. The verbal translation gives him an opportunity to explore those alternatives.

Verbal Translation

In the text-to-text translation, the student translates the poem into the language of his generation. He considers his observations in the experiments on sounds and images, on words, space and time. The goal is to recreate the poet's work in a way that maintains the integrity of the original, represents the mediator's experience of it, and makes that experience accessible to his peers. In the digital environment, the translator can artistically edit his text to strengthen the interpretive perspective of his translation. He can apply variations in spacing or in font treatments such as style, size, and color or bolding, italicizing, and underlining.

This translation, too, requires a documentation of creative choices. When a mediator has traipsed around inside a poem, curiously turning it inside out and upside down without trying to make too much of it in the moment of discovery, a relationship begins. Gradually, what first may have seemed dissonant and unfathomable, comes to feel comfortable. The cursed becomes

appreciated. The mediator handles the poem not with reverence but with respect, and in his translation, he finds he now has something to say as well as the freedom to say it. Replicating some of the target poem's characteristics and expressing other of its aspects in inventive ways, he creates a hybrid that distinctly bears the imprint of both its parents. The intimacy of the verbal translation – the word-to-word connection that emerges from the digital fragments – yields profound satisfaction.

VOWELS, languishing in your panoply of colors,
Soon I will call into being your potentialities:
Amid black straightjackets of shrill scrawls,
Of stinking traditions bumbling in subterranean tombs;
Escaping the stark whiteness of *vaporous* halls,
Piercing stares of ice kings and their fawning entourages;
Into crimson billows, blood shouting, beautiful lips laughing
With rebellion or the *intoxication* of freedom;
Unto divine circles, undulations of green waves,
Peaceful like flowing meadows, like calm ripples
That *transformation* imprints on thoughtful brows.

O, supreme Trumpeter, blaring my **INCANTATIONS**
Across blue silent spaces traversed by flesh and gods;
Oh, Omega, the transparent clarity of my eyes.

Fig. 17. Text-to-text translation

My own log describes the tango between the original poem and my verbal translation (Figure 17). I kept the fourteen-line format of the sonnet, but adjusted the spacing to produce three segments: the apostrophe of the first two lines in which the speaker addresses the vowels, the four images associated with A, E, I, and U, and the ecstatic cry of accomplishment in the final three lines. Unintentionally, I also kept the end sound of /z/ in all except lines two lines, just as did the original poem. Possibly, the surprising similarity evidences the empathy that arises between poem and translator during the experiments. Rather than naming the vowels and linking

them to colors, in the opening line I invoked the vowels by coloring the type. The interpretive framework is that of a poet determined to free his muse from restrictive traditions to issue forth a creation the world has not seen before. Maintaining the original color scheme, the four images of the central segment represent the struggle and transformation. I kept my favorite word, "bumbling," but in its new context it more nearly means "inept" than the sound of insects. To keep true to Rimbaud's derangement of the senses, I also incorporated synesthetic phrases such as "shrill scrawls" and "blood shouting." Those terms that feature the spiritual nature of the effort – vaporous, intoxication, transformation – I italicized and greyed out. The last lines are separated from the others as the speaker praises himself for the breakthrough, although the segment does hearken to the opening line with the use of color for "incantations." The vowels – that is, the words they represent – are the magic that enables the poet to walk among the gods. "O" becomes "Oh" in my last line to distinguish between the vowel and the interjection. The line is bolded and italicized to intensify its emotional force.

In the verbal translation, as in the multimedia, the digital experiments have opened the poem to multiple understandings, and the digital environment offers a creative palette to synthesize the generated data in unique renderings of the text. Translation supplies the component that has evaded the visualizations of past digital ventures in poetry analysis, leaving them ultimately unsatisfying. That component is the human element – the emotional, spiritual, or intellectual interactions between the poem and its readers. Teachers can find that in upgrading their curriculum to include digital methods, they can interest their students in the technical aspects of poetry and inspire their love for the art as they remake a poem within the context of their own perceptions and experiences.

CHAPTER 5

REMAKING POEMS: UPGRADING THE CURRICULUM

Poetry will find its role in the digital age because Rimbaud was right. Poets – the visionaries of language – will explore the new world and test each creative avenue the realm offers. But what of the study of poetry and its high language? To inspire high school students to enjoy and benefit from it, the study of poetry must also set its face toward the digital horizon. The necessity goes beyond the mere fact that the natives of the new millennium think differently than their elders. More importantly, digital applications bring language close like Hubble does the galaxies, which allows students to examine its intricacies to become better readers and writers. Nevertheless, despite the obvious benefits, the transition to a digital curriculum for poetry analysis has its challenges.

The scorn the academy harbors toward innovation threatens experimentation with and implementation of digital methods in education. Traditionalists view proponents of technology and humanities integration as snake-oil salesmen making Faustian bargains that will extinguish rather than enhance the artistic use of language. Decrying what Adam Kirsch calls the "false analogy between the humanities and the sciences," they characterize computer-related literary projects as unnecessary, ineffective, and impractical at best and, at worst, insidious, like a flesh-eating virus that devours the ability of humans to think. Kirsch claims an "intellectual responsibility" to resist "the tech tsunami" to protect the community's literary birthright. Like Stanley Fish, many scholars have drawn the battle lines saying, "Whatever vision of the digital humanities is proclaimed, it will have little place for the likes of me and for the kind of criticism I practice." They are right to critique the movement, as thoughtful criticism yields improvement,

but to choke it withholds from millennials what could be a productive means for strengthening rather than eliminating their language skills and love of literature. It is understandable but perhaps unfortunate that early advances in applying the computer to literary study involved big data and data mining projects. The leap was too great from the intimate one-to-one relationship between the scholar and the page to the distant reading of massive corpora. Naturally, the messiahs of change provoked establishment fears and resistance. But if our children are to enjoy the blessings of their linguistic birthright, both the humanists and the techno-humanists must lower their defenses. Because the task is daunting, the traditionalists and the tinkerers must collaborate to upgrade the curriculum to some measure of relevance to this new generation of thinkers.

Aside from philosophical opposition, the foremost problem teachers and curriculum writers face in revamping pedagogical modalities is their ignorance of computer functions and the technical skills required to employ them. This dissertation offers a case study of the challenges. As a seasoned teacher of high school English, I have ample opportunity to witness the deadening effect and negligible results of traditional methods of poetry analysis. Personally, I thrill to take to the desk and under the document camera perform a biopsy – students might say an autopsy – on the poet's literary strategies and the poem's central theme. However, what Fish would call, "my kind" of criticism generates little enthusiasm among the students. I am jealous of the immediate explosion of energy that comes when they pick up their phones to share apps that allow them to creatively manipulate text and images. Their relationship to increasingly intuitive technology does not correspond to the relationship of previous generations to their labor-saving devices. Much more personal, today's teenagers' connection to technology is

essential to their identity, their behavior, and the ways in which they learn. Therefore, I launched this study in digital methods to bring the potential and the energy of that connection to the study of poetry. Armed with my experience in teaching literature and daring in my cause, I thought it should be easy to compensate for my lack of technical skills by relying on a variety of resources. For, although I use the computer regularly, I do not understand it and sometimes fear it.

Seeking tutorials to help me negotiate the digital environment, I immediately sank into a quagmire of foreign terminology and concepts. As I struggled to understand the most foundational concepts, I realized that for me to program my ideas for the computer would not be possible in my lifetime. Surely with the ubiquitous presence of the computer, programmers would abound who could help me. However, programmers do not abound. Professionals find little interest in obscure academic research projects and students of programming have their own projects to complete. Every lead failed, and I despaired of seeing the fruition of my work. Thankfully, the Translation Center at the University of Texas at Dallas loaned me the use of their student programmer, and we entered a collaboration that, though productive, was tedious and eye-opening.

The process for producing each activity partially reveals the complexity of shifting to digital methods. After conceptualizing an activity, I wrote straightforward, detailed instructions as to how it should look on the screen, what the text should say, and how the activity should work. Appendix C.1 provides an example of the instructions to the programmer for "Rhyme." In addition to the step-by-step instructions, I provided all information the programmer needed to complete the instructions. For example, for "Rhyme," that information included a list of phonetic symbols I devised, a list of the frequency with which those sounds appeared in the

poem, a list of the HTML color codes I assigned to each phonetic symbol and how I wanted the colors to be used, and a phonetic transcription of the poem. Upon receiving all the instructions and information, the programmer wrote a feasibility study in which she restated the task in her own words and estimated the time for completion. I reviewed her notes, clarified any discrepancies, and authorized the work to begin. As technical issues arose, we dealt with them in meetings by text, phone call, email, video conferencing, or in person. On completion, the programmer demonstrated the activity to me, invited suggestions for revisions, and made the requested changes. A portion of the code for "Rhyme" is supplied in Appendix C.2. To write the code for all the activities involved hundreds of hours and the use of multiple programming languages such as HTML, CSS, PHP, and JavaScript. "PoemSquare" alone required more than four thousand lines of code. The intricacy of that work requires a skill set unsuited to most literature teachers. Of course, teachers interested in using digital experiences to ignite their students' interest in poetry analysis do not have to wait for elaborate experiments to be written. As I did with "Canvas" and "Chronograph," they can even now create activities from common word processing and draw programs they have at their disposal on their classroom computers. Publication of their grassroots ventures may help allay scholarly fears and inspire formal research into upgrading the curriculum.

Ultimately, efforts to bring significant curriculum change requires institutional, interdisciplinary support. University humanities departments could add courses in basic computer functions and skills and perhaps require at least one of them. Although most literature teachers do not have the genetic constitution or the time to be programmers, the knowledge of how the computer and its languages function may stimulate their thinking about how to design

instruction to better meet the needs of their digitally-minded students. Furthermore, such courses could provide a field for collaborations between humanities and technology doctoral students for mutually beneficial digital curriculum applications. Experiments with the essentially human phenomenon of language could not only renovate the English curriculum, but also could provide an ideal testing ground for the capabilities of artificial intelligence. An artificial intelligence that distinguishes the difference between "reading" as a noun, a verb, or an adjective would allow writers to create programs that apply to all poems instead of specifically coded ones. In addition to universities, professional literary organizations could expedite change by offering incentives to members who pioneer innovative computer-assisted curriculum and hosting a website that features news about digital projects. That, of course, brings us back to the need for champions. Little progress will be made in the face of substantial dedicated resistance.

It remains to the few enlightened faculty, to the increasing number of doctoral students, and to the teachers of secondary school students to continue to make small gains until the balance swings in favor of the reading public. As for this project, I am building a website called *Remaking Poems* that will make the experiments available to others. The website will be organized in line with the categories detailed in this paper with tabs for "Experiments" and "Translations." "Experiments" has a drop-down menu for aural, visual, verbal, spatial, and chronological activities. The "Translation" menu features verbal and multimedia translations. It will include a "Showcase" tab that directs users to a library of finished verbal and multimedia translations. Completing the website will require improving the existing experiments, creating new ones, and deploying them on the website. Before the website opens to the public, decisions will need to be made about registration requirements, copyright compliance, and privacy laws for

minors. A long-term goal is to invite teachers to write their own experiments to deploy on the website for others to enjoy. In addition, the means should exist for teachers to register whole classes to participate in the experiments.

Maintaining *Remaking Poems* will require a team and a commitment, one that I make for my personal pleasure, for my profession, and, above all, for my students.

APPENDICES

A.1. "Aural Field Trip: Actions/Reactions Log"

Experiment: Aural Field Trip

SEED QUESTIONS:

- In the readings of the sounds of English, how do the waveforms reflect open and closed sounds? Which consonants seem to have the most or the least energy?
- In the poem, where does the sound appear to be the most complex? What connections, if any, do you see between the complexity of sound and the corresponding lines of the text? Which words have the highest or lowest sounds? The loudest or softest? The longest or shortest? The fullest or thinnest? What patterns, if any, do you observe? Which words have the most interesting sound signatures? How did you choose your color schemes for the spectrograms?
- What vowel and consonant sounds might closely resemble the graphs of the sounds to which the poem alludes?
- What other observations did you make?

Actions	*Observations*
Recorded consonant and vowel sounds; compared/contrasted waveforms	Generally, vowel sounds are longer, higher, and louder than consonant sounds. Open vowel sounds such as /o/, /a:/, /I/ are tall and wide; you can see the difference between open vowels that end with an open mouth and those where the mouth closes a little at the end; closed vowels are short and of various widths; voiceless consonants don't have much substance to them; consonants that seem to have the most energy are /s/ and /z/, /zh/ and /sh/; also the nasals /m/, /n/, and /ng/
Recorded poem to memory and played it back; divided poem into segments; tried several configurations but went with six segments: the one-sentence apostrophe in the opening two lines, and the phrases of lines 3-5a; 5b-6, 7-8, 9-11, 12-14; recorded segments and viewed spectrograms multiple times; tiled recordings to compare/contrast sounds; played with zoom and color schemes	Seems like the lines that have the most sonic energy are lines 7-8; they have a lot of open vowels such as /I/ and /a/; also fricatives such as /s/, /f/, and /v/, and voiced consonants such as /b/ and /d/; the sound is compact and has a lot of variation in intensity; very complex; those two lines also seem to express the peak of rage in the poem before the tone turns around in the next segment; interesting how the most complex looking sounds are the lines that express the most complex emotion; the single word that appears to be the most dynamic is "face" in line 7; probably because the vowel /A/ is not closed and fricatives open /f/ and close /s/ the short word; a lot of sonic power unleashed in that one word; for this segment I chose the reversed red/yellow/black color scheme because it emphasized the color red – a color associated with rage – and the most forceful sound shows in black, which represents the dark place of the soul these lines seem to convey; segments two and three are both in the reverse of the black and white because the two are opposite sides of the same reality – the black pit of decay and the white citadels of cruel power; chose the blue/red/yellow on a field of black for the opening lines because the fiery clarity depicts the challenge the speaker in chaos is throwing out to the vowels; last two segments in the blue/green color scheme indicate the transition to peace.
Identified three sounds referenced in the poem: insect bumbling and buzzing, insane laughter, otherworldly trumpet; found sound files for buzzing and trumpet; created sound file for insane laughter; compared/contrasted the waveforms of the files of the real sounds with the sounds of the words representing them	Clearly missing from the top frames are the indicators of consonants that separate vowel sounds needed to form words. But the remaining vowel sounds reveal similarities with the graphs of the words representing the sound; "Bumbling and buzzing" spectrograms share features of the actual insect buzzing – not just the /z/ sound but also the /uh/, the /m/, and the /ng/ sounds; also true in the word laughter and the sound of laughter, especially the

	/a/ and /ur/ sounds; the /e/ sound in trumpet closely resembles the sound of the trumpet;

Reactions:

1. Initially, I was just going to divide the poem by stanzas. But the process of dividing the poem into segments for recording made me aware that the entire poem is one sentence, a core sentence followed by five descriptive phrases which could represent a progression of events or various aspects of a single experience that occur simultaneously.
2. Using the reversed black and white color scheme for both the second and third segments helped me to see those two segments as opposite sides of the same reality rather than two separate scenes.
3. "Face" might be the most important word in the poem. Its sounds call attention to it., and everything else in the poem can be seen in relation to it. The "face" makes it personal touching my own fears, experience, and hopes.
4. I expected similarities between the sounds and the sounds of the words for "bumbling and buzzing" as the words are onomatopoetic, but I did not anticipate the similarities in the other pairs; is much of language more onomatopoetic than we realize?

A.2. "Rhythm: Actions/Reactions Log"

Experiment: Rhythm

SEED QUESTIONS:

- Do any traditional metrical units occur in the poem? If so, where? What effects, if any, does the use of particular metrical units create? Where are the most interesting or effective uses of metrical units? Are there places where the rhythmic flow seems to change? How does the arrangement of stressed and unstressed syllables affect your impressions of the poem's tone?
- How many complete sentences does the poem contain? How do the rhythm phrases relate to the clause(s)? How do the clauses and rhythm phrases contribute to the movement of the poem? Where do the full stops occur? Is there any significance in their positions?
- How do the pauses function? Where do lines carry a thought over to the next line of text? What is the effect of the extension? How do the stanzas relate to each other and to the poem as a whole?
- How does your understanding of the poem's rhythm change the way you read it aloud?

Actions	*Observations*
Clicked on "Layers"; looked for sentences; noted end punctuations	The whole poem is one sentence; first line is an apostrophe in which the speaker addresses the vowels; second line is the message to the vowels – that the speaker will force the vowels to give up their secrets, to speak; the remainder comprises a series of phrase images that either illustrate a process or a state of being, either the stages of giving up secrets or the ambiguity of feeling rage on one level, calm on another, and ecstasy on another; the phrases complete the thought initiated in the opening two lines Three of the five end punctuation marks occur in stanza two; not surprising as this stanza is the one that expresses rage to the level of insanity; the frequent stops contribute to the sense of breaking;
Read the poem aloud; paid close attention to the weighted syllables; looked for repeating metrical units	Generally meter is irregular but varied metrical units appear throughout the poem sometimes in isolation and sometimes grouped with other similar or different units; the first line is all stressed syllables in spondaic pairings until the last syllable, which is unstressed; second line is mainly in trochaic metrical units until the end which is in dactylic; both open with a stressed syllable; along with the opening line of stressed syllables, the pattern creates a heavy, forceful tone; the use of spondaic, trochaic, and dactylic stresses continues in the last two lines of the stanza; second stanza continues an emphasis on stressed syllable with line three maintaining a strict trochaic pulse until the end when the line shifts to a anapestic metrical unit; effect of this change is to put a strong emphasis on the word "face," which is the word at the center point of the poem; the "U" in the first line of stanza three is followed by an iambic metrical unit plus a trochaic unit – gives a rolling effect and an upward reach that is reinforced by two anapestic units; the metrical change marks a tonal change from rage to rest – calm but not joyful, still weighed down as indicated by the trochaic last line; stanza four opens with the same pattern as stanza three; the middle of line three begins an iambic/anapestic series that returns to and ends with an uplifting tone; opening lines of stanzas three and four are my favorite lines in the poem – just like the feel of them, the sensation of movement that they generate
Observed pauses and lines that continue a thought in the next line of text; determined rhythm phrases	Identifying rhythm phrases requires consideration of individual words, stressed and unstressed syllables, metrical units, and punctuation; a rhythm phrase won't separate a word; it won't break

	a metrical unit; it won't include a punctuation mark somewhere in the middle; it won't transect stanzas; it will usually contain one or more stressed syllables and one or more unstressed syllables – an exception might be a rhythm phrase containing two stressed syllables as in a spondaic metrical unit; it can contain more than one metrical unit; it can be as short as two words or it can span a line; a number of options exist for determining the rhythm phrases, and I had to play with several different configurations before finding a final version with which I am happy; having found them, I think the poem begins to hold together and make more sense to me; in several places a thought carries over from one line to the next; the second line completes the thought of the first; line four completes the thought of line three; the opening of line five – which is also the opening line of stanza five – completes the thought of line four – the last line of stanza one; this enjambment links the first two stanzas into a one thematic whole, so I see the poem essentially as three stanzas – one of eight lines and two of three lines each
Arranged the poem by rhythm phrases – one phrase per line. Read the poem aloud to my group; listened to each group member read the poem	I read the poem in thought groups rather than in single words or by lines or even stanzas. For example, although the comma after "burst flies" calls for a brief pause only quick enough to steal a quick breath, I move quickly into the next line it continues the thought of the previous line: "burst flies bumbling and buzzing…" instead of: "…burst flies. Bumbling and buzzing…" The same kind of continuation occurs from the last line of stanza one and the first line of stanza two so that the division between the stanzas virtually disappears. I have a much more fluid reading of the opening lines of stanzas three and four – more rolling with an upward reach. Also, in the last line, instead of equally emphasizing "his" and "Eyes," I say "his" as unstressed and add weight to "Eyes" which turns the focus more toward the eye than the person.

Reactions:

1. I have always focused primarily on meter as being the essence of rhythm in poetry. Now I see that many interacting elements work together to influence the movement of the poem, and taking all of those elements into consideration facilitates the understanding and interpretation of the poem.

2. Identifying rhythm phrases reveals some of the nuances of the poem. For example, in line 16, "Silences traced in angels and astral designs" reads much differently than "Silences – traced in angels – and astral designs." The rhythm phrases isolate the word "silences" putting it in stark contrast to the "silent pregnancies" of line 2. One is the silence of repressed speech, and the other is the silence of fulfillment.

A.3. "Visual Annotation Blog: Actions/Reactions Log"

Experiment: Visual Annotation Blog

SEED QUESTIONS:

- What images do the words create?
- What image startled you the most? What made it so surprising?
- How do the images of the poem connect to each other: compare, contrast, cause, effect, sequence, paradox, describe, combine?
- How do the images change through the course of the poem?
- How do your visuals reflect the images of the poem?
- What treatments did you use to maximize the effects of the images?
- What picture/video did you see on the blog that intrigued you most? Why did it interest you?
- What other observations do you have?

Actions	*Observations*
I looked for images in the poem. Took pictures/videos against colored walls in my game room Searched internet for images; manipulated some for effect; created soundtrack for some	Images in poem: • Letters as fetus waiting to be called forth – ideas waiting to find expression – repressed memories seeking release ▪ Alpha • A forceful speaker – creator • A dark/black scene of repression/destruction/corruption with engorged stinging insects buzzing around ▪ Bombers and aftermath ▪ Black straightjacket • Stark seats of power – white – don't get their hands dirty – coldhearted – intimidating/imposing – a force that opposes expression/release ▪ Washington D.C. buildings; columnar ▪ White wall; fearful escape • Insanity – brutality – red – rage – insane or wild laughter – liberation ▪ Bloody face; insane laughter; skull spectrogram ▪ Breaking out; martial arts kick; beautiful lips • Translation to earthly peace/calm – weary but wise – nature – pastoral scene – green ▪ Cemetery ▪ Thought emerging – forehead • Take place among the gods – renaissance – creators – unity – blue – joy ▪ Crying soldier ▪ Cartwheel ▪ Omega Images for title, poet, year • Rimbaud portraits • Handwritten original • Drawings Franco-Prussian War I could add a photograph, shot with my phone, of giant red lips against a bright red wall in my game room. The room has brightly colored walls that correspond closely to the colors of the poem. The

	room might make a good setting for a series of photographs to use in an interpretation of the poem as a representation of the creative process rather than the healing release of repressed memories.

Reactions:

I keep coming back to the lines associated with red. "Face" is at the center of the poem, and somehow it seems more important than even the transitions in the last two stanzas. It is the place of breakthrough that makes the transformation possible. It was the word that had the most interesting sonic signature in the spectrograms of the poem. I snipped it, colorized it red, and put a soundtrack of insane laughter under it.

I pixelated and colorized the image of the soldier in the field to represent the translation to a different plain.

B.1. “Common Sounds of English”

16 vowel sounds			24 consonant sounds	
/A/	game		/b/	**b**a**b**y
/ah/	f**a**r		/d/	**d**ollar
/a/	c**a**p		/f/	**f**ine
/E/	b**e**l**ie**ve		/g/	**g**o
/e/	b**e**d		/h/	**h**appy
/I/	br**i**ght		/j/	fu**dg**e
/i/	f**i**t		/k/	**k**ing
/O/	b**o**ld		/l/	**l**ike
/aw/	t**au**ght		/m/	**m**ake
/oi/	b**oy**		/n/	**n**ews
/ow/	cr**ow**d		/p/	**p**lease
/or/	m**or**e		/r/	**r**ose
/U/	fl**u**te		/s/	**s**weet
/u/	g**oo**d		/t/	**t**ime
/uh/	**u**p		/v/	**v**ictory
/ur/	g**ir**ls		/w/	**w**ise
			/y/	**y**ou
			/z/	**z**oo
			/ch/	**ch**ance
			/sh/	**sh**out
			/th/	**th**ink
			/TH/	**th**em
			/ng/	si**ng**
			/zh/	vi**s**ion

Vowel Formations				
		Open	*Mid*	*Closed*
/A/	game		x	
/ah/	far	x		
/a/	cap	x		
/E/	believe			x
/e/	bed	x		
/i/	bright	x		
/i/	fit			x
/O/	bold		x	
/aw/	taught	x		
/oi/	boy		x	
/ow/	crowd	x		
/or/	more		x	
/U/	flute			x
/u/	good			x
/uh/	up		x	
/ur/	girl		x	

Consonant Formations				
Voiced		*Voiceless*		
	Plosive		*(air stopped then released in voiced or voiceless puff)*	
/b/		/p/		
/d/		/t/		
/g/		/k/		
Voiced	*Fricative*	*Voiceless*	*(air forced through a narrow space; voiced or voiceless)*	
/v/		/f/		
/TH/		/th/		
/z/		/s/		
/zh/		/sh/		
		/h/		
Voiced	*Affricate*	*Voiceless*	*(air stopped then forced through narrow space, voiced or voiceless)*	
/j/		/ch/		
Voiced	*Nasal*		*(air escapes through nose rather than mouth)*	
/m/				
/n/				
/ng/				
Voiced	*Approximant*		*(air dispersed in and escapes through mouth; lacks forces of other consonants*	
/w/				
/l/				
/r/				
/y/				

B.2. "Terms Associated with Sound"

Sound begins as an action that moves molecules. The moving molecules bump into other molecules, creating waves of molecules that travel through gaseous, liquid, or solid environments in peaks of high pressure and valleys of low pressure until they lose force or are blocked. The waves of molecules, when detected and processed by biological or mechanical listening devices, are perceived as sound. All three factors – the act that originally sets molecules in motion, the environment through which the molecular waves travel, and the physical properties of the listening device – shape the sound (JISC).

Acoustics: the study of how sound behaves in its three phases of origin, movement, and reception

Sine wave/waveform: a graph that shows variations of pressure in a sound wave over time

Spectrogram: computer-generated image that visualizes the pitch, volume, duration, and resonance of sound; the image is read from left to right; the height of a figure reflects the pitch of the sound, the intensity of its color indicates volume, its length represents duration; ladder-like parallel columns show resonance (Bioacoustical).

Frequency/pitch: the number of wave repetitions in a second (frequency) determines how high or law a sound is (pitch).

Amplitude/volume: amplitude – the measure of sound level displacement in a sine wave – relates to the intensity of sound that is perceived as loudness (volume); loudness is measured in decibels

Duration: length of a sound

Harmonics/resonance: layers of sound that comprise what is perceived to be a single sound; a tone and its overtones

Timbre: subjective, non-technical terms that describe the qualities of a sound; it might be bright or muted, warm or piercing or any number of other perceived qualities

(Definitions paraphrased from JISC Digital Media's "Guide to the Physical Principles of Sound" and Cornell University's "Raven Lite 1.0 User's Guide.)

B.3. “Rhythm”

Definition: Rhythm is the sensation of movement that a poet creates by applying emphasis, duration, and sometimes repetition to the arrangement of sound, silence, and space. Rhythmic units might occur independently or in patterns.

Language systems that interact to create rhythm:

Organic
- Phonemes
- Syllables
  - Stressed
  - Unstressed
- Words

Syntactic
- Rhythm phrases
  - Natural groupings
- Clauses
  - Dependent
  - Independent
- Punctuation
  - Period
  - Semicolon
  - Question mark
  - Exclamation point
  - Comma
  - Colon

Poetic
- Metrical patterns
  - Iamb iambic (sS)
  - Anapest anapestic (ssS)
  - Trochee trochaic (Ss)
  - Dactyl dactylic (Sss)
  - Spondee Spondaic (SS)
- Caesura
  - Dash
  - Ellipsis
  - Space
- Lines
- Continuation
- Stanzas

B.4. “Rhyme”

Definition: In its simplest form, rhyme is the repetition of a sound in two or more words.

Types: Poets use many types of rhyme. Some scholars count as many as twenty. Types depend on various relationships between vowels and consonants, stressed and unstressed syllables. Some common types of rhyme are:

True/perfect/full/exact: stressed vowel sound and the sounds that follow it in a word match the sounds that follow the same pattern in another word

Identical: two or more words match in all sounds or the same word is repeated as a rhyming word

Slant/approximate: two or more words have similar but not matching sounds

Alliteration: repetition of initial consonant sounds in two or more words that are close to each other

Consonance: repetition of consonant sounds regardless of their position in words

Assonance: repetition of vowel sounds regardless of their position in words

Position: A word within a line, rhyming with the word at the end of the line, is called internal rhyme. Two or more lines closing with syllables that rhyme is end rhyme.

Function: Rhyme creates a pleasing effect. It also contributes to the shape of a poem. Rhyme can unify the poem by linking a line to lines before and/or after it.

Rhyme scheme: a rhyming pattern

B.5. “Research Links: Biography, History, Literature”

Biography

http://biography.yourdictionary.com/jean-nicolas-arthur-rimbaud

https://www.britannica.com/biography/Arthur-Rimbaud

http://www.mag4.net/Rimbaud/Biography.html

https://www.poetryfoundation.org/poems-and-poets/poets/detail/arthur-rimbaud

https://www.poets.org/poetsorg/poet/arthur-rimbaud

https://en.wikipedia.org/wiki/Arthur_Rimbaud

History

http://francoprussianwar.com/

http://history-world.org/franco_prussian_war.htm

http://www.newworldencyclopedia.org/entry/Franco-Prussian_War

Literature

http://www.frenchtoday.com/french-poetry-reading/voyelles-arthur-rimbaud-french-poetry-audio

- Hear the poem read in French

https://www.britannica.com/art/Symbolism-literary-and-artistic-movement

http://www.world-class-poetry.com/symbolism-poetry-movement.html

https://www.poetryfoundation.org/

- Browse “Poems & Poets”
  - Under “Poems,” see “Poetic Terms”
  - Under “Poets,” see representative poems of Baudelaire, Mallarmé, Verlaine, Rimbaud

PLEASE ADD USEFUL LINKS THAT YOU DISCOVER DURING YOUR RESEARCH

C.1. Instructions to programmer for “Rhyme”

Part I: Coding Instructions:

1. An instructions box spans the top of the page.

   Instructions: Select “Sounds” to see the sounds listed and colored in order of the frequency with which they are used in the poem. Click on a sound in the list to see all occurrences of that sound colorized in the poem. Click again on the same sound in the list to undo the color. “Color All” will colorize the entire poem at once. Select “Scheme” to indicate the rhyme scheme. (See “Rhyme” in “Resources.”) Document your work in your log and save screenshots of your results.

2. The poem text box is on the left; two command buttons are under the poem in the poem text box: SOUNDS and SCHEME; the phase box is on the right.

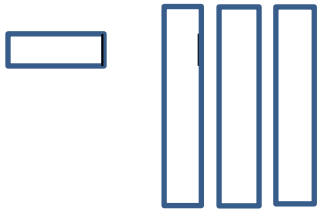
3. Mediator clicks on SOUNDS in the poem text box: two text boxes appear in the phase box; on the left side in a wide box is a phonetic transcription of the poem; on the right side in a narrow box is a list of the phonetic symbols for each English sound that occurs in the poem; the number of occurrences of that sound in the poem appears beside the phonetic sound in the list; the list is ordered from most frequently occurring to least; the list is color-coded; at the bottom of the list of sounds are a “Color All” and a “Reset” button.

   Mediator clicks on a sound in the list; each occurrence of that sound is colorized in the transcribed poem in the matching color code; click again on the sound in the list to undo the colorization; user may click on “Color All” to see all sounds colorized at the same time.

4. Mediator clicks on SCHEME. The text (not the phonetic transcription) of the poem appears in the phase box. At the end of each line are three boxes. Mediator should be able to click

on the box and a list of letters A through Z appears in a dropdown menu. The mediator should be able to click on a letter and the letter appears in the box.

Example:

Black A, white E, red I, green U, blue O – vowels, 

Part II: Vowels – Phonetic Transcription

/b/l/a/k/ /A/ /w/I/t/ /E/ /r/e/d/ /I/ /g/r/E/n/ /y/U/ /b/l/U/ /O/ /v/ow/w/uh/l/z/
/s/uh/m/ /d/A/ /I/ /w/i/l/ /O/p/e/n/ /y/u/r/ /s/I/l/e/n/t/ /p/r/e/g/n/uh/n/s/E/z/
/A/ /b/l/a/k/ /b/e/l/t/ /h/e/r/E/ /w/i/th/ /b/ur/s/t/ /f/l/I/z/
/b/uh/m/b/l/E/ng/ /e/n/d/ /b/uh/z/E/ng/ /O/v/ur/ /s/t/E/ng/k/E/ng/ /k/r/U/e/l/t/E/z/

/p/i/t/s/ /uh/v/ /n/I/t/ /E/ /k/e/n/d/or/ /uh/v/ /s/e/n/d/ /e/n/d/ /p/uh/v/i/l/y/uh/n/z/
/h/I/ /g/l/A/sh/uh/l/ /s/p/E/r/z/ /w/I/t/ /k/E/ng/z/ /t/r/e/m/b/l/E/ng/ /k/w/E/n/ /e/n/z/ /l/A/s/
/I/ /b/l/uh/d/E/ /s/p/i/t/l/ /l/a/f/t/ur/ /d/r/i/b/l/E/ng/ /f/r/uh/m/ /A/ /f/A/s/
/i/n/ /w/I/l/d/ /d/E/n/I/y/uh/l/ /or/ /i/n/ /A/ng/g/ur/ /v/ur/m/i/l/y/uh/n/z/

/y/U/ /d/i/v/I/n/ /m/U/v/m/e/n/t/ /uh/v/ /v/i/r/i/d/i/y/uh/n/ /s/E/z/
/p/E/s/ /uh/v/ /p/a/s/ch/ur/z/ /a/n/i/m/uh/l/ /s/t/r/U/n/ /p/E/s/ /uh/v/ /k/ah/l/m/ /l/I/n/z/
/d/r/aw/n/ /aw/n/ /f/or/h/e/d/z/ /w/or/n/ /w/i/th/ /h/e/v/E/ /a/l/k/i/m/E/z//

/O/ /s/U/p/r/E/m/ /t/r/uh/m/p/e/t/ /h/ah/r/sh/ /w/i/th/ /s/t/r/A/n/j/ /s/t/r/I/d/e/n/s/E/z
/s/I/l/e/n/s/e/z/ /t/r/A/s/t/ /i/n/ /a/s/t/r/uh/l/ /d/E/z/I/n/z
/O/ /O/m/A/g/uh/ /TH/uh/ /v/I/y/O/l/e/t/ /l/I/t/ /uh/v/ /h/i/z/ /I/z/

Part III: Sound Frequency in "Vowels"

n	11
l	29
E	25
uh	24
t	24
s	24
e	21
z	21

r	20
l	20
i	20
d	16
v	15
m	12
A	11
b	11
p	11
w	10
k	9
ng	8
y	8
a	7
O	7
U	7
ur	6
h	6
g	5
f	4
or	4
th	3
ah	2
aw	2
sh	2
ow	1
j	1
ch	1
TH	1
u	1
oi	0
zh	0

Part IV: Color Assignments

Open vowels: **bright background fill with black type**

/ah/	cc66ff
/a/	ff3399
/ow/	ffcc06
/e/	6699ff
/I/	ffff00
/aw/	00cc99
/or/	ccccff

Mid vowels: **dark background fill with white type**

/A/ 000066
/O/ 006666
/uh/ 336600
/ur/ 663300
/oi/ 660033

Closed vowels: **no background fill; darkly colored letters**

/E/ 006600
/i/ cc3300
/U/ 990033
/u/ 000999

Voiced Plosive Consonants: **bright background fill with black type**

/b/ 00cc00
/d/ 33cccc
/g/ ff0066

Voiceless Plosive Consonants: **no background fill; colored type only**

/p/ 00cc00
/t/ 33cccc
/k/ ff0066

Voiced Fricative and Affricate Consonants: **dark background fill with white type**

/v/ 990000
/TH/ 269900
/z/ 002699
/zh/ 996600
/j/ 006666

Voiceless Fricative/Affricate Consonants **no background fill; colored type only**

/f/ 990000
/th/ 269900
/s/ 002699
/sh/ 996600
/ch/ 006666
/h/ 660066

Nasal consonants: **colored background fill with white type**

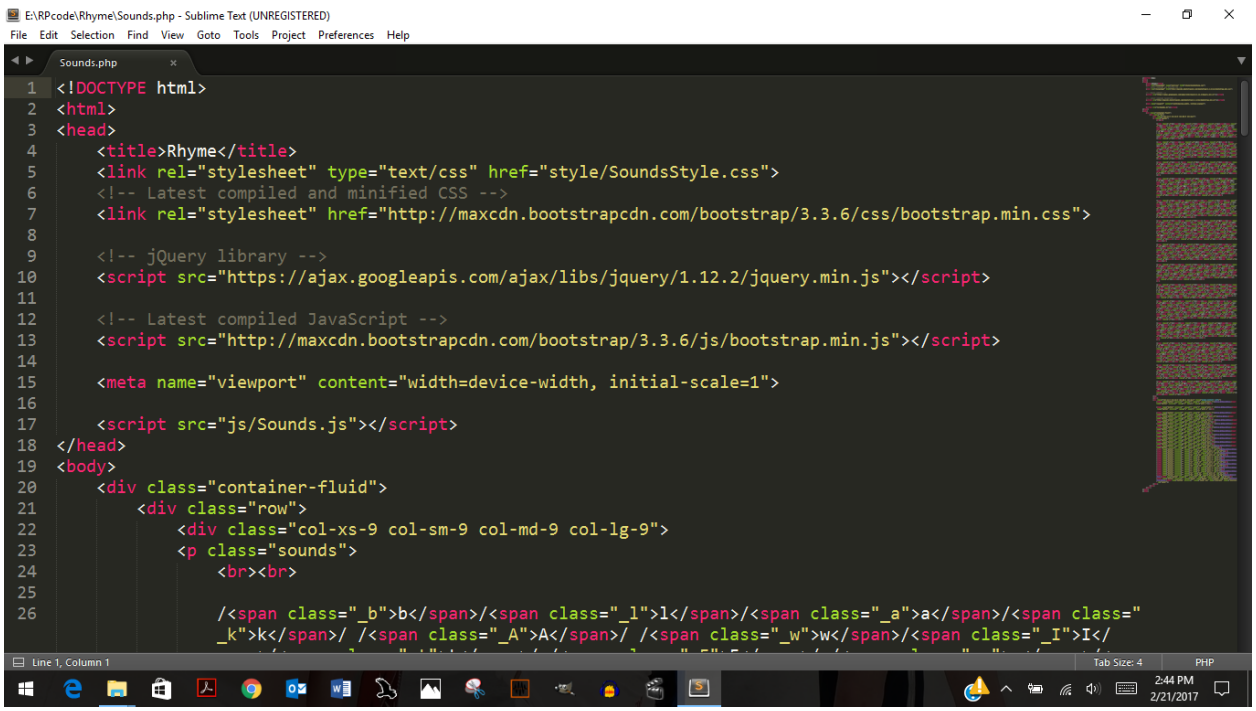
/m/ ff0000
/n/ 33cc33
/ng/ 0040ff

Approximant consonants: **colored background fill with white type**

/w/ 737373
/l/ 000000
/r/ 404040
/y/ 969696

C.2. Code for “Rhyme”

Full code for “Rhyme” has been uploaded as a supplemental file.



C.3. Demonstration video

The demonstration video has been uploaded as supplemental file.

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BIOGRAPHICAL SKETCH

A native Texan, Amy Simpson graduated from Bryan Adams High School and later earned a Bachelor of Arts degree at the University of North Texas. Before returning to academic studies in which she completed the Master of Arts from Dallas Theological Seminary, Amy served as a research/writer for several historical associations in the Dallas/Ft. Worth metroplex. For the past twenty-five years, she has taught English in various settings ranging from junior high to college and private to public schools. She has also worked as a consultant in English studies for the Center for Educational Revision and the National Math and Science Initiative. Currently she teaches Advanced Placement Literature for the Garland Independent School District at Rowlett High School.

CURRICULUM VITAE

Amy Simpson
Rowlett High School
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Education

BA	1970	University of North Texas
MA	1994	Dallas Theological Seminary
PhD	2017	University of Texas at Dallas

Certifications

State of Texas English Language Arts and Reading 8-12
State of Texas English as a Second Language 8-12 Supplemental
State of Texas Gifted and Talented 8-12 Supplemental

Teaching Experience

2015 – present	Rowlett High School – English teacher
2015 – present	Eastfield College – English adjunct faculty
2014 – 2015	MacArthur High School – English teacher
2004 – 2014	North Garland High School – English teacher
2010 – 2014	Richland College – English adjunct faculty
1995 – 2003	Rockwall Christian Academy – English teacher; Academic Dean
1994 – 1996	Eastfield College – English as a Second Language adjunct faculty
1992 – 1995	Dallas Theological Seminary – ESL adjunct faculty

Professional Memberships

Association of Texas Professional Educators
Modern Language Association
National Council of Teachers of English
The Association for Computers and the Humanities